

ICT INTEGRATION FRAMEWORK IN TRAINING PUBLIC SERVANTS IN KENYA: A CASE OF THE KENYA SCHOOL OF GOVERNMENT

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Abstract: *The integration of Information and Communication Technology in higher education has become essential for enhancing teaching, learning, and administrative efficiency. However, in Kenya, adoption remains low due to infrastructural limitations, financial constraints, and the absence of standardized digital training policies. This study examined the factors influencing the integration of ICT at the Kenya School of Government, and developed a practical framework tailored to public service training. A descriptive survey research design was employed, targeting 439 participants comprising trainers, IT staff, and trainees from the KSG Nairobi and Baringo campuses. A sample size of 209 was determined using Yamane's formula and selected through proportionate stratified random sampling method. A total of 203 responses were obtained, resulting in a 97% rate. Data was collected using a semi structured questionnaire, with content validity ensured through expert review and reliability established through a pilot study. The findings revealed that user-related factors, especially age, influence ICT competency and attitudes, while organizational support and resource allocation significantly affect integration success. Based on these findings, a framework was developed and evaluated through expert review. The study recommends policy reform, strategic resource planning, and stakeholder engagement to support sustainable integration efforts aligned with national development goals.*

Keywords: *ICT, ICT integration, Training, Factors influencing ICT integration*

1.0 Introduction

Information and Communication Technology (ICT) has significantly transformed education, business, communication, and governance globally (Bahrini & Qaffas, 2019). ICT is increasingly recognized in the education sector for its potential to improve access to learning resources and create innovative teaching and training methodologies (Saif et al., 2022). However, as Gottschalk and Weise (2023) note, the mere presence of ICT tools does not automatically enhance learning outcomes unless guided by strategic implementation. Without careful integration, ICT can inadvertently widen existing disparities.

Effective training is a cornerstone for institutional performance and national development, especially in the public sector. Akpalu and Markom (2022) assert that such training equips civil servants with the competencies necessary for efficient governance. Similarly, Allawi et al. (2020), Elhadi (2021), Wang'ombe et al. (2019),

and Williams et al. (2020) emphasize that investing in the continuous development of public servants directly influences policy implementation and service quality.

In Kenya, the Kenya School of Government (KSG), established under the KSG Act No. 9 of 2012 and aligned with Kenya Vision 2030, plays a pivotal role in building capacity within the public sector through training, consultancy, and research (Nyambura et al., 2023). Onyango et al. (2021) and Ominde et al. (2021) highlight ICT's transformative role in enhancing the efficiency, relevance, and accessibility of public sector training. As a leading institution mandated with capacity building for public servants, KSG has a strategic opportunity to leverage ICT to modernize its training programs and improve service delivery.

The institution comprises of five campuses: Nairobi (Lower Kabete), Baringo (Baringo County), Embu (Embu County), Matuga (Kwale County), and Mombasa (Mombasa County). These campuses serve as key training centers for public servants nationwide. Each campus is strategically positioned to facilitate accessibility for public servants from various regions, ensuring a localized approach to governance training. The Nairobi campus, being the main campus, hosts a wide range of programs and workshops, aiming to foster collaboration among public officials (Opondo et al., 2021). This decentralization allows for targeted training that addresses the unique challenges and opportunities faced by various counties, thereby promoting improved public service delivery across Kenya (Ndubai et al., 2016).

Despite the recognized benefits, ICT integration in training institutions like KSG faces numerous barriers. These include infrastructural limitations, unreliable internet connectivity, budget constraints, and the absence of a unified national policy on digital learning (Kumari & Srivastava, 2023). Furthermore, low digital literacy and insufficient learner motivation present additional hurdles to meaningful ICT adoption.

To bridge these gaps, it is imperative to identify and analyze the specific factors influencing ICT integration within KSG. This involves examining both internal and external attributes such as organizational readiness, user competence, resource availability, and policy frameworks and assessing their impact on the success or failure of ICT initiatives. Scholars such as (Tiwari, 2024), Nabin (2023), Kumar (2022), Adrien (2021), and Barakabitze et al. (2019) emphasize the importance of developing comprehensive ICT integration frameworks that align digital tools with institutional training goals while ensuring adaptability and sustainability.

Moreover, Kenya's Vision 2030 recognizes ICT as a driver of national development, underscoring the urgency for collaborative efforts, policy innovation, and targeted investments in public sector training (Gitonga & Moyi, 2019; Oduol, 2023). By systematically exploring the factors that influence ICT integration at KSG, this study aims to provide actionable insights that can inform future strategy, enhance training delivery, and ultimately contribute to a more capable and digitally empowered public service.

1.1 Statement of the problem

Despite significant investments in ICT, public service training institutions in Kenya continue to face challenges in effectively integrating technology into their instructional models. Key barriers include inadequate infrastructure, policy misalignment, and limited user capacity (Kimani, 2017; Mukuna, 2014; Cabunoc & Ubayubay, 2024). These limitations undermine the quality and relevance of public service training, with broader implications for governance and service delivery. Existing efforts largely emphasize technological acquisition rather than alignment with pedagogical needs or institutional readiness. This study seeks to address this gap by developing a strategic ICT integration framework tailored to the unique needs of a Kenyan institution mandated to train public servants. By focusing on policy support, organizational structures, and

stakeholder engagement, the research aims to enhance ICT uptake and improve training quality in alignment with Kenya's Vision 2030.

1.2 Objectives of the Study

The specific objectives of the study were;

- i. To identify and analyze the factors influencing ICT integration in the Kenya School of Government, including their attributes and impact.
- ii. To develop an ICT integration framework in training public servants at the Kenya School of Government.
- iii. To evaluate the ICT integration framework.

2.0 Literature Review

This literature review explores ICT integration in public service training, examining theoretical frameworks, existing models, and empirical research to identify key factors influencing adoption globally and in Kenya. Analyzing best practices and contextual challenges aims to establish a strong foundation for developing an effective ICT integration framework and provide insights that inform a tailored approach to enhancing ICT use in public service training.

2.1 Review of existing Frameworks

The Community of Inquiry (CoI) Framework (Purwandari et al., 2021) highlights social, cognitive, and teaching presence but offers limited attention to technology-mediated interactions and the broader sociocultural and institutional factors affecting ICT integration (Krzyszowska et al., 2021). Its abstract nature and lack of practical guidelines also hinder implementation. The Open Education Resources (OER) Framework (Tlili et al., 2023), developed by UNESCO in 2002, promotes free access to quality education through open-licensed materials. Despite its popularity, OER faces challenges in resource-constrained settings due to dependence on digital infrastructure and connectivity (Huang et al., 2020). Digital Competency Frameworks guide the development of 21st-century digital skills and offer structured, adaptable approaches for ICT integration in education (Mattar et al., 2022). However, inconsistencies in terminology and assessment standards (Chohan et al., 2022), along with rapid technological changes, limit their long-term applicability. The UNESCO ICT Competency Framework for Teachers (Mtebe, 2020) supports structured ICT use but is hindered by resource limitations (Guitert et al., 2020). In Kenya, a tailored, stakeholder-driven approach is necessary to address local constraints. Overall, existing frameworks highlight valuable principles but fall short in addressing the contextual challenges of ICT integration in Kenyan public service training. A more inclusive, dynamic, and locally relevant framework emphasizing stakeholder engagement, capacity building, and ongoing support is essential for sustainable digital transformation.

Furthermore, the implementation of pedagogical frameworks such as Technological Pedagogical Content Knowledge (TPACK) has been shown to enhance educators' capability to integrate ICT into their teaching, fostering a more interactive learning atmosphere (Tran et al., 2020; (Tondeur et al., 2013) Alayyar et al., 2012). By focusing on the intersection of technology, pedagogy, and content knowledge, the Kenya School of Government can cultivate pre-service teachers who are proficient in using technology and adept at applying it

strategically to enhance student learning outcomes. This integration approach is increasingly relevant in the era of Industry 4.0, where technological literacy is crucial for both educators and learners (Tondeur et al., 2013).

2.2 Conceptual Framework

The conceptual framework (Figure 1) aims to illustrate the connections between variables (Orodho, 2005). Mugenda and Mugenda (2003) explain that a conceptual framework visually represents the relationship between variables in the study. The conceptual framework illustrates the key factors influencing ICT integration in public service training at the Kenya School of Government, highlighting their attributes and impact. ICT integration is modeled as the dependent variable, influenced by three categories of independent variables: User, Organization, and Technology.

User factors such as gender, age, ICT competence, attitudes, perceptions, and professional development determine the readiness and willingness of trainees and trainers to adopt ICT.

Organizational factors including ICT policies, digital resource availability, accessibility, quality, and usability reflect the institutional capacity to support technology-enabled learning.

Technological factors like internet reliability, device availability, and ICT infrastructure status directly affect the feasibility and efficiency of ICT use in training.

Resources—comprising ICT budgets, funding sources, review frequency, and technical support—act as a moderating variable, strengthening or weakening the relationship between these independent factors and ICT integration. Collectively, the framework demonstrates that successful ICT adoption at KSG depends on the synergy between user readiness, organizational support, technological capacity, and sustained resource allocation.

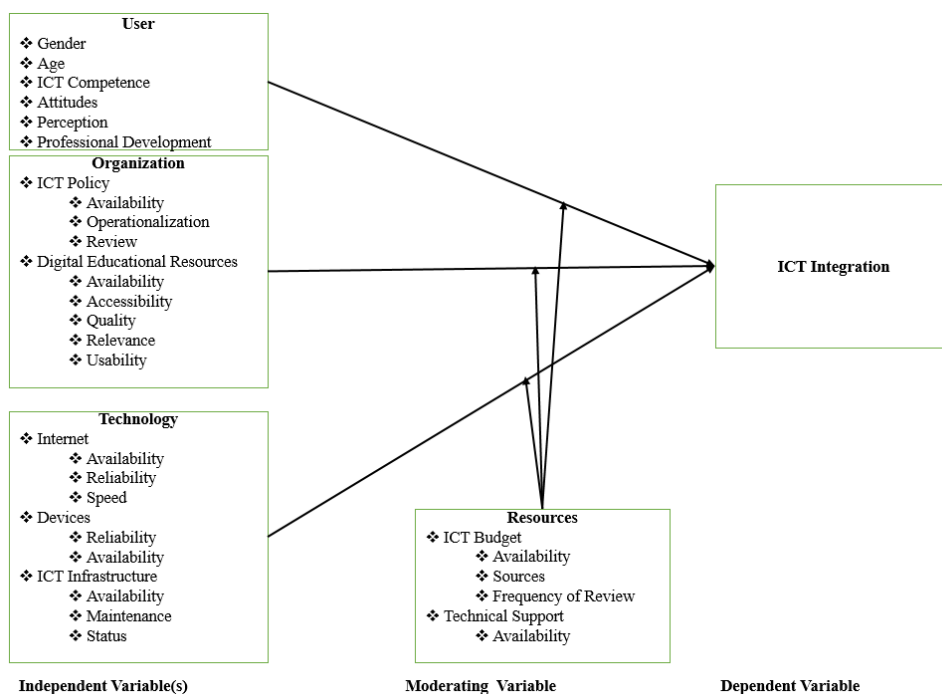


Figure1: Conceptual Framework

2.3 Research Gaps

The research gap identified in the literature is the lack of frameworks that account for the broader sociocultural contexts, institutional factors, infrastructure limitations, and resource constraints affecting ICT integration in training institutions, particularly in settings like Kenya. Existing frameworks, such as the CoI, OER, and UNESCO ICT Competency Framework, fail to fully address these external factors and the rapidly changing technological landscape. Additionally, there is a need for dynamic and evolving frameworks that can adapt to the fast pace of technological advancements while also considering the practical challenges related to limited access to professional development and resources for educators. Further research should focus on developing more inclusive, adaptable, and context-specific ICT integration frameworks that bridge these gaps and enhance the effectiveness of ICT-enabled training programs.

3.0 Research Methodology

This study employed a descriptive survey research design, which, as noted by Deckert and Wilson (2023), facilitates the collection of both qualitative and quantitative data for a comprehensive understanding of complex phenomena. The study targeted two campuses, Nairobi and Baringo. The target population comprised all trainers and ICT staff from KSG Nairobi and Baringo Campuses, 52, and trainees admitted to the two campuses, amounting to 387 as of 2024 (KSG, 2024). Therefore, the total target population for the study was 439. A sample size was determined using the formula devised by Yamane (1967) formula and selected through proportionate stratified random sampling procedure since the target population is less than 10,000 (Henry, 1990).

Sample size $n = N / (1 + N(e^2))$

Where;

N is the population size

n is the sample size

e is the level of precision /standard error

Hence: $n = 439 / (1 + 439(0.05)^2) = 209$

Trainers and ICT staff provided insights into instructional practices and technological infrastructure, while trainees assessed service quality and overall satisfaction, allowing the study to capture diverse stakeholder perspectives across contrasting contexts.

Data was collected using a semi-structured questionnaire designed to elicit information on latent variables such as perceptions, attitudes, and experiences. Content validity was ensured through expert review and iterative refinement, while instrument reliability was verified through a pilot study involving 10% of the sample (24 participants). The questionnaire was administered online via Google Forms, facilitating the collection of both qualitative and quantitative data.

The study adhered strictly to ethical standards. Approvals were obtained from the KSG Director and the National Commission for Science, Technology and Innovation (NACOSTI). Participants were provided with an introductory letter outlining the study's objectives, their rights, and assurances of confidentiality. Informed

consent was obtained prior to participation. Notably, this study was conducted independently and does not form part of the institution’s official review processes.

The collected data was analyzed using SPSS, a statistical software commonly used for data management and analysis. Descriptive statistics, including frequencies, means, and standard deviations, were computed to summarize the dataset. Inferential statistics, such as correlation and regression analysis, were also conducted to examine relationships between variables.

4.0 Results and discussions

Out of the 209 expected responses, 203 were received, resulting in a response rate of 97%. This high response rate reflects strong engagement and ensures that the research findings are representative. The gender distribution among the respondents was nearly balanced, indicating fair gender representation. Most respondents (79) were between 30 and 39 years old, while the least represented group was those aged 60 years and above, comprising only 2 respondents. This age distribution suggests that the participants possessed the maturity and experience necessary to provide authoritative answers.

Regarding campus representation, 61% of participants were from the Nairobi Campus, while 39% were from the Baringo Campus, indicating a fair distribution across the two locations. A significant portion of respondents (124) held a bachelor's degree, followed by 56 who had completed a master's degree. Additionally, there were 12 diploma holders, 8 doctorate holders, 2 higher diploma holders, and 1 postgraduate diploma holder. This illustrates that the participants had an adequate level of education to comprehend and respond to the study questions effectively. The respondents also varied in terms of years of service: 55 had 1 to 5 years of service, 49 had more than 15 years, 39 had less than a year, 31 had 11 to 15 years, and 29 had 6 to 10 years of service. This diversity in experience contributes to the overall depth of the study.

4.1 Key Findings on Factors Influencing ICT Integration in Public Service Training in Kenya

This study identified four critical categories of factors influencing ICT integration: user factors, organizational factors, technological factors, and resource factors.

User Factors

ICT Competency: Overall competency was strong (mean = 4.22), but decreased with age ($r = -0.649$ for staff, $r = -0.343$ for trainees). Gender did not significantly influence ICT skills.
Perceptions and Attitudes: Positive perceptions and attitudes toward ICT were noted, but both declined with increasing age. Gender again showed no significant effect.
ICT Professional Development: A gap in advanced ICT training exists across all user groups. Barriers included missed training opportunities due to unawareness or lack of management support.

Table 1: Relationship between User Factors and ICT Integration

		USER Factors	ICT Integration
USER Factors	Pearson Correlation	1	.273**
	Sig. (2-tailed)		.000
	N	203	203

ICT Integration	Pearson Correlation	.273**	1
	Sig. (2-tailed)	.000	
	N	203	203

** . Correlation is significant at the 0.01 level (2-tailed).

Impact on ICT Integration: A weak, statistically significant positive correlation ($r = 0.273$; $p > 0.01$) suggests user factors, while important, are less influential compared to organizational and technological factors.

Organizational Factors

The study examined the organizational factors that affect ICT integration in learning. Descriptive statistics were utilized to analyze the data, and results were displayed as appropriate. The analysis of the organizational factors are shown in Table 2 below.

Table 2: Organization Factors Analysis

Indicators	Minimum	Maximum	Mean
ICT tools and resources effectively enhance the learning experience for both lecturers and students.	1.00	5.00	4.33
ICT tools significantly improve administrative and operational processes at the KSG.	1.00	5.00	4.31
The digital resources provided are relevant to the curriculum and training needs at the KSG	1.00	5.00	4.13
Lecturers find digital resources easy to use and integrate into their teaching methods.	1.00	5.00	4.07
Digital educational resources (e.g., online courses, and databases) are easily accessible to lecturers and staff.	1.00	5.00	4.05
The digital resources available are of high quality and meet educational standards.	1.00	5.00	3.99
My institution provides adequate support for using ICT in teaching.	1.00	5.00	3.93
The KSG has a clearly defined ICT policy that guides its operations and educational initiatives.	1.00	5.00	3.92
The ICT policy is effectively implemented and integrated into daily operations and teaching practices	1.00	5.00	3.88
The ICT policy is regularly reviewed and updated to adapt to technological advancements and changing educational needs.	1.00	5.00	3.82
Valid N (listwise)	203		

Institutional Support: High mean scores (around 4.04) reflected strong use of ICT tools in learning and administration.

ICT Policy: Strong frameworks exist but need more frequent updates to stay aligned with technological changes.

Digital Resources: Resources are accessible and relevant but require continuous quality improvements.

Table 3 shows the relationship between organization factors and ICT integration.

Table 3: Relationship between Organization Factors and ICT Integration

		ICT Integration	Organization Factors
ICT Integration	Pearson Correlation	1	.727**
	Sig. (2-tailed)		.000
	N	203	203
Organization Factors	Pearson Correlation	.727**	1
	Sig. (2-tailed)	.000	
	N	203	203

** . Correlation is significant at the 0.01 level (2-tailed).

Impact on ICT Integration: A strong positive correlation ($r = 0.727$; $p < 0.01$) shows that leadership, policy, and resource allocation significantly drive ICT adoption.

Technological Factors

The study sought to examine the technological factors which affect ICT integration in learning. Descriptive statistics were utilized to analyze the data, and results were displayed appropriately in Table 4 below.

Table 4: Technological Factors Analysis

Indicators	Minimum	Maximum	Mean
The availability of Internet access during training sessions is sufficient	1.00	5.00	3.93
The Internet connectivity is reliable during training sessions.	1.00	5.00	3.83
The speed of the Internet connection is adequate for training purposes.	1.00	5.00	3.77
The devices provided (e.g., desktops, laptops, tablets) are reliable during training sessions.	1.00	5.00	3.68
The devices provided (e.g., desktops, laptops, tablets) are reliable during training sessions.	1.00	5.00	3.81
The devices provided are easy to use.	1.00	5.00	3.93
I am satisfied with the overall availability of ICT infrastructure for training purposes.	1.00	5.00	3.81
The ICT infrastructure is maintained regularly.	1.00	5.00	3.81
The current status of ICT infrastructure at the School is up-to-date.	1.00	5.00	3.79
Valid N (listwise)	203		3.81778

Internet and Infrastructure: Availability (mean = 3.93) and reliability (mean = 3.83) of internet were crucial enablers. Device availability was good but reliability needs improvement.

Table 5 shows the relationship between the technological factors and ICT integration.

Table 5: Relationship between Technological Factors and ICT Integration

		ICT Integration	Technological Factors
ICT Integration	Pearson Correlation	1	.765**
	Sig. (2-tailed)		.000
	N	203	203
Technologic al Factors	Pearson Correlation	.765**	1
	Sig. (2-tailed)	.000	
	N	203	203

** . Correlation is significant at the 0.01 level (2-tailed).

Impact on ICT Integration: Technological factors had a strong positive and significant correlation ($r = 0.765$; $p < 0.01$) with ICT integration, stressing the importance of stable internet, reliable devices, and updated infrastructure.

Resource Factors as a moderating variable

The study examined the resources and their impact on ICT integration in learning. Descriptive statistics were utilized to analyze the data, and the results were displayed appropriately in Table 6 next page.

Table 6: Resources Analysis

Indicators	Minimum	Maximum	Mean
There is a need for additional funding sources to enhance ICT-enabled training.	1.00	5.00	4.22
The technical support team is readily accessible for addressing ICT-related issues in training.	1.00	5.00	3.92
The quality of technical support provided for ICT-enabled training is satisfactory.	1.00	5.00	3.91
I am satisfied with the overall technical support for ICT integration in training.	1.00	5.00	3.78
The technical support team receives adequate training and updates on new technologies to support ICT-enabled training effectively.	1.00	5.00	3.77
The frequency of ICT budget reviews positively impacts the effectiveness of ICT integration in training.	1.00	5.00	3.75
The ICT budget is effectively utilized for training purposes.	1.00	5.00	3.5
The frequency at which the ICT budget is reviewed is appropriate for maintaining effective ICT integration in training	1.00	5.00	3.46
The current ICT budget is sufficient to support ICT-enabled training.	1.00	5.00	3.26
The current sources of ICT funding (e.g., government, donor agencies, private sector) are adequate for supporting ICT-enabled training.	1.00	5.00	3.25
Valid N (listwise)	203		3.682

ICT Budget and Funding: While the need for funding scored high (mean = 4.22), concerns exist over sufficiency (mean = 3.26) and funding stability (mean = 3.25).

Technical Support: Support services were rated moderately high, but adequacy and training of technical staff require strengthening.

Table 7 shows the relationship between resources and ICT integration.

Table 7: Relationship between Resources and ICT Integration

		ICT Integration	Resources Factor
ICT Integration	Pearson Correlation	1	.762**
	Sig. (2-tailed)		.000
	N	203	203
Resources Factor	Pearson Correlation	.762**	1
	Sig. (2-tailed)	.000	
	N	203	203

** . Correlation is significant at the 0.01 level (2-tailed).

Impact on ICT Integration: A strong positive correlation ($r = 0.762$; $p < 0.01$) indicates that adequate financial and technical resources are essential for sustainable ICT integration.

The findings highlight that while user factors like competency and attitudes are important, organizational support, technological readiness, and resource availability are more decisive in driving effective ICT integration in public service training institutions like KSG. Addressing gaps in professional development, strengthening institutional frameworks, improving infrastructure, and securing stable funding will be critical to advancing ICT adoption in public service training in Kenya.

4.2. Regression Analysis Results

4.2.1. Model Summary

Multiple linear regression analysis was conducted to examine the influence of user factors, organizational factors, and technological factors on ICT integration, with resources introduced as a moderating variable.

The initial model (Model 1), without the moderating variable, produced an R Square value of 0.6536, indicating that user, organizational, and technological factors collectively explained 65.36% of the variance in ICT integration. Upon inclusion of resources as a moderator (Model 2), the R Square value increased to 0.7043, suggesting an improvement in the model's explanatory power. Thus, both the predictor variables and the moderating variable were determined to be significant predictors of ICT integration.

Table 8: Model Summary

Model	R	R Square	Adjusted R Square	Sig. F Change
1	0.808	0.6536	0.6484	0.000
2	0.839	0.7043	0.6953	0.000

Note. Model 1 = Without Moderation; Model 2 = With Moderation.

4.2.2. Analysis of Variance (ANOVA)

Analysis of variance was used to assess the overall significance of the models. The results indicated that both models were statistically significant ($p < 0.05$), confirming that the regression models were a good fit for the data.

Table 9: ANOVA Results

Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression: 72.500	3	24.167	125.18	0.000
	Residual: 38.419	199	0.193		
2	Regression: 78.122	6	13.020	77.807	0.000
	Residual: 32.800	196	0.167		

Note. Model 1 = Without Moderation; Model 2 = With Moderation.

Regression Coefficients and Interpretation

The following regression model with moderation was fitted:

$$Y=1.698-0.467X_1+0.682X_2+0.103X_3+0.140X_4-0.117X_5+0.051X_6$$

Where:

Y = ICT Integration

X₁ = User Factors

X₂= Organizational Factors

X₃= Technological Factors

X₄ = Interaction between User Factors and Resources

X₅ = Interaction between Organizational Factors and Resources

X₆ = Interaction between Technological Factors and Resources

Table 10: Regression Coefficients

Predictor	B	Std. Error	Beta	t	Sig.
(Constant)	1.698	0.235	—	7.225	0.000
User Factors (X ₁)	-0.467	0.155	-0.423	-3.006	0.003
Organizational Factors (X ₂)	0.682	0.296	0.609	2.305	0.022
Technological Factors (X ₃)	0.103	0.237	0.073	0.440	0.661
User Factors * Resources (X ₄)	0.140	0.042	0.430	3.317	0.001
Organizational Factors * Resources (X ₅)	-0.117	0.087	-0.310	-1.353	0.178
Technological Factors * Resources (X ₆)	0.051	0.069	0.110	0.747	0.455

Note. Dependent variable = ICT Integration.

Interpretation of Findings

User Factors (X₁): A one-unit increase in user factors led to a 0.467 unit decrease in ICT integration (p = 0.003). This negative and significant effect suggests that challenges related to user skills, attitudes, and professional development inhibit successful ICT integration.

Organizational Factors (X₂): A one-unit increase in organizational factors resulted in a 0.682 unit increase in ICT integration (p = 0.022), indicating that supportive organizational environments significantly promote ICT integration.

Technological Factors (X₃): Although a positive coefficient (0.103) was observed, the relationship between technological factors and ICT integration was statistically insignificant (p = 0.661). This suggests that

technology availability alone does not significantly enhance integration unless supported by user and organizational factors.

Interaction between User Factors and Resources (X_4): The interaction term was positive and significant ($B = 0.140$, $p = 0.001$), indicating that resources moderate the negative effect of user factors on ICT integration. Adequate resources can help overcome user-related challenges.

Interaction between Organizational Factors and Resources (X_5): Although a negative coefficient was observed ($B = -0.117$), the effect was not statistically significant ($p = 0.178$), suggesting that resource availability does not significantly moderate the relationship between organizational factors and ICT integration.

Interaction between Technological Factors and Resources (X_6): Similarly, the interaction was statistically insignificant ($p = 0.455$), indicating that the presence of resources alone does not significantly strengthen the relationship between technological factors and ICT integration.

4.3. The Proposed KSG Information and Communication Technology Integration Framework.

The proposed ICT Integration Framework for the Kenya School of Government (KSG) aims to address key challenges in ICT adoption and enhance training effectiveness and operational efficiency. The framework is structured around seven components, each with clear objectives, actions, and Key Performance Indicators (KPIs) to ensure measurable success in ICT integration.

ICT Professional Development

This component focuses on equipping ICT officers and Trainers with contemporary ICT skills through professional courses, continuous learning, and access to self-learning resources. KPIs include certification completion rates, professional development hours, and participation in learning communities.

Enhanced ICT Training Programs

The framework emphasizes developing training programs that equip staff with the necessary skills to integrate ICT into educational practices. It includes training on interactive tools, learning management systems (LMS), instructional design, and data analytics. KPIs track enrollment, skill assessment scores, and the application of learned skills.

Organizational Support and Resources

This component ensures that the environment is conducive to ICT integration by providing quality digital resources and necessary ICT tools. KPIs measure resource utilization, tool availability, technical support response time, and user satisfaction.

ICT Policy Development and Implementation

The ICT policy will be developed with input from various stakeholders and regularly reviewed to ensure relevance. KPIs track policy adoption, review frequency, compliance incidents, and achievement of implementation milestones.

Monitoring and Evaluation

Regular evaluations using both qualitative and quantitative methods will assess the success of ICT integration. KPIs focus on evaluation completion rates, the impact on training outcomes, feedback implementation rates, and organizational factors influencing ICT integration success.

Stakeholder Engagement

This component fosters collaboration among Trainers, ICT officers, learners, and administrative staff through regular engagement activities. KPIs measure stakeholder participation, engagement activity frequency, collaboration effectiveness, and stakeholder satisfaction.

Additional Elements and KPIs

Additional focus is placed on ensuring the sustainability, accessibility, and security of ICT initiatives. Sustainability is measured by maintenance downtime and secured funding. Accessibility is assessed through compliance rates and usage of accessibility features, while security and privacy are tracked through data breach incidents and cybersecurity training completion rates.

Table 11: Proposed ICT Integration Framework for Kenya School of Government

Component	Objective	Key Actions	Key Performance Indicators (KPIs)
ICT Professional Development	Build capacity through modern, relevant ICT skills.	<ul style="list-style-type: none"> Conduct professional training Promote self-learning Support continuous learning 	<ul style="list-style-type: none"> % of staff certified Training hours completed Participation in learning communities
Enhanced ICT Training Programs	Equip staff with skills for digital learning and teaching.	<ul style="list-style-type: none"> Develop ICT-integrated modules Train on LMS & analytics tools Evaluate learning outcomes 	<ul style="list-style-type: none"> Enrollment rates Post-training assessment scores Application rate of acquired skills
Organizational Support & Resources	Provide reliable digital tools and technical assistance.	<ul style="list-style-type: none"> Improve tool and resource availability Ensure technical support Conduct user feedback 	<ul style="list-style-type: none"> Tool utilization rate Average support response time User satisfaction scores
ICT Policy Development	Guide ICT use through policies aligned to current needs.	<ul style="list-style-type: none"> Engage stakeholders in policy design Schedule regular reviews Monitor policy adherence 	<ul style="list-style-type: none"> Policy compliance rate Review frequency Milestone achievement rate

Monitoring and Evaluation (M&E)	Track ICT integration outcomes and improve processes.	<ul style="list-style-type: none"> • Conduct regular evaluations • Use M&E feedback for improvement • Track organizational impact 	<ul style="list-style-type: none"> • Completion of M&E cycles • % of feedback implemented • Measured impact on learning outcomes
Stakeholder Engagement	Foster collaboration among users and ICT teams.	<ul style="list-style-type: none"> • Organize ICT engagement forums • Facilitate cross-unit collaboration 	<ul style="list-style-type: none"> • Participation rates • Frequency of engagement • Stakeholder satisfaction
Additional elements	Ensure sustainability, accessibility, and security.	<ul style="list-style-type: none"> • Plan for sustainable funding • Adopt inclusive technologies • Conduct cybersecurity training 	<ul style="list-style-type: none"> • % uptime (maintenance) • Accessibility feature usage • Security incidents • Training completion rate

The framework in Figure 2 is designed to be dynamic, ensuring that ICT integration at KSG supports teaching, learning, and administrative functions effectively, while also being adaptable to future challenges and technological advancements.

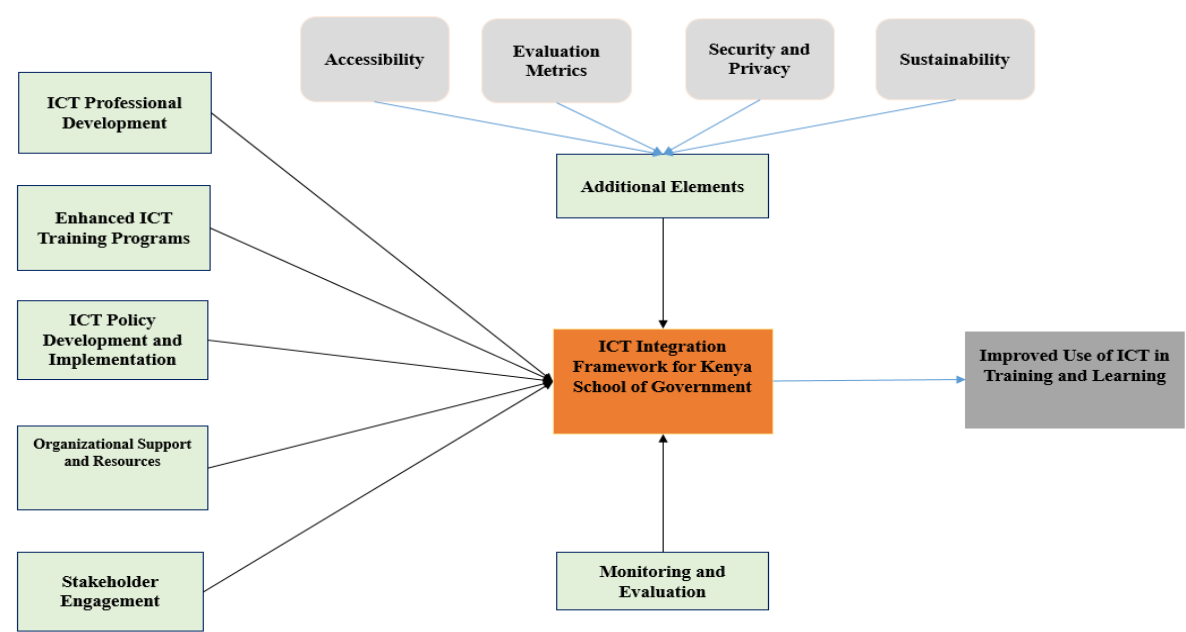


Figure 2: Proposed ICT Integration Framework for Kenya School of Government

4.4 Evaluation of the Developed Framework

To assess the validity, feasibility, and relevance of the developed ICT Integration Framework for public service training, an expert review method was employed. This process was critical to ensure that the framework would

be practical, contextually appropriate, and aligned with institutional objectives. A total of seven experts, selected based on their academic qualifications and professional experience in ICT integration, educational technology, and policy development, participated in the review.

The experts were provided with a detailed version of the framework, outlining its six core components: ICT professional development, enhanced ICT training programs, organizational support and resources, ICT policy development and implementation, monitoring and evaluation, and stakeholder engagement. Additional elements addressing sustainability, accessibility, and cybersecurity were also included. Feedback was gathered using a structured survey instrument based on a 5-point Likert scale, focusing on the clarity of objectives, relevance of actions, feasibility of implementation, and measurability of key performance indicators (KPIs).

The evaluation results showed consistently high mean scores (all ≥ 4.26), indicating strong consensus among the experts on the framework's overall quality and applicability. The ICT Professional Development and Stakeholder Engagement components, in particular, received very high ratings, underscoring the significance of continuous capacity building and inclusive involvement in successful ICT integration.

Expert feedback was systematically analyzed and integrated into the final version of the framework, leading to refinements that enhanced its clarity, alignment with practical needs, and adaptability across different institutional contexts. The validation findings affirm the framework's robustness and its potential as a strategic guide for the structured and sustainable integration of ICT in public service training. This rigorous evaluation process strengthens the credibility and utility of the framework for policymakers, institutional leaders, and practitioners.

5.0. Conclusion

Overall, the study concludes that successful ICT integration in public service training requires a multi-faceted approach that addresses user competencies, organizational support, resource allocation, and continuous professional development. While technological infrastructure is necessary, it must be complemented by strong institutional support and strategic resource management to achieve meaningful ICT integration outcomes.

5.1. Recommendations for future works

This study provides valuable insights into the factors influencing ICT integration in public servants' training. However, there are several areas where further research is needed to extend the understanding of ICT integration within public institutions. Future studies should consider a longitudinal approach to evaluate the long-term impact of continuous ICT professional development on training outcomes, including skill acquisition and retention. Additionally, research should investigate how organizational policies such as ICT governance, e-learning strategies, and digital infrastructure either support or hinder ICT adoption. Exploring these aspects would deepen the understanding of systemic influences on ICT integration and guide the development of more effective strategies for implementing technology in public service training.

References

- Adamu, Sa'ad, Madaki., Kamsuriah, Ahmad., Dalbir, Singh. (2024). Information technology integration implementation in public sector organizations: Exploring challenges, opportunities, and future trends. Information Development.*
- Adrien, L. (2021). PISA 2021 ICT Framework.*

- Alayyar, G., Fisser, P., & Voogt, J. (2012). *Developing technological pedagogical content knowledge in pre-service science teachers: support from blended learning*. *Australasian Journal of Educational Technology*, 28(8). <https://doi.org/10.14742/ajet.773>
- Allawi, K. M., Mijbil, S. H., & Hussein, B. M. (2020). *The extent of using managerial accounting innovations in the government sector in Iraq*. *Periodicals of Engineering and Natural Sciences*, 8(4), 2417-2423.
- Akpalu, V. L., & Markom, M. N. B. (2022). *The Impact of Training and Development on the Performance of Academic Staff in Technical Universities in Ghana [A Conceptual Paper]*. *International Journal of Academic Research in Business and Social Sciences*.
- Awati, R., & Pratt, M. K. What is ICT?. *TechTarget*. <https://www.techtarget.com/>
- Bahrini, R., & Qaffas, A. (2019). *Impact of Information and Communication Technology on Economic Growth: Evidence from Developing Countries*. *Economies*, 7(1), 21.
- Barakabitze, A. A., William-Andey Lazaro, A., Ainea, N., Mkwizu, M. H., Maziku, H., Matofali, A. X., Iddi, A., & Sanga, C. (2019). *Transforming African Education Systems in Science, Technology, Engineering, and Mathematics (STEM) Using ICTs: Challenges and Opportunities*. *Education Research International*, 2019, 1–29.
- Candice, Faye, L., Cabunoc., Roie, M., Ubayubay. (2024). *Competency and Barriers in Using ICT among Public School Teachers in Tagoloan District*. *International journal of multidisciplinary research and analysis*, 07(08) doi: 10.47191/ijmra/v7-i08-14
- Chohan, S. R., & Hu, G. (2022). *Strengthening digital inclusion through e-government: cohesive ICT training programs to intensify digital competency*. *Information technology for development*, 28(1), 16-38.
- Elhadi, I. Y. (2021). *Influence of Results Based Management on Performance of Public Servants in Kenya (Doctoral dissertation, Kampala International University, College of Humanities and Social Science)*.
- Gitonga, A., & Moyi, E. (n.d.). *The Role of Information Communication Technologies in Innovation in Kenya's Micro, Small and Medium Establishments*.
- Gottschalk, F., & Weise, C. (n.d.). *Digital equity and inclusion in education: An overview of practice and policy in OECD countries*.
- Guitert, M., Romeu, T., & Colas, J. F. (2020). *Basic digital competencies for unemployed citizens: conceptual framework and training model*. *Cogent Education*, 7(1), 1748469.
- Huang, R., Liu, D., Tlili, A., Knyazeva, S., Chang, T. W., Zhang, X., & Holotescu, C. (2020). *Guidance on open educational practices during school closures: Utilizing OER under COVID-19 pandemic in line with UNESCO OER recommendation*. Beijing: Smart Learning Institute of Beijing Normal University.
- Kibuku (2008). *A framework for ICT integration for distance education programmes of the University of Nairobi*
- Kimani, J. G. (2017). *Challenges Facing Integration and Use of ICT in the Management of County Governments in Kenya*. *Journal of Information Technology*, 1(1), 1–11.

- Kumar, P. (2022). *Role of ICT in Teacher Training Education*. *JOURNAL OF TEACHER EDUCATION AND RESEARCH*, 17(01), 29–30.
- Kumari, P., & Srivastava, A. (2023). *Challenges and Issues of Integrating Information and Communication Technologies in Higher Education in Rural Areas: A Review*. 5(6).
- Krzyszowska, K., & Mavrommati, M. (2021). *Applying the community of inquiry e-learning model to improve the learning design of an online course for in-service teachers in Norway*.
- Matovu, Davis., Mwase, Ali., Engotoit, Benard., Mukuuma, Kassim., Ocen, Gilbert, Gilibrays. (2019). *ICT integration challenges into service delivery in the Ugandan ministry of local government: a literature review*. 1(1):1-10. doi: 10.47672/AJODL.395.
- Mattar, J., Santos, C. C., & Cuque, L. M. (2022). *Analysis and Comparison of International Digital Competence Frameworks for Education*. *Education Sciences*, 12(12), 932. <https://doi.org/10.3390/educsci12120932>
- Mukuna, T. (2014). *Integration of ICT into Teacher Training and Professional Development in Kenya*. *Makerere Journal of Higher Education*, 5(1), 3. <https://doi.org/10.4314/majohe.v5i1.1>
- Mtebe, J. S. (2020). *Applying UNESCO ICT competency framework to evaluate teachers' ICT Competence Levels in Tanzania*. In *Handbook of research on innovative pedagogies and best practices in teacher education* (pp. 350-366). IGI Global.
- Nabin, R.A. (2023). *Role and Impact of ICT on Rapidly Advancing New Age Teaching Pedagogy in Higher Educational Institutions in Oman*. In *Redefining Virtual Teaching Learning Pedagogy* (eds R. Bansal, R. Singh, A. Singh, K. Chaudhary and T. Rasul).
- Ndubai, R., Mbeche, I., & Pokhariyal, G. (2016). *A study of the relationship among performance contracting, measurement and public service delivery in Kenya*. *Oalib*, 03(09), 1-11. <https://doi.org/10.4236/oalib.1102850>
- Oduol, W. (2023). *Governance Frameworks and Revenue Enhancement in Devolved Governments in Kenya* (Doctoral dissertation, JKUAT-COHRED).
- Onyango, G., & Ondiek, J. O. (2021). *Digitalization and integration of sustainable development goals (SGDs) in public organizations in Kenya*. *Public Organization Review*, 21(3), 511- 526.
- Opondo, O., Opio, P., & Ongeti, W. (2021). *Land administration in Kenya: the case for leading and managing change*. *International Journal of Research and Studies Publishing*, 11(5), 86-92. <https://doi.org/10.29322/ijssrp.11.05.2021.p11313>
- Purwandari, E. P., Junus, K., & Santoso, H. B. (2022). *Exploring the E-Learning Community of Inquiry Framework for Engineering Education*. *International Journal of Instruction*, 15(1), 619-632.
- Rebecca, Wambui, Nyambura., Denis, Kamau., Monica, Nderitu. (2023). *Transformational Leadership Style and Organizational Performance in the Ministry of Lands, Public Works, Housing and Urban Development in Kenya*. *International journal of social science and humanities research-MIYR*, doi: 10.61108/ijsshr.v1i1.54

- Saif, S. M., Ansarullah, S. I., Ben Othman, M. T., Alshmrany, S., Shafiq, M., & Hamam, H. (2022). *Impact of ICT in Modernizing the Global Education Industry to Yield Better Academic Outreach*. *Sustainability*, 14(11), 6884. <https://doi.org/10.3390/su14116884>
- Tlili, A., Nascimbeni, F., Burgos, D., Zhang, X., Huang, R., & Chang, T. W. (2023). *The evolution of sustainability models for Open Educational Resources: Insights from the literature and experts*. *Interactive Learning Environments*, 31(3), 1421-1436.
- Tiwari, S. P. (2024). *Digital Transformation Framework for Higher Education: Principles, Guidelines, and Actionable Recommendations*. *International Journal of Social Science Research and Review*, 7(9), 132–139. <https://doi.org/10.47814/ijssrr.v7i9.2299>
- Tondeur, J., Roblin, N., Braak, J., Fisser, P., & Voogt, J. (2013). *Technological pedagogical content knowledge in teacher education: in search of a new curriculum*. *Educational Studies*, 39(2), 239-243. <https://doi.org/10.1080/03055698.2012.713548>
- Tran, T., Phan, H., Le, H., & Nguyen, H. (2020). *ICT integration in developing competence for pre- service mathematics teachers: a case study from six universities in Vietnam*. *International Journal of Emerging Technologies in Learning (Ijet)*, 15(14), 19. <https://doi.org/10.3991/ijet.v15i14.14015>
- Wang'ombe, H., Kivoi, D., Laibuni, N., Musili, B. M., & Ngugi, R. W. (n.d.). *Tracing the Path to Transformative Leadership in the Public Sector in Kenya*.
- Williams, B., & Lodhia, S. (2021). *Integrated reporting in public sector organizations: A study of Australian local councils*. *Journal of Environmental Management*, 280, 111833.