

# Leveraging Information and Communication Technology in Distance Learning: Analyzing Challenges and Competence among Adult Learners in Kisarawe District, Tanzania

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## Abstract

This study examines the impact of Information and Communication Technology (ICT) on distance learning among adult learners in the Kisarawe District, focusing on Open and Distance Learning (ODL) programs. Using the Technology Acceptance Model (TAM) and Connectivism Theory as guiding frameworks, the research identifies ICT support services, evaluates the outcomes of ICT integration, explores challenges, and examines the influence of ICT competence on learning processes. A mixed-methods approach was employed, involving 40 participants, including students, facilitators, and coordinators. Findings reveal that ICT tools, such as smartphones, laptops, and educational software, enhance learning accessibility and engagement. However, barriers such as limited infrastructure, inadequate training, and high costs hinder optimal utilization. The study highlights the need for strategic investments in ICT infrastructure, comprehensive digital literacy programs, and robust technical support systems to bridge the digital divide and enhance learning outcomes for adult learners.

**Keywords:** *ICT, Distance Learning, Adult Learners, Open and Distance Learning (ODL), Competence, Tanzania.*

## I. INTRODUCTION

Information and Communication Technology (ICT) has emerged as a transformative force in education, reshaping teaching and learning practices to meet the needs of a rapidly evolving digital world. Distance learning, in particular, has significantly benefited from ICT integration, offering flexible and accessible education opportunities for adult learners who face time, geographical, and financial constraints. The use of ICT tools such as smartphones, laptops, and online learning platforms facilitates self-paced and personalized learning, enabling learners to overcome traditional barriers to education. Globally, ICT has been recognized as a catalyst for improving educational equity and lifelong learning opportunities, especially for underserved populations (UNESCO, 2016).

In Tanzania, the government has demonstrated a commitment to integrating ICT into education through policies such as the National ICT Policy for Basic Education. Despite these efforts, the implementation of ICT in distance learning programs remains uneven, with significant disparities between urban and rural areas. Kisarawe District, a predominantly rural area, exemplifies the challenges faced by adult learners in accessing and utilizing ICT for educational purposes. Limited

infrastructure, high costs of technology, and inadequate digital literacy are among the key obstacles that hinder effective ICT integration in distance learning programs (Senkoro, 2020).

This study aims to analyze the role of ICT in enhancing distance learning for adult learners in Kisarawe District. It examines the availability and usage of ICT tools, identifies the challenges faced by learners and facilitators, and evaluates the impact of ICT competence on learning outcomes. By addressing these dimensions, the study contributes to the broader discourse on leveraging ICT to promote inclusive and equitable education. The findings offer actionable insights for policymakers, educators, and other stakeholders to improve ICT integration and support adult learners in distance learning programs.

## II. LITERATURE REVIEW

The integration of ICT into distance learning has been extensively studied, with research highlighting its potential to improve access, engagement, and learning outcomes. However, challenges such as resource constraints, inadequate training, and limited digital literacy persist, particularly in resource-constrained settings.

The theoretical foundation of this study is grounded in two frameworks. The Technology Acceptance Model (TAM), developed by Davis (1989), provides insights into how perceptions of ease of use and usefulness influence the adoption of technology. For adult learners, these perceptions are critical in determining their willingness and ability to integrate ICT tools into their learning practices. For example, an adult learner who perceives e-learning platforms as user-friendly and beneficial for accessing educational resources is more likely to adopt and use them effectively.

The second framework, Connectivism Theory, proposed by Siemens (2004), emphasizes the role of digital networks in learning. According to this theory, knowledge is distributed across networks, and learning occurs through the ability to connect with and utilize information sources effectively. In the context of distance learning, Connectivism highlights the importance of ICT competence in accessing and applying knowledge from digital platforms. It underscores the role of facilitators in guiding learners to navigate complex digital networks and collaborate with peers in virtual environments.

Empirical studies underscore the positive impact of ICT on distance learning. Piper et al. (2015) found that the integration of ICT tools such as multimedia content and interactive platforms significantly enhanced learner engagement and comprehension. Similarly, Masabo et al. (2017) observed that ICT-enabled distance learning allowed adult learners in Tanzania to overcome geographical barriers, providing them with access to high-quality educational resources. However, these benefits are often constrained by systemic challenges, including inadequate infrastructure and limited digital literacy, particularly in rural areas.

Teacher and facilitator competence is another critical factor influencing the success of ICT integration in distance learning. Research by Ghavifekr et al. (2015) demonstrated that learners with advanced digital skills achieved better academic outcomes, while facilitators with ICT training were more effective in delivering content through digital platforms. These findings underscore the importance of continuous professional development for educators to ensure that they are equipped to utilize ICT tools effectively.

Policy and systemic support play a crucial role in fostering ICT integration in education. Tanzania's National ICT Policy for Basic Education has laid a foundation for incorporating technology into teaching and learning practices. However, the implementation of these policies has faced challenges, particularly in rural and underserved areas where infrastructure and resources are limited (URT, 2016). Addressing these gaps requires coordinated efforts from policymakers, educators, and other stakeholders to create an enabling environment for ICT-based distance learning.

### III. METHODOLOGY

This study employed a mixed-methods research design to provide a comprehensive analysis of the role of ICT in distance learning for adult learners in Kisarawe District. The combination of quantitative and qualitative approaches enabled the collection of both measurable data and in-depth insights into learners' and facilitators' experiences.

The study targeted a total of 40 participants, including 30 adult learners, 5 facilitators, and 5 coordinators from selected distance learning centers in Kisarawe District. Purposive sampling was used to select facilitators and coordinators with significant experience in ICT integration, while learners were randomly selected to ensure a diverse representation of perspectives.

Data were collected through three primary methods. Structured questionnaires were administered to learners and facilitators to gather quantitative data on ICT usage, availability, and challenges. Semi-structured interviews with coordinators explored systemic challenges and policy-level insights, while classroom observations provided real-time evidence of ICT integration and its impact on learner engagement and performance.

Quantitative data were analyzed using SPSS, employing descriptive statistics such as frequencies and percentages to identify trends in ICT usage and challenges. Qualitative data were analyzed thematically, identifying recurring patterns and significant themes related to ICT integration, learner competence, and systemic barriers. Ethical considerations included obtaining informed consent from all participants, ensuring confidentiality, and securing ethical approval from relevant authorities.

### IV. FINDINGS AND DISCUSSIONS

#### ➤ *Availability and Utilization of ICT Tools*

The study reveals a mixed landscape regarding the availability and utilization of ICT tools in distance learning for adult learners in Kisarawe District. Smartphones emerged as the primary device used by 90% of participants, serving as a vital tool for accessing e-learning platforms, communicating with facilitators, and engaging with peers. Social media applications, particularly WhatsApp, were frequently cited as critical for sharing course materials and maintaining communication channels between learners and facilitators. Despite these advantages, the overreliance on smartphones highlights a concerning limitation: the absence of diverse and advanced ICT tools that could enrich learning experiences. For instance, only 30% of participants reported having access to laptops or educational software, tools essential for tasks requiring extensive data analysis or complex digital resources.

This disparity reflects systemic inequities in resource allocation, disproportionately affecting rural and underserved areas. While smartphones are versatile, their limitations in functionality—such as small screens and

limited storage—constrain their effectiveness in meeting the broader demands of distance learning. One facilitator noted, “*Smartphones are useful for basic tasks, but they fall short when learners need to create detailed assignments or analyze geographic data.*” Such gaps in resource availability underscore the need for targeted investments in diverse ICT tools to enhance the quality and breadth of learning.

Furthermore, the findings indicate a significant underutilization of institutional ICT resources. While several distance learning centers had computer labs, learners reported that these facilities were often inaccessible due to restrictive schedules or technical issues. This mismanagement of resources exacerbates existing inequalities and diminishes the potential of ICT integration to bridge educational gaps. These findings align with studies by Kweka et al. (2018), which identified poor infrastructure planning and resource allocation as critical barriers to ICT integration in Tanzanian education.

#### ➤ *Challenges in ICT Integration*

The integration of ICT in distance learning for adult learners is impeded by multiple systemic and individual challenges. High internet costs emerged as the most frequently cited barrier, with 65% of participants reporting difficulty affording reliable connectivity. This issue disproportionately affects rural learners, who often rely on expensive mobile data packages due to the absence of broadband services. As one learner explained, “*Sometimes I have to choose between buying internet data and paying for other necessities, which affects my studies.*” This trade-off undermines the inclusive intent of distance learning programs and highlights the urgent need for affordable connectivity solutions tailored to the needs of adult learners.

Another critical challenge is inadequate infrastructure. Many participants reported that the learning centers lacked stable electricity, reliable internet connections, and up-to-date ICT tools. For instance, 70% of facilitators indicated that they were unable to utilize advanced e-learning platforms due to technical constraints. This finding mirrors observations by Ngeze (2017), who noted that infrastructure deficits remain a significant barrier to ICT integration in Tanzanian education. Such challenges not only limit the effectiveness of distance learning but also perpetuate the digital divide, leaving learners in resource-constrained settings at a disadvantage.

Inadequate training for both learners and facilitators further compounds these challenges. While ICT competence is critical for navigating e-learning platforms and maximizing their benefits, 60% of learners reported limited digital literacy. Facilitators, too, expressed frustration over the lack of professional development opportunities to enhance their ICT skills. One facilitator remarked, “*We are expected to use these tools effectively, but there’s no structured training to help us adapt to the changing demands of teaching.*” This gap in training underscores the need for targeted capacity-building

programs to equip both learners and educators with the skills necessary for effective ICT utilization.

#### ➤ *ICT Competence and its Influence on Learning Outcomes*

The findings highlight a strong correlation between ICT competence and learning outcomes, with learners who demonstrated higher digital literacy achieving significantly better results in assessments. These learners were more confident in navigating e-learning platforms, accessing diverse resources, and engaging in collaborative tasks. One coordinator observed, “*Learners with strong ICT skills tend to perform better because they can access more resources and manage their studies independently.*” However, this advantage further accentuates the disparities between learners with varying levels of competence.

Among the less digitally literate learners, challenges included difficulty accessing online resources, limited ability to use productivity tools, and reliance on facilitators for basic tasks. Such learners often struggled to keep pace with course demands, resulting in lower engagement and retention rates. These findings echo the observations of Ghavifekr et al. (2015), who emphasized that digital literacy is a critical determinant of success in ICT-based learning environments.

Facilitators, too, acknowledged the impact of their competence on the effectiveness of ICT integration. Those with advanced ICT skills reported greater confidence in using e-learning platforms to deliver content and engage learners. However, facilitators with limited training expressed hesitancy in adopting new technologies, which hindered their ability to create dynamic and interactive learning environments. This disparity highlights the importance of professional development programs tailored to the unique needs of facilitators in distance learning contexts.

#### ➤ *Systemic Support and Policy Implementation*

The role of systemic support and policy implementation in enabling ICT integration cannot be overstated. The study found that while national policies such as the National ICT Policy for Basic Education provide a framework for integrating technology into education, their implementation at the local level remains inconsistent. Coordinators reported that funding constraints and inadequate planning often resulted in resource shortages and delayed program rollouts. One coordinator stated, “*The policies are there, but the execution is where we fall short. There’s a gap between the vision and what actually happens on the ground.*”

Moreover, participants highlighted the lack of technical support as a recurring issue. Facilitators frequently faced challenges in maintaining and troubleshooting ICT tools, which disrupted the continuity of learning. The absence of dedicated technical staff at most learning centers further exacerbated this issue, leaving facilitators to manage complex technical problems independently. This finding aligns with observations by Peeraer and Van Petegem (2011), who noted that

inadequate technical support undermines the sustainability of ICT integration in education.

These systemic shortcomings point to a need for greater collaboration between policymakers, educational institutions, and private sector stakeholders. Partnerships with technology providers could facilitate access to affordable devices, reliable internet connectivity, and ongoing technical support. Additionally, regular monitoring and evaluation mechanisms should be established to assess the impact of ICT integration and inform evidence-based adjustments to policies and practices.

## **V. THEORETICAL AND EMPIRICAL IMPLICATIONS OF THE STUDY' FINDINGS**

The study reinforces and extends the relevance of the Technology Acceptance Model (TAM) and Connectivism Theory in understanding the adoption and utilization of ICT in distance learning environments. The Technology Acceptance Model's assertion that perceived usefulness and ease of use drive technology adoption is validated by this study. Learners who found ICT tools such as smartphones and e-learning platforms user-friendly and beneficial demonstrated higher engagement and learning outcomes. This suggests that simplifying the design and usability of digital learning platforms could enhance adoption rates, particularly for adult learners with varying levels of digital literacy.

The findings also emphasize the critical role of Connectivism Theory, which views learning as a process of interacting with and leveraging digital networks. Adult learners in Kisarawe District benefited from collaborative learning facilitated by platforms like WhatsApp and other social media tools. These networks enabled them to exchange ideas, seek support, and share resources. However, the limited availability of advanced tools and inconsistent technical support constrained learners' ability to fully capitalize on the interconnected learning environments envisioned by Connectivism Theory. This gap highlights the need to align theoretical frameworks with practical realities, especially in resource-constrained settings.

Empirically, the study offers actionable insights for policymakers, educators, and other stakeholders. First, it highlights the transformative potential of ICT in promoting flexible and accessible education for adult learners, particularly in rural areas. The positive impact of tools like smartphones and e-learning platforms on engagement and learning outcomes underscores the importance of integrating technology into distance learning curricula.

Second, the findings draw attention to systemic barriers that limit the effectiveness of ICT, including high internet costs, inadequate infrastructure, and limited digital literacy. These challenges are not unique to Kisarawe District but reflect broader trends in low-

resource settings. Addressing these barriers requires targeted interventions such as affordable internet packages, investments in digital infrastructure, and capacity-building initiatives.

Third, the study underscores the role of ICT competence among both learners and facilitators in determining the success of distance learning programs. Learners with higher digital literacy achieved better academic outcomes, while facilitators with advanced ICT skills were more effective in delivering content and engaging students. These findings support calls for comprehensive training programs to equip all stakeholders with the necessary skills for navigating digital learning environments. Finally, the study provides evidence that while national ICT policies exist, their implementation remains inconsistent. Strengthening policy frameworks and ensuring their localized application is essential to bridge the digital divide and enhance educational equity.

## **VI. CONCLUSION AND RECOMMENDATIONS**

This study concludes that Information and Communication Technology (ICT) plays a transformative role in enhancing distance learning for adult learners in Kisarawe District. Tools such as smartphones, e-learning platforms, and social media applications have significantly improved access to educational resources, enabled flexible learning schedules, and fostered collaboration between learners and facilitators. These tools allow adult learners to balance educational pursuits with work and family responsibilities, making distance learning a viable option for underserved populations. However, the study reveals several critical challenges that undermine the potential of ICT in distance learning.

Systemic barriers, such as high internet costs, limited access to advanced ICT tools, and inadequate digital literacy, constrain the effectiveness of ICT integration. Learners frequently struggle with the financial burden of maintaining connectivity, particularly in rural areas where broadband services are scarce. Moreover, facilitators and coordinators face challenges related to limited training opportunities and insufficient technical support, which hinder their ability to use ICT tools effectively. These challenges highlight the urgent need for coordinated efforts to address the digital divide and create an enabling environment for ICT-based distance learning.

The findings of this study emphasize the importance of targeted investments in ICT infrastructure to expand internet access and provide affordable, high-quality devices to learners and facilitators. Strengthening digital literacy through comprehensive training programs is equally critical, as ICT competence directly influences learning outcomes and engagement levels. Additionally, robust policy implementation and effective monitoring mechanisms are necessary to ensure that national ICT strategies translate into meaningful improvements at the local level.

Based on these conclusions, several recommendations are proposed to address the identified challenges and enhance the integration of ICT in distance learning. First, there is a need for substantial investment in digital infrastructure, particularly in rural and underserved areas. Expanding broadband coverage, ensuring stable electricity supply, and equipping learning centers with modern ICT tools are critical steps toward creating a conducive learning environment. Partnerships between the government, private sector, and international organizations could mobilize the resources needed to achieve these goals.

Second, digital literacy programs should be prioritized for both learners and facilitators. These programs should include hands-on training in navigating e-learning platforms, using productivity tools, and troubleshooting basic technical issues. For facilitators, professional development opportunities should focus on advanced skills such as designing digital content, integrating multimedia resources, and managing virtual classrooms.

Third, policymakers must ensure that existing ICT policies are effectively implemented and adapted to the specific needs of distance learning programs. Regular monitoring and evaluation mechanisms should be established to track progress, identify gaps, and inform evidence-based adjustments to policies and practices. Inclusive planning processes that involve learners, facilitators, and coordinators are essential to ensure that policies address the practical realities of distance learning environments.

Fourth, technical support systems must be strengthened to reduce disruptions in ICT-based learning. This could include deploying dedicated technical staff at learning centers, offering helplines for troubleshooting, and developing user-friendly guides for common technical challenges. Facilitators and coordinators should have access to on-demand technical assistance to enhance their confidence in using ICT tools.

Finally, fostering stakeholder collaboration is crucial for sustainable ICT integration. Partnerships with technology providers can facilitate access to affordable devices and software, while collaborations with NGOs and international organizations can support capacity-building initiatives. Community involvement in resource mobilization and awareness campaigns can further enhance the reach and impact of ICT-based distance learning programs.

By addressing these recommendations, stakeholders can unlock the full potential of ICT to transform distance learning, enabling adult learners in Kisarawe District to achieve their educational aspirations and contribute to sustainable development. These efforts will not only enhance educational equity but also align with global goals for inclusive and quality education.

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