The Relationship Between Management Support Given to Teachers for Enhancing Application of ICT Aids and Effective Instructional Delivery in Meru District Council Private Secondary Schools, Arusha-Tanzania

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Abstract

The study focussed on determining the relationship between management support given to teachers in enhancing application of ICT aids and effective instructional delivery in Meru district council, private secondary schools. Technological Pedagogical Content Knowledge, and Constructivism Learning Theories underpinned this study. The research employed mixed method research approach with convergent parallel mixed method design. The sample size was 66 respondents from a population of 850 including; teachers, school board chairpersons, academic masters/mistresses and heads of schools who were sampled via systematic, total population and purposive sampling. Data collection methods were questionnaire, interview guide and observation checklist. The obtained data were analysed through descriptive statistics, inferential statistics and thematic analysis. The findings of the study established that there was a significant positive relationship of p-value $0.019 < 0.05$ between management support for teachers' use of ICT aids and effective interaction delivery. The study concludes that school management teams play a crucial role in enhancing ICT aids utilization in private secondary schools and support teachers to update their knowledge. The study recommended school administrators to benchmark with other schools for observing the updated ICT materials for teaching and learning, and ensure that their schools are maintained with advanced ICT tools.

Keywords: Management Support, ICT Aids, Effective Instructional Delivery, Private Secondary Schools, Differentiated Instruction

1. INTRODUCTION

The rapid advancement of Information and Communication Technology (ICT) has transformed nearly every aspect of modern life, including education. In the 21st century, ICT has become an indispensable component of teaching and learning processes, reshaping traditional pedagogical practices and creating new opportunities for improving educational quality and access. Within the educational domain, ICT equipment such as projectors, interactive whiteboards, document cameras, digital displays, and multimedia presentation tools plays a crucial role in supporting learning and fostering interactive engagement between teachers and students. The effective use of these technologies has been linked to improved instructional delivery, increased learner motivation, and enhanced teacher efficiency (UNESCO, 2023; Anderson & van Weert, 2019).

Globally, education systems increasingly recognize the potential of ICT to improve teaching effectiveness and support teachers' professional development on ICT use. ICT tools enable teachers to present abstract and complex concepts in more engaging and accessible ways, promote multisensory learning, and encourage learner participation and autonomy. Recent studies indicate that well-integrated ICT resources enhance learners' conceptual understanding, retention, and active classroom participation (Tondeur et al., 2017; OECD, 2021). Furthermore, teachers who effectively integrate ICT tools into their instructional practices tend to demonstrate higher levels of confidence, creativity, and reflective practice, which are essential for continuous professional growth (Schleicher, 2018).

Despite these benefits, the contribution of ICT equipment to effective teaching and professional development vary considerably across contexts, particularly between developed and developing countries. In sub-Saharan Africa, ICT integration in education has been promoted through national policies and international partnerships; however, implementation remains uneven due to persistent infrastructural, financial, and human capacity challenges (World Bank, 2020). Many schools continue to face unreliable electricity supply, limited internet connectivity, and inadequate technical and pedagogical support, which constrain meaningful ICT integration in classroom practice (UNESCO, 2023).

In private secondary schools in Kenya, ICT integration is moderately advanced, especially in urban areas. Many schools use computers and digital systems for administration, communication, and computer studies, and some have well-equipped ICT labs with internet access. However, the use of technology in everyday classroom teaching across all subjects remains uneven, often depending on the availability of infrastructure, school policy, and teachers' ICT skills. While private schools generally perform better than public ones in ICT adoption, full integration into teaching and learning is still developing (Haji et al., 2023).

ICT integration in Rwanda's secondary education has expanded significantly over the past decade, led by institutions such as the Rwanda Education Board. Many secondary schools have been equipped with smart classrooms, computers, and internet connectivity, and ICT has been incorporated into the national curriculum to promote digital literacy and 21st-century ICT skills. Teachers have received professional development training to enhance their ability to use technology in instruction, and e-learning platforms now provide access to digital learning materials aligned with national subjects. However, challenges remain, including unequal access to devices in rural schools, inconsistent internet reliability, limited computer-to-student ratios, and varying levels of teacher confidence in integrating ICT effectively into daily classroom practice. Overall, while infrastructure and policy support are strong, deeper

pedagogical integration and equitable access continue to be key areas for improvement in Rwanda's secondary education sector (Mpumuje, 2024).

In Tanzania, the government has made deliberate efforts to mainstream ICT in education through national frameworks such as Tanzania Vision 2025, the Education and Training Policy (URT, 2014), and the ICT Framework for Education and Training (URT, 2021). These policies emphasize the importance of equipping teachers with relevant digital competencies to enhance instructional quality and innovation. The Ministry of Education, Science and Technology has encouraged the adoption of ICT tools sin secondary schools as part of broader efforts to modernize education and prepare learners for participation in the digital and knowledge-based economy. Nevertheless, implementation at the school level, particularly in rural districts such as Meru, remains slow due to inadequate infrastructure, limited access to ICT devices, and insufficient teacher training opportunities (Twaakyondo & Mtaho, 2020; World Bank, 2022).

In Meru District Council, secondary schools are gradually adopting ICT equipment through government initiatives and donor-supported projects (URT, 2021; World Bank, 2022). Nonetheless, disparities persist in teachers' access to ICT resources, levels of digital competence, and attitudes toward technology use (Tondeur et al., 2017; OECD, 2021). Some teachers remain reluctant to adopt ICT due to limited training or fear of technological change, while others face challenges related to equipment maintenance and the adaptation of teaching materials to digital formats (UNESCO, 2023; Redecker, 2017). These issues may negatively affect both teaching effectiveness and teachers' professional development on ICT use, thereby limiting the impact of ongoing educational reforms (Schleicher, 2018).

Given these circumstances, there is a clear need to examine the influence of ICT management on teaching effectiveness and teachers' professional development on use of ICT tools in secondary schools within Meru District Council. Such an investigation is essential for identifying barriers and enabling factors for ICT integration, assessing its pedagogical value, and informing evidence-based strategies for teacher capacity building (Darling-Hammond et al., 2017; OECD, 2021). Moreover, insights from this context contribute to broader discussions on how developing countries can harness ICT to enhance educational quality, equity, and sustainability in line with Sustainable Development Goal 4 (Quality Education) (UNESCO, 2023). Specifically, ICT equipment's such as projectors, interactive whiteboards, digital displays, Rachel plus and other multimedia devices have been introduced in many secondary schools as tools to enrich classroom instruction and foster interactive learning environments (Anderson & van Weert, 2019).

Despite the policy efforts and investments, regarding ICT integration in teaching evidence from many Tanzanian secondary schools suggests that the effective use of ICT tools in teaching remains limited and inconsistent (World Bank, 2022; Twaakyondo & Mtaho, 2020). In rural districts such as Meru, private secondary schools continue to face considerable challenges related to inadequate infrastructure, irregular electricity supply, insufficient ICT resources, and limited technical support (UNESCO, 2023; URT, 2021). Even where equipment is available, many teachers lack the pedagogical and technological competence required to integrate these tools meaningfully into their lessons (Redecker, 2017; Tondeur et al., 2017). As a result, ICT devices are often underutilized, used merely for presentation rather than learner-centered engagement, or left idle due to maintenance difficulties and skill gaps (OECD, 2021).

District Council report limited opportunities for sustained ICT training and inadequate institutional support for technology-enhanced teaching (Darling-Hammond et al., 2017; URT, 2021). This raises the critical questions about whether the availability of ICT equipment has genuinely improved teaching effectiveness or contributed to long-term professional growth among teachers (Schleicher, 2018).

Moreover, the anticipated relationship between ICT equipment and teachers' professional development on the use of ICT has not been clearly established in this context. While ICT tools have the potential to promote reflective practice, professional collaboration, and continuous skill development, many teachers in Meru

The gap, therefore, lies in the lack of sufficient empirical evidence on how management supports utilization of ICT equipment is utilized in private secondary schools within Meru District Council and the extent to which it influences teaching effectiveness and teachers' professional development on ICT use. Without such evidence, policymakers, education officers, and school administrators face challenges in making informed decisions regarding ICT investment, teacher training, and pedagogical innovation (World Bank, 2020; UNESCO, 2023). This study therefore sought to investigate how ICT equipment influences teaching effectiveness and teachers' professional development on use of ICT aids in Meru District Council secondary schools, while identifying factors that facilitate or hinder its optimal use.

2. LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Technological Pedagogical Content Knowledge (TPACK)

The Technological Pedagogical Content Knowledge (TPACK) framework provides a comprehensive model for understanding how teachers integrate technology effectively into teaching. Originally developed by Mishra and Koehler (2006), the framework extends Shulman's concept of pedagogical content knowledge by incorporating technological knowledge as a third core domain. The model emphasizes the interaction between content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK), forming an integrated knowledge base necessary for effective ICT-supported instruction (Widiawati, 2022).

2.1.2 The Constructivism Learning Theory

Constructivism is a learning theory which argues that learners actively construct knowledge rather than passively receive information. The theory is mainly associated with Jean Piaget, who, in the mid-20th century, developed cognitive constructivism and explained that children build understanding through processes of assimilation and accommodation. Another key contributor is Lev Vygotsky, who introduced social constructivism and emphasized the importance of social interaction, cultural context, and the Zone of Proximal Development. Jerome Bruner further expanded constructivist ideas through discovery learning and the spiral curriculum, highlighting the role of inquiry and guided exploration in learning. Constructivism posits that learning is an active process in which learners construct meaning based on prior knowledge and experiences, knowledge is socially constructed through interaction with others and learning occurs most effectively in authentic, real-world contexts where learners engage in problem-solving and inquiry Soleha, 2026).

2.2 Management Support in Enhancing Use of ICT Aids and Instructional Delivery

Recent studies show that teacher support mechanisms are critical for enhancing the effective use of ICT aids during instructional delivery. In Tanzania, Mgaza and Chacha (2024) explored strategies that help teachers integrate technology into classroom instruction. Using a qualitative descriptive design with interviews and focus groups in secondary schools in Iringa Municipality, the study found that computer literacy programs and targeted training on ICT tools were essential for equipping teachers with the skills to use aids effectively. Teachers relied on peer networks to troubleshoot problems, but a lack of follow-up support and technical assistance limited sustained use of ICT in lessons. Language barriers and technical terminology also inhibited adoption. The authors concluded that schools need structured, continuous professional development and technical support systems to enhance ICT usage, while highlighting a gap in quantitative measures of support effectiveness, particularly in linking support interventions to classroom outcomes.

Similarly, Bendera (2024) conducted a systematic review of ICT adoption in Tanzanian secondary schools, emphasizing the role of external support in teacher ICT integration. The study analyzed 17 empirical studies, identifying limited ICT infrastructure, insufficient professional development, and lack of technical support during instruction as major barriers. Teachers' attitudes and perceptions were also shown to influence ICT application, with leadership support and policy frameworks impacting willingness and capacity to use ICT tools. The review concluded that without sustained, systemic support, teachers' use of ICT aids remains sporadic. However, it noted a lack of studies evaluating specific support interventions, such as in-class coaching or mentoring, indicating a significant research gap.

Exploring collaborative professional support, Kopanyi and Mwangi (2024) examined how professional learning communities (PLCs) influenced teachers' integration of ICT in secondary schools. Using a qualitative phenomenological design with thematic analysis of interviews from 15 teachers, the study found that PLCs facilitated shared problem-solving, improved teachers' confidence with digital tools, and fostered innovative lesson designs incorporating ICT aids. Despite these benefits, teachers expressed the need for formal administrative support, including time allocation and resource provision, while the absence of recognition limited PLC impact. The authors concluded that PLCs are valuable but insufficient without structured institutional support, revealing a gap in management-led mechanisms to sustain ICT integration in instructional delivery.

Extending the perspective to Europe, Haarala-Muhonen et al. (2023) investigated how pedagogical and ICT training influenced teachers' use of digital tools for online teaching in Finland. Using a cross-sectional quantitative design with 265 university teachers, the study found that pedagogical training, rather than ICT training alone, strongly predicted meaningful use of digital tools for student engagement. Teachers who received both pedagogical and ICT training applied ICT aids more effectively, particularly for interactive learning, while technical training alone led mainly to information delivery without engagement. The study concluded that pedagogically framed professional development is essential for effective ICT integration, highlighting a gap in most programs that focus on technical skills without integrating teaching strategies.

From a Chinese perspective, Wang and Huang (2025) examined rural teachers' digital literacy and professional development in western Guangdong. Using a descriptive survey

with 1,220 teachers, they found that disparities in digital literacy and access to professional development significantly limited teachers' abilities to use ICT, including aids, in instructional delivery. Teachers who had higher levels of professional development demonstrated better ICT competency, suggesting that systematic support improves classroom application. The study concluded that inequitable access to professional development and insufficient institutional support hinder ICT integration, identifying gaps in targeted interventions and school management involvement in enhancing teachers' instructional capacities.

Cheng and Khy (2025) studied on ICT adoption in supporting teachers' instruction in higher education based on benefits and challenges. The reviewed paper synthesizes evidence from secondary sources to present a unified framework that integrates both the advantages and limitations of ICT adoption. The review identifies key ICT applications, including online learning platforms, digital assessment tools, and innovative teaching technologies, which facilitate classroom interaction, collaborative learning, and computer-based assessment. These technologies are presented as important enablers of learner-centered, flexible, and inclusive instructional practices. While the review contributes valuable insights into the transformative potential of ICT in higher education, further empirical and context-specific research is needed to validate its conclusions and inform effective implementation strategies.

3. RESEARCH METHODOLOGY

3.1 Research Approach, Design and Area of the Study

Research approach refers to the overall plan of conducting research. It guides the researcher on how the research processes are conducted in terms of sampling, data collection processes, analysis and presentation. The study adopted mixed-method descriptive research approach, combining both quantitative and qualitative approaches (Creswell & Creswell, 2023). The approach allowed for the collection of comprehensive data to assess various support given to teachers by management to enable them in applying ICT aids for effective teaching in private secondary schools. This study used convergent parallel mixed methods design which merge both quantitative and qualitative data at the same phase of the research process, analyses it separately, and then integrates it at the interpretation stage. The study was conducted in Meru District Council, located in Arusha Region, Tanzania. The district comprises both urban and rural secondary schools with varying levels of ICT resource availability and teacher exposure

3.2 Population

Population refers to the complete set of individuals, objects, or events sharing common characteristics that a researcher aims to study and draw conclusion about the studied phenomenon (Willie, 2024). Population for the study was 850 including 510 teachers, 34 heads of schools, 34 academic masters/mistresses and 272 school board members of all the 34 private secondary schools within Meru District Council. This population was considered appropriate because the stakeholders were directly involved in instructional delivery, ICT aids resource utilization, and implementation of professional development programs on the use of ICT aids on teaching and learning (Meru District Education Office, 2024).

3.3 Sample Size

The sample refers to the representative part of a whole population. Researchers select a sample size so as to save cost and time during data collection process and analysis. A researcher can calculate sample size by taking 10% to 30% of the total population (Creswell

& Creswell, 2023). The researcher used 10% to obtain a sample size of 51 from 510 teachers. Furthermore, 5 heads of schools, 5 school board chair persons and 5 academic masters were sampled purposively to ensure manageability. Therefore, the total sample size was 66.

3.4 Sampling Techniques

Sampling is the process of selecting a smaller group (sample) from a larger population in order to study it and make conclusions about the whole population. It is widely used in fields like Statistics, research, surveys, and quality control. Studying the whole population is often too expensive, time-consuming, or impossible. A well-chosen sample can give accurate estimates of the population (Makwana et al., 2023). In this study, three sampling methods were employed which were; Total population and systematic random sampling which were used in sampling of teachers in the selected secondary schools, and expert purposive sampling was applied to select school administrators (School board members, Academic masters and Heads of schools) to provide the data on their experience regarding the ICT equipment integration.

3.5 Data collection tools and Data Analysis

The study employed three main instruments namely; questionnaire, interview guide and observation checklist. The triangulation of these instruments ensured that data collected was valid through cross-verification from multiple perspectives (Cohen, Manion, & Morrison, 2018). Quantitative data were analysed statistically by using descriptive (percentages, means and standard deviations). Qualitative data were analysed thematically and presented through codes which were categorized according to their subthemes.

3.6 Validity and Reliability of Instruments

To ensure content validity, the research instruments were reviewed by experts in educational technology and research methodology from local universities. Their feedback guided refinement of wording, structure, and content. Moreover, the researcher collected data from the defined population to ensure that data were provided with people who were familiar with the investigated phenomenon. Also, the researcher ensured validity by reporting what was found in the real context which enabled the findings to be applied in another environment (William, 2024). Reliability of the questionnaire was tested using Cronbach's Alpha coefficient. Pilot testing was conducted in one school which was not included in the final sample to verify clarity and appropriateness. The researcher administered questionnaires and entered in the SPSS programmed software and computer to obtain the Cronbach's Alpha of 0.896. The obtained Cronbach Alpha was above 0.7 which allowed the researcher to continue with the data collection process. A coefficient value of 0.7 or above is considered acceptable (Haji-Othman & Yusuff, 2022).

3.7 Ethical Considerations

Research ethics constitute the set of moral principles, guidelines, and norms that regulate scientific activity to ensure honesty, integrity, and safety. Research ethics included obtaining informed consent where the researcher informed the respondents about the purpose, procedures, and voluntary nature of participation. Confidentiality, was ensured by the researcher through the use of pseudonyms and restricted data access, integrity and honest, fairness and justice, minimizing harm, avoiding reproducibility and accountability, compliance with laws and regulations was maintained throughout the research process through following the institutional ethical standards (Creswell & Creswell, 2023).

4. RESEARCH FINDINGS/RESULTS

4.1 Demographic Information of the Participants

Table 1: Demographic Information of the Participants

Characteristic	Category	Frequency (F)	Percentages (%)
Gender	Male	50	78.1
	Female	14	21.9
	Total	**64**	**100**
Educational level	PhD	2	3.1
	Master degree	8	12.5
	Bachelor	54	84.4
	Total	**64**	**100**
Working experiences	1-10 years	48	75.0
	11-20years	11	17.2
	21-30 years	5	7.8
	Total	**64**	**100**

Source: Field data 2025

According to table 1 the total number of 64 respondents were used by the researcher to provide data, 50 (78.1%) were males and 14 (21.9%) were females. This implies that in private secondary schools, there are more male teachers compared to female teachers. This might be due to the fact that male teachers tend to be more available at the work place compared to female teachers. Most private schools do not pay female teachers during the maternity period which makes difficult for them to comply with the contracts.

On the aspect of education level, table 1 shows that 54 (84.4%) have a bachelor degree, 8 (12.5%) have a master degree, 2(3.1%) have PhD level of education. This implies that all teachers are qualified and have adequate knowledge and skills as the current education policy instructs that teachers of secondary schools should have a bachelor degree. Also the teachers have knowledge and skills on use of ICT aids in education, as it is validated that people with high level of education have high level of knowledge and skills.

On the aspect of working experience in table 1, 48(75.0%) of respondents have the working experience of 1-10 years, 11(17.2%) have the working experience of 11-20 and 5(7.8%) have a working experience of 21-30 years. This implies that majority of workers in private secondary schools are newly employed and could be interested in science and technology as most of them graduate from institutions equipped with technology that can be used in teaching and learning.

4.4 The Use of ICT Aids and Effective Instructional Delivery

On this theme, the researcher identified and analysed several subthemes including; the role of ICT in facilitating learners' participation, classroom interaction, online learning collaboration,

differentiated instructions, learners' assessment, scaffolding activities, inquiry-based learning, brainstorming, project-based learning, as well as individual learning as shown on table 2.

Table 2: The Use of ICT Aids and Effective Instructional Delivery (N=Teachers)

Descriptive Statistics			
Items	**N**	**Mean**	**Std. Deviation**
ICT facilitate learners' participation	50	3.48	0.580
ICT facilitate Classroom discussion	50	3.46	0.579
ICT enhance online learning collaboration	50	3.46	0.579
ICT facilitate learners' assessment	50	3.42	0.575
ICT facilitates differentiated instructions	50	3.42	0.575
ICT facilitates scaffolding activities	50	3.40	0.606
ICT facilitate inquiry-based learning	50	3.38	0.567
ICT enhance brainstorming	50	3.36	0.525
ICT facilitate project-based learning	49	3.35	0.597
ICT facilitate individual learning	50	3.32	0.621
Overall mean		**3.381**	

Source; Field data, 2026

According to data table 2, majority of the respondents strongly agreed that ICT facilitates learners' participation due to the mean response of 3.45. This reveals that via ICT tools learners can be engaged in practicing different activities related to delivered lesson. Leaners can search for knowledge by using online sources and share to their fellow students in the class. Also, teachers can assign students accomplish practical assignments by using computers in computer related studies. Encouraging learners' participation using ICT make students to be active in learning and easier understanding. From the interview data, SA2 said that "*ICT tools help students participate actively in class activities as they search information and share ideas with others leading to more engaging and interactive learning*" (Interview with SA2 in April, 2026). Another, said that "*learners become more involved when ICT is used in teaching as they perform practical tasks instead of only listening which increases their interest and participation*" (Interview with SA4 in April, 2026). SA7 reported that "*students use ICT to explore content independently and contribute more during lessons after researching which improves their confidence*" (Interview with SA7 in April, 2026). Finally, SA8 commented that "*ICT encourages collaboration among learners which promotes active involvement in learning*" (Interview with SA8 in April, 2026). Therefore, the findings indicate that ICT significantly enhances learners' participation by promoting engagement, collaboration, and active involvement in classroom activities.

Concerning the role of ICT aids in facilitating classroom discussion on table 2, the mean was 3.43. This implies that students can use ICT aids to search for knowledge on complex concepts when they are being assigned with group task. This reduces work load for teachers in provision of responses to all challenges encountered by students during the learning process. Furthermore, learners can search updated knowledge from current researches concerning the studied phenomenon and share to their fellow students. ICT helps students understand difficult concepts better. From the interview data, SA1 reported that "*they search explanations online during discussions which improves classroom interaction*" (Interview with SA1 in April, 2026). Moreover, SA3 said that "*group discussions are more effective with ICT tools as learners gather the relevant information quickly making the discussions meaningful*" (Interview with SA3 in April, 2026). SA4 reported that "*ICT allows students to*

bring updated information and share new knowledge with peers for enriching discussions" (Interview with SA4 in April, 2026). Overall, ICT improves classroom discussions by enhancing access to information, promoting student independence, and reducing teachers' workload.

Based on the role of ICT in enhancing online learning collaboration in table 2, the mean of 3.43 implies that majority of respondents strongly agreed. This reveals that students are trained to use various online learning programs including the use of zoom meeting as well as using WhatsApp groups during the holydays. This motivates students to attend online session programs which are facilitated by other teachers from other educational organizations through online systems. From the interview with SA5 said that "*Students collaborate using Zoom and WhatsApp as they continue learning even during holidays*" (Interview with SA5 in April, 2026). Another, SA6 said that "*ICT enables participation in online sessions as they interact with external teachers which broader learning experience*" (Interview with SA6 in April, 2026). Also, interview with SA4 "*online tools promote cooperation among students when work together from different locations, this improves collaboration*" (Interview with SA4 in April, 2026). Finally, SA8 "*students are motivated to join online sessions which is influenced by which easier the communication process to enhance learning interaction*" (Interview with SA8 in April, 2026). The findings show that ICT strengthens online collaboration by enabling communication, teamwork, and continuous learning beyond the classroom.

Concerning the role of ICT in facilitation of differentiated instructions on table 2, the mean was 3.41 showing that majority of the respondents strongly agreed. This reveals that teachers use ICT to design the teaching pedagogy which align with the students' level of understanding. And teachers can plan different varying learning tasks for each student within a single class which enables students to accomplish the syllabus timely. This implies instead of enrolling students for four years of secondary education, strategies can be made to enable students to graduate their learning pace. Those who accomplish their studies early should be certified, since ICT tools can enable leaners to acquire knowledge easily. From the interview with SA2 said that "*ICT helps assign tasks based on student level where learners work according to ability for supporting effective learning*" (Interview with SA2 in April, 2026). Moreover, SA5 commented "*students learn at their own pace using ICT which advanced learners progress faster and make teaching flexible*" (Interview with SA5 in April, 2026). Another, SA6 said "*ICT provides varied learning resources and design lessons for diverse needs for enhancing instruction*" (Interview with SA6 in April, 2026). Thus ICT supports differentiated instruction by allowing personalized learning, flexible pacing, and accommodation of diverse student needs.

Concerning the role of ICT aids in facilitation of learner's assessment, table 2 shows that majority of the respondents strongly agreed as the mean response was 3.39. This implies that students can use online learning constructed assessment tools to assess themselves on the extent they have acquired the intended learning goals. Also, the ICT aids simplify processing of results where teachers can provide timely feedback to the students for improving the learning processes. This calls on the attention of heads of schools to prioritize professional development to teachers on how to use the online learning tools for assessments. From the interview with SA4 said that "*ICT allows students to assess themselves online as they complete quizzes and tests easily for tracking progress*" (Interview with SA4 in April, 2026). Another, SA said that "*teachers provide quick feedback using ICT which results are processed faster*" (Interview with SA6 in April, 2026). Moreover, SA7 said that "*assessment becomes simple with ICT as both teachers and students benefit from saving time*" (Interview

with SA in April, 2026). The findings reveal that ICT enhances assessment by improving efficiency, providing timely feedback, and supporting student self-evaluation.

Concerning the role of ICT in facilitation of scaffolding activities, the mean of 3.39 implies that majority of respondents strongly agreed as shown on table 2. This shows that teachers have ability of designing different activities which enhance classroom instruction for enhancing students understanding. This happens due to the presence of training session as well as employment of new teachers with ICT expertise. These activities include designing games where learners can play to facilitate competency reinforcement. From the interview, SA6 said that "*teachers guide students step by step using ICT which support gradual learning which improves understanding*" (Interview with SA6 in April, 2026). Moreover, SA3 commented that "*complex topics are simplified with ICT tools when students follow structured steps*" (Interview with SA3 in April, 2026). SA7 said that "*interactive activities like games support learning which reinforces knowledge*" (Interview with SA7 in April, 2026). Therefore, ICT enhances scaffolding by supporting structured learning, simplifying complex content, and promoting progressive knowledge acquisition.

Also, data in table 2 shows the mean of 3.38 regarding inquiry-based learning which implies that majority of the respondents strongly agreed on the role of ICT in facilitation of inquiry-based learning. This implies that schools with ICT tools enable learners to design questions and respond to them on their own with little help from the teacher. This enables nurturing of the students with the heart of self-directed learning as well as retention of knowledge for a long period of time. This provides chance for teachers to design a lot of activities where students can work on their own. Interview with SA said that "*ICT encourages students to ask questions and search answers independently*" (Interview with SA1 in April, 2026). Moreover, SA3 said that "*learners investigate topics using ICT resources to explore information deeply which improves thinking skills*" (Interview with SA3 in April, 2026). Also, SA5 said that "*ICT supports independent knowledge exploration where students discover information themselves which strengthen inquiry learning*" (Interview with SA5 in April, 2026). The findings suggest that ICT promotes inquiry-based learning by encouraging independent research, critical thinking, and self-directed learning.

The mean of 3.33 in relation to brainstorming, implies that majority of the respondents strongly agreed that ICT aids enhance brainstorming as presented on table 2. This implies that teachers can use the ICT devices to test prior knowledge concerning the content of study. For example, teachers can ask new students on how to start a computer, the provided responses will determine how to demonstrate the new knowledge to the learner. This calls for attention of teachers to encourage students to share ideas, group working skills as well as enhancing them to learn from each other. From the interview with SA4 said that "*teachers use ICT to test prior knowledge where students respond using digital tools which supports brainstorming*" (Interview with SA4 in April, 2026). SA7 said that "*students share ideas easily through ICT which encourage participation*" (Interview with SA7 in April, 2026). In addition, interview with SA8 said that "*brainstorming sessions become interactive as students engage actively which enhances learning*" (Interview with SA8 in April, 2028). Interview data reveals that ICT enhances brainstorming by promoting interaction, idea sharing, and collaborative learning among students.

Table 2 reveals that majority of the respondents strongly agreed on the role of ICT aids in enhancing project-based learning due to the mean of 3.35. This implies that teachers are using ICT devices in facilitation of project-based learning highly. Learners can acquire knowledge

of graphic designing via project-based learning by using computers which can enable them to gain income after accomplishment of their studies. This can further be interpreted apart from gaining ICT skills, that students get being introduced to opportunities of using ICT devices in generation of income. From the interview with SA3 said that "*students use ICT tools for project work in creating designs and presentations for building practical skills*" (Interview with SA3 in April, 2026). Another SA said that "*project-based learning improves with ICT where students access resources easily and gain skills for employment*" (Interview with SA5 in April, 2026). SA6 commented that "*ICT motivates students in projects as they become creative and innovative which improves outcomes*" (Interview with SA6 in April, 2026). The findings indicate that ICT strengthens project-based learning by enhancing creativity, practical skills, and real-world application of knowledge.

Based on the role of ICT aids on enhancing individual learning, the mean was 3.32 which implies that majority of the respondents strongly agreed as indicated in table 2. This reveals that teachers are capable of directing students so that they can guide themselves in learning. This can be done through YouTube channel as well as downloading the materials and reading by themselves. This enables preparation of students for higher learning where individual learning style is much preferred. From the interview, SA1 commented that "*students learn independently using ICT tools through watching lessons online as well as accessing materials*" (Interview with SA1 in April, 2026). To add more, SA3 said that "*student study at their own pace*" (Interview with SA3 in April, 2026). Finally, SA7 said that "*Individual learning is strengthened through ICT as students rely on digital resources. This prepares them for higher education*" (Interview with SA7 in April, 2026). Overall, ICT enhances individual learning by promoting self-study, independent access to resources, and preparation for lifelong learning.

The Overall mean of 3.381 implies that majority of respondents strongly agreed on the use of ICT aids and effective instructional delivery as the findings revealed that ICT has influence on facilitating learners' participation, classroom interaction, online learning collaboration and differentiated instructions.

4.3 Results for Hypothesis Testing

In this study, the researcher tested a **null hypothesis** which stated that "*there is no significant relationship between regular ICT training programs for teachers and classroom discussion*"

Table 3: Hypothesis Testing Results

Correlations

		Regular ICT training programs for teachers	Classroom discussion
Regular ICT training programs for teachers	Pearson Correlation	1	0.330*
	Sig. (2-tailed)		0.019
	N	50	50
Classroom discussion	Pearson Correlation	0.330*	1
	Sig. (2-tailed)	0.019	
	N	50	50

*. Correlation is significant at the 0.05 level (2-tailed).

Source; Field data, 2026

The researcher tested the hypothesis to determine the relationship between regular ICT training programs for teachers and classroom discussion. This was done by subjecting the quantitative data of the two variables to inferential statistics by using Pearson correlation. The obtained p-value of 0.019 (Sig. (2-tailed)) is lower than the significant level of 0.05 as indicated in table 3. The decision rule is that, if the p-value is less than or equal to the level of significance, the null hypothesis must be rejected. Therefore, it can be concluded that there is relationship between regular ICT training programs for teachers and classroom discussion. This reveals that in schools where teachers invest on skills development to their workers in ICT devices, teaching strategies are being improved which might lead to improvement of students' performance.

5 DISCUSSIONS OF FINDINGS

The study investigated several instructional strategies highly influenced by ICT aids in the teaching and learning process such as learners' participation, classroom discussion, online learning collaboration and its facilitation of individual learning which scored low mean compared to the other instructional strategies.

Regarding learners' participation, the current findings revealed that when students interact with ICT aids, they become active in learning as they participate in accomplishing various learning tasks online via ICT tools by collaborating with each other. The current findings are in line with Haarala-Muhonen et al. (2023). who found that teachers who received training on pedagogical and ICT learning facilitated interactive learning which made teaching to be more effective. This calls for attention to management teams to align the training with the classroom needs to impact learning. In addition, the findings go hand in hand with TPACK model which insists that teachers should have technological knowledge, content knowledge and pedagogical knowledge which facilitate them to be effective and efficient in teaching (Widiawati, 2022). This implies that teachers who are well trained with ICT skills easen learners' participation process in comparison to those who are not trained in ICT skills.

Based on the influence of classroom discussion via ICT aids, the current findings revealed that students use ICT aids in searching for knowledge and skills which make the discussion to be more meaning full while teachers act as facilitators. The current findings are in line with Wang and Huang (2025) who found that teachers who are equipped with the ICT skills in teaching and learning are more switable in improving the classroom interaction. The study relied on ICT in enhancing classroom interaction, leaving a gap on other factors such as maturity and motivation. Moreover, constructivism learning theory explains that collaboration in learning acts as a core element in learning where learners share knowledge, challenge each other and negotiate meaning (Dili, 2026). This reveals that teachers are encouraged to design instructional strategies which facilitate learning among students.

The teaching and learning processes should be more interactive and cooperative such as using question and answers, group discussion and project work which provide space for students to interact with each other.

In relationship to the influence of ICT in enhancing online learning collaboration, the current findings revealed that as a result of ICT skills which are obtained in schools, students continue to share knowledge even during the holidays. When the schools are closed students share via online learning platforms and apps (zoom meeting and WhatsApp). The current findings are in line with Wang and Huang (2025) who found that disparities in digital literacy hinder teachers to access the ICT knowledge effectively. This implies that if people are not aware on how to use different programs for learning it becomes difficult for them to access

knowledge and skills based on ICT. This reveals the significance of orientation on digital tools to teachers so that they can facilitate the teaching and learning processes. The study aligns TPACK framework model which emphasizes that technological knowledge is important in enhancing effective ICT supported instruction which can enable teachers to facilitate instruction comfortably as they would be aware of what they are integrating in the classrooms (Widiati, 2022).

Concerning the role of ICT in enhancing individual learning. The current findings revealed that students practice different learning activities by using computers which facilitate them to be familiar with more skills to search for knowledge alone by using online sources. The current findings are in line with Dival (2022) who revealed that when ICT tools are integrated in learning they make learning more active. This implies that when learners practice knowledge which they obtain from the class their learning becomes more active. Furthermore, the findings are in line with constructivism learning theory which posits that engaging learners in different activities can enhance higher order thinking skills which skills facilitate problem solving skills (Dili, 2026). This implies that teachers who expose students to different individual learning tasks facilitates facilitate them with individual learning skills which reduces chances of seeking assistance from the teacher.

6. CONCLUSION AND RECOMMENDATIONS

The study concludes that school management teams play a crucial role in enhancing ICT aids utilization in private secondary schools as they ensure the availability of both ICT teaching aids as well as supporting teachers to update their knowledge. The study recommended that the school administrators should benchmark with other schools for observing the updated ICT materials for teaching and learning, and ensure that their schools are maintained with advanced ICT tools. The government institutions and agencies to support private secondary schools by providing practical knowledge on the correct ICT aids to be used in schools for teaching and learning and Further research should be done to investigate on the support of community and parents towards provision accessibility of ICT teaching aids in schools.

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