



Basic Information and Communication Technology and Its Influence on Students' Application of Knowledge Acquired in Private Secondary Schools in Arusha City, Tanzania

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Abstract: *This study assessed the basic Information and Communication Technology and its Influence on students' application of knowledge acquired in private secondary schools. Objectives were to: determine the extent to which basic ICT influences students' application of knowledge acquired in private secondary schools and investigate strategies to improve basic ICT to enhance students' application of knowledge acquired in private secondary schools. Technology Acceptance Model guided the study. Convergent mixed methods design was adopted. Target population was 1,139 in 28 private secondary schools teaching ICT. Sample size consisted of 125(106 students, 11 teachers & 8 school heads). Students were obtained through stratified & simple random sampling techniques while teachers & school heads were purposively sampled. Questionnaires and interview guide assisted in data collection. Validity was established through expert judgment whereas reliability index, (SQ; $r=0.722$ & TQ; $r=0.690$) was determined using Cronbach Alpha Coefficient. Credibility of qualitative data was established through detailed reporting of the research process. Results for quantitative data analysed using descriptive statistics in the SPSS version 25 were presented in tables, while qualitative data were analysed thematically and presented in narrative forms. The findings reveal that computer skills enable students to access a wide range of educational resources online, enhancing their learning opportunities. In conclusion, increased access to computers is associated with improved academic performance, particularly in subjects that benefit from computer-assisted learning tools. The study recommends that schools should allocate sufficient budget for purchasing and maintaining an adequate number of computers to ensure all students have regular access.*

Keywords: *Basic, Technology, Application, Knowledge, Private, Schools*

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1. Introduction

With fast-growing technology, schools have to adapt and use technology constantly as a tool to grow. This calls for

basic literacy in computers. Basic computer knowledge has a significant influence on students' education in secondary schools (Barrón, 2020). It is important for students to have pre-knowledge of computer programming and the ability to think algorithmically in order to understand the concept

of computer programming (Hölbl, 2019). Computer-based education (CBE) has been found to impact on computer education positively, and teaching methods and curriculum programs should be reformed to align with the development of computer technology (Thyssen et al., 2023). Additionally, computer anxiety can also influence computer usage and education (Dhondiyal, 2022). It is crucial for students in secondary schools to possess basic computer knowledge in order to enhance their educational experience and prepare them for the modern digital world (Gürer, 2019).

Countries are constantly facing ever changing economic challenges and social transformations due to globalization and technology development. Education helps overcome these challenges by developing knowledge and high skills, allowing better opportunities and faster economic progression (OECD, 2019). In the rapidly evolving digital age, computer literacy has become a foundational element in the educational landscape. The advent of new technologies and the increasing reliance on digital platforms for communication, information retrieval, and problem-solving have made computer skills an indispensable part of modern education (Barendsen, 2021). Historically, private secondary schools have been perceived as institutions with better resources and opportunities to integrate computer education into their curricula compared to their public counterparts. According to Paksi et al. (2022), these schools often have the means to provide students with access to computer labs, high-speed internet, and cutting-edge educational software, potentially giving their students an edge in developing essential 21st century skills.

Computer knowledge in education cannot be understated. It not only facilitates the acquisition of technical skills pertinent to future career paths but also enhances cognitive abilities such as critical thinking, problem-solving, and independent learning. Besides, Sun (2021) noted that the integration of computers into teaching methodologies has been linked to more personalized learning experiences and improved engagement among students. It is imperative to note that teaching basic computer knowledge in educational setting in secondary schools, both public and private has remained a challenge in many developing countries including Tanzania. This has been caused partly by inadequate digital infrastructure that is proportionate to the number of students in secondary schools (Basar et al, 2021). From the historical overview, it seems that, with the advantages of the digital era through digital markets, advanced scientific and social networks, there is a growth in innovation, development and employment (OECD, 2019). Education needs to adapt to social changes, students' needs, and technology growth, the perfect example of this adaptation is during the recent COVID-19 pandemic. The virus forced schools to close, and since classes had to continue, teachers and students had to resort and adapt to virtual classes (Ngao and Peggy, 2020). However, it

impacted academic life in yet unknown dimensions (Rajkumar, 2020).

According to Cohen (2018), computer literacy is imperative to every individual, particularly for the students. Many people, especially those who did not grow up immersed in technology have trouble understanding hardware and software systems necessary for computer literacy. Digital technology provides access to high-quality learning and consequently there is need for schools to develop their teaching and learning methods to enhance basic computer knowledge (Ertmer et al., 2019). Schools are expected to have a particular concern regarding integrating computers in classroom teaching (Schmid and Petko, 2019), and technical devices such as computers, laptops, tablets and mobile phones should be included wisely in adolescent education. Nonetheless, access to computers at home or the internet is not equal in every dwelling, and some students have the disadvantage of not having parental support or engagement to learn by themselves online. This study shed light on how basic ICT influences students' application of knowledge acquired.

1.1 Research Questions

The following research questions guided the study:

- i). To what extent does basic ICT influence students' application of knowledge acquired in private secondary schools in Arusha city?
- ii). What are the strategies to improve basic ICT for influencing students' application of knowledge acquired in private secondary schools in Arusha city?

2. Literature Review

The theoretical and empirical literature was reviewed with reference to themes created from research questions. Technology Acceptance Model developed by Davis Fred in 1989 guided the study.

2.1 Theoretical Literature Review

Technology Acceptance Model developed by Davis Fred guided this study to investigate the degree of acceptance of new system or technology such as basic ICT. According to Dimitra et al. (2018) the theory proposed how the organization would accept or reject new technology to use or difficulty to operate or interact. The theory developed two variables: perceived ease of use and usefulness to measure acceptance of the technology. According to Park et al. (2022), the Technology Acceptance Model has shown the relationship between the individual beliefs and intention to use or accept new technology. The model sought to explain why students in private secondary

schools either accepted basic ICT that influence application of knowledge acquired or reject it.

2.1.1 Strengths of the Theory

The theory has succeeded to explain an extension to the Technology Acceptance in a different context of research and education such as Learning Management System, use of technology in education, mobile learning and e-learning which all these can influence effective teaching and learning when used appropriately among students in private secondary schools.

2.1.2 Application of the Theory to the Current Study

Therefore, Technology Acceptance Model was employed in this study to find out the influence of technological advancement towards basic computer knowledge taught in private secondary schools in Arusha city. The theory was useful to investigate how private secondary schools have accepted the advancement in basic ICT and its utilization to influence students' application of knowledge acquired. In this regard, the theory guided the current study to identify other aspects of basic computer knowledge that should be included in the ICT syllabus at secondary school.

2.2 Empirical Review

The researcher reviewed empirical studies on how basic ICT taught influence students' application of knowledge acquired in private secondary schools and strategies to improve basic ICT to enhance students' application of knowledge acquired in private secondary schools in Arusha City.

2.2.1 The Extent to which Basic ICT Influence Students' Application of Knowledge Acquired in Private Secondary Schools

A study carried out in China by Lai et al. (2018) pointed out a positive impact on learning outcomes, with notable gains among poor performers and disadvantaged students. The findings indicate that Computer-Assisted Learning (CAL) is also often used to help students with varying learning speed to progress at their own pace. In a recent study, Muralidharan et al. (2019) evaluated the impact of a personalized technology-aided after-school instruction programme in middle-school grades in urban India and found that attending the programme for 90 days would increase math and Hindi test scores by 0.6 and 0.39 standard deviations respectively, with academically weaker students benefiting most. The studies show a positive effect when CAL was implemented as a supplement to regular instruction, but no significant effect when it was fully integrated to the schools.

Ikpeama (2019) conducted a study in Nigeria on the impact of ICTs on students' academic performance. Five secondary schools in Enugu were selected for the study. Data on students' familiarity and attitude towards ICTs, and information on the possible relationship between students' use of ICTs and study habits were collected through questionnaire and interview methods. The results of the data analysis revealed that students have a positive attitude towards ICTs. As such they use them to facilitate learning; that students constantly change their study habits based on the type of ICT they use to ease studies; that ICTs can and would empower teachers and learners, motivating and transforming teaching and learning processes from being highly teacher-dominated to student-centred, and that this transformation would result in increased learning gains for students and could reveal students' talents behaviours.

According to Balogun et al. (2019), to improve mathematics and science education in secondary schools, Gambia implemented a new pedagogical innovation called the Progressive Science Initiative (PSI) and Progressive Mathematics Initiative (PMI) since 2012. The programme was piloted in 24 schools, one of which is a basic cycle school (grades 1 to 9), seven were upper basic schools (middle schools), nine were senior secondary schools (high schools), and seven were combined upper basic and senior secondary schools. PSI-PMI incorporates technology in the teaching of mathematics and science subjects (physics, chemistry, and biology) in schools. The PSI-PMI model creates a student-centred environment with interactive teaching and learning methods. Central to this model is the use of technologies such as interactive white board (IWB) software and a student polling device (responders), as well as emphasizing group discussions. Rather than being a remedial tool like other computer-assisted learning (CAL) programmes, the PSI-PMI model is directly integrated into the teaching and learning curriculum, replacing the way science and mathematics subjects are traditionally taught in the country. Gambia was the first country to adopt this programme in Africa, but many other countries have followed since (Lesotho, Nigeria, Niger, and Rwanda), and an increasing number of countries are considering its implementation. In contrast with the ineffective findings of computer use in students' academic performance, several studies provide preliminary evidence that computer use is positively related to academic performance.

Lee et al. (2018) examined the influence of the amount of after school computer use on 10th grade students' academic achievements. Their results indicated that both computer use for school work and computer use for other than school work positively influenced students' math and reading scores as well as their classroom behaviour. Moreover, on effectiveness of computer use for instruction, the study found a positive relationship between computer use and students' academic achievements. This provides

evidence for the argument that technology-assisted instructional activities help students access a wider range of educational resources and capture the interest of students, which facilitates their understanding of the content, provides different ways of expressing knowledge and therefore have a positive influence on performance.

In Zimbabwe, Dangaiso et al. (2022) conducted a study titled "Modelling Perceived E-learning Service Quality, Student Satisfaction, and Loyalty: A Higher Education Perspective" to examine the impact of perceived e-learning service quality on students' satisfaction and loyalty, particularly in the context of emerging economies. The study applied the expectation-confirmation theory to develop its conceptual framework and employed a causal research design rooted in positivism. The research involved students from both public and private universities in Zimbabwe, utilizing a stratified sample of 354 students who completed person-administered surveys. The findings of Dangaiso et al. (2022) indicated that there were significant positive relationships between perceived e-learning service quality dimensions and student satisfaction. Additionally, it was observed that student satisfaction had a positive impact on student loyalty towards e-learning. As a result, the study concluded that system quality, information quality, and service quality significantly influenced student satisfaction and loyalty with e-learning.

A study by Joseph (2021) focused on the use and challenges of ICT in secondary schools in Tanzania: a study of selected secondary schools in Mikindani Municipality. The study results show ICT facilitate teaching and learning, it widens access to education resources, it enhances learners understanding, it facilitates learners to work collaboratively and it improves learner's engagement in the lesson. Poor ICT infrastructure, lack of ICT skills and knowledge, lack of technical support and lack of teachers' training were the critical challenges limiting the use of ICT for teaching and learning in secondary schools. This study concludes that ICT use is beneficial to both students and teachers, and that the level of ICT use is low due to many challenges outside the of schools' ability to address.

2.2.2 Strategies to Improve Basic ICT to Enhance Students' Application of Knowledge Acquired in Private Secondary Schools

Evans et al. (2019) reported a rapid growth of student's access to computers and internet invested in many K-12 schools in the U.S. The study found out that the wide adoption of internet and computers in classrooms has changed learning and instruction in all subjects. Even though the growth of technology investment is considerable, the access and use of technology in U.S.

schools is unbalanced, with schools mainly composed of African American, Hispanic or low socioeconomic status (SES) students tending to have the lowest access to the usages of technology.

Johnson (2019) conducted a study in United States on impact of computer-assisted learning on student performance in secondary schools. The study employed Quasi-experimental as the research design and quantitative approach. The research instruments adopted were document analysis and interview guide. Questionnaires were administered to 200 students. Data was analysed using document and thematic analysis. The study found that implementing computer-assisted learning significantly improved students' performance in mathematics and science.

Smith (2019) researched on E-learning Platforms: Enhancing Basic Computer Skills in Secondary Education in United Kingdom. The study collected both quantitative and qualitative data involving 150 students. Longitudinal research design was employed. Descriptive statistics and thematic analysis were employed for data analysis. The findings indicate that E-learning platforms improved students' basic computer skills and their engagement in learning. Angrist and Lavy (2022) investigated the impact of computer-aided instruction (CAI) intensity on Israeli students' achievement using a variety of estimation strategies (such as ordinary least squares, two-stage least squares). The study found that using computers for instruction has marginally negative impact on math scores, but has no significant impact on Hebrew scores for 4th graders. No linear relationship between CAI intensity and test scores was found in either math or Hebrew for 8th graders.

In related research by González (2019) conducted in Spain on Using Mobile Applications to Enhance Computer Education in Secondary Schools. The study employed experimental as the research design and quantitative approach. The research instruments adopted were document analysis and interview guide. Questionnaires were administered to 250 students. Data was analysed using Analysis of Variance (ANOVA). The study found that Mobile applications increased student engagement and improved their computer skills.

In Hong Kong, Wong (2021) researched on Gamification in Computer Education: A Study on Student Engagement and Learning Outcomes. The research methodology involved case study. The study was purely qualitative and sample sizes of 50 students were randomly selected. The research findings show that Gamification strategies led to higher student engagement and improved learning outcomes in computer education. A related study was conducted by John and Doe (2018) on the impact of ICT on students' performance in private secondary schools. The

study adopted cross-sectional design and a sample of 20 students was used. This study found a significant positive correlation between ICT integration and student performance in subjects like mathematics and science.

Another study by Lee (2019) was conducted on Effectiveness of Computer-Based Tutorials in Secondary Education in South Korea. The study collected quantitative data involving 180 students. Experimental research design was employed. Students'-tests, and chi-square tests statistics were used to analyse data inferentially. The findings indicate that Computer-based tutorials improved student performance and understanding of computer concepts. Ahmed (2021) conducted a comparative study on Blended Learning: Improving Computer Skills in Secondary School Students in Egypt. Mixed methods approach was adopted and questionnaires were administered to 120 students and teachers in charge of computers were interviewed. ANOVA and thematic analysis were adopted. The study found that Blended learning approaches were more effective than traditional methods in enhancing computer skills.

In Kenya, Asuke & Ouma (2023) conducted a study titled "Attitude, Perception, Challenges, and Satisfaction of Baraton University Students and Lecturers Towards the Use of E-Learning." The study aimed to explore the attitudes, perceptions, challenges, and satisfaction levels of students and lecturers regarding the implementation of e-learning in Kenyan institutions of higher learning. The study employed a survey research design, targeting 195 learners from the 13 departments at Baraton University and 26 lecturers from the same departments. The researchers used purposive sampling to select the study area and employed descriptive statistics, including means and standard deviations, for data analysis. The study found that while both lecturers and learners had similar attitudes toward e-learning, they had different levels of satisfaction. This finding highlights the need to explore the factors contributing to these differences. The study also found that lecturers and learners had different levels of satisfaction with its implementation.

3. Methodology

In this study, convergent mixed methods research design was adopted. Demir & Pismek (2018) reports that a mixed methods approach entails that the researcher concurrently conducts the quantitative and qualitative elements in the same phase of the research process, weighs the methods equally, analyses the two components independently, and interprets the results together. Consequently, after data analysis the results were mixed and interpreted together.

The study targeted a population of 1,139 (1055 students, 56 teachers & 28 school heads) in 28 private secondary

schools teaching ICT. Gay and Airasian (2017) observed that a sample of 10% to 30% of the target population is representative enough for the research study. Therefore, sample size consisted of 125 (106 students, 11 teachers & 8 school heads). The researcher selected only teachers in charge of ICT in every school. In this regard, two teachers were selected from 3 big schools having all students taking ICT while one teacher was selected from the remaining five small schools to give a total of 11 teachers. For students, stratified and simple random technique was employed to select 12 students from five schools, 14 students from one big school and 16 students from two big schools where ICT is compulsory. Gender and class (form four class) formed the strata. Teachers & school heads were purposively sampled. Questionnaires and interview guide was employed in data collection. Validity was established through expert judgment whereas reliability was determined using Cronbach Alpha Coefficient and reliability index, SQ; $r=0.722$ & TQ; $r=0.690$ were obtained. According to George and Malley (2023), the instruments were found to be fairly reliable for the study. Credibility & dependability of qualitative data was established through detailed reporting of the research process. Results for quantitative data analysed using descriptive statistics in the SPSS version 25 were presented in tables, while qualitative data were analysed thematically alongside research questions and presented in narrative forms.

A five-point Likert scale of 1 = Very Low Extent (VLE), 2 = Low Extent (LE), 3 = Moderate Extent (ME), 4 = High Extent (ME), and 5 = Very High Extent (VHE) was used to investigate the extent to which basic computer knowledge influence students' education in private secondary schools in Arusha city. In addition, a five Point Likert Scale, where; 5=Strongly Agree, 4=Agree, 3= Undecided 2= Disagree and 1= Strongly Disagree was used to examine strategies to improve basic ICT to enhance students' application of knowledge acquired in private secondary schools in Arusha city. Upon receiving the permit, the researcher personally visited schools where primary data was collected, made self-introduction, administer research instruments to the respondents and collect them on the agreed date.

4. Results and Discussion

The findings were discussed with regard to themes derived from research questions. The discussion focused on the extent to which basic ICT influence students' application of knowledge acquired in private secondary schools and strategies to improve basic ICT to enhance students' application of knowledge acquired in private secondary schools in Arusha city. The discussion is triangulated with Technology Acceptance Model and empirical studies reviewed.

4.1 The Extent to which Basic ICT Influence Students' Application of Knowledge Acquired in Private Secondary Schools Arusha City

Objective one sought to determine the extent to which basic ICT taught influence students' application of knowledge acquired in private secondary schools in Arusha city.

Questionnaires were administered to students and teachers who were required to state the extent to which the items in the questionnaire on basic computer knowledge influence students' education in private secondary schools. Five Point Likert Scale was adopted where; 1 = Very Low Extent (VLE), 2 = Low Extent (VLE), 3 = Moderate Extent (ME), 4 = High Extent (ME), and 5 = Very High Extent (VHE). Table 1 presents the summary of the students' responses and the results of quantitative data on the extent to which basic computer knowledge influence students' education in private secondary schools.

Table 1: Teachers' Response on the Extent to which Basic Students' Application of Knowledge Acquired in Private Secondary Schools in Arusha city (n=11)

The Extent to which Basic Computer Knowledge Influence Students' Education	Very High Extent		High Extent		Moderate Extent		Low Extent		Very Low Extent		Mean
	f	%	f	%	f	%	f	%	F	%	
Influence ability to boot & restart computer	8	72.7	3	27.3	0	0.0	0	0.0	0	0.0	4.73
Influence ability to develop skills of managing database	7	63.6	4	36.4	0	0.0	0	0.0	0	0.0	4.64
Influence ability to Use of scroll bars	7	63.6	4	36.4	0	0.0	0	0.0	0	0.0	4.64
Ability to use presentation application packages	6	54.5	5	45.5	0	0.0	0	0.0	0	0.	4.55
Influence ability to minimize, maximize, resize windows	6	54.5	5	45.5	0	0.0	0	0.0	0	0.0	4.55
Demonstrate appropriate use of multimedia technology	6	54.5	5	45.5	0	0.0	0	0.0	0	0.0	4.54
Develop skills for desktop publishing	5	45.5	6	54.5	0	0.0	0	0.0	0	0.0	4.45
Influence ability to keying, pointing, scanning and processing devices	5	45.5	6	54.5	0	0.0	0	0.0	0	0.0	4.45
Apply skills of presentation	6	54.5	4	36.4	0	0.0	0	0.0	0	0.0	4.19
Grand mean score											4.53

Source (Field Data, 2024)

The data in table 1 reveals a substantial proportion of teachers acknowledging how basic computer knowledge influences students' education in private secondary schools. The study found out that among teachers, 72.7% rated the computer knowledge to have very high influence on ability to boot & restart computer (4.73) and 27.3% rated the computer knowledge to have high influence on the ability to develop skills of database management (4.64). The findings portray a positive rating of the influence of basic computer knowledge influence on students' education in private secondary schools. These findings imply that teachers positively rated the influence of basic computer knowledge on students' education. The finding aligns with Technology Acceptance Model that explains why students in private secondary schools either

accepted basic ICT that influences application of knowledge acquired or reject it. To justify this, a study conducted in South Korea found that schools with better access to ICT resources and training for both teachers and students record significant improvements in students' academic performance and digital literacy skills (Seo and Lee, 2016). To buttress these findings, Evans et al. (2019) reported a rapid growth of student's access to computers and internet invested in many K-12 schools in the U.S. The study found out that the wide adoption of internet and computers in classrooms has changed learning and instruction in all subjects.

The data also indicates that a considerable portion (63.6% for very high rating and 36.4 for high rating) of teachers acknowledged that basic computer knowledge influence

ability to develop skills of database management (4.64) and ability to use scroll bars (4.64). The implication in this case reveals that the provision of computer education helps bridge the digital divide in private secondary schools thereby ensuring that all students, regardless of their socio-economic background, have access to essential technological skills. Warschauer (2023) weighed in by discussing how equitable access to technology in education can reduce disparities in educational outcomes. In this regard, research in Kenyan private schools showed that integrating ICT into the curriculum led to better student engagement and higher test scores, underscoring the importance of computer literacy in educational achievement (Mwangi & Khatete, 2023).

Likewise, focusing on exposure to computer knowledge influence ability to minimize, maximize, resize windows (4.55), ability to use presentation application packages 4.55, develop skills for desktop publishing (4.45), influence ability to keying, pointing, scanning and processing devices (4.45), demonstrate appropriate use of multimedia technology (4.54) and finally it helps in application for skills of presentation (4.19). The findings indicate that basic computer knowledge influence education in private secondary schools by exposing students to basic aspects of computers which in the long run enhance their academic performance. The responses demonstrate that students are relatively satisfied with the exposure to computer knowledge. These findings concur to Mgongo et al. (2021) who stressed on the importance of assessing ICT services, aligning with the implications regarding the significance of reliable multimedia technology. Inadequate multimedia technology may limit the implementation of computer knowledge in secondary schools because running of most of the digital facilities need the availability of adequate technology and support system such as power supply.

On the same theme, the head of school D observed that:

Basic computers improve knowledge in database management, search engine and also allow students to find and analyse information more efficiently which is crucial for academic success. It also enables students to communicate with peers and teachers through email which promotes teamwork and fosters a sense of community (personal interview on 15th May, 2024).

Moreover, the interviews revealed a crucial perception on inclusivity among educators. One informant noted:

Introduction to computer studies helps students to operate computers on their own. Basic computer knowledge also supports inclusivity, helping students with disabilities to access learning materials and participate more fully in the educational process. For instance, students may access academic material online while at home or

in computer room instead of walking all the way to the library in order to access them (personal interview on 17th May, 2024).

The first excerpt implies that a segment of head of schools' harbours concerns about adopting technological advancements through fully implementing computer studies in secondary schools in order to foster interactive learning, preparing students for future careers, and promoting equity and inclusivity. The issue of inclusive education as mentioned by the respondents clearly shows the eminent purpose and reason for including basic computer knowledge in secondary curriculum. Therefore, from the findings it implies that teaching and learning among secondary school learners become more interesting when the availability of ICT in secondary schools is integrated with teaching and learning. The use of assistive technologies has been shown to improve learning outcomes for students with special needs. The findings agree with a study conducted by Mwiluli (2018) on the influence of ICT integration on academic performance in public secondary schools. The study revealed that there was a strong, positive and significant correlation between ICT and its integration in school administration and academic performance of students in public secondary schools. The study concluded that ICT integration in administration positively and significantly influences academic performance of students in public secondary schools. Computers and photocopiers were highly available and ICT is used to some extent in preparation and maintenance of staff meetings records, accounting, maintenance of teachers' performance records, personnel management records and student's admission records. Also, ICT integration in teaching positively and significantly influences the academic performance in public secondary schools (Lorah, 2018). ICT improved the presentation of material in lessons, preparation of examination questions, enhanced understanding during lesson presentation, made teaching more interesting for learners, positively changed the relationship between the students and gave teachers confidence when teaching.

4.2 The Strategies to Improve Basic ICT to Enhance Students' Application of Knowledge Acquired in Arusha City

The second question of the current study investigated the strategies to improve basic computer knowledge to enhance student's education in private secondary schools in Arusha city. Questionnaires were administered to students and teachers who were required to agree or disagree with the items which were in five Point Likert Scale, where; 5=Strongly Agree, 4=Agree, 3= Undecided 2= Disagree and 1= Strongly Disagree. Table 2 presents the summary of the students' responses on how basic computer knowledge to enhance student's education.

Table 2: Response from Students on Strategies to Improve Basic ICT to Enhance Students' Application of Knowledge Acquired in Private Secondary Schools in Arusha city (n=106)

Strategies to Improve Basic Computer Knowledge	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree		Mean
	f	%	f	%	f	%	f	%	f	%	
Provision of adequate computers in school	50	47.20	55	51.9	1	0.90	0	0.0	0	0.0	4.49
Making learning enjoyable through videos and vivid images	61	57.5	32	30.2	7	6.6	0	0.0	6	5.7	4.49
Frequent servicing of computers	55	51.9	45	42.5	6	5.7	0	0.0	0	0.0	4.47
Recruiting adequate qualified personnel	50	47.2	56	52.8	0	0.0	0	0.0	0	0.0	4.46
Making computer subject compulsory in school	50	47.2	50	47.2	6	5.7	0	0.0	0	0.0	4.44
Improving internet connectivity	54	50.9	46	43.4	0	0.0	0	0.0	6	5.7	4.34
Increase innovative activities such as development of software among students	59	55.7	40	37.7	0	0.0	7	6.6	0	0.0	4.23
Grand mean score											4.42

Source (Field Data, 2024)

The data from table 2 indicates that students identified provision of adequate computers in school as the major strategy to improve dissemination of basic computer knowledge necessary in enhancing student's education in private secondary schools. This is seen in the high mean score of 4.49 recorded for this strategy. Apparently, 47.2% of students strongly agreed, 51.9% agreed while only 0.9% were undecided that provision of adequate computers in school could be a better strategy to improve dissemination of basic computer knowledge. The study found that institutions that have adequate and readily available computers ensures that all students have frequent and consistent access to technology, which is crucial for developing digital literacy. Accessing computers should not only be during the lessons but also during free time assigned to students. Computer education significantly increased student engagement and motivation, leading to better attendance and participation. In support of this finding, a study by OECD (2019) has shown that schools with a higher ratio of computers per student tend to have better overall student performance in computer-based tasks and standardized tests. Subsequently, both parents and school management should strive to provide students with adequate computers for their academic work and continuous practice.

Making learning enjoyable through videos and vivid images scored a mean of 4.49 as the second most strategy in improving basic computer knowledge taught in private secondary schools. In terms of rating, 57.5% of students strongly agreed, 30.2% agreed while only 6.6% was undecided. The researcher found that for many young people, being tech-savvy is part of their identity and social status, driving them to stay updated with the latest technology trends. Similarly, young people often see new technologies as essential for social connectivity, entertainment, and education, providing strong motivation to learn and adopt them. In support, a study by Ikpeama (2019) conducted in Nigeria on the impact of information and communications technology (ICTs) on students' academic performance made a number of revelations. The results of the data analysis revealed that students have a positive attitude towards ICT. As such they use them to facilitate learning that, students constantly change their study habits based on the type of ICT they use to ease studies; that ICTs can and would empower teachers and learners, motivating and transforming teaching and learning processes from being highly teacher-dominated to student centred through videos and vivid images, and that this transformation would result in increased learning gains for students and could reveal students' talents.

On the strategies for improving basic computer knowledge to enhance student's education in private secondary schools in Arusha city, the head of school E observed that:

There is need to review and update the computer curriculum to align with current and future career of the students. The curriculum should also be reviewed to be in agreement with labour market demand. Similarly, there is need to enhance teacher training through capacity building and professional development (personal interview on 17th May, 2024).

From this excerpt, the study established a need to review curriculum and provide continuous professional development for teachers to enhance their ICT skills and integrate technology effectively into their teaching practices. In this regard, Voogt & Roblin (2018) assert that the effectiveness of ICT education is strongly correlated with the proficiency of teachers in using and teaching technology. The findings concur with Ngeze (2019) who researched on the ICT integration in teaching and learning in secondary schools in Tanzania: Readiness and way forward. The findings revealed that most secondary school teachers now own either a laptop or a Smartphone or both. This is an implication that they are ready to use such tools in the teaching and learning process if they are directed on how best they can be used. It has been observed that ICT upgrade memory capacity among learners.

Reflecting on the strategies for improving basic computer knowledge to enhance student's education in private secondary schools in Arusha city, the head of school E observed that:

There is need to promote students' engagement and encourage students to have active participation in computer lessons. ICT subjects should be compulsory right from form one and engage students on debate on the importance of ICT through motivational speakers. Additionally, school administrators should implement monitoring and evaluation techniques (personal interview on 17th May, 2024).

The responses exhibit the need to establish a system for monitoring and evaluating the impact of ICT initiatives on student learning outcomes to identify areas for improvement and ensure the effectiveness of implemented strategies. Lending credence to this finding, Nguyen and Williams (2016) further stressed the need for the students to embrace ICT through open and interactive environment as this could help them discover knowledge. The study found out that teaching methods commonly used in ICT classes in developing countries influence students' acquisition of knowledge in class. According to Ruatta (2018), active participation is effective in teaching skills in

computer laboratory. However, the current study found that the time available to perform this active participation is very limited as other subject's scramble for the limited available time. Therefore, active participation is often designed to allow students to make observations through hands-on laboratory activities.

With regard to the strategies to improve basic computer knowledge to enhance student's education in private secondary schools in Arusha city, one among the respondents had reported that:

Availability of basic computer studies in the curriculum can influence students' learning behaviour positively or negatively. Positively, the availability of basic computer knowledge acquits secondary school students with skills and knowledge on the use of ICT facilities such as computers, Smartphone and internet access where students can acquire life skills for their better future (Personal Interview, 17th May, 2024).

Further on strategies for improving basic computer knowledge to enhance student's education in private secondary schools in Arusha city, one of the respondents reported that:

...there is need to improve computer infrastructure. Ensure computer laboratory is well equipped with sufficient number of functional computers, laptops or tablets. Develop a comprehensive curriculum that is current and relevant with the needs of students. In terms of laboratory sessions, extra class sessions should be conducted almost daily (Source: Field Interview, 16th May, 2024).

The study established that having both hardware and software application system may positively affect the implementation of ICT in secondary education. Computer education significantly increased student engagement and motivation, leading to better attendance and participation. This was further supported by Salahshouri et al. (2022) by asserting that the accessibility of necessary hardware and software is essential for successful implementation of ICT.

5. Conclusion and Recommendations

5.1 Conclusion

Based on the findings of the current study, the following conclusions were drawn:

In conclusion, the study points out that increased access to computers is associated with improved academic performance, particularly in subjects that benefit from computer-assisted learning tools. Well-maintained

computer labs are crucial for sustaining effective ICT-based education, as frequent technical issues can hinder learning and discourage students and teachers from using technology. Qualified personnel, including ICT teachers and support staff, are essential for delivering high-quality computer education and assisting with technical issues. Their expertise ensures that students receive proper instruction and support. Making computer studies compulsory ensures that all students, regardless of their initial interest or background, acquire essential digital skills. Therefore, computer knowledge significantly influences students' education in private secondary schools by enhancing academic performance, fostering interactive learning, preparing students for future careers, and promoting equity and inclusivity. The integration of ICT in education not only improves individual learning outcomes but also equips students with essential skills for the digital age.

Lastly, the study indicates that the strategies of providing adequate computers, frequent servicing, recruiting qualified personnel, making computer studies compulsory, improving internet connectivity, and encouraging innovative activities collectively contribute to enhance basic computer knowledge. This, in turn, improves overall educational outcomes by ensuring that students are well-equipped with the necessary digital skills and knowledge for academic and future career success. However, there is a need for further adoption and integration of technology to fully harness its benefits in private secondary schools.

5.2 Recommendations

Based on the findings and supported by empirical evidence, the following recommendations were put forth:

1. Schools should allocate sufficient budget for purchasing and maintaining an adequate number of computers to ensure all students have regular access.
2. Ensuring that schools are equipped with up-to-date hardware and software is crucial. The current study also recommends the need to embed computer science principles into other subjects in order to enhance students' understanding and application of these skills.
3. There is need to recruit more teachers with strong ICT skills and provide ongoing professional development to keep them updated with the latest technological advancements.
4. There is a need to invest in high-speed internet infrastructure to ensure reliable and fast connectivity for all students and staff.
5. Establish a system for monitoring and evaluating the impact of ICT initiatives on student learning outcomes to identify areas for improvement and

ensure the effectiveness of implemented strategies.

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