Journal of Teaching, Learning & Curriculum (JTLC)
Volume 2 Issue 1 Year 2026 Pages 150 - 166
E–ISSN : 3110-3707 | DOI: 10.61227
E-mail : jtlc.journal@gmail.com
https://journal.pusmedia.com/index.php/JTLC/index

Computer Usage in Enhancing Teaching and Learning Process in Secondary Schools in Misungwi District, Mwanza-Tanzania

Florencia Ndubashe[1]*, Georgina Mugisha[2], Felister Tangi[3]

[1] Janeth Magufuli Secondary School, Misungwi District Council
[2,3] Department of Education Foundations, St. Augustine University of Tanzania

Correspondence e-mail * : ndubasheflorensia@gmail.com

Abstract : This study aimed to examine the availability of computer usage in enhancing teaching and learning process in public secondary schools in Misungwi district, Mwanza-Tanzania. The study was guided by the Technological Pedagogical Content Knowledge (TPACK) theory developed by Mishra and Koehler (2006). A mixed research approach and an explanatory sequential research design were employed. The sample size was 151 respondents, including 100 students, 41 teachers, 4 head of schools, 3 Ward Education Officers, 1 District Quality Assurance Officer, 1 Statistics and Logistics Officer, and 1 District Education Officer. Data collection methods were questionnaires, and face-to-face semi-structured interviews. A pilot study was conducted to assess the reliability of the data collection instruments. The results of Test 1 showed an average reliability coefficient of 0.797, and the results of Test 2 was 0.812. Quantitative data from questionnaires were analysed using SPSS version 23, and descriptive statistics were used for data presentation. Qualitative data from interviews were analysed thematically. The study findings indicates that while few schools are well-equipped with computer facilities, others still face significant shortages. Such disparities create inequalities in teaching and access to digital resources. The study suggests that teachers should be accountable in identifying and reporting the computer needs of their schools such as inadequate computer devices, lack of training, lack of technical support, poor internet connectivity, maintenance of digital devices, data integration, and lack of managerial support. It is recommended on the need for government and stakeholders to prioritize investments in computer usage by considering a foundational element of effective teaching and learning needs in public secondary schools.

Keyword : Computer usage, teaching and learning process, public secondary schools

Article info: Submitted : 2026-02-22 | Accepted : 2026-04-15 | Published : 2026-04-23

INTRODUCTION

Computer usage plays a big role in almost every area of life, including teaching and learning. Teaching and learning processes are undergoing transformation as computers, internet connectivity, and other information and communication technologies (ICTs) become more widespread. The availability of computers, meaning the number of machines, their accessibility to teachers and learners, and their functional state and the actual usage of those computers in the teaching-learning cycle are two inter-related but distinct variables. According to Oshowole (2024) availability refers to tangible resources: computers placed in computer labs or classrooms, the presence of infrastructure (power, internet, maintenance), teacher training, and school policy supporting computer use. Ukpe (2023) usage refers to the degree to which those computers are integrated into pedagogical practices: teachers using computers to plan lessons, teach large groups, assess student progress, show videos, present slides, and keep records. students using computers for their own learning pace, access to learning materials online, do research, and linkage of computer use with improved learning outcomes.

Historically, the use of computers in the teaching and learning process began gaining global attention in the early 1980s, particularly in developed countries such as the United States and the United Kingdom. This emergence was driven by the rise of personal computers and increasing awareness of their potential to support education through interactive learning, simulations, and access to digital content. In 1984, Apple's "Kids Can't Wait" program donated thousands of computers to schools in the U.S., marking a major step forward. The movement later spread globally as countries recognized the role of Information and Communication Technology (ICT) in modern education. By the late 1990s, global organizations like UNESCO began promoting ICT integration in schools worldwide. Today, computer usage in classrooms continues to expand, enhancing both teaching methods and student engagement (Alam 2022).

In the United States, Mojapelo and Durodolu (2022) asserted that computers are widely present in secondary schools: a survey indicated that as of 2008, all public K-12 schools had one or more computers for instructional purposes, and by 2009 97 % of teachers reported having at least one computer in their classroom. Moreover, the location of computers matters: when they are located in labs away from the classroom, their usage is lower. These findings suggest that in the U.S., although availability of computers is high, integration into daily teaching and learning remains a challenge. In Belgium, computer availability and usage rates are relatively high compared to many other countries, with more established

infrastructure, teacher training programmes, and supportive policy frameworks. Thus, Belgium serves as a reference point for what may be possible when resources, expertise and policies align (Timotheou et al., 2023). In the Russian, computer system was piloted in Russian schools aiming to replace traditional textbooks and integrate digital devices into teaching and learning. Such initiatives point to ambitious national visions of using computers widely in classrooms. The situation in Russia thus illustrates a scenario where availability is being actively expanded and used as part of broader educational reform (Rawal 2024).

In Nigeria, Oshowole (2024) stated that secondary schools show computer availability, but usage remains uneven, particularly in public schools. Computer usage in Nigeria is limited by inadequate number of computers, lack of training, maintenance issues, and curriculum misalignment. However, in Ethiopia, Zulu et al., (2025) the picture of computer (ICT) integration in secondary schools' points to significant resource and usage gaps. Secondary s schools in Addis Ababa have inadequate resources like hardware, software and internet infrastructure; many schools lacked fully equipped ICT labs and teachers did not always have adequate training. According to Aunzo (2025) Kenyan secondary schools have basic computer facilities such as desktop computers were available in most secondary schools, which the researcher attributed to a government investment priority. However, access remained a major challenge, especially in disadvantaged regions, and usage for teaching/learning was limited.

Saif et al., (2022) asserted that the Government of Tanzania recognizes the importance of computer usage in enhancing teaching and learning by integrating ICT into the education system through various strategic initiatives and programs, such as the Tanzania ICT Policy for Basic Education and the Education Sector Development Programme (ESDP). The 1995 Education and Training Policy (ETP) highlighted the need to incorporate technology in education, albeit with limited specificity due to the era's technological context. The 2014 ETP placed greater emphasis on ICT integration in curriculum delivery, teacher training, and infrastructure development to improve quality and access to education. The 2023 ETP Edition builds on this by strongly advocating for digital learning environments, equitable access to computers, and teacher digital literacy as core components of modern education. Mukred et al., (2024) added that despite the policies initiatives the availability of computers in secondary schools is often limited, outdated or under-utilised, and the translation of computer availability into meaningful teaching and learning enhancement remains a significant challenge.

Misungwi District recognizes the importance of computer usage in enhancing teaching and learning by working in line with national education policies to promote ICT integration in schools. The government through District Education Office has supported initiatives to equip some secondary schools with computers and basic ICT infrastructure. Efforts have been made to train teachers in digital skills and encourage the use of computers in classroom instruction. However, implementation faces challenges such as limited resources, unreliable electricity, and insufficient computer access in many schools (Manyasa 2022). Therefore, this study aimed to examine the availability of computer usage enhances the teaching and learning process in secondary schools in Misungwi district.

Literature Review

1. Theoretical Review

The Technological Pedagogical Content Knowledge (TPACK) theory developed by Mishra and Koehler (2006) centered around the concept that teachers use computers in a way that helps students understand the subject better. It highlights that a teacher can use videos, presentations or educational software to explain a science topic more clearly. It further underscore that teachers plan their lessons in a way that connects the subject they are teaching, the best method to employ, and the right technology to support the teaching and learning process.

2. Empirical Literature Review

The availability of computer usage in public secondary schools vary greatly from country to country depending on the national education policies, economic status, infrastructure, quantity and quality.

In France, Mojapelo and Durodolu (2022) conducted a study on the available of computer for integration in education setting. The study adopts a multidisciplinary research approach, focusing on integrating microelectronics in education, emphasizing how ICT applications and connected objects drive innovation to both teachers and students. The study employs an explanatory research design in examining the development of innovative microelectronic platforms, with a particular focus on their use in teaching and learning. Findings reveal that the computer in ICT platforms developed by the French National Microelectronics Education Network significantly enhance the teaching and learning process by providing hands-on multidisciplinary training that bridges theoretical knowledge with practical application. The study recommends that, incorporating computers in secondary schools foster a deeper understanding of subject matter.

The study conducted by Tiyagarajan et al. (2024) employs a

quantitative research approach, in analyzing teachers' perceptions regarding the challenges of using ICT tools in classrooms. A descriptive research design is employed. Data were randomly collected from 100 secondary school teachers in Melaka, Malaysia, through a modified and adapted survey questionnaire. The research findings highlight several significant challenges in using computer tools, including limited accessibility and network connection, inadequate technical support, lack of effective training, limited time, and teachers' insufficient competency. Based on these findings, the study presents the need for improved infrastructure, more professional development opportunities for teachers, and better support systems. However, there is a need for more studies like this to provide broader insights into the effectiveness of computer integration in teaching and learning processes.

Privalov and Privalova (2021) conducts a study on current problems of modern digital education in Russia. The study uses an economic and statistical analysis approach to explore the impact of digital technologies on education within the context of Russia's education system under the Bologna process. It employs a descriptive research design that assesses the risks and benefits of integrating digital tools in education, highlighting their influence on student health, memory, communication and critical thinking. The study finds that while digital technologies offer advantages, they also create significant risks, such as the deterioration of traditional values, sensory deprivation, and an increasing gap between educational levels, with elite institutions remaining less affected by these digital shifts. The recommendations include reverting to traditional educational practices, increasing classroom hours, and reducing excessive formalization and technologization to restore the spiritual and intellectual aspects of education.

Timotheou et al. (2023) investigate on the influence of internet on the academic achievement of Senior High School students in the Cape Coast Metropolis of Ghana. The research approach used in the study is a mixed-methods research design, combining both qualitative and quantitative methods to gather data. The research design employed is a cross-sectional survey, involving a sample size of 300 participants, including students, teachers, parents and internet café operators. The research findings confirm that the use of computer and internet had a positive influence on the academic performance of students, highlighting the significance of computer in improving students' academic achievements. The study recommends that students should be encouraged to use computer and the internet strictly for academic purposes, suggesting the need for better guidance on internet usage. The study highlights the limited geographical scope, as it is confined to a single school in Cape

Coast, while substantially, it could have been more diverse to improve generalization.

Oshowole (2024) explore secondary school internet and network usage policy and students' learning outcomes in public day secondary schools in Kenya. The research employs a quantitative research approach to examine the relationship between students' adherence to internet usage policies and their academic performance. It utilizes a descriptive research design to collect data on the students' use of the internet, particularly their engagement with social media and its impact on their academic outcomes. The findings indicate that a significant portion of students, 72.6%, who disregard the internet policy and engage in non-academic social media activities face challenges in constructing proper English sentences, leading to lower overall examination scores. The recommendations of the study emphasize the importance of enforcing social media policies in schools to ensure students focus on academic excellence and use digital tools effectively for learning. Hence, the study's results are insightful and the research could benefit from more in-depth qualitative data to understand the specific reasons behind students' non-compliance with the internet policy and how schools can better support students in managing their online activities.

A mixed was study conducted by Mukred et al. (2024) on internet use among secondary school students and its effects on their learning. The study utilized a descriptive design, involving a sample of 310 students to gather data on their internet usage patterns and their effects on their learning. The research findings reveal that while internet use for educational purposes have improved, many students primarily engage in social media, watching movies and listening to music, which lead to negative consequences such as time wastage, delayed schoolwork submissions, poor academic results and school absenteeism. Recommendations include encouraging students to use the internet for educational purposes by guiding them on how to utilize it effectively for learning. The idea effectively summarizes the study's objectives, findings, and recommendations; however, it could be improved by providing more specific details on the qualitative aspects of the research and a clearer distinction between positive and negative effects of internet usage on learning outcomes.

The study conducted by Seif et al., (2022) about the access and use of the internet in teaching and learning at two selected teachers' colleges in Tanzania uses a quantitative research approach to gather numerical data through surveys. It focuses on the access and use of the internet in teaching and learning at teachers' colleges in Tanzania. It employs a

descriptive research design, collecting data on how the internet is utilized by respondents for various academic and non-academic purposes. The research findings show that most respondents use the internet for academic purposes, news and communication. However, their daily use for academics is low, with limited internet access and computer facilities in the colleges. The recommendations highlight the need for improved internet access, computer facilities, and enhanced training for tutors in computer basics and information literacy. Though the study highlights important gaps in internet access and usage, it does not research deeply into the impact of internet access on the actual teaching quality and learning outcomes.

METHODOLOGY

This study employed a mixed research approach, combining quantitative and qualitative methods to gather comprehensive data and provide a deeper understanding the availability of computer usage in public secondary schools in Misungwi District. The research design used was an explanatory sequential design, involving two phases of data collection: starting with a quantitative phase followed by a qualitative phase. The sample size consisted of 151 respondents, including 100 students, 41 teachers, 4 head of schools, 3 Ward Education Officers, 1 District Quality Assurance Officer, 1 Statistics and Logistics Officer, and 1 District Education Officer. Respondents were selected using purposive, stratified, and simple random sampling methods to ensure representation across various categories within the educational sector. Data collection instruments included questionnaires for students and teachers, while interview guides for DQAO, DEO, SLO, WEOs, and head of schools. The use of diverse data collection instruments allowed the researcher to gather comprehensive information on availability of computer usage to enhance teaching and learning processes. Both quantitative and qualitative analysis methods were utilized in the study, with SPSS version 23 used for quantitative data analysis and thematic analysis for qualitative data. The researcher conducted a pilot study to refine the instruments before the main study, ensuring the reliability of the instruments at 0.70. Ethical considerations were prioritized, with permission for data collection obtained, informed consent from participants secured, and confidentiality guaranteed.

RESULT AND DISCUSSION

The researcher sought to assess how the availability of computer usage enhances the teaching and learning process in public secondary schools. The researcher collected data by providing questionnaire to students and teachers which were to be answered through Likert scale by responding whether they strongly disagree, disagree, agree, or strongly

agree. However, their responses are complemented by the interview responses provided by the District Education Officer, District Statistics and Logistics Officer, District School Quality Assurance Officer, Ward Education Officers, and Head of Schools in the Misungwi district.

Table 1. Teachers' Responses on the Availability of Computer Usage in Enhancing the Teaching and Learning Process (n = 41)

Key: *SD-Strongly disagree, D-Disagree, A-Agree, SA-Strongly agree: F-frequency %-percentage*

No	Items	SD		D		A		SA	
		F	%	F	%	F	%	F	%
1.	Availability of computer in schools	5	12.2	10	24.4	15	36.6	11	26.8
2.	Teachers access to computer for teaching	8	19.5	11	26.8	17	41.5	5	12.2
3.	Computer improve teachers' lesson plan	1	2.4	6	14.6	18	43.9	16	39.0
4.	Computers help to explain complex topics	3	7.3	3	7.3	15	36.6	20	48.8
5.	Computers help to track students' progress	1	2.4	9	22.0	15	36.6	16	39.0
6.	Teachers use computer for students' results	2	4.9	3	7.3	14	34.1	22	53.7

Source: Field Data (2025)

Availability of Computers in Schools

Table 1 shows that 15 (36.6%) of the respondents agreed and 11 (26.8%) strongly agreed that computers are available in their schools, while an equal number, 15 (36.6%), disagreed with the statement. These responses suggests that the availability of computers is uneven across the surveyed schools, indicating lack of uniform infrastructure. According to Oshowole (2024), the integration of computer into education largely depends on infrastructural readiness, and limited access to digital tools is a key barrier to meaningful use of technology in schools. Similarly, Timotheou et al., (2023) argue that rural schools often lack adequate computer resources, widening the digital divide in educational settings. When the interviewees asked about the availability of computer in public secondary schools, one interviewee said:

> *"Our school has computers, but they are outdated and limited in number. Often, we have to schedule turns, and this affects how often we can use them for lesson delivery. Sometimes, when the machines break down, it takes weeks to repair them due to lack of technical support. This situation limits both teachers and students from effectively using technology in the learning process" (Interviewee 'B', June 2025).*

This quotation reveals that, limited and outdated computers, compounded by delayed technical maintenance hinder frequent and effective technology use. According to Mojapelo and Durodolu (2022), access

to functional ICT equipment and reliable technical support is fundamental for successful technology integration in schools.

Teachers' Access to Computers for Teaching

The table reveals that 17 (41.5%) respondents agreed and 5 (12.2%) strongly agreed that they have access to computers for teaching, while 19 (46.3%) disagreed. These findings indicate that nearly half of the teachers do not have regular access to computers for instructional purposes. Limited access is attributed to a low number of devices, lack of personal laptops, or school policies restricting usage. Manhibi (2019) similarly observes that when teachers are not provided with personal or classroom devices, the motivation to plan digital-integrated lessons decreases. Similarly, the interview conducted to one among the interviewees emphasized the following:

> *"Computers are mostly locked in the staffroom and require administrative approval for use. This delays our lesson preparations or forces us to abandon the use of digital content altogether. Sometimes, even when approval is granted, the time lost waiting limits our ability to complete tasks effectively. As a result, many teachers resort to traditional teaching methods instead of integrating technology" (Interviewee 3, Jun 2025).*

The quotation implies that bureaucratic control and restricted access to ICT resources hinder the effective integration of technology in teaching. According to Rawal (2024) restricted access to school ICT infrastructure, such as requiring administrative permissions, significantly limits teachers' use of digital tools in lesson planning and delivery.

Computers Improve Lesson Planning

As shown in Table 1 a total of 34 (82.9%) of the respondents agreed or strongly agreed that computers enhance the quality of lesson planning, while only 7 (17.0%) disagreed. This strong agreement indicates that majority of teachers recognize the value of computers in organizing, preparing and improving their lesson delivery. Zulu et al., (2025) otes that computer positively influences lesson planning by enabling creativity, access to updated materials, and efficiency. Ukpe (2023) similarly emphasizes that ICT reduces teachers' workload by simplifying repetitive tasks like formatting lesson plans or adapting existing templates. On the same line, interview findings concurred with questionnaire findings, as one interviewee was quoted saying:

> *"Having access to computer saves me time. I can prepare slides, print handouts, and even simulate scientific experiments virtually. It's a huge boost to lesson quality. I also use online videos and*

> *interactive tools to explain complex topics, which helps students understand better and keeps them engaged in class" (Interviewees 1, July 2025).*

The quotation implies that access to computers enhances teaching efficiency and improves lesson quality through digital tools and resources. It highlights the role of ICT in simplifying lesson preparation and delivering engaging, interactive content. According to Manyasa (2022), effective teaching with technology requires integrating content, pedagogy and technological knowledge. When teachers have access to and proficiency with digital tools, they can create richer and more interactive learning experiences.

Computers Help to Explain Complex Topics

According to Table 1, 36.6% of the respondents agreed and 48.8% strongly agreed that computers help in explaining complex topics, while only 14.6% disagreed. This indicates a strong consensus among teachers on the instructional value of computers, particularly in simplifying abstract or difficult concepts. Ziatdinov and Valles (2022) argue that computer supports constructivist learning by enabling learners to visualize and manipulate content, especially science subjects and mathematics. Aunzo (2025) also emphasizes that computer facilitates differentiated instruction and fosters a deeper understanding among learners. These findings are complemented by the information from interview as one interviewee exposed:

> *"I use animations and YouTube videos during biology classes. It makes the abstract processes like cell division or DNA replication clearer to students than using chalk and board. These visuals help them to see the actual movement and interaction of cell components. Students are more attentive and ask deeper questions, which shows they understand the topic better" (Interviewee 4, July 2025).*

This quotation implies that multimedia tools enhance students' comprehension of complex scientific concepts by providing visual representations. Syukur and Tohamba (2025) argues that students learn better from words and pictures than from words alone. Visual aids like animations simplify complex scientific phenomena, making learning more meaningful. Studies show improved retention and engagement when multimedia is used in science instruction.

Computers Help to Track Students' Progress

The findings show that 16 (39.0%) of the respondents strongly agreed and 15 (36.6%) agreed that computers help track students' progress, whereas 10 (24.4%) disagreed. This indicates that 75.6% of teachers recognize the effectiveness of computers in monitoring student

performance and academic development. Thiyagarajan et al. (2024) note that technology-assisted progress tracking enables real-time feedback and data-informed instruction. Nelson et al., (2025) also argue that such systems promote teacher efficiency in assessment and reporting. Likewise, an interview conducted with one interviewee remarked that:

> *"We use Excel and simple learning management systems to record test scores. It helps me spot which students need extra help, and I can share reports easily with parents. The system calculates averages and trends, which saves me time and reduces errors. It also keeps parents more engaged in their children's academic progress" (Interviewee 2, July 2025).*

The quotation implies that digital tools like Excel and LMS platforms streamline assessment management and enhance data-driven decision-making in education. According to Bergamaschi et al., (2025) digital data systems empower teachers to monitor student progress and adjust instruction accordingly.

Teachers Use of Computers for Students' Results

The table shows that the majority of teachers 22 (53.7%) strongly agreed and 14 (34.1%) agreed that they use computers for entering and processing students' academic results, while only 12.2% disagreed. This high level of agreement 87.8% demonstrates that computers are widely used as essential tools for academic record management. The use of spreadsheet software, grading programs, and school management systems allow teachers to handle student data more accurately and efficiently. According to Alam (2022), computer improves educational management by enabling faster processing and dissemination of academic records. Saif et al. (2022) further suggests that digital technologies reduce teacher workload related to paperwork and enhance transparency. These finding was supported by the interview when one interviewee was quoted arguing the following:

> *"In our district, results processing is now done entirely on computers. We no longer spend hours calculating manually. Thus, it minimizes errors and makes retrieval of past data much easier. It also allows us to generate reports faster and share results with schools across the district more efficiently" (Interviewee 'A', July 2025).*

The quotation implies that the integration of computer systems into academic assessment has enhanced efficiency and accuracy in managing student performance data. According Mukred et al. (2024) the use of educational technologies for data management significantly improves assessment accuracy and decision-making processes in schools.

Likewise, in this first objective also, students were required to respond to the same question by stating the availability of computer usage on enhancing learning in public secondary schools. The findings of the students are presented in Table 4.5:

Table 2.
Students' Response to the Availability of Computer Usage in Enhancing Learning Process (N=100)

Key: *SD-Strongly disagree, D-Disagree, A-Agree, SA-Strongly agree: F-frequency, %-percentage*

No.	Items	SD		D		A		SA	
		F	%	F	%	F	%	F	%
1.	Students access to computer	17	17.0	17	17.0	35	35.0	31	31.0
2.	Computer use in learning	8	8.0	12	12.0	38	38.0	42	42.0
3.	Students' lesson understanding	7	7.0	15	15.0	43	43.0	35	35.0
4.	Computers for assignments	14	14.0	27	27.0	33	33.0	26	26.0
5.	Students' computer focus	5	5.0	23	23.0	44	44.0	28	28.0
6.	Computer-based activities	9	9.0	25	25.0	35	35.0	31	31.0

Source: Field Data (2025)

Students' Access to Computers

A total of 66% of students agreed that they have access to computers, indicating moderate access levels. However, a significant minority (34%) disagreed, suggesting that access is still inconsistent across the student population. This disparity suggests digital inequality, affecting students' ability to learn effectively using technology. According to Oshowole (2024) digital access plays a critical role in student learning outcomes, and limited access hinders students' ability to develop necessary digital competencies that support 21st-century learning. This insight is supported by some information from an interview done by a researcher; one interviewee informed the researcher:

> *"While some of our students can access computers in the school lab, the number of machines is not enough for everyone. During peak times, students have to wait for long or work in groups, which limits personal interaction with the tools. Also, many students lack home access, which creates a digital divide. We need more infrastructure to ensure equal access" (Interviewee 4, July 2025).*

This quotation underscores that insufficient infrastructure is a key limitation in promoting equitable access to education. Mojapelo and Durodolu (2022) assert that disparities in computer access among students lead to inconsistent skill development and create achievement gaps, particularly in low-resource schools.

Computer Uses in Learning

A strong majority (80%) of students agreed that computers are used in learning, indicating widespread integration of technology

into the curriculum while (20%) of students disagreed. This generally reflects a growing adoption of digital tools in classroom environments. This aligns with Timotheou et al. (2023) emphasize that integrating computers into instruction enhances student engagement, understanding and retention when aligned with curriculum goals. Similar information was gathered during the interview conducted to one interviewee who argued:

> *"Our teachers have embraced computer-based instruction, especially for subjects like science and geography where simulations and videos make lessons more engaging. Students participate more actively, and even the quiet ones find ways to interact. However, we still need to train teachers to align tech with content better" (Interviewee 1, July 2025).*

This statement shows that while computer use is prevalent, there remains a gap in strategically linking technology to content knowledge. Manhibi (2019) notes that technology must be pedagogically purposeful, and without the appropriate TPACK training, technology use risks being superficial or misaligned with instructional goals.

Students' Lesson Understanding

A total of 78% of students reported that using computers improves their lesson understanding, with few 22% disagreeing with the statement. This demonstrates that digital learning tools are positively influencing comprehension and retention among students. Manyasa (2022) found that digital tools like visual simulations and animations significantly improve learner comprehension, especially in complex subjects. The same findings were gathered during the interview as one of the interviewees reported the following:

> *"Students have shown improved academic performance, especially in STEM subjects, thanks to computer-assisted instruction. Visual tools help them grasp difficult concepts more easily. Teachers now report fewer complaints about abstract topics, and students participate more actively in discussions" (Interviewee* 3, July 2025).

The quotation confirms that technological resources enhance conceptual clarity and student interaction, making the learning process more effective and participatory. Zulu et al. (2025) emphasize that visual and interactive computer tools support student-centered learning, improving both motivation and understanding.

Computers for Assignments

Only 59% of students agreed that they use computers for assignments, while a notable 41% disagreed. This suggests that while many students benefit from digital

tools for assignments, others face barriers such as access, familiarity or teacher encouragement. Ukpe (2023) argues that without proper access and task-oriented guidance, students may not utilize digital tools for academic assignments, reducing the effectiveness of tech integration. The similar findings were gathered during the interview as one of the interviewees reported the following:

> *"Some teachers encourage students to type and research using computers, but others still rely heavily on handwritten assignments. It's partly due to limited computer access and lack of policy enforcing digital submissions. Students also need digital literacy skills to complete assignments independently" (Interviewee 1, July 2025*).

There is inconsistency in how computers are used for academic tasks due to access gaps and uneven teacher practices. Rawal (2024) highlights that unless digital tools are embedded into assessment and homework policies, their usage remains optional and often underutilized.

Students' Computer Focus

Table 2 indicates that 72% of students reported that computers help them focus more during lessons. This suggests that technology has a motivating effect on learners and supports concentration, though 28% still struggle with distractions or disengagement. Aunzo (2025) reported that the interactive nature of technology-enhanced lessons tends to increase student concentration and attentiveness, especially in practical or visual subjects. These findings are supported by the information gathered during the interview as one of the interviewees said:

> *"We have noticed that students are more attentive during computer-based lessons. Tools like quizzes, games and videos seem to hold their focus better than traditional lectures. But distractions like social media also pose challenges, so teachers must manage classroom usage effectively" (Interviewee 4, July 2025).*

This implies that, while computers improve engagement, they can also be sources of distraction if not well managed. Ziatdinov and Valles (2022) found that while digital tools enhance engagement, misuse or lack of classroom control can reduce focus, indicating the need for effective classroom management strategies alongside tech integration.

Computer-Based Activities

Table 2 shows that, 66% of students reported engaging in computer-based activities, which is a positive indicator of interactive and student-centered learning. However, a quarter (25%) disagreed, pointing to inconsistent activity implementation across classrooms. Syukur and Tohamba (2025) note that computer-based learning activities foster

creativity and critical thinking, especially when students actively engage with real-world content through technology. These findings are tied with the information gathered during the interview as one of the interviewees argued:

> *"Teachers are trying out computer-based projects, like digital storytelling or online science labs, which students really enjoy. It gives them a chance to learn by doing rather than just listening. Still, not every class or teacher has fully embraced these methods due to lack of resources or experience" (Interviewee 2, July 2025).*

This quotation implies that, computer-based activities support active learning and engagement, but their success is contingent on teacher readiness and resource availability. Means et al. (2010) show that students in classrooms with regular computer-based learning activities outperform their peers, provided teachers are trained and resources are sufficient.

CONCLUSION

Based on the findings, this study concludes that availability of computer in schools, teachers access to computer for teaching, computer improve teachers' lesson plan, computers help to explain complex topics, computers help to track students' progress, and teachers use computer for students' results. Few public secondary schools have taken steps toward computer usage, reflecting a significant digital gap that hinder the effective use of computer in teaching and learning process to many public secondary schools across Misungwi district. Therefore, the finding underscore the need for government and stakeholders to prioritize investments in computer usage by considering a foundational element of effective teaching and learning needs in public secondary schools.

From the findings, this study recommends that teachers should actively engage and participate in the computer usage in the teaching and learning process, and in identifying and reporting the computer needs of their schools such as inadequate computer devices, lack of training, lack of technical support, poor internet connectivity, maintenance of digital devices, data integration, and lack of managerial support. Head of schools should conduct regular inspection of computer devices necessary for teaching and learning processes and submit timely reports to responsible authorities. The government should prioritize investment in public secondary schools' computer usage for teachers and students through National Education Policy and budget allocations.

REFERENCES

Alam, A. (2022). Platform utilising blockchain technology for eLearning and online education for open sharing of academic proficiency and progress

records. In *Smart data intelligence: Proceedings of ICSMDI 2022* (pp. 307-320). Singapore: Springer Nature Singapore.

Aunzo Jr, R. T. (2025). Advancing sustainable development goals with educational technology: supporting stem education and fostering innovation through educational technology. *Advancing sustainable development goals with educational technology* (pp. 65-98). IGI Global Scientific Publishing.

Bergamaschi, A., Giambruno, C., & Morales, P. (2025). Empowering Schools with Data: How Can We Achieve Effective Use of Educational Dashboards for Teachers and Principals?

Manyasa, E. M. M. A. N. U. E. L. (2022). *Assessing the impact of ICT integration policy on the equitable access to quality education in African contexts: the case of Kenya*.

Mojapelo, S. M., & Durodolu, O. O. (2022). Information and communications technologies in library facilities in disadvantaged rural schools in South Africa: Lessons from Limpopo province. *Education for Information*, *38*(2), 113-131.

Mukred, M., Asma'Mokhtar, U., Hawash, B., AlSalman, H., & Zohaib, M. (2024). The adoption and use of learning analytics tools to improve decision making in higher learning institutions: An extension of technology acceptance model. *Heliyon*, *10*(4).

Oshowole, S. A. (2024). *Barriers Impacting the Integration of Classroom Technology in Primary Schools in Lagos, Nigeria* (Doctoral dissertation, Saint Leo University).

Privalov, N., & Privalova, S. (2021). Current problems of modern digital education in Russia. *European Proceedings of Social and Behavioural Sciences*, 103.

Rawal, D. M. (2024). Mapping of school teachers' digital competency in the context of digital infrastructure: a systematic review and empirical study of India. *Journal of Professional Capital and Community*, *9*(3), 173-195.

Saif, S. M., Ansarullah, S. I., Ben Othman, M. T., Alshmrany, S., Shafiq, M., & Hamam, H. (2022). Impact of ICT in modernizing the global education industry to yield better academic outreach. *Sustainability*, *14*(11), 6884.

Syukur, M., & Tohamba, C. P. P. (2025). Mind Mapping Technique In Vocabulary Teaching And Learning Context: A Systematic Literature Review. *IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature*, *13*(1), 526-539.

Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V., Giannoutsou,

N., Cachia, R., ... & Ioannou, A. (2023). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and information technologies*, *28*(6), 6695-6726.

Ukpe, E. (2023). Information and communication technologies (ICTS) for E-Learning in tertiary education. *Open Journal of Social Sciences*, *11*(12), 666-680.

Ziatdinov, R., & Valles Jr, J. R. (2022). Synthesis of modeling, visualization, and programming in GeoGebra as an effective approach for teaching and learning STEM topics. *Mathematics*, *10*(3), 398.

Zulu, N., Bweupe, B. S., Masaiti, G., Mundende, K., Bwembya, I., & Sinyangwe, D. (2025). Integrating Ict Tools in Lesson Preparation and Delivery: A Way to Go in Zambian Schools.

AUTHOR CONTRIBUTIONS

Conceptualization: All Authors ;

Methodology: All Authors ;

Investigation: All Authors ;

Writing—original draft preparation: All Authors ;

Writing—review and editing: All Authors ;

Visualization: All Authors ;

All authors have read and agreed to the published version of the manuscript.