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Challenges Faced by Students and Teachers in Utilizing Digital Technologies For Enhancing Map Reading and Interpretation Skills: A Case of Kisarawe District, Tanzania

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Abstract: Background: The integration of digital technologies in geography education has shown promise, with tools such as Google Maps, and Google Earth enhancing map reading abilities. However, secondary schools in Tanzania encounter obstacles including limited digital resources, inadequate internet connectivity, and insufficient teacher training, which impede effective implementation. The study aimed to explore those challenges in secondary schools of Tanzania. Methods: This research employed a mixed-methods approach, integrating quantitative and qualitative techniques. Statistical analyses, including Chi-Square and Wilcoxon Signed-Rank tests, were used to examine relationships between variables, while surveys, interviews, and observations provided more comprehensive insights. Thematic analysis identified key challenges, such as training inadequacies, financial limitations, and policy shortcomings. Results: Indicated that the digital divide and poor infrastructure were the most significant hurdles, followed by insufficient teacher training and financial constraints that limited access to digital tools. Responses regarding policy alignment were mixed, while resistance to change was a minor issue. Language barriers and motivation also played a role in digital adoption. Conclusion: Despite these obstacles, educators recognize the potential of digital tools to enhance geography education. Statistical analysis revealed no significant correlation between specific challenges and teachers' attitudes, suggesting a willingness to embrace technology given adequate support. Overcoming these barriers is essential for successfully incorporating digital technologies into geography education in Tanzania's secondary schools.

Keyword: Digital technologies, Map reading and Interpretation, Geography Education, Infrastructures Challenges, Teacher competence, Sustainable Development Goal 4 (SDG4)

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Introduction

The adoption of digital technologies in education is widely acknowledged as a revolutionary method for improving teaching and learning experiences. Tools like Geographic Information Systems (GIS), Google Maps, and Google Earth are increasingly utilized to enhance geographic education, particularly in map reading and interpretation. The United Nations Sustainable Development Goal 4 (SDG 4) emphasizes the significance of high-quality education and equal access to learning

opportunities, including the use of digital tools to boost geographical literacy and spatial thinking abilities (United Nations, 2015). Despite the vast potential of digital technologies in enhancing map reading and interpretation skills, their effective implementation remains problematic in various educational settings worldwide.

Studies from developed nations suggest that digital learning tools have considerably improved students' capacity to analyze, interpret, and visualize spatial data (Selwyn, 2021; Kent & Foskett, 2020). However, in developing regions, such as sub-Saharan Africa, the incorporation of these technologies into curricula has been impeded by various obstacles, including inadequate infrastructure, insufficient teacher training, and limited digital resources (Msuya & Mtei, 2018; Chilongo & Mtenzi, 2020; Cutter et al., 2018). Research conducted in Tanzania highlights systemic issues related to teachers' digital literacy, inconsistent access to technological tools, and resistance to pedagogical changes (Mtebe & Raphael, 2018; Mwalongo, 2020; Shaban & Nzilano, 2024). These challenges ultimately impact the quality of geography education and students' ability to effectively utilize digital platforms for map reading and interpretation.

In Tanzania, secondary school students and educators continue to encounter various challenges in effectively implementing digital technologies for geography education, despite their growing importance. The main obstacles include limited access to technological resources, poor alignment between digital tools and curriculum requirements, and insufficient digital skills among teachers (Masumbuko, 2021; Mosenda & Helahela, 2020; Mhando, 2020; Komba & Mwandaji, 2015). Additionally, infrastructure issues such as inconsistent internet connectivity and power supply further complicate the integration of digital technologies into classroom teaching (Minga & Ghosh, 2024; Msuya & Mtei, 2018; Kimaryo & Mwinyi, 2016).

This research seeks to examine the difficulties faced by students and teachers in leveraging digital technologies to enhance map reading and interpretation abilities in geography for Form Three secondary school students in Tanzania. The study concentrates on identifying primary barriers, including infrastructure constraints, teacher expertise, availability of digital resources, curriculum integration, and resistance to adopting new methods.

Literature Review

Tarmo, A et al., (2023) the study was called *Integration of Information and Communication Technology in Instruction of Geography: A study of public secondary school in Manyoni District*, Tanzania. The study involved 9 secondary schools and employed mixed research approach. The major findings in their study include; insufficient of ICT tools and many Geography teachers never used ICT in teaching. The study conclude that in service training play great role in improving teaching and learning strategies to the teachers

Mwalongo, P (2023) the study was called *Factors Influencing the use of Information resources among Open and Distance Learners Living in Remote Areas of Tanzania: A case of Rukwa Basin District.* The study involved 101 purposive samples were used. Multiple statistical analysis was used to analyze the questionnaires. Lack of training and digital literacy was mentioned as the major findings.

Banda, A (2023) In his study called *Investigation into Integration of ICT in the teaching and Learning of Geography in Secondary Schools in Nkhotakota district in Malawi*. The study applied Roger's theory of diffusion of innovation Model. The data was analyzed in descriptive techniques from 12 secondary schools. While purposive sampling from 12 head teachers, 36 geography teachers and 240 students were sampled. The major challenges were: inadequate of ICT resources, lack of power supply, internet connectivity, school lack ICT policy

Mkilamwe, P (2023) the study was called *Assessing the Role of ICT on Secondary School Students' Academic Performance in Njombe, Tanzania*. The study adopted TAM and applied questionnaire techniques. The major findings were the ICT tools were not well supplied and misalignment of education policy and curriculum.

Yunusu, Z (2023) the study was called *Awareness, Interest and Altitude of geography teachers towards the utilization of social media for teaching in senior secondary schools in Nigeria.* 131 geography teachers were selected to fill questionnaire. The descriptive and inferential analysis were done. The major findings of this study; teachers are not aware on ICT tools but have positive interesting on them. In other hand male teacher prefer to use digital technologies.

In general from reviewed literatures. This study aimed to fulfil the gap in remote areas, in Kisarawe district, Tanzania in sense of statistical analysis where the study applied both qualitative and quantitative approach to have wide range of responses. Also the study based in geography for only 1 topic while many studies based in general subject. Only two software were used google earth and google map.

Methodology

The study adopted a mixed-methods research design, integrating both quantitative and qualitative approaches. The presence of statistical analysis, such as the Chi-Square Test of Independence and the Wilcoxon Signed-Rank Test, indicated a quantitative approach to examining relationships between variables, while the use of direct quotes from teachers, students, and parents suggested a qualitative approach aimed at capturing in-depth perceptions and experiences. This methodological integration allowed for a comprehensive examination of the challenges associated with digital technology use in Geography education.

The research was both descriptive and correlational in nature. Descriptive research was evident in the study's presentation of frequency distributions, summarizing teachers' responses regarding challenges in digital technology use. This

was demonstrated through statistical tables and figures that highlighted the prevalence of specific challenges. Additionally, the correlational aspect was reflected in the use of the Chi-Square Test of Independence, which aimed to establish relationships between different challenges, such as the digital divide, training deficiencies, and access to resources. By employing this combination of descriptive and correlational research, the study provided both an overview of digital technology challenges and insights into how various factors were interrelated.

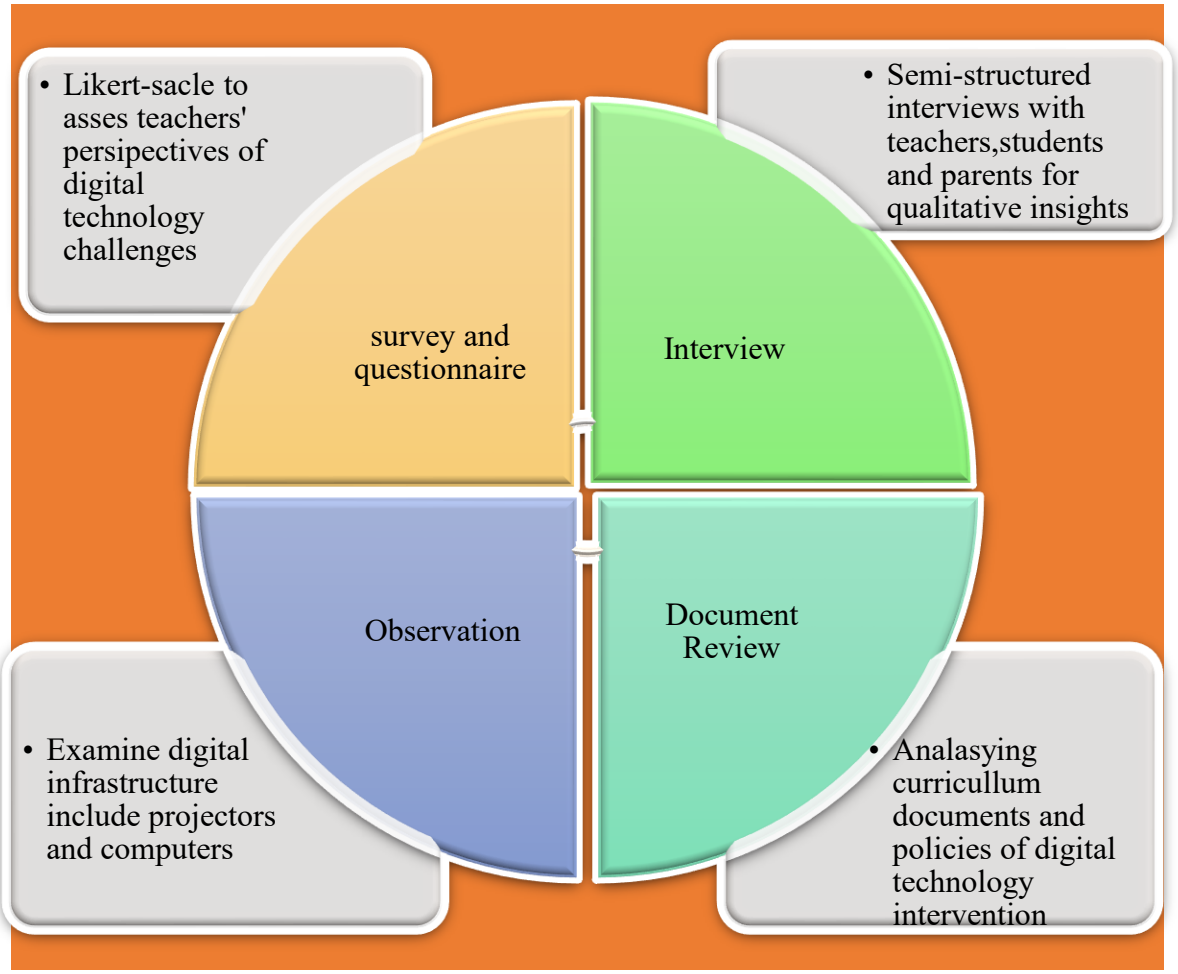
Area of Study

This study was conducted in Kisarawe District, located in the Coastal Region in the eastern part of Tanzania (East Africa). The choice of this location was justified by the researcher's familiarity and experience working in this district, which provided an advantage in understanding the local educational environment and logistical context, aiding efficient data collection and engagement with participants.

Table 1.
Presents Data Collection Method and Explanation

Data Collection Method	Description
Surveys and Questionnaires	Used Likert-scale questions to assess teachers' perceptions of digital technology challenges.
Interviews	Conducted semi-structured interviews with teachers, students, and parents to gather qualitative insights.
Observations	Examined school digital infrastructure, including projectors and computer labs.
Document Review	Analyzed curriculum documents and policies on digital technology integration.

Designed by researcher (2024)



Designed by researcher (2024)

Figure 1. Presents Data Collection and Explanation

Table 1 and Figure 1 presenting that the data collection procedures in this study involved multiple methods to ensure a comprehensive understanding of the research problem. One of the primary methods used was surveys and questionnaires. Specifically, a Likert-scale questionnaire (Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree) was administered to collect teachers' perceptions of challenges related to digital technology in Geography teaching. This structured survey method facilitated the quantification of responses, making it possible to analyze trends and statistical relationships. The questionnaire likely included items addressing infrastructure gaps, training opportunities, financial costs, curriculum alignment, and resistance to change.

Another data collection method used in the study was interviews. The inclusion of direct quotes from teachers, students, and parents suggested that semi-structured interviews were conducted. These interviews provided rich qualitative insights into personal experiences and opinions regarding digital technology use in education. Teachers discussed challenges such as lack of training, gender bias in in-service training, and financial constraints. Students offered perspectives on digital resource

access and language barriers, while parents highlighted economic difficulties in providing digital tools for their children. By incorporating qualitative interviews, the study was able to complement quantitative findings with detailed narratives.

Observations also played a significant role in data collection. The researcher personally observed the conditions of digital infrastructure in schools, including the placement of projectors and the number of functional computers in the computer lab. Observational data served to validate the responses obtained from questionnaires and interviews, ensuring a more reliable assessment of the actual state of digital technology implementation in schools.

Additionally, document review was employed as a data collection method. The study referenced existing policies and educational guidelines regarding digital technology integration. The researcher likely analyzed curriculum documents to determine the extent to which digital tools had been incorporated into the teaching framework. This method provided a contextual background to the study, ensuring that findings were aligned with national educational policies and objectives.

For the qualitative data obtained from interviews, thematic analysis was used. This involved identifying recurring themes, such as lack of training, financial constraints, and policy gaps. Thematic analysis allowed the study to organize qualitative data into meaningful categories, highlighting key issues raised by participants. Quotes from respondents were used to illustrate these themes, providing a richer understanding of the challenges encountered.

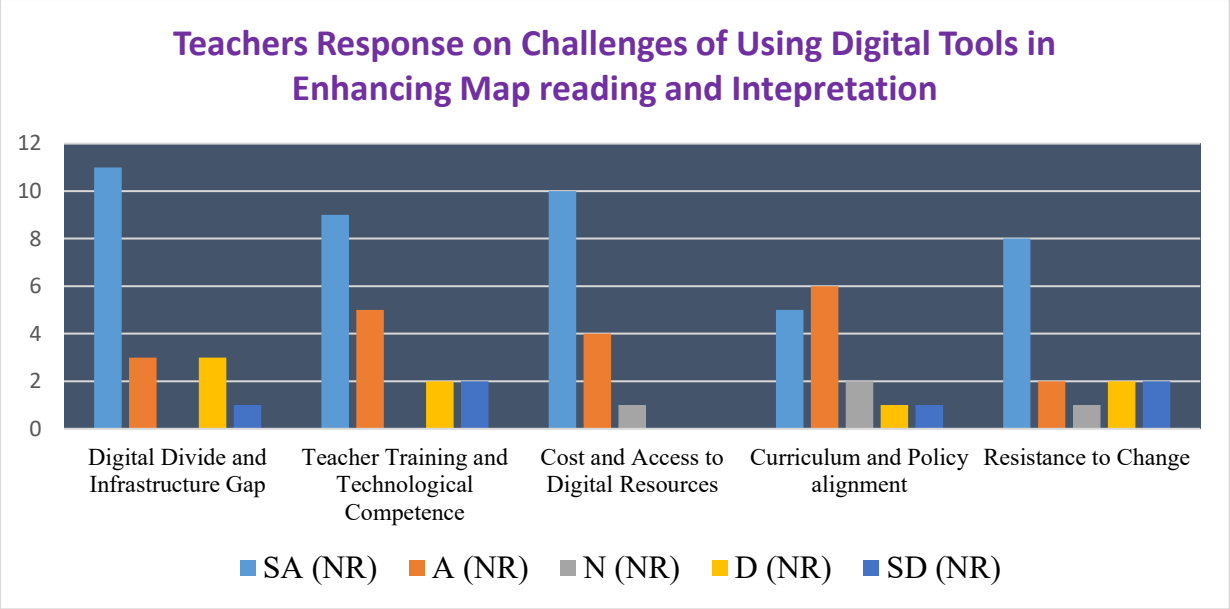
Results and Discussion

Result

Table 2.
Challenges in Using Digital Technologies for Map Reading and Interpretation Skills in Geography: Teachers' Responses

Statement	SA (NR)	A (NR)	N (NR)	D (NR)	SD (NR)
Digital Divide and Infrastructure Gap	11	3	0	3	1
Teacher Training and Technological Competence	9	5	0	2	2
Cost and Access to Digital Resources	10	4	1	0	0
Curriculum and Policy alignment	5	6	2	1	1
Resistance to Change	**8**	**2**	**1**	**2**	**2**

Data obtained from Research Field (2024)



Data obtained from Research Field (2024)

Figure 2.

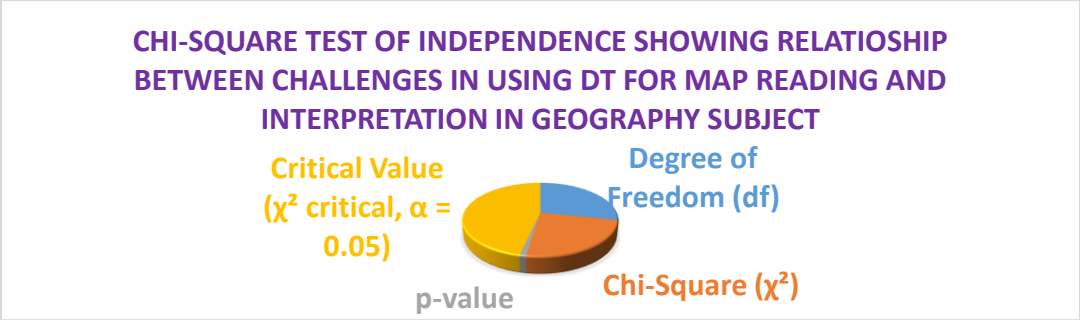
Teachers' Responses on Challenges of Using Digital Tools in Enhancing Map Reading and Interpretation

Table 3.

Chi-Square Test of Independence: Relationship between Challenges in Using Digital Technologies for Map Reading and Interpretation in Geography subject

Test	Degree of Freedom (df)	Chi-Square (χ^2)	p-value	Critical Value (χ^2 critical, $\alpha = 0.05$)
Chi-Square Test of Independence	16	13.68	0.622	26.3

Data obtained from Research Field (2024)



Data obtained from Research Field (2024)

Figure 3.

Chi Square Test of Independence Showing Relationship Between Challenges in Using DT for Map Reading and Interpretation in Geography Subject

Table 4.
Teachers' Responses to Challenges in Using Digital Technologies for Map Reading and Interpretation Skills in Geography

Statement	SA		A		N		D		SD	
	NR	%	NR	%	NR	%	NR	%	NR	%
Digital Divide and Infrastructure Gap	11	73.33	03	20	00	00	03	20	01	6.66
Teacher Training and Technological Competence	09	60	05	33.33	00	00	02	13.33	02	13.33
Cost and Access to Digital Resources	10	66.66	04	26.66	01	6.66	00	00	00	00
Curriculum and Policy alignment	O5	33.33	06	40	02	13.33	01	6.66	01	6.66
Resistance to Change	**08**	**53.33**	**02**	**13.33**	**01**	**6.66**	**02**	**13.33**	**02**	**13.33**

Data obtained from Research Field (2024)

Discussion

The Table 2 presents the frequency distribution of responses for different statements related to challenges in using digital technologies. For the "Digital Divide and Infrastructure Gap," the majority of respondents strongly agreed (11) or agreed (3), with few disagreeing (3) or strongly disagreeing (1). In terms of "Teacher Training and Technological Competence," most respondents strongly agreed (9) or agreed (5), with fewer responses in the disagreement categories. For "Cost and Access to Digital Resources," most respondents strongly agreed (10) and agreed (4), indicating fewer challenges related to costs. The other statements, such as "Curriculum and Policy Alignment" and "Resistance to Change," showed a more balanced distribution, with responses across all categories, reflecting varied perceptions of these challenges.

Figure 2 presents teachers' responses regarding the challenges of using digital tools in enhancing map reading and interpretation skills. The chart categorizes responses into five key challenges: Digital Divide and Infrastructure Gap, Teacher Training and Technological Competence, Cost and Access to Digital Resources, Curriculum and Policy Alignment, and Resistance to Change. The responses are measured using a Likert scale, with categories including Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD).

From the figure, the Digital Divide and Infrastructure Gap is the most significant challenge, with the highest number of teachers strongly agreeing (SA). This indicates that inadequate access to digital tools and poor infrastructure significantly hinder the integration of digital technologies in map reading and interpretation.

Similarly, Teacher Training and Technological Competence is another critical issue, with a high number of responses under SA and A, suggesting that many teachers feel they lack the necessary training to effectively utilize digital tools in teaching geography.

Cost and Access to Digital Resources is also a major concern, as reflected by the high SA responses, indicating that financial constraints limit teachers' ability to access and use digital learning tools.

In contrast, Curriculum and Policy Alignment presents a mixed response. While some teachers strongly agree that it is a challenge, others disagree, showing that the extent of this issue may vary based on institutional policies and support systems.

Finally, Resistance to Change shows a relatively lower number of responses in the SA and A categories, implying that while some teachers acknowledge this as a barrier, it is not as critical as other challenges. However, the presence of Neutral (N) and Disagree (D) responses suggests that some educators may be open to adopting digital tools if provided with proper guidance and support.

Overall, the findings align with various research in Tanzania (Masumbuko, 2021; Mosenda & Helahela, 2020; Mhando, 2020; Msuya and Mtei, 2018; Komba and Mwandaji, 2015) and globally (Selwyn, 2021; Kent & Foskett, 2020) consistently found that that infrastructure limitations, teacher training, and financial constraints are the primary barriers to effectively integrating digital tools for map reading and interpretation in geography education.

The researcher aimed to examine the relationship between challenges in using digital technologies for map reading and interpretation skills in Geography subject among Geography teachers. The purpose of this test was to determine whether students' responses (Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree) were significantly influenced by specific challenges such as the digital divide, teacher training, and access to resources. The tables 4.64 analysed;

Both Table 3 and Figure 3 illustrate the findings of the Chi-Square Test of Independence, which was conducted to examine the relationship between challenges in using digital technologies for map reading and interpretation skills in Geography subject among Geography teachers. The purpose of this test was to determine whether students' responses (Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree) were significantly influenced by specific challenges such as the digital divide, teacher training, and access to resources.

The results of the Chi-Square test yielded a χ^2 value of 13.68 with 16 degrees of freedom and a p-value of 0.622. Since the p-value exceeds the 0.05 significance level,

the null hypothesis was not rejected. This indicates that there was no statistically significant relationship between the types of challenges and teachers' response categories. In other words, teachers' perceptions of digital technology use for map reading and interpretation were not strongly determined by the specific challenges they encountered.

Figure 3 visually represents these findings, displaying the distribution of student responses across different challenge categories. The graphical representation reinforces the statistical conclusion by showing that variations in responses were not concentrated in any particular challenge area. This suggests that despite encountering difficulties such as limited access to technology and inadequate teacher training, teachers' overall perceptions about the role of digital tools remained relatively stable across response categories.

Additionally, the researcher employed the post hoc Wilcoxon Signed-Rank Test to compare responses to Statement I, "Digital Divide and Infrastructure Gap," with Statement II, "Teacher Training and Technological Competence." The results suggested that participants perceived these challenges similarly in terms of their role on the use of digital technologies for map reading and interpretation.

These findings align with previous studies conducted by Mtebe and Raphael (2018), Mwalongo (2020), and Shaban and Nzilano (2024), who found that while digital technologies enhance learning, their effectiveness is often hindered by challenges such as insufficient ICT resources, lack of proper teacher training, and disparities in technological access. Similarly, Minga and Ghosh (2024) reported that while students have a generally positive attitude toward ICT integration, their perceptions vary depending on their experiences and the barriers they face in accessing and utilizing digital resources.

Digital Divide and Infrastructure Gap

In this statement the Table 4 shows strong agree 11 (73.33%), agree were 03 (20%), neutral 00 (0.00%), 03 (20%) was disagree and 01 (6.66%) strong disagree. Both agree and disagree were 03 (20%) and neutral were absent. only 01 (6.66%) strongly disagree. additionally 11(73.33%) of respondent accept that among other challenges digital divide and infrastructures was big challenges.

According to a Geography teacher from School B, when asked about the use of digital tools, he stated: "*Despite the fact that schools lack digital technological tools, nearly 70% of students in urban areas possess smartphones. They use these devices to download notes, save them, and form study groups via WhatsApp.*" He further explained: "*In our school, we regularly conduct inspections, particularly at the Advanced Level, and we find many smartphones. However, only a few students at the Ordinary Level have phones.*" (Interview, School B, 15th October 2024).

At School B, the researcher observed that the computer room was poorly equipped, with the projector placed in an inconvenient position. This hindered its effective use. One student interviewed expressed frustration, saying in Swahili: "*Njia tuliyotumia inafaa lakini projector yetu imekaa vibaya,*" which translates to, "*The approach we used is fine, but our projector is poorly positioned.*" (Form Three student, school B, 16th October 2024).

The use of the English language was highlighted as a significant challenge for students in utilizing digital tools. Students strongly emphasized that teachers should incorporate regular English language practice in both speaking and writing. The other male student from school B said *"Vifaa vingi vya kidigitali vinatumia kiingereza na mimi sjui kiingereza hivyo inawia vigumu kwa mimi kutumia vifaa hivi, hivyo tunaomba tufundishwe kuongea kiingereza mara kwa mara ili iwe rahis kwetu kujifunza"*

English Translation "*Many digital tools use English, and I don't know English, so it becomes difficult for me to use these tools. Therefore, we request to be taught English frequently so that it becomes easier for us to learn.*"

The other problem was insufficient tools including computers. The school B had 15 computers and designated one classroom as a computer lab, but only 10 computers were operational due to limited space. Despite having these computers, students were not allowed to use them. The school B consisted of 104 students, with 53 male students (50.96%) and 51 female students (49.03%). The ratio of computers to students was 1:24, highlighting the severe inadequacy of this critical digital tool. This challenge aligns with findings from previous studies by Msuya and Mtei (2018), Chilongo and Mtenzi (2020), and Cutter et al. (2018), which emphasize that insufficient access to digital resources significantly hinders the integration of technology in education.

Adopted from Researcher (2024)

Figure 5. Photograph Showing Computer Room in School B

Teacher Training and Technological Competence

In this statement the Table 4.65 shows strong agree 10 (66.66%), agree were 05 (33.33%), neutral 00 (00%), 0 (00%) was disagree and 00 (00%) strong disagree. according to analysed table strong agree were having highest number of respondent

10 (66.66%), followed with agree 05 (33.33%) while all other Likert scale respondents were 00 (00%).This indicate that teachers are not given digital technology apperencetership, digital conferences, digital seminar sand digital technology meeting. This allegation was supported by female teacher from school D and she said "…Since I get employment from this school never attend any digital workshop or conferences" (Young female teacher, from school D, Wednesday, 30th October 2024). Another teacher from School B expressed gratitude to the government for providing tablets but highlighted a significant challenge:

> *"We thank our government for giving us tablets, but these tablets are meaningless because they were provided with the assumption that we already know how to integrate and operate them in teaching and learning. As a result, many teachers simply download music and games since no one received any form of training. "*

This statement underscores the need for comprehensive training programs to ensure that teachers are equipped with the skills necessary to effectively utilize digital tools for educational purposes. (Male teacher interviewed, 15th October 2024). Furthermore, a teacher from School D shared additional concerns, stating, "Not all teachers attend in-service training; only a few are selected each year, which demotivates the rest of us." She elaborated further, saying, "These in-service trainings are biased because they mostly benefit male teachers. The scheduling is poor and fails to consider that female teachers have numerous domestic responsibilities. Sometimes, these workshops run until 6:00 PM, making it difficult for female teachers to participate fully." This perspective highlights the need for more inclusive and equitable training schedules that accommodate the diverse needs of all teachers, ensuring equal opportunities for professional development. (Young female teacher, from school D, Wednesday, 30th October 2024). The idea supported by; Msuya and Mtei (2018); Kimaryo and Mwinyi (2016); Fitzpatrick (2020); Mkumbwa (2019), Hong and Stonier (2020); Mosenda and Helahela (2020); Mwakapenda and Ndalichako (2018)

Cost and Access to Digital Resources

In this statement the Table 4.65 shows strong agree 10 (66.66%), agree were 04 (26.66%), neutral 01 (6.66%), 00 (00%) was disagree and 00 (00%) strong disagree. Data analyzed from table both disagree and agree were 00 (00%). 01 (6.66%) of respondent was neutral while strong agree were 10 (66.66%) followed by agree 04 (26.66%). The strong agree got high number of respondents. This means majority of teachers accept that among big challenge face integration of digital technology was cost and access to digital resources.

The challenges surrounding the use and maintenance of digital tools in schools were highlighted in various interviews with educators and administrators. A Head of School (HoS) from School A stated, "*It is difficult to maintain the tools; that's why you see we have 11 computers, but only 7 are working. We don't have the funds to fix them*" (Interview, Monday, 30th September 2024). This issue was echoed by a female Geography teacher from the same school, who noted, "*It is too expensive to purchase my own laptop or tablet, especially considering the little salary I receive from the government*" (Interview, Monday, 30th September 2024). These comments underline the financial strain faced by educators and schools in acquiring and maintaining the necessary digital tools for teaching.

The Head of School at School A further emphasized the financial constraints, stating, "*We don't receive any funds allocated to buy or maintain digital tools.*" This lack of financial support appears to be a systemic issue, limiting the effective integration of technology into teaching and learning processes.

Additionally, a computer room manager from School B highlighted the lack of internet connectivity, stating, "*We are not using a Local Area Network (LAN) because there are no funds. Instead, we rely on TTCL for network issues in Tanzania, but teachers have to purchase their own bundles when they want to use the computers*" (Interview, Thursday, 9th October 2024). This practice places an additional financial burden on teachers, further discouraging them from utilizing available resources.

However, there are plans for improvement. The HoS of School B indicated optimism, saying, "*We expect to connect our school with LAN before January next year so that teachers can access teaching and learning materials without spending their own money. We will use our school funds to achieve this*" (Interview, Friday, 11th October 2024). He elaborated that implementing LAN would not only facilitate access to resources but also encourage teachers to remain on campus throughout the day.

> "*By having LAN, teachers can stay in school from morning until departure time to support students, which will also help maintain discipline among teachers. Currently, some teachers leave soon after completing their teaching periods,*" he added.

When parents were asked about the challenges they face regarding the use of digital technology in the education of Form Three students in Kisarawe, one female parent, who completed the questionnaire, expressed:

> "*Mimi niwaze kununua chakula, sare za shule na michango mwingine na niwaze kumnunulia mwanangu tena na gharama za vifaa hivyo ni kubwa sana labda wawape wanafunzi bure huko shuleni sawa.*"

The English translation of this response is:

> "*I have to think about buying food, school uniforms, and other contributions, and I also have to consider buying these materials for my child, yet the cost of such equipment is very high. Perhaps they could provide these materials to students for free at school.*"

This response highlights the financial burden parents face when providing necessary learning materials, particularly digital technology, and suggests that offering such resources free of charge at school could alleviate this challenge. Masumbuko (2020); Mhando (2020); Mosenda and Helahela (2020); Mkumbwa (2019); Mwakapenda and Ndalichako (2018); Komba (2017) supported this idea.

Curriculum and Policy alignment

In this statement the Table 4.65 shows strong agree 05 (33.33%), agree were 06 (40%), neutral 02 (13.33%), 01 (06.66%) was disagree and 01 (06.66%) strong disagree. Both disagree and strong agree only 01 (06.66%) respondent. Agree were 06 (40%) this was highest rate of respondent followed by strong agree 05 (33.33%). 02 (13.33%) respondent rate was neutral. According to the table analysed curriculum and policy alignment was challenge of integrating digital technologies in teaching and learning.

The evidence gathered highlights the challenges faced by teachers in integrating digital technologies into the teaching of Geography. A teacher from School D noted that "*in many cases, few topics in the Geography syllabus direct teachers to use digital technological tools. The syllabus is still reliant on traditional methods of teaching and learning strategies*" (Male teacher, Interview, Thursday, 31st November 2024). This observation underscores the limited alignment of the curriculum with modern digital teaching approaches, indicating that the syllabus predominantly emphasizes conventional methods over technology-based strategies.

Moreover, some teachers demonstrated a lack of awareness of educational policies related to digital technology integration. One respondent expressed frustration and skepticism, stating:

> "*Don't tell us about the policy what is a policy, by the way? (Firmly and angrily) What I want here are tools like tablets, computers, smartphones, smartboards, and others. Politicians intervene in the education system every year, promising to give us digital tools for teaching, but after elections, they disappear. Education should not be interfered with by politicians*" (Male teacher, Interview, Thursday, 31st November 2024).

This statement highlights a disconnect between policy and practice, as well as teachers' disillusionment with unfulfilled political promises. It reflects the frustration of educators who feel unsupported and under-resourced in their efforts to incorporate digital tools into their teaching. The findings suggest that beyond providing tools, there is a need for clear policy implementation, teacher training, and sustained government commitment to equipping schools with the necessary resources to

effectively integrate digital technologies. The idea supported by Kimaryo and Mwinyi (2016); Jeket et al (2017); Kent and Foskett (2020) and Demirci (2019)

Resistance to Change

In this statement the Table 4.65 shows strong agree 08 (53.33%), agree were 02 (13.33%), neutral 01 (6.66%), 02 (13.33%) was disagree and 02 (13.33%) strong disagree. In this case agree, disagree and strong agree Likert scale were 02 (13.33%). Strong agree were 08 (53.33%) which showing that majority of respondent agree that resistance to change was the challenge of using digital technology in map reading and interpretation skills. Only 01 (6.66%) respondent was neutral.

This claim was supported by a Geography teacher who was asked about using digital maps to teach map reading and interpretation in Form Three. The researcher sought to understand why Geography teachers do not utilize digital technological tools in their classrooms, even when such tools are available in schools. One female respondent explained:

> "*I can't use digital tools for teaching maps in a digital way because it consumes a lot of time in lesson preparation, and school quality assurers expect the topics to be covered on time*" (Female Geography teacher, Experimental Group, 11th October 2024).

Response highlights a key challenge faced by teachers balancing the use of innovative digital tools with the strict timelines and expectations of curriculum coverage set by school administrators. It also emphasizes the need for systemic support, such as training, revised curriculum pacing guides, and understanding from quality assurers to enable the effective integration of digital technologies into teaching practices.

Furthemore when parents were asked about the challenges faced in the education of Form Three students in Kisarawe, one aged female parent, who completed the questionnaire, expressed concern:

> "*Wanafunzi kushindwa kufikiria kwa akili zao na waalimu kushindwa kutumia ujuzi wao katika kufundisha.*"

The English translation of this response is:

> "*Students are unable to think for themselves, and teachers are unable to utilize their skills effectively in teaching.*"

This response reflects concerns about both student independence and the effective use of teaching skills, suggesting a potential gap in the learning process that may need to be addressed for better educational outcomes.

The other parent was asked about the challenges associated with the use of digital technology in the education of Form Three students in Kisarawe, one elderly male parent, who completed the questionnaire, stated:

> "*Changamoto kubwa ya kutumia hivi vifaa kwa waalimu na wanafunzi endapo watatumia vifaa hivyo kwa kufundishia wengi wanakuwa wanafuatilia mambo yasiyofaa na wanafunzi hawatoweza kusoma kwa maana atategemea upande wa matukio mabaya.*"

The English translation of this response is:

> "*A major challenge of using these devices for teachers and students is that if they use them for teaching, many will follow inappropriate content, and students will not be able to study properly because they will rely on negative events.*"

This response highlights the concern that while digital technologies can be a valuable teaching tool, there is a risk of students being distracted by unsuitable content, which may hinder their learning progress.

Moreover other parent asked about the challenges associated with the use of digital technology in the education of Form Three students in Kisarawe, one male parent, who completed the questionnaire, expressed:

> "*Husababisha mmonyoko wa maadili kwa wanafunzi, kushiriki katika mapenzi akiwa na umri mdogo na mwanafunzi kushindwa kuhudhuria shule kwani masomo yote yapo katika mitandao.*"

The English translation of this response is:

> "*It causes a decline in morals among students, leading them to engage in relationships at a young age, and students fail to attend school because all lessons are online.*"

This response highlights concerns about the potential negative effects of digital technology, where students may be exposed to inappropriate behavior, leading to moral decline, and may miss physical school attendance because they rely too heavily on online less

Implications

The results underscore the urgent requirement to address the digital gap in Tanzania's secondary education system, stressing the importance of enhancing infrastructure and ensuring fair access to digital tools. Tackling the shortcomings in teacher training is vital, as insufficient digital proficiency hampers the effective use of

technology in geography instruction. Moreover, monetary limitations severely restrict educators' capacity to obtain and employ digital learning resources, calling for policy-driven solutions. The misalignment between curriculum and policies further obstructs technology adoption, necessitating updates to incorporate digital learning methods. These implications are in line with SDG 4 (Quality Education), emphasizing the need for inclusive and equitable education through digital transformation.

Limitation of Research Study

The researcher encountered several challenges during the data collection process that impacted the completeness and timeliness of the findings. One of the main challenges was the incomplete or missing questionnaires. While some respondents failed to return their questionnaires, others submitted them with incomplete answers. Additionally, some respondents struggled to fully understand the questions, which led to gaps in the data that could have compromised the overall quality of the findings.

Another significant challenge was the bureaucracy involved in the process. Several head teachers were reluctant to provide the necessary information or follow through on promises to participate in interviews. This lack of cooperation resulted in delays, hindering the timely progress of the research report.

Conclusion

This research uncovered that major obstacles such as the digital divide, insufficient teacher preparation, financial restrictions, and policy inconsistencies impede the effective utilization of digital technologies in enhancing map reading and interpretation abilities. Despite these hurdles, educators acknowledge the potential of digital tools to improve geography education. However, statistical analysis revealed no significant correlation between specific challenges and teachers' views on digital technology use. This implies that while obstacles exist, educators remain receptive to integrating digital tools if provided with adequate support. Addressing these issues is crucial for improving geography education in Tanzania's secondary schools.

Recommendations for further studies

The study suggests that the following studies should be done based on the findings; Investigate the role of teacher training in digital technology, Assess the impact of infrastructure and connectivity and learning outcome, compare digital learning outcomes across the regions or school type and further studies should explore students' and motivation towards digital tools in Geography.

Conflict of interest

The researcher declare that this study has no any conflict of interest to any one

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