# SELECTED DIGITAL TOOLS AND GEOGRAPHY INSTRUCTION IN PUBLIC SECONDARY SCHOOLS IN MERU SOUTH SUB-COUNTY, THARAKA NITHI COUNTY, KENYA

**MISIANI DAVID MAMBO**

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## DECLARATION AND RECOMMENDATIONS

**Declaration**

This thesis is my original work and has not been presented for award of a diploma or conferment of a degree in this or any other University.

Signature..... Date.....11/10/2024.....
Misiani David Mambo
EM14/39832/18

**Recommendation**

This thesis has been examined, passed and submitted with our consent as University Supervisors.

Signature..... Date...11/10/2024.....
Prof. Mercy Wanja Njagi
Chuka University


Signature..... Date.....4/10/24.....
Dr. Ogembo John Otieno
Chuka University

## COPYRIGHT

## DEDICATION

I dedicate this work to my family, to my late mother Immaculate and my siblings Timothy, Thaddeaus, Solomon, Baylon, Grace and to my niece Lyla.

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## ABSTRACT

Geography is a fundamental subject that enables students to comprehend the physical as well as the human aspect of the world around them. The subject area surrounds the study of human activities and how they relate and interact with the environment from local to global scales. Despite its importance as a subject area, Meru South Sub-County students have shown a low performance in Geography in their KCSE examinations. Poor performance in Geography may be attributed to many factors among them lack of adequate and poor use of teaching resources. This study was focused on establishing the types of digital tools, frequency of use, influence of use and challenge faced when using the selected digital tools in Geography instruction in all Meru South Sub-County public secondary schools which are located in Tharaka Nithi County. This study employed a descriptive survey research design with a target population of 1995 respondents comprising of 1868 form three Geography students, 89 Geography teachers and 38 heads of Geography subject. The researcher employed both purposive and simple random sampling methods to determine a sample size of 347 participants. The research instruments used were questionnaires for students and Geography teachers and an interview schedule for Geography subject heads. The instruments were piloted in two schools located in Maara Sub-County to assess their internal consistency. A reliability index of 0.80 was achieved for the teachers' questionnaire, while the students' questionnaire yielded a reliability index of 0.82 as determined by Cronbach's Alpha method. The data analysis was conducted quantitatively using the Statistical Package for the Social Sciences (SPSS) version 29. Both descriptive statistics (percentages and frequencies) and inferential statistics (Chi-square) were employed in the analysis. The hypothesis was tested at a significance level of $\alpha=0.05$. Qualitative data from the interview was analyzed thematically. The research demonstrated that digital tools are utilized in Geography instruction and have a significant impact on the teaching and learning processes in this subject. The study also established some factors that impedes the use of digital tools like YouTube, Facebook, WhatsApp, Instagram and Twitter in Geography instruction effectively. The effectiveness in content delivery by Geography teachers by use of instructional resources may increase the learner's concept learning and knowledge retention. It is therefore recommended that teachers of Geography use appropriate teaching resources like the digital tools that may facilitate teaching of abstract topics in Geography. This could also enhance learners understanding of the geographical concepts and help to improve their performance in the subject. The Ministry of Education and school managements should develop technology-related infrastructure and personnel in the institutions to make the digital tools more accessible for use in instruction.

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## ABBREVIATIONS AND ACRONYMS

**CIM:** Conventional Instructional Methods

**GIS:** Geographic Information System

**GOK:** Government of Kenya

**GPA:** Grade Point Average

**GPT:** Geography Performance Test

**GSQ:** Geography Students' Questionnaire

**GTQ:** Geography Teachers' Questionnaire

**HOD:** Head of Department

**HOS:** Head of Subject

**ICT:** Information Communication and Technology

**KCSE:** Kenya Certificate of Secondary Education

**KICD:** Kenya Institute of Curriculum Development

**KIE:** Kenya Institute of Education

**KNEC:** Kenya National Examinations Council

**MOEST:** Ministry of Education Science and Technology

**NACOSTI:** National Commission for Science, Technology and Innovation

**SCDE:** Sub County Director of Education

**SNS:** Social Network Site

**SPSS:** Statistical Package for Social Sciences

**TAM:** Technology Acceptance Model

**TATWAQ:** Teachers' Attitude Towards the Use of WhatsApp Questionnaire

**UNESCO:** United Nations Educational, Scientific and Cultural Organization

**URL:** Uniform Resource Locator

# CHAPTER ONE
# INTRODUCTION

## 1.1 Background Information

Education is a highly vital part in human growth and is seen primarily as an essential human right. (Ayoo, 2016). The majority of people throughout the globe believe that education plays a crucial role in determining each person's destiny. Since education is an essential human right, most countries have started to invest heavily in matters of education. This can be established keeping in consideration the investment that goes to the process as related to other programs in most (Oduor, 2017). There are also huge returns expected from education in actualizing individual development as well as in nation-building. Therefore, it is crucial to ensure that educational standards are met through regular reforms and research. The outcome of the educational process is achieved through implementation of various programs that are meant to meet the needs of the society (MoEST, 2017). One of the areas considered significant for implementation in secondary schools is the humanities which comprises of Geography alongside History and Government and Religious Education.

Geography is a fundamental subject that enables students to comprehend the human and physical aspects of our planet around them. Having the knowledge of Geography is very valuable and important in all societies. Murphy discusses the function of geographers in examining the physical environment in (Ofomata, 2008). Additionally, looking at the interconnections between locations may provide insight on the pattern and the natural world that surrounds human civilization. The topic of geography is vital because it teaches people of all ages and backgrounds about the value of our planet and the resources it contains. As stated by UNESCO (2014), geographical researchers learn a variety of skill sets that let them see things from different angles.

Teaching young people about the world that is around them is one of four main objectives of geography curricula across the world. Geography teaches us how the places we live in and the people inside them are interdependent on one another and the ecosystems around us. Acquiring the competence necessary to conduct geographical research is the focus of the second objective. Geographical research, fieldwork, and mapmaking are all part of this. Inspiring wonder and gratitude for the

natural environment is the third goal. As a last point, studying geography allows us to become more aware and concerned citizens of the globe. Additionally, being able and willing to do good deeds on a local and global scale actions (Clifford, French, & Valentine, 2010). When designing geography curricula in Kenya, the country's demands are taken into account as the primary factor actions actions (MoEST, 2017). As a whole, the goals are designed to familiarize pupils with the various living situations experienced by individuals across the globe. Insight into the importance of resources from nature and the ways in which climate and the environment affect our daily lives may be gained through this.

In order to have a broader perspective, students must get information about the social and physical surroundings in which they reside. Their understanding of geographical phenomena, including fundamental ideas, principles, and theories, will be significantly enhanced by the information they get (Mwenda & Mwiti, 2020). The students obtain their nature studies training through these interactions. Research like this helps students improve their analytical thinking, reasoning, and memorization abilities. Students are also given the ability to think creatively as part of the instruction.

Despite its importance, the discipline is experiencing a weakened position in education reflected by low enrolment, poor performance, reduction in the number of credit hours, and the fact that Kenyan students see geography as both a mandatory and elective subject (Lane & Bourke, 2017). According to Chang and Kidman (2019), geography should be seen as more of a fascinating endeavor that students can immerse themselves in. Teachers and facilitators of the subject should help students learn, acquire, and apply geographical knowledge, while also helping them develop their geographical skills and attitudes.

Kimathi (2014) observed that student enrollment has been declining while many students struggle to excel in Geography due to various reasons, including lack of interest, difficulty in understanding the subject matter, and ineffective teaching methods. A student's test scores are the primary indicator of their educational attainment in Kenya, according to Okumbe (2017). After a great deal of effort has

gone into the educational process, this kind of performance is possible. All of the following are considered inputs into the educational process: the learner, the instructor, the lesson plan, the students, the school's physical space and infrastructure, and the learning tools and materials. When you do well in your Geography exams, it solidifies your commitment to the subject and fuels your ambition to take it to the next level professionally. Throughout the years 2018–2022, the student's Meru South Sub-County KCSE Geography performance was below the average mark of 50%. Table 1 shows the illustration on the learners' performance in Geography both nationally and in Meru South Sub-County.

Table 1: Mean Scores for Learners in Geography Nationally and in Meru South from 2018 to 2022

| Year | Mean score in % | |
|---|---|---|
| | Nationally | Meru South |
| 2018 | 41.62 | 38.51 |
| 2019 | 46.50 | 39.64 |
| 2020 | 47.59 | 42.17 |
| 2021 | 54.02 | 49.28 |
| 2022 | 51.19 | 44.62 |

Source: Kenya National Examination Council, 2022

The findings show that the scores in KCSE geography examination are way below the average score of 50% except for 2021 and 2022 nationally. This raises an important issue primarily among educators and students, on why learners' Geography scores continue to be low year after year. It is essential for the Kenyan education system to enhance students' performance in Geography in order to meet the goals of industrialization outlined in vision 2030 and to guarantee food security, an essential part of our daily life (Omoro & Wakhungu, 2014). Hence, there is need to focus on the materials our secondary schools utilize to teach the subject and how it is taught. Assessing the process of instruction, student performance, and the level of competence of geography teachers who are seen as a major motivator for students in their learning can help determine the effectiveness of school teaching. Similarly, some educators fail to adequately prepare for class resulting in students becoming passive listeners while the teachers recite their notes (Yambo, 2012).

There is currently a shift towards technology-based teaching and learning methods in Geography education, which is being advocated by the Kenyan government (KICD, 2014). One possible intervention that could improve students' achievement and attitude in Geography is the use of digital media platforms. Without a doubt, media technology has evolved to great lengths since the 1970s, and it has had a profoundly beneficial impact on educational institutions. Mobile technology and the World Wide Web (the Internet) are the two most significant developments in media technology in recent years. Not only have these innovations made it easier to send and receive data, but they have also opened the door to a flood of previously hidden data sharing. Electronic books, movies, games, websites, and social media are just a few of the current formats for information and knowledge. However, this technology has influenced every part of students' life. Learners assert a strong sense of ownership and proficiency with a variety of technologies. College students, in comparison to the general population, were found to be the majority users of Internet in a 2008 research study (Steve, 2008). Another survey found that among adolescents ranging from 12–17 years old, 74% had mobile Internet access via smartphones, tablets, or other comparable devices, and 24% uploaded self-filmed videos on social networking sites (Scott & Paul, 2012).

Students' increased reliance on digital media is changing long-held assumptions about education, the task of teachers, and the very definition of knowledge. Because they can study more outside of school, students become disengaged and forgetful in class. In addition, students must learn to respect themselves, others, and intellectual property as technology grows more ingrained in their daily lives and educational experiences. They must also develop the ability to critically analyze as well as avoid detrimental information and conduct on the internet (Andrews, Digital Citizenship Research and Planning School Technology, 2013). Consequently, there is a great deal of demand for change in the educational and learning institutions. In this age of ubiquitous media devices, the traditional classroom model cannot compete. Facilitated learning is becoming more common in new forms of instruction.

Educators have been exploring alternative teaching methods to improve students' academic achievement and attitude towards geography (Mwenda & Mwiti, 2020).

One way to measure the success of a curriculum is by looking at how well its students do in class (Abolmaali, Rashedi and Ajilchi 2014). That is why academic accomplishment and the variables influencing it are often included in evaluations of educational systems, analysts note. Factors that have been identified by Abolmaali et al. (2014) include motivational factors (such as dedication to goals and inspirational beliefs), as well as internal and external factors (such as classroom environment perceptions and feelings of belonging), family factors (such as how one perceives one's own family environment and the support it provides), socio-economic status (as measured by parents' education and occupation), non-cognitive factors (such as one's personality traits, identities, self-concept, and self-esteem), and an array of factors (such as mental, emotional, behavioral, learning dedication, and being resilient. According to Abolmaali, Rashedi and Ajilchi (2014), research has shown that over 90% of college students utilize social media. According to the study, students incorporate the usage of social networking sites (SNSs) into their daily routines and spend about thirty minutes on these sites Abolmaali et al. (2014). Students' academic performance may be positively or negatively impacted by the amount of time they spend on these sites, as shown by the findings.

Using forty (40) Taiwanese secondary school students as a sample, Yang and Tang (2018) looked at how students' grades changed when they started using social media for schoolwork. The students worked in groups of fourteen to answer questions pertaining to the arts and humanities in a designated online forum. As part of their assignment, students were required to synthesize the topics covered in the forum. For this study, forty students were asked to fill out questionnaires on their own time at the conclusion of the course. The research set out to determine if there was a connection between variables including friendship, guidance, and antagonistic relationships and students' academic achievement. A significant relationship between students' academic achievement and the centrality in friendship component was found in the investigation.

Studies reviewed globally, regionally in Africa and east Africa as well as in Kenya showed that access to and use of educational materials have contributed to the learner’s successful acquisition of knowledge. Majority of those studies provided

information on other learning resources except for the digital tools, the resource for which this study sought to focus on. Additionally, few studies put their focus on the frequency of use and influence of the use on the geography instructional process. Therefore, this study focused on the types of digital tools, frequency of use, influence of use of digital tools and challenges of use of digital tools in geography instruction.

### 1.2 Statement of the Problem

Geography is among the subjects considered significant in enabling a country achieve its developmental targets. Despite its importance, learner achievement in the subject continues to be poor in Meru South Sub-county and Kenya at large. The poor results might have been caused by a multitude of factors according to the existing research. The factors include unfavorable learning environment, teacher-related factors, learner-related factors, factors attributed to access and implementation of instructional materials to aid in how the subject is taught and learned. Studies also indicate attempts by researchers and stakeholders to implement interventions. To date, limited data exist that can shed light on the extent to which digital resources have been used and their contribution in improving Geography instruction especially considering the fact that in most public institutions limited financial resources exist to enable acquisition of other standard resources. While digital resources can easily be accessed even through Geography teachers using digital gadgets such as smartphones. For that reason, the purpose of this research was to fill the gap in knowledge by investigating the types, frequency, and influence of digital resources used in geography classrooms. The study also sought to establish some of the challenges that are faced in the integration of digital resources in Geography instruction with a specific focus on public secondary schools in Meru South Sub-county in Tharak Nithi County in Kenya.

### 1.3 Purpose of the Study

The purpose of this study was to establish how public secondary schools in the Meru South Sub-county of Tharaka-Nithi County utilize selected digital tools to teach Geography,

## 1.4 Objectives of the Study.

i. To identify the types of digital tools being used in Geography instruction in public secondary schools in Meru South Sub-county.
ii. To establish frequency of use of selected digital tools in Geography instruction in public secondary schools in Meru South Sub-county.
iii. To determine the influence of use of selected digital tools on Geography instruction in public secondary schools in Meru South Sub-county.
iv. To establish the challenges faced in use of selected digital tools in Geography instruction in public secondary schools in Meru South Sub-county.

## 1.5 Research Questions

i. What types of digital tools are being used in Geography instruction in public secondary institutions in Meru South Sub-County?
ii. How frequent is the use of selected digital tools in Geography instruction in public secondary schools in Meru South Sub-County?
iii. What are the challenges faced while using selected digital tools in Geography instruction in public secondary schools in Meru South Sub-County?

## 1.6 Research Hypothesis

$H_0$1: Use of selected digital tools does not significantly influence Geography instruction in public secondary schools in Meru South Sub-County.

## 1.7 Significance of the Study

The study's results are useful and beneficial to various education stakeholders, particularly those involved in secondary school education. This research provides valuable information for educators by showing how using digital technologies during Geography lessons can improves students' performance and enthusiasm towards the subject. Using digital media in the classroom as instructional resources facilitates the teaching of abstract topics and sub-topics enhancing better understanding of concepts and retention of knowledge by learners. The findings can also be useful in informing the government and the school administrators of the importance of establishing technology-related infrastructure and developing personnel to enhance access to digital media resources for using in the classroom at their schools. This study may be

useful for guiding the teacher trainers on designing training programs on the use of instructional resources like the digital tools when teaching complex Geography topics. Additionally, the study may offer a groundwork for further studies in the area of digital media in the curriculum setup.

### 1.8 Scope of the Study

The research looked at how often and what types of digital tools were utilized in geography classes. Additionally, this research aimed to determine the impacts of the selected digital media on geography classes in Meru South Sub-County, as well as the difficulties associated with utilizing these resources in the classroom. The study involved a selected sample of 6 heads of Geography subject, 39 teachers of Geography and 302 form Three Geography students since they are well exposed to several topics in physical geography which are mostly abstract in nature. Meru South Sub-county was selected due to the low performance in Geography compared to the national performance and also the Sub-county is found within the rural regions of Kenya therefore, access to adequate educational infrastructure could be a challenge.

### 1.9 Assumptions of the Study

The following assumptions formed the basis of this study:

i. The data on the frequency of digital tool usage in Geography lessons was supplied by credible sources, including instructors and students in Form 3. Regarding the impact of digital media technologies on geography teaching, the respondents also gave accurate information.
ii. Geography teachers gave accurate information on the challenges they face when using digital tools in Geography instruction.

## 1.10 Operational Definition of Terms

The following concepts were defined in an operational form to aid with understanding of the study:

| | |
|---|---|
| **Achievement:** | It is the extent to which a learner has achieved their educational goals. In this study, it refers to the extent that the learner has acquired knowledge and skills which is measured by the score that a student attains in a standardized examination. |
| **Attitude:** | It is an expression of like or dislike towards a person or a thing. In this study, attitude refers to student's feelings, beliefs and perceptions towards geography. |
| **Digital Tools:** | Websites created using multimedia technologies that employ text, images, audio, and video to support teaching and learning. In this study, the digital tools include Facebook, WhatsApp, YouTube, Instagram. |
| **Influence:** | Refers to the ability to affect or manipulate something. Influence in this study refers to the impact of digital media technologies on the attitude and performance of geography learners. |
| **Learning and Teaching Resources:** | These are resources that educators and students as well rely on when acquiring knowledge. In this study, these resources include digital media tools, textbooks, radio, pictures, slides, maps. |

# CHAPTER TWO
# LITERATURE REVIEW

## 2.1 Geography Instruction in Secondary Schools in Kenya

Geography instruction entails lesson preparation, lesson presentation and evaluation of learners on geographical concepts. Preparation for effective Geography instruction surpasses the initial training teachers receive, evolving into an ongoing and dynamic process. The subject's changing nature with the growth of disciplinary knowledge underscores the imperative for educators to consistently engage in pursuit of professional growth. For the purpose of keeping up with fresh and new material, approaches, as well as technology developments that might improve their teaching methods, teachers must engage in continuous learning (Schulman, Fuchs, Kisser, & Notter, 2021). Given the constant influx of new information, changing perspectives, and evolving global dynamics inherent in Geography, teachers must possess the latest knowledge to furnish students with accurate and relevant insights. Continuous professional development becomes essential, facilitating educators in adapting their instructional approaches to align with contemporary geographic theories, technological advancements, and societal changes (Hong & Stonier, 2015).

Moreover, the significance of systematic education on fundamental concepts and methods cannot be overstressed. The effectiveness of geography education may be compromised in the absence of a systematic approach to teachers coaching, especially when it comes to the exploitation of instructional materials. Systematic education guarantees that educators not only stay informed about the latest content but also become adept at employing various tools and resources to improve the educational process so that it is more interesting and meaningful for learners (Cifci, 2016). Crucial elements of a teacher's professional journey include opportunities for professional growth such as workshops, conferences, and collaborative learning environments. Such avenues offer educators platforms to exchange ideas, share exemplary practices, and gain insights from each other's experiences. Additionally, exposure to innovative teaching methodologies and resources during professional development sessions empowers teachers to integrate inventive approaches into their Geography instruction (Chorley & Haggett, 2019).

During the preparation of a Geography lesson, instructional materials are assembled. Students benefit from instructional resources because they meet the demands of a wide range of learners; these resources help students develop abilities in areas such as critical thinking, creativity, memory, and problem solving; they also make learning enjoyable and inclusive. Resources have an impact on children's learning both in terms of content and process (Children, 2017) and on learners' attitude, performance, attention, as well as comprehending (Oguzor, 2011). They also help students visualize phenomena, learn facts about them, analyze and interpret them, and formulate generalizations based on those facts and phenomena.

The aspect of delivering Geography instruction is intricate, encompassing the skillful utilization of teaching and learning resources to amplify the educational experience. Visual aids play a critical role in expediting effective concept development within the geography classroom (Schulman et al., 2021). Visual aids function as potent instruments for educators to succinctly and captivatingly communicate intricate geographical concepts. By harnessing multimedia resources, teachers can present information in a manner that is not only more easily comprehensible but also permits a more streamlined transmission of knowledge. Use of multimedia resources holds particular significance in Geography, where the comprehension of spatial relationships and interconnected concepts can be significantly enriched through visual representation (Hong & Stonier, 2015).

The utilization of visual materials enhances the learning experience for students, creating an immersive and captivating educational setting. Merely relying on verbal communication, listening, or conventional reading and writing approaches may inadequately capture the depth of geographical content. Visual aids offer a sensory dimension that surpasses linguistic expression, allowing students to establish a connection with and gain a more profound understanding of the subject matter (Egiebor & Foster, 2019). Furthermore, the transition from traditional methodologies to a multimedia-oriented approach underscores the significance of sensory engagement in efficient knowledge transmission. The transition aligns with contemporary educational theories that advocate for active and experiential learning. Through the incorporation of diverse multimedia components into Geography

instruction, educators can cultivate a more vibrant and engaging classroom environment (Chorley & Haggett, 2019).

Assessment is a pivotal element of Geography instruction in secondary schools, ensuring a comprehensive evaluation of students' grasp of geographical concepts (Schulman et al., 2021). Continuous assessment entails the ongoing evaluation of students' advancement throughout the entire learning process. Continuous assessment method delivers instantaneous feedback to both educators and students, enabling adjustments in teaching strategies and learning approaches. By incorporating continuous assessment into geography instruction, teachers can discern areas where students may encounter difficulties and introduce timely interventions to assist them in their learning journey (Hong & Stonier, 2015). Formative assessments are crafted to oversee and gauge students' understanding and performance during the instructional period. These evaluations, taking diverse forms like quizzes, class discussions, and group activities, provide insights into both individual and collective learning progress. Educators leverage formative assessments to customize their teaching methods, address misconceptions, and reinforce pivotal geographical concepts as necessary (Cifci, 2016). On the other hand, summative evaluations typically occur at the conclusion of a unit, semester, or academic year to evaluate the overall comprehension and mastery of Geography concepts. These assessments, which may encompass exams, projects, or presentations, present a comprehensive overview of students' knowledge and skills. Summative evaluations aid in discerning whether learning objectives have been achieved and serve as a foundation for assigning grades (Egiebor & Foster, 2019).

Evaluation methods must exhibit flexibility and responsiveness, integrating the latest advancements in the field to accurately measure students' proficiency in current Geography concepts (Schulman et al., 2021). Furthermore, alignment of evaluation methods with established educational standards is crucial to ensure uniformity and comparability across diverse schools and regions. Adhering to recognized standards enables educators to uphold a stringent level of rigor in their assessments, thereby contributing to the overall excellence of Geography instruction. Alignment with

standards also fosters accountability and facilitates effective communication regarding educational outcomes (Hong & Stonier, 2015).

Learning goals and objectives are a key part of Geography instruction, informing curricular designs, assessment and learning. The curriculum and learning objectives in Geography may evolve over time to incorporate new research, technological advancements, and global developments (Obondo & Wesonga, 2016). To achieve instructional objectives, Geography teachers can use different styles and strategies in lesson presentations that fall under two categories: teacher-centered and student-centered methods. Teachers should innovatively vary the use of these methods and strategies during their presentation as well as link the previous knowledge for continuity of the instructional process. In Kenya, various teaching and learning methods and strategies are used for enhancing the quality of education. Some of the commonly used methods and strategies include lecture method, demonstration method, cooperative learning and problem-based learning (Otieno & Osodo, 2019).

Sarkar (2016) argues that four factors—school administration, student and teacher quality, instructional materials, and pedagogical approach—pose threats to high-quality geography education. The claim is backed by research conducted by (Datti & Garba, 2015) that looked at the accessibility and use of visual aids for instruction and learning, as well as their efficacy and utility in geography classes. The results show that teaching geography with the limited visual aids provided was not effective.

### 2.2 Learning Resources in Geography Instruction

The role of instructional materials is to facilitate the transmission of information from the teacher to the learners. One potential role of instructional materials is to inspire teachers and students throughout the learning process. Students' attention and boredom may be alleviated by the use of these tools. The use of high-quality instructional resources is crucial in the classroom, particularly for educators without extensive training. Regardless of the subject matter, teachers depend on a variety of educational tools. Because of the importance of disciplinary and paradigm shifts in geography, instructional materials play a significant role in the subject's teaching and

learning. Preparing and using appropriate and relevant instructional materials will improve the facilitation of geography as a topic in secondary schools (Dhakal, 2014).

According to Saglam (2014), educational content and assets are considered learning resources if they help students acquire the needed information, abilities, values, and perspectives. Teachers and students alike might benefit from educational materials and tools that encourage active participation in the learning process. Formal learning materials, according to Azikwe (2014), should be evidence-based, precise, and driven by objectives in order to engage both instructors and learners. The following items were listed as learning resources by Dahar and Faize (2011): kits, textbooks, periodicals, newspapers, images, audio files, slides, transparencies, films, video records, workbooks, and digital media such as films, music, radio, software, CD-ROMs, as well as internet services. In the classroom, learners and instructors use instructional resources by showing, finding, comparing, analyzing, and stressing a phenomenon (Ashaver & Mwuese, 2013). Students learn geographical ideas in an abstract way without adequate teaching materials, which forces them to rely on their own imaginations when describing the occurrences they have studied. The importance of teacher training in relation to instructional resource utilization, as pointed out by (Kelly, 2020), cannot be overstated if we want to see a shift in classroom practice and the development of more effective geography learning experiences. As stated by by (Children, 2017), it is important to provide instructors with assistance so that they may make affordable teaching tools that are both acceptable and sourced from local materials.

Learning resources are unquestionably acknowledged as crucial in the context of education. For instance, the UNESCO (2012) indicates that quality education is contingent upon the learning resources used in the teaching and learning process, in addition to the qualifications of teachers and the availability of school facilities. Oluoch (2012), the researcher, emphasizes that the development and selection of learning resources and instruments are integral components of the design of a new curriculum initiative. The significant function that educational resources play in the facilitation of teaching and learning is demonstrated by their incorporation. The UNESCO (2012) even further reinforces this perspective by stating that the

availability of quality learning resources in sufficient quantities to both instructors and students is essential for satisfactory assistance in teaching and learning.

The indicators of quality learning resources have been provided by the Saskatchewan Ministry of Education (2013). The following are the six indicators that have been presented: physical quality (they are durable and therefore have a high level of physical and technical quality, making them appealing to users); content/format indicator (they should be well-organized and have a high level of artistic/literary quality, with up-to-date and authenticated information); social considerations (they should be fair and equitable in terms of the age of learners, their ability, their way of life, their gender, their socio-economic status, their belief system, and sexual orientation); design (they are easy to navigate, for example, extensive in-service training is not required, and they are consistent with the curriculum's philosophy); developer qualifications (it is essential that they are developed and validated by individuals who are qualified and have a high reputation); and finally, cost (they are reasonable in terms of cost).

Saglam (2014) maintains that educators are obligated to employ the necessary materials and methodologies during the teaching and learning process, in light of the extensive selection of learning resources available. Instructional resources facilitate the capacity of a teacher to convey information to learners in a manner that is plain, accurate, proper, and comprehensible, as Saglam (2014) points out. The capacity of learners to comprehend complex concepts is facilitated by the transformation of abstract knowledge into concrete knowledge and the simplification of complex ideas.

Geographical education in Nepalese secondary schools was investigated by Dhakal (2020) with regard to the accessibility and use of resource materials. According to the results, written and graphic materials were more often utilized in geography classes than audio, visual, and audiovisual resources, which were either unavailable or used seldom. Indigenous resources were also seldom used. As part of their 2013 study, Gaudence, Too, and Nabwire looked at how schools in Western Kenya's Homa Bay area used video materials to teach geography. This study found that using videos improved students' knowledge, engagement, and recall of course material, according

to experimental research that included a preliminary and final test in the control group.

In secondary public schools in the Bureti sub-county of Kericho County, Kenya, Ng'eno (2015) investigated the obstacles to the successful application of instructional materials. This research aimed to identify the required instructional resources for Geography education, evaluate their utilization, and propose strategies to overcome utilization challenges. The research included 45 educational institutions, a total of 15217 pupils, and 77 geography instructors. It used a descriptive survey approach. Using criteria such as school type and gender distribution, nine government schools were chosen on purpose. Data collection employed stratified sampling techniques, with questionnaires administered to 10 Geography instructors and 342 form two learners. In order to make sure the instruments were clear, genuine, and reliable, piloting was done. Data analysis made use of descriptive statistics, which were shown graphically using graphs, pie charts, percentages, and tables of frequency. The results indicated inadequate utilization of instructional resources, with textbooks being the most common, while others like dioramas, internet, and radio were underutilized. Challenges such as teachers' limited computer literacy, insufficient time for resources like field trips, and financial constraints were also identified.

Ng'eno (2015) recommended comprehensive training and re-training of teachers through workshops and seminars to enhance their proficiency in producing or improvising instructional resources. Additionally, fostering a positive attitude toward resource utilization among teachers was deemed crucial for improving students' learning experiences. The recommendations aimed to address identified challenges and enhance the utilization of instructional resources for Geography education in public secondary schools in Bureti sub-county, ultimately improving the quality of education.

Research was carried out by Ruthiri (2009) on the accessibility, acquisition, and usage of English language learning materials. Research took place in Kenya's Buuri Division, which is part of the Imenti North District. The primary questions addressed by the study's authors were the accessibility, acquisition, and use of English language

learning materials. Stratified random sampling was used to choose the study's sample. There was a total of 120 students from seventh and eighth grade, six principals, and twelve instructors. Two sets of surveys were administered to educators, and the other to students, in order to gather information. An observation checklist was used for schools, and interviews were conducted with school leaders to gather data. Results were expressed as percentages after data was examined by coding, tabulation, and the use of frequency tables. The results of the survey demonstrated that primary school textbooks were the most important educational resource accessible to students. Teaching and studying English in Buuri Division seldom made use of additional learning materials accessible via the Kenya National Library Service, Teacher Advisory Centres, and Resource Persons.

Additionally, most schools found it difficult to acquire additional learning and teaching tools (Ruthiri, 2009). The ineffective improvisation of learning materials was a result of understaffing, a lack of funds, a lack of time, and a hard workload. The researcher's recommendations are as follows: first, that we immediately begin collecting a wide range of non-textbook English language learning resources; second, that all relevant parties should work together to acquire these resources; and third, that we immediately begin raising awareness among English language teachers of the significance of materials for learning in the classroom by holding frequent seminars, workshops, or in-service courses on the topic. Nonetheless, the research by Ruthiri did not look at the many kinds of learning tools that are utilized in the classroom. Rather, the researcher urged immediate action to gather a variety of learning tools to enhance English language instruction and student performance.

According to Lambert and Balderstone (2012), one of the obstacles to teaching and studying geography is the lack of sufficient instructional materials. The reviewed studies evidently indicate that learning resources are important and significant in the process of learning and teaching. The resources enhance understanding of concepts as well as retention of knowledge. Despite this fact, instructional resources though available are under-utilized or selectively used during the instructional process.

According to the reviewed literature on the instructional resources used in the teaching and learning of geography, digital media tools being part of instructional resources used in geography instruction are under-used and therefore limiting their influence on students' achievement in geography. This presents a knowledge gap that necessitated this research on the usage and influence of the digital devices on geography instruction in Meru South sub-county.

### 2.3 Types of Digital Tools in Instruction

Many people's primary means of communication in the new century has been the integration of technology into their social lives. According to Matthews (2020), even for everyday tasks, people now rely on the internet. Although other social media platforms have improved societal communication, MySpace has dominated the provision of electronic communication. Other platforms include WhatsApp, Instagram, LinkedIn, YouTube, and Twitter. As an illustration, social media has seen fast growth and become more important in people's everyday lives in Sri Lanka (Matthews, 2010). Internet connectivity is becoming a requirement at many universities, colleges, and technical institutes. Iorliam and Ode (2014) found that students actively participate in online academic societies by connecting with one another for the purpose of exchanging knowledge, forming research groups, and learning new concept.

According to Joosten (2012), the term digital media is generally used to describe any number of technological systems connected to cooperation and community. More specifically, as (Kietzmann, Hermkens, McCarthy, & Silvestre, 2011) quoted, digital media "employs mobile and web-based technologies to create highly interactive platforms via which individuals and communities share, co-create, discuss, and modify user-generated content". Likely, (Dulek & Saydan, 2019) defined digital media as "platforms where users share their information, manners, interests through the internet or mobile systems" and big data applications. Additionally, (Grosseck & Bran, 2016) underlined that digital media is a way of sharing online information among people in a virtual community and creating material. Digital media can be more easily defined and understood through some vital examples. According to Kappen (2010), some of the most popular examples of digital media are; Content

Communities such as YouTube, Blogs like WordPress, Collaborative Projects such as Wikipedia, Social Networking Sites like Facebook, Instagram, Twitter, and Linkedln and Social Messaging Applications such as Viber, Skype and WhatsApp. According to Jiao, Gao and Yang (2015), digital social media is used to create social relationships and educational purposes. In several contexts, digital media has attracted the interest of academics. Digital media is used by millions of people all over the world. Young learners, teenagers, high school students, university students and elderly people use social media for communication, entertainment, work, sales, shopping, information sharing, travelling information sharing, sharing experiences, news, announcements and so forth.

Pew Research Center (2018) found that Facebook, the biggest social media platform, boasts 2.49 billion active users, and that figure is growing annually. According to the poll, 72% of college students and 72% of high school students use various social media platforms such as Instagram, Twitter, YouTube, Facebook, Viber, email, etc. These figures show just how engaged the student body is with this online networking scene. The convenience of having everything in one place is why students see social networking sites as trustworthy sources of information. According to Gagne (2017), media in general refers to elements in a classroom that have the potential to improve students' concentration and performance. Researchers also discovered that students benefit from using some forms of social media for a variety of reasons, including meeting their academic demands, developing a sense of self, and improving their networking abilities.

Smartphones have the capability to access digital media services via various apps or web browsers. This makes them more accessible to everyone, particularly those involved in education. A new study by Human IPO cites Githinji (2019) as asserting that, compared to the usual range of 18–20% throughout Africa, Kenya's smartphone penetration rate is 67%. The community's news and events as reported in the digital media have an impact on schools and the way students and teachers interact. School administrators may get valuable insight into the school community's opinion and comments by perusing social media posts made by members of the community. Network platforms that are used for educational reasons may enhance people's

communication skills, which is beneficial for both their schooling and their employment prospects (Kim, Hwang, & Hwang, 2020). Emotional intelligence sharing is just one more way that digital media networking opens up possibilities for connection, interaction, exchange of information, sharing of videos, and learning material sharing (Gikas & Grant, 2013).

Hamid, Chang, and Kurnia (2009) state that educational settings may benefit from social media platforms for content production, dissemination, participation, and group bonding. Digital networking may facilitate the distribution of educational resources, data, updates, and the promotion of interaction and cooperation. Similarly, other scholars have contended that digital media has the potential to foster open dialogue between educators and their students, bolster self-assurance, and forge robust partnerships (Hung & Yuen, 2010). According to McCaroll and Curran (2013), digital media has several positive effects on pupils, including easing anxiety, promoting socializing, "building community," and encouraging information sharing. Additionally, prior research has shown that digital media may enhance learning via collaborative and active communication (Anastasiadou & Dimitriadou, 2011).

Digital media also comes with its fair share of downsides. First and foremost, protecting one's privacy is a major challenge when dealing with digital media. Modern technology makes it easy to monitor people's online activity, which might compromise their privacy and security (Brew, Cervantes, & Shepard, 2013). The safety of teachers' private lives and profiles was a major worry for them (Moran, Seaman, & Tinti-Kane, 2011). Similarly, students may experience prejudice due to their use of digital media, instructors' biases, or bullying from unfriendly classmates, disagreements and misunderstandings might arise due to the intricacy of online communication. In addition, the fact that all the activities take place in a virtual student environment, which might sometimes vary greatly from the actual one, suggests that digital media could contribute to antisocial conduct (Hope, 2016). The difficulty in regulating and overseeing the quality of instruction is an additional drawback. Teachers have a tough time keeping tabs on all the many accessible digital media sources to make sure their kids aren't abusing them. In addition, Phillips (2011) argues that digital media may disrupt study time. Put simply, the student's focus might

be taken elsewhere, resulting in lost study time. Finally, it's worth considering that some students may not have access to the Internet at home or may face restrictions when trying to download data from their mobile devices. In any case, this might significantly hinder their ability to learn. The fact that certain LMSs are only compatible with specific mobile devices is further shown by (Ryan, Magro, & Sharp, 2011.

According to Schill (2011), negative behaviors such as drug and substance misuse among teenagers are promoted by digital media. Additionally, they waste a lot of time on the internet, chatting in posh forums and playing games that have nothing to do with their schoolwork. Academics, on the other hand, may benefit much from students' responsible use of digital media for the purposes of expanding their horizons, strengthening their social skills, and becoming engaged, content-creating citizens. Whether you think digital media is good or bad, a lot of kids use these sites every day. With the proliferation of social media, technology has emerged as a critical component of the modern student success equation. Concerning the goals of digital media use, research by Nalwa and Anand (2018) on the effects of social media use on the academic performance of secondary school students in Malaysia found that students' performance suffered when they used these sites for purely social and non-academic purposes.

Studies done by different researchers such as Bere (2013), Eraslan (2019) and Rizal (2021) focused mostly on the use of digital tools by students and instructors in post-secondary institutions. Researchers also majored on the utilization of a single type of digital tool in the entire study. Therefore, this study sought to establish the use of selected digital tools in public secondary schools.

### 2.3.1 WhatsApp and Instruction

One technological advancement that is often used on certain desktops and mobile phones is WhatsApp (Cohavi, 2016). WhatsApp is an app for smartphones that works with almost every OS and device out there. Since 2010, users have been able to access the application. The creators' stated goal was to create a system that could replace the current SMS platform with one that was free and ad-free. One of the many features of

WhatsApp is the ability to send and receive multimedia messages, including text, photos, music, video, and connections to websites. According to Tzu (2013), an estimated 31 billion texts are exchanged each day. Class WhatsApp groups provide four primary functions: facilitating communication with students, fostering a social environment, generating discussion and promoting sharing among students, and serving as a platform for learning (Bere, 2013).

Moreover, WhatsApp serves as a convenient platform for resource sharing in geography education, allowing educators to leverage WhatsApp groups to share a wide range of educational resources with their students. These resources may include articles, videos, maps, study materials, and supplementary readings that complement classroom instruction. By providing access to additional learning materials, WhatsApp enhances students' opportunities for exploration and deepening their understanding of geographical topics. Furthermore, students themselves can contribute to resource sharing by sharing resources they find valuable, thereby fostering a peer-driven approach to learning and encouraging exploration of diverse geographical subjects and perspectives (Yusoff, Kadar, Wan, & Abdullah, 2021).

Additionally, WhatsApp facilitates real-time updates and communication during fieldwork and geography-related excursions, enhancing the overall learning experience outside the classroom. Educators can create dedicated WhatsApp groups for field trips, enabling them to share location updates, important instructions, and safety guidelines with students in real time. Learners are able to utilize WhatsApp for communication with both their peers and educators during fieldwork, sharing observations, findings, and reflections instantly. The real-time communication fosters active engagement with the environment and encourages collaboration among students, allowing them to gain knowledge and experience from one another (Thaba-Nkadimene, 2020).

Research conducted by Bere (2013) evaluated the academic achievement of students at a South African institution who were instructed via WhatsApp. The students provided favorable comments, saying that it facilitated communication with their professors and classmates more effectively and also added an element of enjoyment.

The majority of learners acknowledged that WhatsApp learning fosters collaboration and enhances their social interaction with both classmates and professors. Students often exhibit a positive disposition towards the use of WhatsApp for educational purposes.

While WhatsApp offers numerous benefits for geography instruction, several challenges accompany its use in the educational setting. WhatsApp is a messaging app that requires users to share personal phone numbers to communicate. This raises privacy concerns, especially when educators communicate with students. Sharing personal contact information may not align with institutional policies or students' privacy preferences (Greenhow & Chapman, 2020). WhatsApp also lacks features specifically tailored for classroom management, assessment, and content organization. Educators may find it challenging to manage coursework, assignments, and student interactions effectively within the constraints of WhatsApp's interface (Oriji & Anikpo, 2019). On teachers' attitude towards WhatsApp, (Cohavi, 2016) discovered that students want their instructors to be accessible often and that teachers become irritated by the overflow of useless messages received by students.

### 2.3.2 YouTube and Instruction

According to Hansen and Erdley (2019), Chad Hurley, Steve Chen, and Jawed Karim established YouTube in February 2005. The website may be accessed online. At now, it ranks third in terms of popularity, behind only Google and Facebook, and is one of the largest platforms for streaming video content. Video clips may be uploaded, viewed, and shared on the popular website (Julie, 2014). In addition, creating an account and using YouTube are both free of charge (Agazio & Buckley, 2019). Popular options that help reduce search time and improve playing efficiency include playlists and channels. Users may easily share videos on popular social networking platforms including Google+, Facebook, and Twitter using this player. In addition, the content management system and educational management system may make advantage of the reduced URL and embedded code. For the majority of videos on YouTube, you can also find a transcript or closed captioning option. There is an inbuilt editing tool and the possibility to add text syncing and a transcript to our personal clips on YouTube for users who post material. Users may test and provide

feedback on YouTube's tools and capabilities on a different platform called Test Tube (Julie, 2014).

According to (Agazio & Buckley, 2019), YouTube has many applications in the field of education, including visualizing subject matter, involving students in project research, and generating ideas for new approaches to learning. According to Hartley, Palfrey, alongside Gasser via (Cayari, 2011), society will begin to comprehend and make use of digital resources like YouTube once teachers, teens, and adults are educated to be digitally literate. This is a fresh approach that takes into account different generations' preferences and ways of learning. According to Burke and Snyder (2018), YouTube offers other learning formats, experiences, and ways of acquiring technology to students who do not often attend conventional educational institutions. Moreover, a significant influence on education may be felt when films from YouTube are incorporated in internet-based media or other e-learning systems like Moodle or Blackboard. YouTube is requested to facilitate group work and original thought in the classroom, as well as to evaluate and tailor content to individual needs.

Teachers can use YouTube to encourage student discussion and deep learning by providing resources for students to find information, compare and analyze ideas, test hypotheses, and build their knowledge (Clifton & Mann, 2009). Videos may supplement texts and photos in geography lessons by showing the process in action, such as a lava eruption from a magma core (Dian & Rachmat, 2017). Therefore, students may benefit from dynamic, up-to-date, more extensive, and entertaining material in a format of videos by using YouTube for geography instruction. The knowledge acquisition process will undoubtedly impact students' growth by reducing the breadth and depth of learned material and fostering learning that is novel, imaginative, and enjoyable.

### 2.3.3 Facebook and Instruction

Facebook is an online social networking service where users may keep in touch with friends, family, community leaders, plan events, and share news and other information. For instance, there are picture comments, postings, profile updates, wall-

style messaging, public message publishing, and immediate interaction on social networks (Nielson, 2020). A new example of a communications technology that has gained widespread student adoption is Facebook. As a result, it has the makings of a great tool to help students and instructors communicate and work together in the classroom. Teachers are curious in how high school students use social media, how much time they spend on class preparation, and how much time they spend on extracurricular activities (Junco, 2013).

Facebook has become a cornerstone in Geography education, with educators utilizing specialized groups to foster collaboration and resource sharing on a global scale. These groups serve as vibrant platforms where educators convene to exchange ideas, discuss teaching methodologies and develop innovative approaches to teaching Geography. Within these digital spaces, educators from diverse geographical backgrounds come together to share lesson plans, resources, and strategies, enriching their own teaching practices through exposure to a wide array of perspectives and expertise. By harnessing the global reach of Facebook, educators can tap into a vast network of colleagues, transcending geographical boundaries and cultural differences to create a dynamic and inclusive learning community (Camus, Hurt, Larson, & Prevost, 2016).

Through features like quizzes, polls, and discussions, educators stimulate critical thinking and foster peer-to-peer knowledge exchange among geography students. Not only do these hands-on exercises get students thinking about the world around them, but they also give them practice applying what they've learned about geography in authentic contexts. By engaging in discussions and collaborative activities within the familiar social media environment of Facebook, students develop a deeper connection to the subject matter and are more likely to retain the information they learn. The utilization of interactive learning activities on Facebook not only enhances student engagement but also promotes deeper learning and retention of geographical concepts (Kabilan, 2016).

In a study by Pempek, Yermolayeva and Calvert (2009), the researchers contended that students spend around thirty minutes each day on Facebook, where they engage

in social contact, showcase their identities, and share material with their friends, especially those they already know. In 2009, undergraduates from Britain believed that Facebook was mostly used for social purposes rather than formal education, while it occasionally served informally for learning (Madge, Meek, Wellens, & Hooley, 2009). Nonetheless, there is a history of teachers forbidding pupils from using electronic devices in class (Roblyer, McDaniel, Webb, Herman, & Witty, 2018).

Facebook's social nature can sometimes lead to distractions and misuse in the classroom. Students may be tempted to engage in off-topic discussions, browse unrelated content, or use Facebook for personal socializing during instructional time. Managing students' online behavior and maintaining focus on educational objectives can be challenging for educators, requiring clear guidelines and boundaries for appropriate use of Facebook in the classroom. The vast amount of content shared on Facebook can vary widely in terms of quality and reliability. Educators must critically evaluate the credibility and validity of materials shared on Facebook to ensure that students are accessing reliable information (Barrot, 2016).

### 2.3.4 Instagram and Instruction

Instagram's emergence as a multifunctional social media platform has opened new avenues for language learning and teaching practices. Initially conceived as a photo-sharing app, Instagram has evolved to incorporate various features like video sharing, direct messaging, and story sharing, making it an adaptable tool for educational settings. Studies suggest that Instagram offers diverse activities applicable to language classrooms, such as digital storytelling, grammar exercises through visual content, role-playing scenarios, and speaking activities via video sharing (Handayani, 2016). This versatility allows educators to address all language skills effectively within and outside the classroom environment.

Specific studies have shown Instagram's effectiveness in improving students' writing skills by engaging them in tasks that require written expression through captions and comments (Soviyah & Etikaningsih, 2018). Moreover, Students' engagement and enthusiasm for learning have been shown to rise on this platform, potentially fostering a more dynamic learning environment (Purnama, 2018). Despite Instagram's

expanding user base and its popularity, especially among the younger demographic (Smith & Anderson, 2018), scientific research on its application in educational settings, particularly in language learning, remains relatively limited (Mansor & Rahim, 2017). Compared to extensively studied platforms like Facebook and Twitter, Instagram's potential for language learning remains underexplored.

Erarslan (2019) conducted a study that delved into Instagram's role as an educational tool, specifically exploring its influence on language learning among university students. A mixed-methods approach was employed in the research and it involved a survey of 219 university students studying English, along with an experimental phase encompassing 80 participants. The experimental phase sought to gauge Instagram's impact on language learning, complemented by qualitative insights derived from interviews with six students from the experimental group. Erarslan's findings revealed that Instagram stood out as the most frequently utilized social media platform among the surveyed participants. Moreover, the study highlighted a notable inclination among students to leverage Instagram for educational and language learning purposes. Quantitative analysis presented a positive correlation between Instagram usage and language learning, substantiated by achievement scores indicating a beneficial effect of Instagram supplementation on students' language learning process (Erarslan, 2019). In summary, Erarslan's research strongly suggests that Instagram serves as an effective supplementary tool for enhancing English language learning within university settings. The platform's extensive usage and the students' positive perceptions of its educational potential underscore Instagram's capacity to immerse learners in language learning activities within their everyday routines.

In a study titled "Using Instagram for English Learning: A Thorough Review," Rizal (2021) conducts a thorough qualitative review to assess Instagram's potential in improving English language skills encompassing reading, speaking, listening, and writing. The research involved an exhaustive analysis of 24 academic articles from Google Scholar to ensure comprehensive data examination. Through meticulous readings, data categorization, and refinement, the study sheds light on Instagram's suitability as an educational tool for English language learners. The study findings highlight Instagram's efficacy in aiding English language learning. Notably, the

research emphasizes the importance of integrating Instagram into educational settings, leveraging its popularity among students. The study proposes employing Instagram as a platform for students to practice writing about their daily experiences and offering feedback on peers' writing, indicating its effectiveness in enhancing writing skills, especially in descriptive writing. Additionally, the study demonstrates that students exposed to Instagram media therapy in experimental groups outperformed those in control groups, suggesting the tangible benefits of incorporating Instagram into educational practices.

The integration of Instagram into primary and secondary education for institutional promotion rather than educational purposes is evident, while its application in undergraduate and postgraduate studies poses challenges in data availability. Existing literature highlights its use as an archival platform for student work and showcases postsecondary students' engagement in sharing educational resources, as evidenced by medical students in Nepal (Beese, 2014). Instagram's rapid global growth, surpassing Twitter in popularity, and its reliance on visual communication make it a cross-cultural connector, expanding social networks beyond language barriers. With over 200 billion images, Instagram serves as a rich repository for design, photography, architecture, and illustration. Instagram’s low technological threshold, relying on smartphone access, particularly holds promise for inclusivity, evident in Pakistan's increasing smartphone adoption driven by advanced technology and accessible data plans. Instagram's straightforward comment and response features foster inclusive and visually engaging learning environments, fostering community building beyond institutional constraints (Beese, 2014).

### 2.4 Frequency of use of Digital Tools in Geography Instruction

The utilization of digital resources to impart a variety of skills and knowledge, as well as the use of various digital media tools in the teaching and learning process, determines the extent to which the resources are utilized. The way students utilize digital media technology is changing traditional ideas about learning, the role of teachers, and the very definition of knowledge. As a consequence of having more opportunities to study outside of school, students become disengaged and forgetful in the classroom. Additionally, students need to learn to be respectful of themselves,

others, and intellectual property as technology grows more pervasive in their daily lives and classrooms. They should also develop critical thinking skills to avoid engaging in harmful online behaviors and content (Andrews, Digital Citizenship, 2013).

The world of Geography education is experiencing a significant transformation, evolving alongside the integration of digital media tools that influence the socio-cultural landscape of education. Digital tools, ranging from virtual learning environments to mobile learning via tablets, aim to foster collaborative learning environments (Melhuish & Falloon, 2010). Incorporating digital media in teaching and learning sheds light on various dimensions. Platforms like Instagram and Twitter stimulate critical thinking, encouraging contemplation about the deeper implications of technology in daily life and spatial information transmission (Ash, Kitchin, & Leszczynski, 2018). These platforms enhance students' self-awareness about technology's role in their socio-cultural interactions. With so many students using smartphones and social media, higher learning institutions are putting more emphasis on understanding how digital technology impacts daily life (Holton, 2019). Social technologies play a vital role in student research, facilitating communication during fieldwork (Welsh, Mauchline, Park, Whalley, & France, 2013).

In the USA, Greenhow and Chapman (2020) research scrutinize social media's vital role in education, particularly in times of public health crises like the Covid-19 pandemic, characterized by the prevalence of social distancing measures. The study contains the advantages of social media technologies in K-12 education and includes a thorough literature analysis that covers a decade's worth of research, supplemented with more current case studies. The research highlights three important features of social media: stimulating active learning, fostering communities, and facilitating civic participation. The authors stress the amalgamation of social media with traditional learning systems, highlighting the need to prepare well-informed and engaged citizens during health crises. The researchers emphasize the crucial role of K-12 education in this context and propose integrating social media as a remote education strategy to involve students and enhance civic involvement. The paper provides practical implications and instructional guidance for K-12 educators and instructional designers

to effectively incorporate social media tools into distance learning strategies, aiming to promote civic engagement among students.

In Italy, a research paper on Teaching geography and blended learning: interdisciplinary and new learning possibilities was published by D'Agostino and Santus the authors explore the transformative influence of the COVID-19 epidemic on online learning in Italian Universities particularly in Cultural Geography instruction. The study highlights the integration of various digital tools like Moodle, Google Earth, and Instagram in teaching Geography, revitalizing interest in traditionally less-emphasized subjects. The study emphasizes the significance of blended learning strategies and the symbiotic relationship between technology, pedagogy, and interdisciplinary education, reshaping Geography education in the digital era (D'Agostino & Santus, 2022).

Hogan (2020) conducted a qualitative inquiry to investigate the perspectives and experiences of senior Geography educators regarding the integration of digital technologies in teaching in Auckland, New Zealand. The study aimed to assess the degree to which the envisioned shift in the educational landscape, characterized by student-centered learning facilitated by teachers, has materialized with the advent of digital tools. Six seasoned Geography instructors, each boasting a minimum of two years of experience teaching senior Geography, participated in interviews designed to capture their insights and encounters with digital technologies in the classroom. Through thematic analysis, the data gleaned from these interviews were scrutinized to identify prevalent themes and recurring patterns concerning the integration of digital tools in senior Geography education. The analysis revealed three prominent trends. Firstly, concerns surfaced regarding the digital proficiency of both educators and learners, posing obstacles to the effective utilization of advanced digital resources. Secondly, discrepancies in access to digital tools among teachers and students were apparent, impacting instructional approaches and the potential benefits of digital technologies in Geography education. Lastly, the influence of educational regulations and school policies, particularly concerning assessment standards, emerged as significant drivers shaping pedagogical strategies. Hogan's investigation offers valuable insights into the current landscape of digital technology integration in senior

Geography classrooms in Auckland, New Zealand. Furthermore, it furnishes practical recommendations aimed at refining pedagogical approaches and enriching Geography education through the effective incorporation of digital tools.

In Romania, Dulama, Vescan and Magdas (2016) conducted research at the "Iulian Pop" Economic High School in Cluj-Napoca, analyzing the application of the Facebook social network for Geography learning and assessment among 120 twelfth-grade students. The study organized students into five Facebook discussion groups, examining their questionnaire responses and interactions between teachers and students as well as among students themselves. Findings revealed a favorable perception among students regarding learning and assessment activities, with students considering their teacher as an equal participant. The focus of the activity encompassed clarification, revision, knowledge acquisition, and assessment. However, the study identified. decision-making, comprehending the interplay of geographic factors, influences a learner to manipulate skills development, visual perspective and perception towards a subject through exploration, feelings and social emotional needs, attitude, motivation and ultimately student performance.

Literature reviewed indicated that whereas the digital tools are easily accessible and easy to use, it does not guarantee their use in the instructional process. The existing knowledge gap is to establish the extent of use of the digital tools in the entire learning process and to determine how often the resources are used in the instruction of geography.

### 2.5 Influence of Use of Digital Tools in Geography Instruction

Digital media platforms offer a diverse range of options to enhance Geography education, facilitating interaction, communication, and resource sharing among educators and students. Facebook functions as an online hub for communities, allowing teachers to conduct discussions, live lessons, and updates, fostering immediate engagement. Digital media platforms also connect schools with the community, sharing news, promoting events, and hosting virtual meetings to support Geography initiatives (De Jong, 2015). Twitter's concise format enables effective communication of updates, resources, and responses within its character limit, using

tailored hashtags or handles designed for geography classes. Blogs serve as a reflective space for students to submit geography-related reflections, project instructions, and essay practices, aiding writing skills and serving as a resource hub during remote learning. Pinterest emphasizes visual resource curation, facilitating the exchange of infographics, tutorials, and project examples, promoting collaboration among students and educators. Instagram's visual platform allows teachers to share Geography updates, assignments, and resources, encouraging student engagement and showcasing projects. YouTube, centered on video content, offers educational materials such as tutorials and project presentations relevant to (De Jong, 2015).

The utilization of digital learning media offers multiple advantages, notably active student engagement (Tuko & Hadi, 2022). Unlike traditional methods where students passively receive information, digital media empowers learners to actively participate through interactive exercises, educational games, and online discussions. The active involvement by learners stimulates critical thinking and collaboration, allowing extensive exploration of geographical concepts. Students can delve into projects, utilize Geographic Information System (GIS) software, and access diverse digital resources, nurturing crucial skills like problem-solving and communication. Furthermore, digital media tools promote self-directed learning, empowering students to drive their educational journey by selecting materials, planning study schedules, and employing personal learning strategies (Zahrawati et al., 2023). The approach enhances time management, self-motivation, and critical thinking, crucial for addressing real-world geographical challenges. Digital platforms offer case studies, simulations, and problem-based exercises, refining students' problem-solving abilities while exploring complex geographic issues.

In order to improve one's communication and skill set; one can utilize digital media networking platforms. These platforms also make it easier for students and teachers from different countries and institutions to work together, which opens up new cultural and educational opportunities. Facilitates student-teacher alliances, cooperation, and dynamic interaction; boosts students' innovativeness and imagination; increases their participation in learning activities; boosts self-esteem; assists in the development of reading, writing, and oral communication skills in a

foreign language; raises students' awareness; and concludes with improved academic performance. Furthermore, students may stay updated at all times via digital media networking, which also facilitates the speedy, easy, and extensive sharing of information. The social network encompasses every aspect of a person's life and serves as a platform for users to connect, form friendships, receive and share news, information, and vast amounts of data. It also allows users to successfully generate and influence teaching, learning, and educational processes, as well as knowledge. Users can also work separately solely, and on their own according to their respective schedules, seeking specific information to broaden their horizons.

Researchers Rouis, Limayen, and Salehi-Sangari (2014) looked examined how Facebook use affected the academic performance of Lulea, Sweden, high school pupils in connection to their personality qualities. The suggested study design investigates the impact of Facebook use on academic achievement across a variety of personality types. Furthermore, the study endeavors to validate the findings, which are very noteworthy. Extroverted kids' academic performance is severely affected by Facebook use, according to the report. Because students exhibit a high degree of strong self-control while utilizing social media sites, this detrimental influence is significantly mitigated. This study also takes into account the personality trait of cognitive immersion, which indicates the degree to which one is involved.

With an emphasis on gender comparisons and the medium's effect on students' academic achievement, Junco, Heiberger, and Loken (2018) studied high school students' use and popularity of prominent social media networks. The gender gap and students' perceptions of Facebook's effects on their grades are the main topics of the two researchers' analysis of college students' Facebook use patterns and frequencies. A total of 348 respondents, evenly split between men and females, were surveyed for this study. With an average age of 21, the respondents are students in various levels of higher education. The study's results corroborate those of the vast majority of well-designed research showing that students' use of social media does not adversely affect their academic performance. Researchers further argue that there may be other characteristics associated with internet usage, especially social networking sites, that

lead to poor academic performance, such as social media addiction, spending too much time online, talking too much, and cognitive immersion.

The goal of the study by Yang and Tang (2018) was to examine the effect of social media literacy on the educational achievements of forty (40) Taiwanese secondary school students. In a dedicated online forum, students worked in groups of 14 to address questions pertaining to the humanities. It was the students' responsibility to summarize the posts posted on the forum. Forty students participated in this study by filling out self-administered surveys at the conclusion of the semester. Finding connections between students' academic performance and antagonistic, friendship, and guidance aspects was the goal of the research. Students' academic success is strongly correlated with the centrality in friendship component, according to the investigation. People are more likely to seek out and share knowledge about issues when they have friends since they are psychologically linked with friendship. It follows that encouraging kids to make friendships in a moderated online setting may have a positive effect on their academic achievement.

Gupta (2013) focused on the effects of internet usage on the grades of Indian distance education students. As a result of the utter reliance on social networking tools by distant learning, the study takes on more significance. The participants' attitudes and perceptions of technology in the classroom, as well as their ability to recognize and choose effective technological resources, are key to this research. Five hundred seventy-two students enrolled in a master's degree program in management had their responses analyzed. The administration and delivery of the courses are done online via the use of information and communication technology. According to the findings, there is no correlation between students' academic achievement and their utilization of Facebook as a social media platform for schoolwork. Improved online technologies and resources are needed to facilitate online engagement and the formation of online social networks with the goal of achieving and supporting educational goals, according to the study. Gupta (2013) found that teachers did not see students' Facebook use as beneficial to their academic achievement.

Research by Alwagait, Shahzad, and Lim (2014) verifies that institutions within Saudi Arabia have linked Twitter usage with both beneficial and bad impacts on student success. A number of factors, such as whether students use Twitter primarily for educational reasons or whether they spend too much time on it outside of class, determine whether Twitter has a positive or negative impact on students' performance in higher education. If students do not use Twitter for non-academic reasons excessively, it may have a favorable impact on their academic performance. However, since students in Saudi Arabia's higher education system utilize social media admittance for non-educational purposes, the results are detrimental to their realization. Research analyzing the relationship between social media use and GPA results in Saudi Arabian academic institutions discovered that Twitter had both positive and negative impacts on student success (Alwagait, Shahzad, & Lim, 2014).

Researchers Etim, Udosen, and Em (2016) looked at how secondary school Geography students in Nigeria's Uyo Educational Zone used WhatsApp and how it affected their grades. The study tested two hypotheses using a non-randomized control group approach with a pre- and post-test period. The research included 180 participants, all of whom were Geography majors from two of the area's thirteen public high schools. The Teachers' Attitude Towards the Use of WhatsApp Questionnaire (TATWAQ) and the Geography Performance Test (GPT) were the two study tools used to gather data. Professionals in the fields of geographical study and assessment and measurement validated both tools, and the results showed that GPT had a reliability value of 0.72 and TATWAQ had a reliability coefficient of 0.86. In contrast to the control groups, who received more conventional expository teaching methods, those in the experiments were given access to an educational module in WhatsApp.

The data analysis showed that the WhatsApp module had a notable and beneficial effect on the academic achievement of the geography students. Furthermore, the research discovered that the way instructors felt about the WhatsApp teaching module had a substantial impact on the academic performance of their Geography students. Consequently, the research suggested that educators get training on how to use WhatsApp chat rooms as part of their lesson plans. To further encourage the usage of

chat rooms for educational goals, the research also suggested that schools provide social media resource materials. This study adds to the expanding body of scholarship on the topic of educational technology integration, specifically focusing on WhatsApp. By demonstrating the positive influence of WhatsApp on geography student performance, the study highlights the importance of leveraging digital tools in educational settings to improve learning outcomes.

Charles (2016) conducted a study focusing on the persistent issue of underperformance in Geography subjects within Kipkelion Sub-County, Kericho County, Kenya. Acknowledging the discontent among educators, parents, and stakeholders regarding Geography academic outcomes, the researcher aimed to explore the utilization of instructional materials in practical geography. Employing a descriptive survey design, the study targeted Geography Heads of Department (HODs), teachers, and learners in secondary institutions within the sub-county. Using basic and random selection approaches, a sample was created that included five schools, 300 students, five geography heads of department, and ten geography instructors. Student and instructor questionnaires, interview agendas, and checklists were all used to gather data. The data was analyzed using inferential and descriptive statistics, encompassing tools like percentages and frequencies, as well as using the Statistical Package for the Social Sciences (SPSS). While the majority of schools, about 70% did have instructional materials on hand, the results showed that only 22.5% of instructors actually made use of them, and even fewer did so consistently. Moreover, the study uncovered a prevalent negative attitude among Geography teachers towards the use of instructional resources. Based on these findings, the study proposed several recommendations to enhance the utilization of instructional resources in teaching practical geography. Suggestions included improving resource availability, educating teachers on their significance, incentivizing teachers to change their negative attitudes, promoting student field trips, and revising the geography syllabus to allocate more lesson time to the subject.

The studies reviewed mostly aimed establishing the influence of use of instructional resources on the academic performance of learners. Similarly, the studies do not show how the resource are utilized in the different stages of the instruction process. This

study sought to establish several outcomes related to the use of digital tools in the teaching and learning of geography.

### 2.6 Challenges of Use of Digital Tools in Geography Instruction

The adoption of digital assets in educational settings is hindered by several variables. One of the biggest problems with instructors using digital media tools is the lack of technical assistance. Common problems with technology use, such as broken or unrepaired equipment, slow internet connections, virus attacks, and infrastructure failures that hinder the delivery of digital content, are frequently interrupted due to a lack of technical support, which in turn disrupts the process of learning and teaching. The fear of equipment failure and the resulting shame in front of students prevents instructors from using digital technology in the classroom due to a lack of technical assistance (Turel & Johnson, 2012). Multiple studies conducted in secondary schools throughout Kenya have expressed worry about the integration of technology, highlighting the need for clarification on the technical assistance that is being provided.

Research has shown that instructors' individual traits significantly impact their use of digital tools in the classroom. One study indicated that as teachers become older and more experienced, they become less proficient and efficient when it comes to using ICT for teaching and learning (Cuban, 2015). When compared to older and female educators, Rahim and Shamsiah (2015) discovered that younger and male educators exhibited more confidence when it came to using technology in the classroom. Moreover, as compared to instructors of non-technical topics, those teaching technical subjects expressed more confidence in their ability to effectively use technology in the classroom. The extent to which educators make use of information and communication technology (ICT) in the classroom is based on their level of knowledge in ICT. This was determined by Rosnain and Arif (2010).

In developing nations like Kenya, Tezci (2011) discovered a terrible state of affairs when it came to the usage of technology in the classroom. Both pre-service teacher education and in-service professional development provided insufficient preparation for teachers to effectively use technology in the classroom, according to the research.

There was lack of sufficient information and communication technology resources and insufficient technical assistance for educators. Findings from Mbithi (2016) indicate that teachers' proficiency with digital tools and the availability of adequate resources, including computers, influence their involvement in incorporating digital media into secondary school lessons and student learning. The elimination of obstacles to the integration of ICT in the classroom is a necessary condition for the effective use of digital technology in instruction and documentation. Some of the obstacles include instructors' cultural and personal views on technological advances (Afshari, Bakar, Luan, & Samah, 2009). Attitudes toward technology usage in the classroom and other relevant criteria are still the most hotly debated topics in the current literature.

According to research by Owino (2013), school administrators and policymakers at the national level should work together to ensure that digital technologies are effectively integrated into the learning process. The efficacy of technology integration is also determined by the monitoring and assessment of that process. According to (Mwunda, 2014). Discovered that instructors' proficiency in both knowing how to use digital media tools and effectively incorporating them into their lessons had the greatest impact on students' ability to benefit from digital technology. This statement is even more striking when considering the findings of Mbithi (2014), who discovered that although some Kenyan secondary schools have digitalized the English curriculum, teachers were not adequately prepared to use these technologies in the classroom.

According to the results of this research, providing this conducive atmosphere is still heavily dependent on the mindset, skill set, and character traits of school principals. When implementing new digital media technologies, it is important to examine how instructors would respond (Sang, 2012). For school rules on digital technology usage to be effectively coordinated, it is necessary to eliminate those that are unproductive (Kiano, 2014). Measures ought to be taken to change the way instructors feel about computers and their usefulness in the classroom. Both the why and the how of technology's usage should be very clear (Teo, 2012). Program creators in the field of digital literacy have come under fire for what some see as an insufficient focus on

teacher involvement and the impact this has on students' real use of digital tools in the classroom. The involvement of educators was an important focus of this research.

Research conducted in Kenya has consistently shown that teachers' inexperience, lack of knowledge, self-assurance, and competency when it comes to technology is a major obstacle to its successful integration into the classroom (Owino, 2013). Notably, this situation may have altered due to the advancement of smartphones and social media in recent years; hence, there is an immediate and critical need for research on the current state of teachers' abilities to use and manipulate digital resources. Similarly, research in Kenya has mostly disregarded the current generation of students' tech-savvy attitudes, levels of proficiency, and acceptance of technology in the classroom, with the exception of one study that indicated students' prior tech use to be a strong predictor of future tech use and acceptance (Chappelle, 2011). As a result, this research includes students so that we can learn about their experiences in classes that make use of digital resources.

The reviewed literature on the challenges of effective utilization of digital resources in geography instruction is scanty and presented generally and not specifically. The information therefore does not bring about meaningful interventions. This study sought to establish concrete challenges that impede effective use of digital tools which can lead to right educational solutions in geography instruction.

## 2.7 Theoretical Framework

The study utilized Classroom Instruction Theory and the Technology Acceptance Model as its guiding frameworks.

### 2.7.1 Classroom Instruction Theory

The theory of classroom instruction was advanced by Cohen, Raudenbush, and Ball (2003). The proponents developed the idea to show how learning and teaching are interconnected systems. Participants in the interactions range from students interacting with one another, instructors interacting with content, learners interact with content and teachers interact with learners. That is why, as Kurdziolek (2011) argues, this paradigm is useful for thinking about learning resources as systems that

include objects, connections, actors, and environments, rather than singular physical entities.

Researchers have identified the components of effective training (Cohen et al., 2003). The research' findings reveal that the most successful educators made use of learning tools. Teaching, according to this view, consists of activities that help students become proficient users of various resources. The quality of education is directly correlated to the availability, use, and preparation of instructional resources (Cohen et al., 2003). Instruction, according to these theorists, will take place in classrooms where students and instructors engage in conversation about and with the material. The collaborative effort between instructors and students, which could last for many days, weeks, or months, is what they mean when they talk about interaction. Lampert (2001) posits that students' comprehension grows and shrinks as they engage in the instructional process, and that as tasks progress, teaching changes, which leads to further tasks. Learning materials are crucial for a variety of reasons, such as lesson planning, task setting, interpreting student work, and time and activity management.

The allocation of assets is also dictated by the level of coordination in the classroom. One aspect of coordination problems is the work that teachers and students do on material. Teachers' expertise, presentation skills, students' comprehension, environmental agents, and their desire to generate meaningful connections are all factors in the coordination. Building trust and using social resources to facilitate evidence collecting and analysis are other essential components of coordination. Managing aspects of the educational environment is another crucial area of training. Problems of motivation, resource allocation, and collaboration arise in the context of educational setting.

In their analysis, Cohen et al. (2003) provided a perspective on the causality of learning resources' important role in learning. Proponents of the advancement argue that "Do resources matter?" cannot be the central research question. According to the creators, this is because it's impossible to come up with a worthwhile educational or instructional endeavor when resources are scarce. Additionally, the proponents state that sufficient proof is available demonstrating a causal relationship between

resources and learning. They argue that: " Which resources are crucial, exactly how and under what conditions?" should be the central question. One important condition is the intended outcome, as the developers point out. According to Cohen et al. (2003), better schools should be the end goal of educational resources. For a better grasp of how learning occurs as a result of fruitful interactions between students and available resources, Kurdziolek (2011) suggests looking to the Classroom Instruction Theory. The theory, the author adds, can also help us understand how different learning resources affect vital variables like students' final grades.

### 2.7.2 Technology Acceptance Model (TAM)

According to Davis's (1989) Technology Acceptance Model (TAM), the user's attitude toward the technology, their perceptions of the technology's value and ease of use predetermine the user's incentive to use any given technology. The technology acceptance model states that in order for digital media devices to be successful, both instructors and students must believe that the technology is helpful and easy to use. The effectiveness of digital media technology in improving learners' attitudes towards utilizing digital media tools for learning directly correlates to the quality of those learners' experiences and the results they achieve. Therefore, it seems that the model of technology acceptance is an ideal structure for the utilization of technology for digital media by the learners in this research.

The TAM has been applied in various fields, including education, to understand both students and educators embracing and making use of technological tools. In the context of digital media, the TAM has been used to assess how well digital media technology improves academic achievement for students Studies have shown that students' attitudes towards using digital media tools are influenced by their perceptions of their ease of use and usefulness (Alharbi & Drew, 2014). When students perceive digital media technology as easy to use and useful, they are more likely to have positive attitudes towards using it and to experience better learning outcomes.

According to the model TAM, to be effective, digital tools need to be perceived as useful and easy to use by both learners and teachers. Positive attitudes towards using digital platforms lead to better learning outcomes (Hussain, Akram, Haider, Hussain,

& Ali, 2016). Overall, the TAM provides a useful framework for understanding the factors that influence the acceptance and use of digital media technology in education. By considering students' perceptions of easiness, importance and mindset in regards to usage of digital media technology, educators and developers can design and implement effective digital technology that enhances students' learning experiences and outcomes.

### 2.8 Conceptual Framework

A conceptual framework is a visual representation showing the nature of relationship among the study variables. The relationship between the independent and dependent variables is indicated by the arrows showing the hypothetical link.

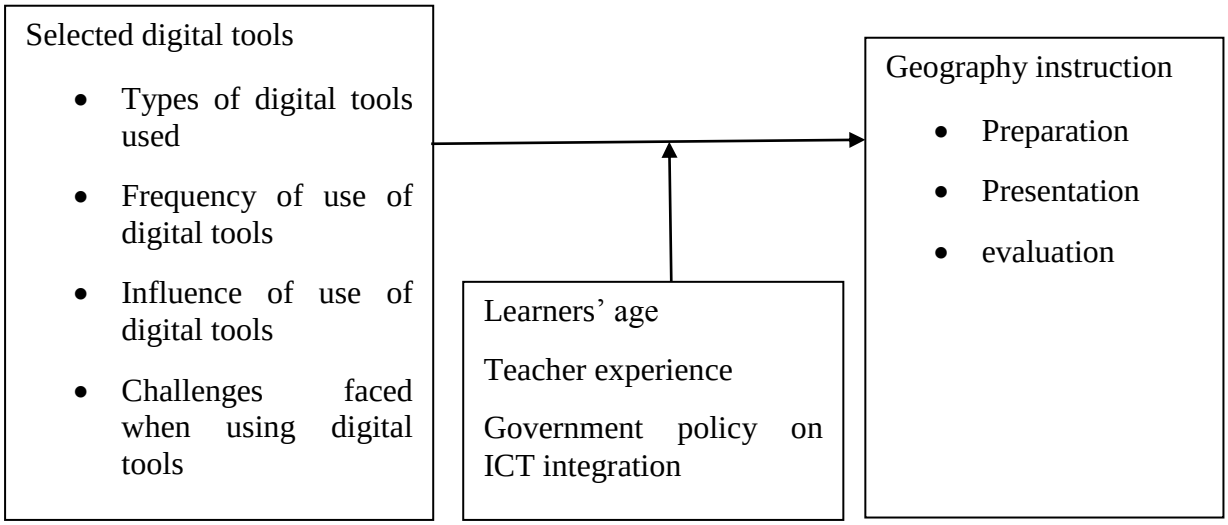


Figure 1: Conceptual Framework of the Study Variables

The independent variable is a variable that the researcher can manipulate in order to manipulate its influence on another variable. The independent variables in this study are types of digital media tools, frequency of use of digital media tools, influence of digital media tools and challenges faced when using digital media tools. The dependent variables vary as a function of independent variables. For this study, effective Geography instruction will vary according to the lesson planning, lesson presentation and evaluation of learners. Learner age, teacher experience and government policy on ICT integration are the intervening variables. The control on

learner age was ensured by selecting form three learners to participate in the study. Teachers with experience of two years and beyond participated in the study. Schools that have adopted and implemented the government policy on ICT integration were selected for the study.

# CHAPTER THREE
# METHODOLOGY

## 3.1 Location of the Study

The location of the research was the Meru South Sub- County of Tharaka Nithi County. Chuka, Mwonge, Magumoni and Karingani are the four zones that make up Meru South. There are a total of 38 secondary schools that are public in the sub-county. The learners' poor Geography performance and the presence of all categories of schools in the sub-county led to its selection as an ideal research site. Consequently, Meru South serves as an example that is indicative of the whole county.

## 3.2 Research Design

A descriptive survey research approach was used in the study. Descriptive survey allows the researcher to analyze the phenomenon without manipulating factors thanks to the research design. Similarly, it allows for the collection of cross-sectional data from a large sample of people and the establishment of correlations between the relevant variables (Orodho, Khatete, & Mugiraneza, 2016). Due to the design's ability to yield large and precise data, the layout is also suitable for use in instructional fact-finding.

## 3.3 Target Population

This research aimed to collect data from 1995 respondents from public secondary schools in Meru South sub-county.

Table 2: Study Population

| Category | Population |
|---|---|
| Heads of Subject | 38 |
| Geography teachers | 89 |
| Students | 1868 |
| Total | 1995 |

According to the data in Table 2, the Sub-county has a total of 1868 form 3 geography students, 89 teachers of geography and 38 heads of geography subject, one from each school. Therefore, a total of 1995 individuals formed a subgroup that possessed characteristics needed for this study.

### 3.4 Sample Size and Sampling Procedures

#### 3.4.1 Sample Size Determination

The sample size was determined using Krejcie and Morgan (1970) sample size table. According to the Krejcie and Morgan (1970) sample size table attached as Appendix V, a study population equivalent to 1995 individuals is supposed to yield 322 individuals. Therefore, 347 respondents were drawn from the study population.

#### 3.4.2 Sampling Procedure

The secondary schools within Meru South formed the sampling units. Stratified method was used to select six schools according to the categories of schools. One national school was selected purposively as it is the only national school in the Sub-county. Simple random sampling technique was used to select one extra-county school. Stratified sampling technique was used to group the county schools into boys only and girls only before a simple random technique is done to select one from each group. Two sub-county schools were randomly selected through balloting. Six heads of subject were purposively sampled each from the sampled schools. All Geography subject teachers from the selected schools were conveniently sampled. From each sampled school, a proportionate sample was drawn using simple random sampling to select form three geography students. In schools with multiple form three streams, students were clustered in their streams and a proportionate sample selected randomly from each stream. Simple random sampling was adopted to give all the members in the category a chance to participate in the study. The Form Three Geography students were preferred to other levels (forms) for the study because the students have been exposed to several abstract topics in the geography syllabus and are less busy than the Form Four students.

Table 3: Sampling Matrix

| Category | Study population | Sample size | Percentage | Sampling procedure |
|---|---|---|---|---|
| Head of subject | 38 | 6 | 16 | Purposive |
| Teachers | 89 | 39 | 44 | Convenience |
| Students | 1868 | 302 | 16 | Simple random |
| Total | 1995 | 347 | 17 | |

### 3.5 Research Instruments

The research used questionnaires to get data from Geography instructors and form three students of Geography, while an interview schedule was utilized to collect information from Geography subject heads. Questionnaires are tools used to gather data on the opinions and viewpoints of people (Orodho 2012). The researcher created questionnaires that included both open-ended and closed-ended questions.

#### 3.5.1 Geography Teachers' Questionnaire (GTQ)

A questionnaire meant for the teachers was used to gather data pertaining to the categories of digital resources, difficulties encountered while using digital resources, frequency of utilization, and the impact of digital resources on Geography education. The questionnaire was considered significant for gathering data from Geography instructors due to its ability to be tailored and used for gathering substantial amounts of data from diverse participants (Wilkinson & Birmingham, 2003). The questionnaire included questions that were assessed using a Likert scale consisting of 5 points, which ranged from SA (Strongly Agree) to SD (Strongly Disagree). The questionnaire comprised of six sections. Section 1 collected demographic information, section 2 gathered data on the geography process, section 3 focused on the various types of digital tools, section 4 examined the frequency of digital tool usage, section 5 explored the impact of digital tools, and section 6 addressed the challenges associated with using digital resources in geography teaching. The researcher collaborated with supervisors and specialists within the education department to create a comprehensive questionnaire for instructors.

#### 3.5.2 Geography Students' Questionnaire (GSQ)

The researcher designed this instrument to gather data from learners on the kinds and frequency of digital media resources utilized, as well as the impact of these technologies on Geography teaching. The use of a questionnaire is crucial in optimizing time efficiency as it enables the collection of data from a substantial sample size (Kombo & Tromp, 2006). The data gathered from the students was collected using a Likert scale of 5 points, ranging from SA (Strongly Agree) to SD (Strongly Disagree), with options for A (Agree), NS (Not sure), and D (Disagree) The scale was used to score the items. The questionnaire comprised of five sections.

Section 1 aimed to gather demographic information, section 2 focused on the geography process, section 3 explored the various types of digital devices, section 4 examined the frequency of digital device usage, and section 5 investigated the impact of digital resources on geography instruction.

### 3.5.3 Interview Schedule

The researcher conducted face to face interviews with heads of Geography subject in each sampled school. The interviews mainly sought in-depth information about the study variables. The interviews also dealt with areas which were not covered in the teachers' questionnaire including administration in the department. Interview sessions accorded the researcher an opportunity to counter check some information provided in the questionnaires especially ones related to students.

## 3.6 Piloting

In Maara Sub-County in Tharaka Nithi County, the researcher chose two secondary schools at random to participate in the pilot project. Maara is a neighboring Sub-County with similar characteristics as Meru South in learners' population and their performance in Geography. The sample for the pilot study should be a minimum of 10% of the sample selected for the study Orodho (2014). The researcher piloted the research instruments on 39 respondents comprising of 2 subject heads, 5 subject teachers and 32 students. The questionnaires for both geography teachers and students were pilot tested. The instruments' internal consistency was determined using the data received from the trial testing.

## 3.7 Reliability

A measuring device's reliability may be defined as its capacity to consistently and reliably measure a given characteristic (Ampofo & Orodho, 2014). In order to check if the instrument is internally consistent in gauging the construct of interest, the Cronbach's Alpha coefficient is used to find out how items are associated among themselves. This was established by doing a test-retest, which involves having exactly the same respondents fill out a survey again to verify the stability of their answers (Kombo & Tromp, 2006). By using Cronbach's Alpha, we were able to assess the instruments' dependability. This is because the GTQ may include certain open-ended

questions that might provide non-binary results (Creswell, 2009). The estimated values obtained for the GTQ was 0.8 and 0.82 for the GSQ. Therefore, the research instruments were deemed reliable based on the minimum threshold of 0.7 as suggested by Polgar and Thomas (2009).

### 3.8 Validity

The degree to which a measuring device accurately measures its intended target is known as its validity (Ampofo & Orodho, 2014). For an instrument to be legitimate, the information it contains must be relevant to the goals of the study. Face validity of the instruments was established by the supervisors and deemed valid and relating to the study objectives. To check on the content validity of the research instruments, the researcher discussed the items in the instruments with the supervisors and other experts from the university in the Department of Education. The advice by the supervisors helped the researcher to improve the content validity of the research instruments. In order to improve face validity, the questions that were deemed unclear were reorganized based on the findings of the pilot research.

### 3.9 Data Collection Procedure

A letter of clearance was obtained from the ethics review committee of Chuka University, followed by an authorization letter from the Graduate school. Thereafter, a permit from National Commission for Science, Technology and Innovation (NACOSTI) was granted, the researcher also notified the county director of education and the county commissioner (Tharaka Nithi County) of the plan of carrying out studies at the schools that were sampled. The researcher paid a visit to the sampled schools and introduced himself to the head of the institution and explained the purpose of the visit in order to enlist cooperation from the school's administration. After the notification was done, the researcher met the geography teachers and the head of subject to arrange when and how to conduct the study, arrangement was made and date set for the administration of the research instruments. During the subsequent visit, the researcher with the help of the geography teachers randomly selected students from form three to fill in the questionnaires. After two weeks, the researcher made another visit to the sampled schools to collect the questionnaires and held an interview with the heads of subject.

### 3.10 Data Analysis

The data collected using the Geography Teachers' Questionnaire and the Geography Students' Questionnaire was first collated and analyzed with the aid of SPSS package version 29. Both descriptive (using percentages and frequencies) and inferential statistics (Chi-square) were used for quantitative data analysis The descriptive statistics describe the data while the inferential statistics show the relationship between the independent variables and dependent variable. The Teachers' Geography questionnaire along with the interview schedule provided qualitative data that was evaluated using content analysis. The concepts from the replies were then categorized thematically. The research hypothesis was tested at $\alpha$=0.05 significance level. Table 4 presents the variables and respective statistical procedures used in analyzing the collected data.

Table 4: Data Analysis Matrix

| Research question/hypothesis | Independent variable | Dependent variable | Statistical analysis methods |
|---|---|---|---|
| What types of digital tools are being used in Geography instruction in public secondary institutions in Meru South Sub-county? | Types of digital tools | Geography instruction | Frequencies, percentages |
| What is the frequency of use of digital tools in Geography instruction in public secondary schools in Meru South Sub-county? | Frequency of use of digital tools | Geography instruction | Frequencies, percentages |
| What are the challenges faced while using digital tools in Geography instruction in public secondary schools in Meru South Sub-county? | Challenges in the use digital tools | Geography instruction | Frequencies, percentages |
| $H_O1$: Use of digital tools does not significantly influence Geography instruction in public secondary schools in Meru South Sub-county. | Influence of use of digital tools | Geography instruction | Frequencies, percentages, Chi-square |

### 3.11 Ethical Considerations

Prior to beginning data collection, strict adherence to ethical norms was maintained, including the following: informed permission, anonymity, and confidentiality. School

administrators were informed of the study's involvement in the classroom via site visits to the selected schools. Complete anonymity and confidentiality were maintained with respect to the data revealed by the participants. Participating students were not subjected to any type of discrimination or disclosure of their identities or school names. Respondents were assured that any information gathered from them would be used only for research and would remain private.

# CHAPTER FOUR

# RESULTS AND DISCUSSIONS

## 4.1 General and Demographic Information

The study sought to examine the use of digital tools in geography instruction in public secondary schools in Meru south Sub-County, Tharaka Nithi County, Kenya. The study sought to establish the different types of digital tools used by teachers in Geography instruction, determine how often digital tools were used in learning of Geography, determine the influence of digital tools on Geography instruction and examine the challenges associated with the use of digital tools in Geography instruction. A descriptive survey research design was adopted to help achieve the study resolution. Questionnaires were used to collect data from students and their Geography teachers while interview schedule was used to collect data from the heads of Geography subject. The sample included 302 form three Geography students, 39 Geography teachers and 6 Geography HOS. Data was collected from 290 students, 39 teachers and 6 HOS yielding a total of 335 respondents. This means the study attained 96.5% return rate which can be presumed to be adequate according to Babbie and Mouton (2011).

### 4.1.1 Reliability Index

Reliability of the study variables was tested using Cronbach's Alpha prior to the analysis and the findings were as presented in Table 5.

Table 5: Reliability Index

| Variable | Teachers' Questionnaire Items | Cronbach's Alpha | Students' Questionnaire Items | Cronbach's Alpha |
|---|---|---|---|---|
| Geography instruction | 12 | 0.7801 | 9 | 0.8164 |
| Types of digital tools used | 15 | 0.8230 | 15 | 0.8493 |
| Frequency of use of digital tools | 5 | 0.8374 | 5 | 0.8166 |
| Influence of use of digital tools | 11 | 0.8061 | 8 | 0.7913 |
| Challenges of use of digital tools | 8 | 0.7639 | - | - |
| Average | | 0.80 | | 0.82 |

Data obtained in Table 5 showed that the reliability index of the variables ranged between 0.80 for teachers' questionnaire and 0.82 for students' questionnaire. The findings mean that all variables had reliability index of above 0.7 which is acceptable and therefore adopted for data collection.

### 4.2 Demographic Information

A probe on the demographic information was made on the form three students and their geography teachers who participated in the study. The findings are presented in this section sequentially.

#### 4.2.1 Teachers' Demographic Information

A probe was made on the sampled geography teachers premised on gender, age, teaching experience, level of education and type of school. The findings are illustrated in Table 6.

Table 6: Teachers' Demographic Information

| Variable | Category | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 24 | 61.5 |
| | Female | 15 | 38.5 |
| | Total | 39 | 100.0 |
| Age | 25-35 | 18 | 46.2 |
| | 36-55 | 18 | 46.2 |
| | Above 55 | 3 | 7.7 |
| | Total | 39 | 100.0 |
| Teaching experience | Below 5 | 5 | 12.8 |
| | 5-15 | 27 | 69.2 |
| | Above 15 | 7 | 17.9 |
| | Total | 39 | 100.0 |
| Level of education | Diploma | 5 | 12.8 |
| | Bachelor | 32 | 82.1 |
| | PGDE | 2 | 5.1 |
| | Total | 39 | 100.0 |
| Type of school | Boys only | 12 | 30.8 |
| | Girls only | 7 | 17.9 |
| | Mixed | 20 | 51.3 |
| | Total | 39 | 100.0 |
| ICT training | Yes | 17 | 43.6 |
| | No | 22 | 56.4 |
| | Total | 39 | 100.0 |

The study established that majority of the geography teachers were male (61.5%) compared to female teachers (38.5%). Most of the teachers are aged between 25-55 years representing (92.4%). Further, majority of the teachers (69.2%) had a teaching experience of between 5-15 years. This indicates that most of the geography teachers had the requisite experience to teach and could provide reliable data. In terms of their level of education, the researcher found out that most teachers (82.1%) held a bachelor's degree. A large majority of the respondents seemed to have the necessary qualifications to teach geography. This study also showed that (56.4%) of the teachers had no training in the use of ICT in teaching. The respondents were drawn from different categories of schools, where the majority (51.3%) were in mixed schools.

### 4.2.2 Students' Demographic Information

A probe was made on the sampled form three geography students premised on gender, age, frequency of use of a digital device and type of school. The findings are illustrated in Table 7.

Table 7: Students' Demographic Information

| Variable | Category | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 161 | 55.5 |
| | Female | 129 | 45.5 |
| | Total | 290 | 100.0 |
| Age | Below 15 | 36 | 12.4 |
| | 16-17 | 217 | 74.8 |
| | Above 17 | 37 | 12.8 |
| | Total | 290 | 100.0 |
| Level of school | Sub-County | 99 | 99 |
| | County | 90 | 90 |
| | Extra county | 51 | 51 |
| | National | 50 | 50 |
| | Total | 290 | 100.0 |

Data obtained in Table 7 show that there were more male students (55.5%) than female students (45.5%). This shows a fair distribution of geography students who participated in the study based on gender. In terms of age, most of the students (74.8%) were between 16-17 years old while (12.4%) were below the age of 15 years. This implies that the students who participated in the study belonged in the appropriate age bracket for form 3 students. Most of the students (34.1%) were drawn from mixed institutions compared to those from boys only (33.8%) and girls only

(32.1%). Also, majority of the students (42.4%) used a digital device for schoolwork compared to (4.1%) who never use digital devices for schoolwork. This implies that the students can provide reliable data for the study problem.

### 4.3 Geography Instructional Process

The study sought to establish the state of Geography instruction in public secondary schools in Meru-South Sub-County. Form three Geography students and their Geography teachers were given a questionnaire to establish their opinion. Responses were as presented in Table 8.

Table 8: Geography Instructional Process in %

| Activities | Teachers | | Students | |
|---|---|---|---|---|
| | NE/LE/ME | GE/VGE | NE/LE/ME | GE/VGE |
| Sources for relevant content | - | 100.0 | - | - |
| Sources for appropriate instructional resources | 25.6 | 74.4 | - | - |
| Identifies appropriate methods of presentation | 12.8 | 87.2 | - | - |
| Selects appropriate assessment methods | 23.1 | 76.9 | - | - |
| Engages learners continuously | 23.1 | 76.9 | 32.0 | 68.0 |
| Helps learners manipulate instructional materials | 23.1 | 76.9 | 63.1 | 36.9 |
| Facilitates learners form groups to undertake discussions | 10.3 | 89.7 | 26.6 | 73.4 |
| Allows learners seek clarification on difficult concepts | 10.3 | 89.7 | 35.9 | 64.1 |
| Gives learners adequate practice activities | 28.2 | 71.8 | 31.4 | 68.6 |
| Gives assignments | 7.7 | 92.3 | 19.6 | 80.4 |
| Provides for fieldwork excursions for practical experience | 56.4 | 43.6 | 34.9 | 65.1 |
| Provides prompt feedback for assignments | 17.9 | 82.1 | 28.6 | 71.4 |

Key: NE- No Extent, LE- Little Extent, ME- Moderate Extent, GE- Great Extent, VGE- Very Great Extent

Table 8 shows data obtained from the sampled teachers on lesson preparation indicate that all teachers (100%) source for relevant content, most of them (74.4%) source for appropriate instructional resources, a majority of them (87.2%) identify appropriate

methods of presentation and also select appropriate methods of presentation (76.9%). The data analyzed indicate that a majority (84.6%) of the geography teachers in Meru South Sub County engage in adequate lesson preparation that include sourcing for content, selecting and assembling relevant instructional resources and methods of presentation. The implication of these findings shows that teacher preparation for geography instruction may promote the efficacy of learning especially when selecting and employing appropriate tools and resources. Chorley and Haggett (2019) asserts that exposure to innovative teaching methodologies and resources during professional development helps teachers to integrate inventive approaches in their instruction.

Responses from teachers on lesson presentation show that a majority of the teachers (76.9%) engage learners continuously, similarly a majority (76.9%) help learners manipulate instructional materials, more than three quarters of the teachers facilitate learners to form groups to undertake discussions and allow learners seek clarification on difficult concepts (89.7%). These findings were confirmed by most of the students who indicated that their teacher engages them continuously (68%), facilitates them to form groups (73.4%) and allows them to seek clarification on difficult concepts (64.1%). The data analyzed indicate that more than three quarters (83.3%) of the geography teachers create an active learning environment for their learners through engaging the learners continuously, helping them manipulate learning materials, forming group discussions and seeking clarification on difficult concepts. This implies that the teachers employ strategies that enhances the learning experiences for students. Teachers might end up creating a captivating instructional setting that permits a more streamlined transmission of knowledge. The findings of the study concur with Munna and Kalam (2021) that active learning environment promotes inclusivity and improves the faculty and student performance in academics.

Data obtained on lesson evaluation also show that majority of the sampled teachers (71.8%) give learners adequate practice activities, give assignments to students (92.3%) and provide prompt feedback for assignments given (82.1%). Sampled students confirmed these observations, most of them (68.6%) indicated that their geography teacher gives them adequate practice activities, gives them assignments (80.4%), allows for fieldwork excursions for practical experiences (65.1%) and

provides prompt feedback for assignments given (71.4%). Data analyzed indicate that over two thirds (82.1%) of the geography teachers carry out continuous assessment for instant feedback on areas where students may encounter difficulties and introduce interventions to assist the learner. This implies that the instructor is able to get feedback on the students advancements throughout the entire learning process and the teacher might be able to introduce timely interventions to assist the learners by adjusting the instructional strategies and approaches. Further the study is collaborated with a study conducted by Worthington (2017) who indicates that learning outcomes in form of assessment contribute to the quality and progression of the instructional program.

Qualitative data from the interviewees attributed the low performance in geography to other factors. Interviewee F had this to say;

> *The poor grades posted in geography by our learners in this school is majorly because of the learners' absenteeism from school due to various challenges and also the low entry behavior of learners.*

This was supported by interviewee A.

> *Poor academic performance among learners is mostly contributed by many other factors that are not teacher-related.*

Most of the interviewees were of the opinion that the low performance in geography was as a result of student related factors as opposed to teacher preparedness and ability to deliver the content. Differing with the findings from the interviews, Hong and Stonier (2015) assert that the subject changing nature with the growth of disciplinary knowledge underscores the imperative for educators to consistently engage in professional development. Continual learning is vital for teachers to stay abreast of emerging content, methodologies, and technological advancements that can enhance their teaching methodologies (Schulman, Fuchs, Kisser, & Notter, 2021). Given the constant influx of new information, changing perspectives, and evolving global dynamics inherent in Geography, teachers must possess the latest knowledge to furnish students with accurate and relevant insights. Continuous professional development becomes essential, facilitating educators in adapting their instructional

approaches to align with contemporary geographic theories, technological advancements, and societal changes (Hong & Stonier, 2015)

### 4.4 Types of Digital Tools and Geography Instruction

The first objective sought to identify the types of digital tools used by Geography teachers in instructing geography in public secondary schools in Meru-South Sub-County. The study sought to establish the type of digital devices and frequency of use of the devices by the geography teachers. The findings are presented in Table 9.

Table 9: Usage of Digital Devices by Teachers

| Variable | Category | Frequency | Percentage |
|---|---|---|---|
| Digital device used | Smartphone | 24 | 61.5 |
| | Tablet | 4 | 10.3 |
| | Computer | 11 | 28.2 |
| | Total | 39 | 100.0 |
| Frequency of use of digital device | Daily | 16 | 41.0 |
| | More than once a week | 18 | 46.2 |
| | Once a week | 2 | 5.1 |
| | Rarely | 3 | 7.7 |
| | Total | 39 | 100.0 |

Data obtained in Table 9 show that majority of the teachers (61.5%) use smartphones to access digital tools for Geography instruction compared to (28.2%) for computers and (10.3%) for tablets. Further, data show that most teachers (46.2%) use the digital devices more than once a week, while (41%) use the digital devices daily and (7.7%) rarely use the digital devices. This implies that the respondents could provide useful data for the study problem. Data was obtained from Geography teachers and students to show the use of the types of digital tools during the lesson preparation and introduction. The findings are illustrated in terms of percentages in Table 10.

Table 10: Types of Digital Tools Used during Lesson Preparation and Introduction

| Digital Tool | Geography Teachers | | Students | |
|---|---|---|---|---|
| | Yes (%) | No (%) | Yes (%) | No (%) |
| Facebook | 69.2 | 30.8 | 57.9 | 42.1 |
| YouTube | 87.2 | 12.8 | 69.3 | 30.7 |
| WhatsApp | 79.5 | 20.5 | 53.4 | 46.6 |
| Twitter | 69.2 | 30.8 | 51.4 | 48.6 |
| Instagram | 15.4 | 84.6 | 7.9 | 92.1 |

The findings in Table 10 show that most teachers (87.2%) use YouTube during lesson preparation. This finding was confirmed by the majority of students (69.3%). WhatsApp (79.5%), Facebook (69.2%) and Twitter (69.2%) were also used by most of the sampled teachers during lesson preparation which was confirmed by the students (53.4%), (57.9%) and (51.4%) respectively. Instagram (15.4%) was the least used digital tool during lesson preparation as confirmed by students (7.9%). This is an indication that digital tools are useful to teachers in the preparation of lessons as they may easily avail information that is not readily available from sources such as textbooks. The findings are collaborated by Hamid, Chang and Kurnia (2009) that social networking can be used for content creation, sharing, engagement, and collective socialization in education and can be enabled to provide instructional materials, educational data update and promote contact and collaboration. Data was obtained from Geography teachers and students to show the use of the types of digital tools used during the lesson presentation. The findings are illustrated in terms of percentages in Table 11.

Table 11: Types of Digital Tools Used during Lesson Presentation in %

| Digital Tool | Geography Teachers | | Students | |
|---|---|---|---|---|
| | Yes | No | Yes | No |
| Facebook | 59.0 | 41.0 | 56.9 | 43.1 |
| YouTube | 87.2 | 12.8 | 77.9 | 22.1 |
| WhatsApp | 56.2 | 43.8 | 51.7 | 48.3 |
| Twitter | 30.8 | 69.2 | 21.4 | 78.6 |
| Instagram | 12.8 | 87.2 | 7.9 | 92.1 |

The findings in Table 11 show that YouTube (87.2%) is most used digital tool among the sampled teachers during lesson presentation which was affirmed by their students (77.9%). Facebook (59.0%) and WhatsApp (56.2%) were also found to be in use by majority of the teachers during lesson presentation which was also confirmed by their students (56.9%) and (51.7%) respectively. This implies that teachers find YouTube, Facebook and WhatsApp useful during lesson presentation especially in the use of tutorials, animated videos, images, live streams, podcasts and audios. This may stimulate learners attention and provide a captivating learning experience when dealing with abstract concepts. The findings of the study that media tools are used during lesson presentation and have positive effect is supported by Chorley and Haggett (2019) who said that through the incorporation of diverse multimedia

components into Geography instruction, educators can cultivate a more vibrant and engaging classroom environment. The researcher also obtained data from Geography teachers and students to show the use types of digital tools during the lesson evaluation. The findings are illustrated in terms of percentages in Table 12.

Table 12: Types of Digital Tools Used during Lesson Evaluation in %

| Digital Tool | Geography Teachers | | Student | |
|---|---|---|---|---|
| | Yes | No | Yes | No |
| Facebook | 35.9 | 64.1 | 36.9 | 63.1 |
| YouTube | 53.8 | 46.2 | 77.9 | 22.1 |
| WhatsApp | 53.8 | 46.2 | 51.7 | 48.3 |
| Twitter | 45.4 | 54.6 | 22.1 | 77.9 |
| Instagram | 15.1 | 84.9 | 7.9 | 92.1 |

The findings in Table 12 show that YouTube (53.8%) and WhatsApp (53.8%) are the most used digital tools by teachers when evaluating a lesson which was ascertained by their students (77.9%) and (51.7%) respectively. This implies that when evaluating their learners, teachers of geography use YouTube and WhatsApp. The tools have unique features such as fun quizzes, surveys, group projects, group assignments and class collaborations. While advocating for use of technology, Schulman (2021) asserts that evaluation methods must exhibit flexibility and responsiveness, integrating the latest advancements in the field to accurately measure students' proficiency in current Geography concepts.

Qualitative findings indicated uniformity of responses from majority of the interviewees on the use of media tools in Geography instruction by the teachers. When giving information, interviewee A indicated that;

> *Most teachers in this school are young and trained in use of ICT therefore they find it easy to use the media tools to present geographical content to learners.*

Interviewee D on his part asserted that;

> *Our school is connected to internet and we have enough laptops for each department. This has made access to digital content and use of internet when teaching very easy to most of the teachers especially in our department.*

Data obtained from the interviewees indicate that the use of digital tools in geography instruction is largely determined by the age of the teacher and the availability of the ICT facilities. The responses by the interviewees concurs with a UNESCO report (2012) that the methods employed by teachers to teach a subject are to a very large extent influenced by the kind of resources and facilities available in the school.

### 4.5 Frequency of Use of Digital Tools

The second goal of the research sought to determine how often geography classes make use of digital resources. The inquiry conducted on Geography teachers was made based on a five Likert-scaled statement. Table 13 illustrate the findings.

Table 13: Frequency of Use of Digital Tools in Geography Instruction in % (Teachers)

| Digital Tool | Never | Rarely | Sometimes | Often | Always | Total |
|---|---|---|---|---|---|---|
| Facebook | 10.3 | 5.1 | 7.7 | 53.8 | 23.1 | 100.0 |
| Twitter | - | 17.9 | 25.6 | 30.8 | 25.6 | 100.0 |
| YouTube | - | - | 12.8 | 35.9 | 51.3 | 100.0 |
| Instagram | 12.8 | 43.6 | 25.6 | 12.8 | 5.1 | 100.0 |
| WhatsApp | 17.9 | - | 25.6 | 10.3 | 46.2 | 100.0 |

Findings obtained in Table 13 show that most geography teachers (87.2%) who participated in the study used YouTube in teaching geography often or always. Similarly, slightly more than three quarters often or always used Facebook (76.9%), WhatsApp (56.5%) and Twitter (56.4%) in teaching geography. However, only less than a quarter often or always used Instagram (17.9%) in teaching geography. Data sought from students on the same issue were as presented in Table 14.

Table 14: Frequency of Use of Digital Tools in Geography Instruction in % (Students)

| Digital Tool | Never | Rarely | Sometimes | Often | Always | Total |
|---|---|---|---|---|---|---|
| Facebook | 16.6 | 2.8 | 10.3 | 50.7 | 19.7 | 100.0 |
| YouTube | - | - | 7.6 | 55.5 | 36.9 | 100.0 |
| WhatsApp | - | 5.9 | 35.5 | 7.9 | 50.7 | 100.0 |
| Twitter | 50.7 | 1.0 | 30.0 | 17.2 | 1.0 | 100.0 |
| Instagram | 50.7 | 20.7 | 28.6 | - | - | 100.0 |

The findings in Table 14 show data collected from students confirming the data shown in Table 13, where majority of the students indicated being taught Geography often or always using YouTube (92.4%), Facebook (70.4%) and WhatsApp (58.6%).

Qualitative findings confirmed the frequency in the use of media tools in Geography instruction. Interviewees B and F agrees with interviewee C's statement that;

> *With most teachers having a smartphone with them, access and use of various media tools has become easy. Most of them prefer to source for content from the media applications instead of the voluminous printed texts.*

According to the data obtained from the respondents, teachers who have had training in ICT, own a personal digital device and have used a digital device for a long period of time are likely to use digital tools more frequently during the instructional process. This implies that frequent use of various digital tools in learning may transform the student's concept of learning, the role of the teacher and nature of knowledge itself. Digital tools used frequently may also foster collaborative learning environments A study by Mwanda (2017) yielded similar results where the propensity of teachers to use digital resources depends on a number of factors such as ICT training, being in possession of a personal computer and period of time that a teacher has had contact with the computer.

### 4.6 Influence of Digital Tools

The third objective aimed at determining the influence of use of digital tools on Geography instruction in public secondary schools in Meru South Sub-county. Teachers' opinion on the use of digital tools relative to geography instruction was sought based on five Likert-scale statements. Data summary illustrated in Table 15.

Table 15: Influence of Digital Tools on Geography Instruction in % (Teachers)

| Statement | D | NS | A | SA | Total |
|---|---|---|---|---|---|
| Digital tools influence the learner to have interest in learning geography | - | 5.1 | 30.8 | 64.1 | 100.0 |
| Use of digital tools help a learner develop new knowledge in certain learning area | - | 25.6 | 43.6 | 30.8 | 100.0 |
| Digital tools influence experiential learning in geography | - | 30.8 | 56.4 | 12.8 | 100.0 |
| Use of digital tools make learning real and permanent | - | 20.5 | 61.5 | 17.9 | 100.0 |
| When digital tools are used, they motivate learning in geography | - | 12.8 | 48.7 | 38.5 | 100.0 |
| Digital tools make learning faster | - | 17.9 | 58.3 | 28.2 | 100.0 |
| Use of digital tools promotes learner's attitude towards learning of geography | - | 5.1 | 41.0 | 53.8 | 100.0 |
| Learner's creativity and problem-solving is enhanced by using digital tools | 7.7 | 15.4 | 59.0 | 17.9 | 100.0 |
| Learner engagement during the instructional process is enhanced when using digital tools | - | 23.1 | 66.7 | 10.3 | 100.0 |
| Digital tools provide for differentiated learning styles and abilities | - | 30.8 | 46.2 | 23.1 | 100.0 |
| Use of digital tools have a positive impact on student's learning outcomes | - | 5.1 | 56.4 | 38.5 | 100.0 |

Key: D- Disagree, NS- Not Sure, A- Agree, SA- Strongly Agree

Majority of the teachers indicated that digital tools increase learner interest in geography (94.9%), improves the students' learning outcomes (94.9%), promotes learners' attitude towards learning Geography (94.8%), increases student's motivation to learn Geography (87.2%), makes learning of Geography faster (86.5%), makes learning real and permanent (79.4%) and enhances learner's creativity and problem-solving (76.9%). Generally, majority of the sampled teachers (87.8%) believe that the use of digital tools in Geography instruction influences the learning of Geography. These findings are greatly collaborated by the results according to (Suciani & Effendi, 2021) who found that digital tools are pivotal in advancing Geography instruction, significantly enhancing the grasp of fundamental geographical concepts. They enable a deeper understanding of intricate elements like climate change, landscape formation, and population migration. The deeper understanding of phenomena nurtures spatial thinking skills essential for real-world problem-solving, decision-making, comprehending the interplay of geographic factors, influences a learner to manipulate skills development, visual perspective and perception towards a subject through

exploration, feelings and social emotional needs, attitude, motivation and ultimately student performance. Similarly, data was obtained from geography students on the influence of digital tools on geography instruction. Data summary illustrated in Table 16.

Table 16: Influence of Use of Digital Tools on Geography Instruction in % (students)

| Statement | SD | D | NS | A | SA | Total |
|---|---|---|---|---|---|---|
| I find geography more interesting when using digital tools. | - | 4.1 | 16.6 | 54.1 | 25.2 | 100.0 |
| I feel more confident in my ability to understand geography concepts when taught using digital tools. | 1.0 | 6.2 | 24.1 | 45.9 | 22.8 | 100.0 |
| I enjoy using digital tools to learn geography | 1.0 | 16.6 | 13.4 | 50.3 | 18.6 | 100.0 |
| I think geography is a less challenging subject when taught using digital tools | - | 12.4 | 25.9 | 41.4 | 20.3 | 100.0 |
| I am more motivated to do well in geography class when taught using digital tools. | 5.5 | 2.4 | 18.6 | 51.0 | 22.4 | 100.0 |
| I believe that use of digital tools is an effective way to learn geography. | 1.4 | 5.2 | 17.2 | 54.8 | 21.4 | 100.0 |
| Digital tools promote my creativity and problem-solving in geography | 0.7 | 7.6 | 27.9 | 49.7 | 14.1 | 100.0 |
| I would like to continue learning geography using digital tools in the future | 0.7 | - | 4.1 | 70.0 | 25.2 | 100.0 |

Key: SD- Strongly Disagree, D- Disagree, NS- Not Sure, A- Agree, SA- Strongly Agree

The findings by the Geography teachers was further affirmed by their students where the majority ascertained that they would like to continue using the digital tools in the learning of Geography (95.2%), that Geography is more interesting when taught using the digital tools (79.3%), they are motivated to do well in Geography when they use the digital tools (73.4%), they enjoy using digital tools to learn Geography (68.9%) and they understand Geography concepts better when taught using digital tools (68.7%). An inferential interpretation of the implication of this finding was sought via Chi-square analysis. Table 17 shows the Chi-square interpretation of the observation.

Table 17: Use of Digital Tools in Geography Instruction (Cross tabulation)

| | | | Use of Digital Tools | | |
|---|---|---|---|---|---|
| | | | Low | High | Total |
| Geography Instruction | Doesn't Influence | Frequency | 56 | 8 | 64 |
| | | Percentage | 19.3 | 2.8 | 22.1 |
| | Influence | Frequency | 37 | 189 | 226 |
| | | Percentage | 12.8 | 65.1 | 77.9 |
| | Total | Frequency | 93 | 197 | 290 |
| | | Percentage | 32.1 | 67.9 | 100.0 |

Results from cross tabulation showed that more respondents who had a positive perception of influence of digital tools on geography instruction, a significant proportion of the students (77.9%) indicating that it influences compared those who believe it does not influence (22.1%). With regard to use of digital tools, more students (67.9%) indicated their teachers use digital tools highly compared to those who reported low use (32.1%). Table 18 presents an inferential interpretation of the observation.

Table 18:Chi-Square Analysis for Influence of use of Digital Tools on Geography Instruction

| | Value | df | Ass Sig. | Exact Sig, | CC |
|---|---|---|---|---|---|
| Pearson Chi-Square | 115.830[a] | 1 | .000 | | .534 |
| Continuity Correction[b] | 112.588 | 1 | .000 | | |
| Likelihood Ratio | 114.165 | 1 | .000 | | |
| Fisher's Exact Test | | | | .000 | |
| Linear-by-Linear Association | 115.431 | 1 | .000 | | |
| N of Valid Cases | 290 | | | | |

a. The predicted count is fewer than 5 for 0 cells (0.0%). A count of at least 20.52 is expected.
b. Only works with 2x2 tables when computing

Table 18 results gave analysis of Chi square $X^2(1) = 115.830$, $p<0.001$ showed that use of digital tools significantly influences geography instruction. Contingency Coefficient measure of Association (CC) illustrated that 53.4% of the total variance in geography instruction could be attributed to use of digital tools. Findings therefore mean that use of digital tools significantly influences geography instruction and the study's null hypothesis $H_0 1$ which stated that the use of digital tools does not

significantly influence Geography instruction in public secondary schools in Meru South Sub-County was rejected.

Information obtained from the heads of subject through a scheduled interview confirmed the positive influence of use of the digital tools in geography instruction. According to interviewee B;

> *Streams taught by teachers who use digital technology in teaching geography tend to cover the syllabus earlier and also the students post better results in geography exams compared to the streams taught conventionally.*

Similarly, interviewee F indicated that;

> *Learners taught regularly using the social media tools select geography in large numbers as they transit to form three.*

Data obtained from the interviewees indicate that the use of digital tools makes learning faster and positively influences learners in selecting geography. Moreover, findings of previous studies like that of Anastasiadou and Dimitriadou (2011) agrees with these findings that digital media has a great potential to improve the learning experience via active communication and cooperation.

### 4.7 Challenges of Use of Digital Tools

The study also sought to establish the challenges faced by teachers when using digital tools in teaching and learning of Geography among public secondary schools in Meru-South Sub-County.

The inquiry made on Geography teachers was based on a five Likert-scale. Table 19 presents a summary of their findings.

Table 19: Challenges of Use of Digital Tools in Geography Instruction in %

| Statement | SD | D | NS | A | SA | Total |
|---|---|---|---|---|---|---|
| Lack of interest | 20.5 | 25.6 | 20.5 | 33.3 | - | 100.0 |
| Lack of internet connectivity | 20.5 | 30.8 | 12.8 | 35.9 | - | 100.0 |
| Lack of technical support | 5.1 | 7.7 | 5.1 | 64.1 | 17.9 | 100.0 |
| Overcrowded classrooms | 15.4 | 12.8 | 15.4 | 56.4 | - | 100.0 |
| Too wide geography syllabus | - | 15.4 | 20.5 | 64.1 | - | 100.0 |
| Lack of time to improvise the content | - | 10.3 | 28.2 | 48.7 | 12.8 | 100.0 |
| Lack of technical skills | - | 46.2 | 12.8 | 41.0 | - | 100.0 |
| Lack of training in ICT | 15.4 | 30.8 | 17.9 | 28.2 | 7.7 | 100.0 |

Key: SD- Strongly Disagree, D- Disagree, NS- Not Sure, A- Agree, SA- Strongly Agree

Relative to the challenges faced, most of the geography teachers who participated in the study (72.0%) indicated lack of technical support. Others felt that the geography syllabus is too wide (64.1%), most of them lack training in ICT (63.9%), that they lack time to improvise the content in the digital tools (61.5%), and that the classrooms are overcrowded (56.4%).

The findings show that there are a number of issues that act as challenges to use of digital tools in Geography instruction. More than two thirds (63.6%) of the sampled teachers indicated that the challenges they faced include lack of technical support, too wide geography syllabus, lack of ICT training, lack of time to improvise content and overcrowded classrooms. In concurrence with these findings Turel and Jackson (2012) assert that due to a lack of technical assistance, educators are hesitant to use digital technology into their lessons for fear of potential equipment malfunctions and corresponding shame around their pupils. The extent to which educators use digital materials into their lessons is significantly impacted by a number of individual personalities. Likewise, it was discovered by (Cuban, 2015) that with age and years of experience, teachers' efficiency, ease of use, and frequency of using ICT in the classroom decline.

Findings from qualitative interviews showed that almost all instructors never participated in in-service training and that the majority had insufficient training in the use of ICT. Interviewee E said this;

> *Most of the geography instructors in this institution are not trained well to use technology in teaching geography*.

Giving another challenge, interviewee B indicated that;

> *Some teachers lack competence in the use of devices available in the school and the devices remain unused because of lack of technical support.*

Data obtained from the interviewees indicated lack of ICT training and lack of technical support as the main challenges in the use of digital tools in geography instruction. Findings of a research by Gesci (2019) also agrees with the interviewees that unreliable information and communication technology (ICT) equipment, vandalism, and a lack of personnel with the necessary expertise to operate and maintain ICT infrastructure were all interfering with technological integration.

# CHAPTER FIVE

# SUMMARY, CONCLUSION AND RECOMMENDATION

## 5.1 Summary

The study sought to investigate the use of selected digital tools in Geography instruction in public secondary schools in Meru-South Sub-County, Tharaka Nithi County. The study was guided by four objectives; identify the types of digital tools used in Geography instruction, determine how often Geography students use digital resources, determine the influence of use of digital tools on Geography instruction and establish the challenges of use of digital tools in Geography instruction among public secondary schools in Meru-south Sub-County, Kenya. The study adopted a descriptive survey research design to answer to the study objectives. The study involved 290 form three students, 39 teachers of geography and 6 heads of Geography department as respondents. Analysis of quantitative data was done using descriptive and inferential statistics with the aid of SPSS version 29 application. Descriptive analysis was based on frequency and percentages while Chi-square was used to test research hypothesis at 95% level of confidence.

Data on types of digital tools used in Geography instruction indicated great extent of use during the processes of instruction. During lesson preparation and introduction, more than three quarters of the sampled teachers indicated that they use YouTube and WhatsApp, while more than two thirds use Facebook and Twitter. During lesson presentation, more than three quarters of sampled teachers use YouTube, while more than half use Facebook and WhatsApp. More than half of the sampled teachers use YouTube and WhatsApp during lesson evaluation. This means that YouTube, Facebook and WhatsApp are highly used digital tools during Geography lessons.

Findings on the frequency of use of digital tools in Geography instruction show that YouTube is the most often or always used digital tool in Geography instruction by more than three quarters of the respondents. Findings also show that Facebook is the second most often or always used tool in teaching geography. Other frequently used digital tools by slightly more than half of the respondents include WhatsApp and Twitter respectively. This means that the digital tools are useful in teaching and learning Geography and therefore used frequently in instruction.

Results on the influence of use of digital tools on Geography instruction disclosed that majority of the sampled teachers believe that the use of digital tools influences learning of Geography. More than three quarters of the teachers indicated that the use of digital tools influences the learner to have interest in learning Geography, positively impacts the learner's learning outcomes, promotes learner's attitude towards learning Geography, motivate learners in learning Geography and they make learning to be faster. Additionally, more than two thirds believe that the digital tools make learning real and permanent, increases learner engagement during the instructional process, enhances learner's creativity and problem-solving skills and helps learners to develop new knowledge in certain areas. Chi-square results $X^2(1) = 115.830$, $p<0.001$ and Contingency Coefficient measure of Association (CC) illustrated that 53.4% of the total variance in geography instruction could be attributed to use of digital tool. Findings therefore mean that use of digital tools significantly influences geography instruction and the study's null hypothesis $H_O1$: which stated that the use of digital tools does not significantly influence Geography instruction in public secondary schools in Meru South Sub-County was rejected and therefore a conclusion was made that the use of digital tools greatly influences geography instruction in public secondary schools.

Data on challenges faced when using digital tools in Geography instruction showed that there exists a number of issues that act as an impediment in the use of digital tools in Geography instruction. For instance, more than two thirds of the sampled teachers felt that lack of technical support in schools was a major setback, that the geography syllabus was too wide, that they had not been adequately trained in use of ICT, that they lacked time to improvise the content on the digital tools while more than half indicated that the classrooms were too overcrowded with learners.

### 5.2 Conclusion

The study aimed at investigating the use of digital tools in geography instruction in public secondary schools in Meru-south Sub-County, Tharaka Nithi County, Kenya. The first objective sought to identify types of digital tools used in geography instruction. Data on types of digital tools used in geography instruction illustrated great extent of use of different types of digital tools. Findings showed that YouTube,

Facebook, WhatsApp, Instagram and Twitter are used in the processes of lesson preparation and introduction, lesson presentation and lesson evaluation. Therefore, a conclusion was made that YouTube, Facebook, WhatsApp, Instagram and Twitter are digital tools that are being used in geography instruction in Meru-south Sub-County.

The second goal was to determine how often digital resources are used in geography classes. Data obtained showed that teachers find digital tools useful in the teaching and learning geography. Specifically, it was established that YouTube and Facebook are the most frequently used digital tools in teaching geography. It can therefore be concluded that YouTube and Facebook are mainly used in teaching geography in Meru-south Sub-County.

The third objective sought to determine the influence of use of digital tools on geography instruction. Data obtained descriptively relative to the objective indicate that a majority of teachers believe that the use of digital tools influences geography learning. Chi square analysis results $X^2(1) = 115.830$, $p<0.001$ and Contingency Coefficient measure of Association (CC) illustrated that 53.4% of the total variance in geography instruction could be attributed to use of digital tool. It can therefore be concluded that use of digital tools significantly influences how geography is learned and taught.

The aim of the fourth goal was to identify the difficulties associated with using technology in geography classrooms. Data obtained showed there exists a number of issues that impend the use of digital tools during geography instruction. Specifically, lack of technical support in schools, too wide geography syllabus, lack of in-service training in ICT utilization, lack of time to improvise the digital content and handling of overcrowded classrooms. It can therefore be concluded that there exist a number of factors that impede the use of digital tools in teaching and learning of geography.

### 5.3 Recommendations

The findings of this study indicated that the use of digital tools have significant influence on the teaching and learning of geography. Based on the observations, the study makes the following recommendation:

i. The Ministry of Education and the school managements should provide adequate technology-related infrastructure and technical personnel in schools to ensure easy access and use of digital tools for instruction.
ii. KICD should include the digital tools in the curriculum as supplementary tools to support learning in secondary schools in Kenya.
iii. Geography teachers should adopt use of teaching resources such as the digital tools in the instructional process so as to improve learner conceptualization and performance in geography.
iv. Teacher training institutions should incorporate ICT modules into teacher training programs to bolster their proficiency in utilizing ICT for Geography instruction.

### 5.4 Suggestion for Further Studies

The study has identified the following areas for possible further studies;

i. The study was conducted in Meru-south Sub-County, Tharaka Nithi County. Studies in other locations on the use of selected digital tools and geography instruction in public secondary schools are suggested.
ii. The study was conducted in public secondary schools. A comparative study of use of selected digital tools and geography instruction in private secondary schools is suggested.
iii. A comparative study on the use of selected digital tools in the instruction of other subjects is also suggested.

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## APPENDICES

### Appendix I: Consent Letter

Misiani Mambo,
P.O Box 487,
Chuka.

Dear Sir/Madam,

**RE: INFORMED CONSENT LETTER.**

I am a student at Chuka University pursuing Masters of Education in Curriculum and Instruction. I am currently undertaking research on "**Selected Digital Tools and Geography Instruction in Public Secondary Schools in Meru South, Tharaka Nithi County, Kenya".** I hereby notify you that you have been selected to participate in this endeavor but you are free to decline or withdraw at any point in the course of the study. The participants shall be the head of Geography department, Geography teachers and form three Geography students.

I hereby seek your consent and promise that the information you will give shall be treated with confidentiality and only used for academic purposes. Please don't divulge your personal details or write it down on the questionnaire.
I look forward to your support and cooperation.
Kind regards,

Misiani Mambo
(Researcher)

**Appendix II: Geography Students' Questionnaire (GSQ)**

You are kindly requested to respond to the questionnaire given. The response you give will be treated confidentially. Thank you in advance for assisting me in this survey. Tick as appropriate.

**Part 1: Demographic Information**

1. What is your gender?
   [ ] Male
   [ ] Female
2. How old are you?
   [ ] Below 16
   [ ] 16-17
   [ ] Above 17
3. State the classification of your school
   (i) Girls only ( ) Boys only ( ) Mixed boys and girls ( )
   (ii) Boarding ( ) Day ( ) Both day and boarding ( )
   (iii) Sub county ( ) County ( ) Extra county ( ) National ( )
4. How frequently do you use a digital device for schoolwork?
   Daily ( ) More than once a week ( ) Once a week ( ) Rarely ( ) Never ( )

**Part 2: Geography Instruction**

Instructions: Please indicate your level of agreement or disagreement with the following statements by ticking. Where; 1= Strongly Disagree, 2= Disagree, 3= Not Sure, 4= Agree and 5= Strongly Agree.

| **During geography lesson, the geography teacher;** | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| Allow us to manipulate learning materials | | | | | |
| Engages us continuously | | | | | |
| Allow us to seek clarification on difficult concepts | | | | | |
| Facilitate us to form groups to undertake discussions | | | | | |
| Give us adequate activities for practice | | | | | |
| Give us enough assignments | | | | | |
| Provide prompt feedback for assignments and activities given | | | | | |
| Provide opportunities for fieldwork practical experiences. | | | | | |
| Evaluates us regularly on topics learnt | | | | | |

**Part 3: Types of Digital Tools used in Geography Instruction**

Please indicate the type of digital media tools your teacher uses during geography lesson introduction.

| **Types of digital media tools** | **Yes** | **No** |
|---|---|---|
| Facebook | | |
| YouTube | | |
| WhatsApp | | |
| Twitter | | |
| Instagram | | |

Please indicate the type of digital media tools your teacher uses during geography lesson presentation.

| **Types of digital media tools** | **Yes** | **No** |
|---|---|---|
| Facebook | | |
| YouTube | | |
| WhatsApp | | |
| Twitter | | |
| Instagram | | |

Please indicate the type of digital media tools your teacher uses during geography lesson evaluation.

| **Types of digital media tools** | **Yes** | **No** |
|---|---|---|
| Facebook | | |
| YouTube | | |
| WhatsApp | | |
| Twitter | | |
| Instagram | | |

**Part 4: Frequency of use of Digital Media Tools in Geography Instruction**

Please indicate your level of agreement with the following statements by selecting the appropriate response on the frequency your geography teacher use each resource on the scale provided where 1= Not at all, 2= Rarely, 3= Sometimes, 4= Often and 5= Always. Tick as appropriate.

| **Types of digital media tools** | **5** | **4** | **3** | **2** | **1** |
|---|---|---|---|---|---|
| Facebook | | | | | |
| YouTube | | | | | |
| WhatsApp | | | | | |
| Twitter | | | | | |
| Instagram | | | | | |

**Part 5: Influence of Use of Digital Media Tools on Geography Instruction.**

Directions: Please select a suitable answer on the scale provided to show your level of approval or disapproval with the following statements: 1 represents Strongly Disagree, 2 represents Disagree, 3 represents Not Sure, 4 represents Agree, and 5 represents Strongly Agree. Tick as appropriate.

| **Statements** | **5** | **4** | **3** | **2** | **1** |
|---|---|---|---|---|---|
| I find geography more interesting when taught using digital media tools. | | | | | |
| I feel more confident in my ability to understand geography concepts when taught using digital media tools. | | | | | |
| I enjoy using digital media tools to learn geography. | | | | | |
| I think geography is a less challenging subject when taught using digital media tools. | | | | | |
| I am more motivated to do well in geography class when taught using digital media tools. | | | | | |
| I believe that use of digital media tools is an effective way to learn | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| geography. | | | | | |
| Digital media tools promote my creativity and problem-solving in geography | | | | | |
| I would like to continue learning geography using digital media tools in the future | | | | | |

**Appendix III: Geography Teachers' Questionnaire (GTQ)**

You are kindly requested to respond to the questionnaire given. The response will be treated confidentially. Thank you in advance for assisting me in this survey. Tick as appropriate.

**Part 1: Demographic Information**

1) What is your gender?
   Male ( ) Female ( )
2) How old are you?
   Below 25 ( ) 25- 35 ( ) 35-55 ( ) Above 55 ( )
3) What is your teaching experience in years?
   Below 5 ( ) 5- 15 ( ) Above 15 ( )
4) Which of the following level is your highest professional training?
   Diploma ( ) Bachelors ( ) PGDE( ) Master's ( ) PhD( )
5) State the classification of your school.
   i. Girls only ( ) Boys only ( ) Both girls and boys ( )
   ii. Boarding ( ) Day ( ) Both day and boarding ( )
   iii. Sub county ( ) County ( ) Extra county ( ) National ( )
6) Have you ever been trained in use of ICT tools in the classrooms?
   Yes ( ) No ( )

**PART 2: Geography Instruction**

Please indicate your level of agreement or disagreement with the following statements by selecting the appropriate response on the scale provided where 1= No extent, 2= little extent, 3= Moderate extent, 4= Great extent and 5= Very great extent. Tick as appropriate.

| **During geography lesson preparation, to what extent do you;** | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| Source for relevant content | | | | | |
| Source for appropriate instructional resources | | | | | |
| Identify appropriate methods of presentation | | | | | |
| Select appropriate assessment methods | | | | | |
| **During geography lesson presentation, to what extent do you;** | | | | | |
| Engage learners continuously | | | | | |
| Help learners manipulate instructional materials | | | | | |
| Facilitate learners form groups to undertake discussions | | | | | |
| Allow learners seek clarification on difficult concepts | | | | | |
| **During evaluation of learning, to what extent do you;** | | | | | |
| Give learners adequate practice activities | | | | | |
| Give assignments | | | | | |
| Provide for fieldwork excursions for practical experiences | | | | | |
| Provide prompt feedback for assignments | | | | | |

Please indicate the type of digital media tools you use during geography lesson preparation

| **Types of digital media tools** | **Yes** | **No** |
|---|---|---|
| Facebook | | |
| YouTube | | |
| WhatsApp | | |
| Twitter | | |
| Instagram | | |

Please indicate the type of digital media tools you use during geography lesson presentation.

| **Types of digital media tools** | **Yes** | **No** |
|---|---|---|
| Facebook | | |
| YouTube | | |
| WhatsApp | | |
| Twitter | | |
| Instagram | | |

Please indicate the type of digital media tools you use during geography lesson evaluation.

| **Types of digital media tools** | **Yes** | **No** |
|---|---|---|
| Facebook | | |
| YouTube | | |
| WhatsApp | | |
| Twitter | | |
| Instagram | | |

**Part 4: Frequency of Use of Digital Media Tools in Geography Instruction**

Please indicate your level of agreement with the following statements by selecting the appropriate response on the frequency you use each tool on the scale provided where 1= Never, 2= Rarely, 3= Sometimes, 4= Often and 5= Always. Tick as appropriate.

| **Type of digital media tools** | **5** | **4** | **3** | **2** | **1** |
|---|---|---|---|---|---|
| Facebook | | | | | |
| YouTube | | | | | |
| WhatsApp | | | | | |
| Twitter | | | | | |
| Instagram | | | | | |

**Part 5: Influence of Digital Media Tools on Geography Instruction.**

Directions: Please select a suitable answer on the scale provided to show your level of approval or disapproval with the following statements: 1 represents Strongly Disagree, 2 represents Disagree, 3 represents Not Sure, 4 represents Agree, and 5 represents Strongly Agree Tick as appropriate.

| **Statements** | **5** | **4** | **3** | **2** | **1** |
|---|---|---|---|---|---|
| digital media tools influences the learner to have interest in learning geography | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Use of digital media tools help a learner develop new knowledge in certain learning area | | | | | |
| digital media tools influence experiential learning in geography | | | | | |
| Use of digital media tools make learning real and permanent | | | | | |
| When digital media tools are used they motivate learning in geography. | | | | | |
| digital media tools make learning faster | | | | | |
| Use of digital media tools promotes learner's attitude towards learning of geography | | | | | |
| Learner's creativity and problem-solving is enhanced by using digital media tools | | | | | |
| Learner engagement during the instructional process is enhanced when using digital media tools | | | | | |
| digital media tools provides for differentiated learning styles and abilities | | | | | |
| Use of digital media tools have a positive impact on student's learning outcomes | | | | | |

**Part 6: Challenges Faced When Using Digital Media Tools in Geography Instruction.**

Directions: Please select a suitable answer on the scale provided to show your level of approval or disapproval with the following statements: 1 represents Strongly Disagree, 2 represents Disagree, 3 represents Not Sure, 4 represents Agree, and 5 represents Strongly Agree Tick as appropriate.

| Challenges | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| Lack of interest by the teacher | | | | | |
| Lack of internet connectivity | | | | | |
| Lack of technical support | | | | | |
| Overcrowded classrooms | | | | | |
| Too wide geography syllabus | | | | | |
| Lack of time to improvise the content | | | | | |
| Lack of technical skills | | | | | |
| Lack of training in ICT | | | | | |

Any other challenge? Please specify

……

……

……

**Appendix IV: Interview Schedule**

This interview schedule for heads of Geography subject seeks your views on use of digital media tools in Geography instruction. The responses you give will be treated confidentially.

**SECTION A: PERSONAL INFORMATION**

Q1. Gender: Male ( ) Female ( )

Q2. How long have you been teaching Geography?

Q3. How long have you served as the head of geography subject?

**SECTION B:**

Q4. What is the trend in performance in geography in your school? Probe for the contribution of the instructional process to this performance.

Q5. In your opinion, to what extent does resource utilization contribute to performance of geography in your school?

Q6. In your opinion, what is the level of access and utilization of digital resources in geography instruction in your school? Probe for;

a) Types of digital media tools used.
b) Frequency of use of digital media tools
c) Influence of digital media tools

Q7. What are some of the challenges that are faced in integrating digital resources in geography instruction?

**Appendix V: Table for Determining Sample Size**

| *N* | *S* | *N* | *S* | *N* | *S* |
|---|---|---|---|---|---|
| 10 | 10 | 220 | 140 | 1200 | 291 |
| 15 | 14 | 230 | 144 | 1300 | 297 |
| 20 | 19 | 240 | 148 | 1400 | 302 |
| 25 | 24 | 250 | 152 | 1500 | 306 |
| 30 | 28 | 260 | 155 | 1600 | 310 |
| 35 | 32 | 270 | 159 | 1700 | 313 |
| 40 | 36 | 280 | 162 | 1800 | 317 |
| 45 | 40 | 290 | 165 | 1900 | 320 |
| 50 | 44 | 300 | 169 | 2000 | 322 |
| 55 | 48 | 320 | 175 | 2200 | 327 |
| 60 | 52 | 340 | 181 | 2400 | 331 |
| 65 | 56 | 360 | 186 | 2600 | 335 |
| 70 | 59 | 380 | 191 | 2800 | 338 |
| 75 | 63 | 400 | 196 | 3000 | 341 |
| 80 | 66 | 420 | 201 | 3500 | 346 |
| 85 | 70 | 440 | 205 | 4000 | 351 |
| 90 | 73 | 460 | 210 | 4500 | 354 |
| 95 | 76 | 480 | 214 | 5000 | 357 |
| 100 | 80 | 500 | 217 | 6000 | 361 |
| 110 | 86 | 550 | 226 | 7000 | 364 |
| 120 | 92 | 600 | 234 | 8000 | 367 |
| 130 | 97 | 650 | 242 | 9000 | 368 |
| 140 | 103 | 700 | 248 | 10000 | 370 |
| 150 | 108 | 750 | 254 | 15000 | 375 |
| 160 | 113 | 800 | 260 | 20000 | 377 |
| 170 | 118 | 850 | 265 | 30000 | 379 |
| 180 | 123 | 900 | 269 | 40000 | 380 |
| 190 | 127 | 950 | 274 | 50000 | 381 |
| 200 | 132 | 1000 | 278 | 75000 | 382 |
| 210 | 136 | 1100 | 285 | 1000000 | 384 |

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

**Appendix VI: Institutional Introductory Letter**

CHUKA UNIVERSITY

Knowledge is Wealth *(Sapientia divitia est)* Akili ni Mali

**OFFICE OF THE DIRECTOR**
**BOARD OF POSTGRADUATE STUDIES**

Telephones: 020-2310512/18
Direct Line: 020-268 7625
postgraduate@chuka.ac.ke
P. O. Box 109-60400, Chuka
Website: www.chuka.ac.ke

**REF: EM14/39832/18**

**26th March, 2024**

**Director**
**National Commission for Science Technology and Innovation**
**Off Waiyaki Way, Upper Kabete**
**P O Box 30623, 00100**
**Nairobi.**

Dear Sir / Madam,

**MISIANI DAVIID MAMBO**

The above-named person is a *bona fide* student of Chuka University pursuing Master of Education in Curriculum and Instructions proposal titled: **Selected Digital Tools and Geography Instructions in Public Secondary Schools in Meru South Sub-County, Tharaka Nithi County, Kenya.**

Mr. Mambo has defended at the Faculty level and is now expected to conduct research.
Any assistance accorded will be highly appreciated.

Yours sincerely,

26 MAR 2024

Prof. Moses Muraya, Ph.D.

**DIRECTOR**
**BOARD OF POSTGRADUATE STUDIES**

## Appendix VII: Ethics Review Letter

**CHUKA UNIVERSITY**

**Knowledge is Wealth *(Sapientia divitia est)* Akili ni Mali**

**CHUKA UNIVERSITY INSTITUTIONAL ETHICS REVIEW COMMITTEE**

**Telephones: 020-2310512/18**
**Direct Line: 0772894438**
**Email: info@chuka.ac.ke,**
**P. O. Box 109-60400, Chuka**
**Website: www.chuka.ac.ke**

**19th March, 2024**

**REF: CUIERC/ NACOSTI/496**
TO: **Misiani David Mambo**

**RE: Selected Digital Media Tools and Geography Instruction in Public Secondary Schools in Meru South Sub-County, Tharaka Nithi County, Kenya**

This is to inform you that *Chuka University IERC* has reviewed and approved your above research proposal. Your application approval number is *NACOSTI/NBC/AC-0812*. The approval period is 19th March, 2024 – 19th March, 2025.

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by *Chuka University IERC*.
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to *Chuka University IERC* within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to *Chuka University IERC* within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to *Chuka University IERC*.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://o.[illegible] and also obtain other clearances needed.

Yours sincerely

**Dr. Benjamin Kanga**
**SECRETARY**

## Appendix VIII: NACOSTI Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 509191

Date of Issue: 08/April/2024

**RESEARCH LICENSE**

This is to Certify that Mr. David Mambo Misiani of Chuka University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Tharaka-Nithion the topic: SELECTED DIGITAL TOOLS AND GEOGRAPHY INSTRUCTION IN PUBLIC SECONDARY SCHOOLS IN MERU SOUTH SUB COUNTY, THARAKA NITHI COUNTY, KENYA for the period ending : 08/April/2025.

License No: NACOSTI/P/24/34452

509191

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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See overleaf for conditions