HNOLOGY-ENHANCED PEDAGOGY, STUDENTS' ATTITUDES, AND ADEMIC COMPETENCIES IN KISWAHILI LANGUAGE IN PUBLIC ARY SCHOOLS OF MBARARA CITY, A QUASI EXPERIMENTAL STUDY

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declare that this thesis titled: "Technology-enhanced Pedagogy, Students' Attitude, and c Competencies in Kiswahili Language among Secondary School Students in Mbarara Quasi-Experimental Study" is my original piece of work and has not been submitted to r educational institution for any award. All the sources of information used or quoted in is have been indicated and acknowledged by citing them using APA referencing styles.

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Declaration on Published Work

This thesis incorporates materials that have previously appeared in peer-reviewed journals, authored by the candidate as part of the dissemination of this doctoral research. These publications were developed within the scope of the study, and while certain sections have been adapted to maintain coherence and thematic consistency within the thesis, the findings remain integral to the overall objectives of the research.

Publications Arising from this Thesis

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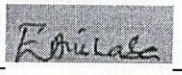
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.PPROVAL

Ve declare that this thesis titled: "Technology-enhanced Pedagogy, Students' Attitude, an ıcademic Competencies in Kiswahili Language among Secondary School Students in Mbarar :ity: A Quasi-Experimental Study" has met the criteria set by the Department of Educationa 'oundations and Psychology in fulfillment of the requirement for the award of the degree of Docto f Philosophy in Educational Curriculum Instruction and Media Studies of Mbarara University c cience and Technology.

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DICATION

Ajuna Angel, Atujuna Elianah, Amujuna Aiden, Arinomujuni Eliora, Abasa Oreen, Igwee, and ıis you have been my joy and strength. Great fun as kids and even greater friends. Your laughter . love have been a constant reminder of what truly matters.

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.IST OF ACRONYMS

ACES	Academic Competency Evaluation Scales
CBC	Competency-based curriculum
EPT	Educational productivity theory
FGD	Focus group discussion
ICT	Information and communications technology
MOES	Ministry of Education and Sports
MUST	Mbarara University of Science and Technology
NCDC	National Curriculum Development Centre
REC	Research ethics committee
SFT	Social Functionalist Theory
TAM	Technology acceptance model
TEP	Technology-enhanced pedagogy
UNEB	Uganda National Examinations Board

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KEY TERMS

Academic competency: Extent of attainment of academic skills and academic enablers accordi to academic competency evaluation scales-students form (ACES-SF) (DiPerna & Elliott, 1999)

Academic skills: writing, speaking, reading/language, and critical thinking. Academic enable interpersonal, engagement, motivation, and study (DiPerna & Elliott, 1999).

Attitude: set of emotions, beliefs, and behavior toward a particular object, person, thing or eve Attitude; Foreign Language Learning (A-FLL) scale) (Vandewaetere & Desmet, 200 **Cognitive**: Intelligence, Aptitude and beliefs or preconceptions.

Affective: Integrative/instrumental orientation, motivation and teacher's influence.

Behavioural: Exhibition/inhibition, tolerance of ambiguity and learning effort.

Behavioural Engagement: Students are asked if they follow school rules, complete their wor and pay attention in class among others.

Emotional Engagement: Students are asked if they like being at school are excited about the work, are bored at school among others.

Technology enhanced pedagogy is an instructional method of using technological gadgets suc as iPad, computers, smart phones, e-books, audio files, videos, desktops, laptops, and tablets t each students. These provide the opportunity for students to ask questions, review conten communicate with peers and have continuous contact with their instructors after school hour ence helping to supplement on their teaching materials

Conventional methods refer to traditional instructional approaches under competence bas commonly used in classrooms, such as group discussions, lectures, chalk and talk, notes dictatic and textbook-based teaching, which typically involve minimal use of digital tools or learn interaction.

ABSTRACT

Kiswahili, as an official language for the East African Community, is mandatory in Uganc secondary schools to foster regional integration and communication. Despite this importan students consistently underperform in the subject, largely due to ineffective teaching methods a negative attitudes. Technology-enhanced pedagogy (TEP) has emerged as a potential solution improving Kiswahili learning outcomes, yet empirical evidence remains limited. This qua experimental study evaluated the impact of digital instructional strategies on Kiswahili acaden competencies and the moderating role of students' attitudes in Mbarara City. A total of 158 Sen Three students from eight government secondary schools participated, divided into control a experimental groups. Data collection involved pre- and post-intervention questionnaires, sc sheets, teacher interviews, and student focus group discussions. Findings revealed a signific improvement in academic competency among the experimental group, with a 25% increase mean scores ($p < .001$), and regression analysis indicating that TEP accounted for 30% of t variance in test scores ($R^2 = .30$, $p < .05$). TEP significantly improved student attitudes ($t(78)$ 2.50, $p = .013$), and attitude was found to moderate the relationship between TEP and acaden competence ($p = .053$). Qualitative data highlighted enhanced engagement, listening and speaki skills, and research capacity. However, challenges included limited access to digital tools and ga in technical skills. The study recommends strengthening ICT infrastructure, teacher training, a further research on the scalability of TEP in diverse contexts.

Keywords: Kiswahili, Technology-Enhanced Pedagogy, digital instruction, student attituc academic competence, Uganda.

CHAPTER ONE

INTRODUCTION

This study is grounded in the interrelationship between Technology-Enhanced Pedagog TEP), learners' attitudes, and academic competencies in Kiswahili among students government-aided secondary schools in Mbarara City. The conceptualization is informed by fo guiding theories: David Kolb's Experiential Learning Theory (2014), Education Productio Theory (Hanushek, 2020), Social Productivity Theory, and Baron and Kenny's (1986) moderatio framework. Each core variable is broken down into its foundational elements and aligned with th study's theoretical and contextual framework to ensure clarity and coherence in the researc approach.

1.1 Background

Education systems worldwide increasingly prioritize the development of academi competencies through learner-centered approaches (Sakata, Bremner, & Cameron, 2022). In lin with this, there has been a global shift toward Competency-Based Education (CBE), whic emphasizes the acquisition of skills and application of knowledge over traditional rote learnin Burnette, 2016). Many countries have leveraged digital innovations to enhance educatio particularly in language instruction, where technology-enhanced platforms and Artifici ntelligence (AI) tools support personalized, interactive, and engaging learning experienc Rahimovna & Mujadidi, 2023). These advancements have significantly improved literac outcomes and learning engagement in developed nations, underscoring the potential of technolog n strengthening language education.

Across Africa, language education remains diverse and complex, shaped by coloni legacies, sociolinguistic realities, and policy reforms. While English and French continue dominate as official languages in many countries, Kiswahili has emerged as a unifying langua in East and Central Africa. Tanzania, for instance, has successfully embedded Kiswahili into i national education system, providing a strong model for multilingual education. However, mar African countries still face challenges, including inadequate teacher preparation, insufficie instructional resources, and resistance to language policy changes, which have limited the effecti eaching and learning of Kiswahili the Republic of Kenya (RoK, 2013)".

In East Africa, Kiswahili is increasingly recognized as a critical tool for region integration, socio-economic development, and cultural exchange. The East African Communi (EAC) has elevated Kiswahili to the status of an official working language, reinforcing its role a bridge among member states (Jjingo & Iddi, 2022). Despite this policy momentum, dispariti in implementation persist. Tanzania and Kenya have made substantial progress in promoti Kiswahili through national curricula, while Uganda continues to struggle with low proficien levels due to historical privileging of English and limited opportunities for learners to u Kiswahili outside formal education contexts (KNEC, 2017).

Uganda has acknowledged Kiswahili's importance by recognizing it as an offic language alongside English and integrating it into the Competency-Based Curriculum (CBC) a compulsory subject in secondary schools (Shinagawa, 2019). The National Curriculu Development Centre (NCDC) has developed syllabi and instructional materials to supp Kiswahili learning. However, studies and examination reports reveal persistent gaps in learne vocabulary, grammar, and comprehension, leading to weak performance in national assessmer

NEB, 2022). Teacher preparedness is also a critical issue, as many instructors lack adequate dagogical skills for effective Kiswahili teaching (Florah, Gershom, & Merab, 2022).

In Mbarara City, the challenges observed at the national level are even more pronounced. ports from the Uganda National Examinations Board (UNEB, 2022) consistently show that rners exhibit low competencies in Kiswahili, particularly in grammar, vocabulary, and mprehension. Despite government interventions, including teacher salary increments and ining initiatives (Ministry of Education and Sports, 2022), performance has remained ɔptimal. Additionally, limited adoption of technology in Kiswahili instruction raises questions ɔut missed opportunities for enhancing learner engagement and outcomes. These contextual alities underscore the need for innovative pedagogical strategies. Consequently, this study vestigates the potential of technology-enhanced pedagogy to strengthen Kiswahili language ɔficiency among secondary school learners in Mbarara City.

Recent global shifts in education have emphasized learner-centered teaching strategies that ster the development of essential academic competencies. These competencies, comprising gnitive abilities, behavioral skills, and motivational factors, are crucial for students to thrive both school and in real-life situations (DiPerna & Elliott, 1999). As digital technologies become creasingly widespread, educational systems worldwide are integrating information and mmunication technology (ICT) into classroom teaching to enhance both the quality and clusivity of learning. Among these innovations, technology-enhanced pedagogy (TEP) has ined recognition as an effective approach for creating interactive, adaptable, and experiential arning environments, especially in language instruction (Cennamo, Ross, & Ertmer, 2014). ɔnetheless, in many post-colonial settings such as Uganda, significant barriers remain,

articularly regarding teaching standards, student engagement, and learning outcomes in subject ike Kiswahili.

Despite progress in promoting technology-enhanced pedagogy (TEP), many schools- articularly in under-resourced contexts continue to rely on outdated teaching techniques such a ectures, note-dictation, and limited student participation. These conventional approaches remai revalent due to factors such as inadequate infrastructure, limited teacher training, and poo nternet connectivity, which hinder the adoption of more interactive, technology-integrated, an tudent-focused practices (Mulaudzi et al., 2024; Mdlongwa, 2024; Tawiah et al., 202 Wikipedia, 2025).

In an effort to foster national cohesion and regional integration, Uganda has mad Kiswahili a mandatory subject in both primary and lower secondary education under the ne competency-based curriculum (MoES, 2019). However, learners' performance in Kiswah continues to fall short of expectations, particularly in government secondary schools. Assessme reports consistently reveal weak student achievement in fundamental areas such as gramma vocabulary, comprehension, and writing skills (UNEB, 2023). This ongoing underperforman not only highlights gaps in teaching and education systems but also reflects prevailing negati student perceptions of Kiswahili as less useful or more challenging than English, which remai the dominant language of instruction.

To address these concerns, the government has implemented initiatives aimed at improvi ICT infrastructure and deploying trained teachers to encourage the integration of TEP in schoo When properly utilized, TEP has the potential to transform language teaching by promoti engaging, student-centered, and digitally relevant instructional approaches. Evidence fro

neighboring countries like Tanzania and Kenya suggests that ICT-supported teaching significant enhances students' language abilities and academic achievement (Kafyulilo et al., 2020; Kihoza et al., 2016). Nevertheless, successful integration depends not only on technological access but also on how well teachers can implement such tools and how positively students respond to this mode of instruction. In the Ugandan context, there remains limited research on the interplay between TEP, students' attitudes, and academic competencies in Kiswahili, a gap this study seeks to fill.

Accordingly, this research explores the influence of technology-enhanced pedagogy and student attitudes on Kiswahili language competency among learners in government secondary schools in Mbarara City. By analyzing these relationships, the study aims to provide evidence that can inform improvements in teaching methods, ICT usage, and curriculum delivery. The findings are expected to support ongoing national efforts to strengthen language education and promote Kiswahili as a vehicle for regional cooperation and socio-economic advancement. Ultimately, a better understanding of how TEP and students' attitudes affect academic competency will aid in shaping more inclusive, impactful, and context-specific educational strategies within Uganda's language instruction framework.

1.1.1 Historical Background

The teaching and learning of Kiswahili in Uganda, and particularly in regions like Mbarara City, is shaped by a complex interplay of language policy, colonial legacy, curriculum reform and evolving pedagogical strategies. Kiswahili is a Bantu language that developed along the East African coast through centuries of trade and cultural exchange among African coastal communities, Arab merchants, and later European colonizers (Mazrui & Mazrui, 1995). Over time it became a lingua franca in East and Central Africa, fostering communication and integration

ong diverse ethnic groups. Under German and British colonial administration in East Africa, rticularly in Tanzania and Kenya, Kiswahili was institutionalized for use in governance, ucation, and media (Nurse & Hinnebusch, 1993). Today, Kiswahili has over 150 million eakers and holds official status in several African states and regional bodies, including the frican Union, which declared it a working language in 2022 (African Union [AU], 2022).

In Uganda, the history of Kiswahili instruction has been marked by inconsistencies and olitical sensitivities. Initially promoted during colonial times for military and trade purposes, its tegration into the national curriculum was hindered by the prioritization of English and negative ssociations with political oppression, particularly in western Uganda (Whiteley, 1969; Batibo 005). The 1995 Constitution formally recognized Kiswahili as Uganda's second official language Government of Uganda, 1995), and the 1992 Government White Paper had earlier acknowledged s strategic importance. However, widespread adoption in schools only gained momentum with eforms by the National Curriculum Development Centre (NCDC), including the revised Lower econdary Curriculum of 2020, which made Kiswahili compulsory at lower secondary level NCDC, 2020). Despite these reforms, teacher shortages, inadequate instructional resources, and ersistent regional resistance continue to impede effective implementation (Jjingo & Bakize, 2022 Ministry of Education and Sports [MOES], 2022).

Globally, technology-enhanced pedagogy (TEP) has developed in parallel with education eform movements. Early innovations such as filmstrips and radio lessons evolved into computer ssisted learning in the 1980s and 1990s, and later, internet-enabled interactive learning platforms Pedagogical models like Technological Pedagogical Content Knowledge (TPACK) stress the meaningful integration of technology with subject content and pedagogy (Koehler & Mishra

2009). Evidence shows that when implemented effectively, TEP can improve learner motivatio engagement, and critical thinking (Rahimovna & Mujadidi, 2023). In Uganda, the integration educational technology has gained ground since the adoption of the ICT in Education Policy 2007 (MOES, 2007). Recent initiatives include smart classroom projects in partnership wi KOICA (2024) and AI-driven lesson planning tools (Kloker et al., 2024). However, infrastructur limitations, teacher digital literacy gaps, and uneven training continue to limit institutionalization (CEO Report, 2022).

Attitudes toward Kiswahili in Uganda remain influenced by historical, cultural, a regional factors. While communities in Eastern and Central Uganda often value the language f its regional communication benefits, many in Western Uganda have historically viewed it wi suspicion due to political associations and its perceived foreignness (Batibo, 2005; Nabirye, 2021 In schools, learner attitudes are shaped by exposure, parental support, teacher competence, and t perceived utility of the language (García & Wei, 2021). Academic competence in Kiswahili h lagged behind other subjects, with persistent gaps in speaking, comprehension, and analytic writing skills (UNEB, 2021; MOES, 2022). Although the Competence-Based Curriculu promotes learner-centered strategies, many teachers still rely on traditional, teacher-dominat methods (NCDC, 2023). This has slowed progress toward proficiency, especially in unde resourced regions like Mbarara.

Although the present study focuses on Senior Three students who have already chos Kiswahili as a subject, investigating their attitudes remains critical. Subject selection does n necessarily reflect intrinsic motivation or long-term positive disposition; choices may influenced by timetabling convenience, peer pressure, perceived ease, or limited alternativ

cles & Wigfield, 2020). Attitudes are multidimensional comprising affective, cognitive, and haviour components and can shift over time depending on classroom experiences and social ntexts (Ajzen, 2005). Research indicates that initial enthusiasm can erode without engaging dagogy, supportive environments, and community reinforcement (Ryan & Deci, 2017). derstanding attitudes within this self-selected cohort provides valuable baseline data for signing targeted, technology-supported interventions that can sustain motivation and strengthen ademic competencies in Kiswahili (Sung et al., 2017).

1.2 Conceptualization of Variables

Technology-Enhanced Pedagogy (TEP) is conceptualized as the deliberate integration of gital technologies into instructional practice with the aim of making learning more engaging, rticipatory, and learner-centered. In this study, TEP extends beyond the mere use of computers r internet access; it encompasses instructional strategies that foster experiential learning eativity, and collaboration among learners. The main elements include the use of multimedia ols such as educational videos, smartboards, simulations, and gamified platforms like Kahoo nd Quizizz; digital collaboration tools such as Google Classroom and Zoom; and real-life nguage tasks enabled through virtual interaction and project-based learning (Koehler & Mishra 009; Rahimovna & Mujadidi, 2023). These elements promote meaningful engagement b ligning with Kolb's experiential learning cycle, which advocates for learning through activ xperimentation and reflection (Kolb, 2014).

Kolb's Experiential Learning Theory (2014) highlights the importance of learner interes nd motivation as prerequisites for progression through the learning cycle. Without positiv ttitudes, learners are less likely to benefit from experiential or digital learning experiences. Th

particularly significant in Uganda, where Kiswahili has historically received mixed publi reception, especially in western regions like Mbarara, where socio-political history has contribute skepticism toward the language (Batibo, 2005; Nabirye, 2021). In classrooms, student attitude ward both Kiswahili and the use of technology significantly shape their level of engagemen mprehension, and performance.

The dependent variable, academic competence in Kiswahili, refers to learners' mastery c ssential language skills that enable effective communication, cultural appreciation, and academi dvancement in the subject. These competencies include reading comprehension, writin peaking, listening, and translation, each playing a pivotal role in classroom performance and rea world language use. Reading comprehension involves accurately decoding and interpretin Kiswahili texts, identifying main ideas, making inferences, and critically evaluating writte materials. Writing skills encompass correct grammar and orthography, logical organization c deas, stylistic appropriateness, and the ability to produce cohesive compositions. Speakin ompetence relates to oral fluency, correct pronunciation, appropriate vocabulary use, an effective expression in social and academic contexts. Listening skills entail understanding spoke Kiswahili in both formal and informal settings and interpreting tone, intonation, and contex Translation ability reflects the learner's skill in accurately conveying meaning between Kiswahi nd English, ensuring semantic fidelity, grammatical correctness, and cultural relevance (Arishal & Balimuttajjo, 2025; UNEB, 2023).

Together, these competencies provide measurable indicators of Kiswahili proficienc directly influencing learners' ability to meet curriculum requirements, excel in nation assessments, and participate effectively in regional communication. Mastery of these skills n

y facilitates academic progression but also underpins students' engagement with **technology-anced pedagogy (TEP)**, as learners with stronger foundational competencies are better itioned to utilize digital tools, interactive resources, and collaborative learning environments to nce their Kiswahili language outcomes (Arishaba & Balimuttajjo, 2025; UNEB, 2023)

Furthermore, TEP is supported by the TPACK framework, which emphasizes the fusion of nological, pedagogical, and content knowledge required for effective digital instruction ishra & Koehler, 2006). Despite its potential, the implementation of TEP in Uganda remains onsistent due to infrastructural limitations, inadequate digital literacy among teachers, and ufficient training (MOES, 2022). The Education Production Theory (Hanushek, 2020) derscores that when pedagogical inputs such as instructional methods and resources are weak outdated, student outcomes are negatively affected. Traditional approaches like chalk-and-talk, ation, and rote memorization still dominate many Ugandan classrooms (Wangia, 2014; ngagga & Oonyu, 2020), limiting the effectiveness of current curriculum reforms.

Learners' attitudes function as a moderating variable in this study, influencing the lationship between TEP and academic competence in Kiswahili. Attitude is conceptualized as a ree-dimensional construct comprising the cognitive, affective, and behavioral components ognitively, it refers to students' beliefs and perceptions about the relevance of Kiswahili and th sefulness of digital tools in learning the language (Ajzen, 2005). Effectively, it captures learner motional responses, such as enthusiasm, anxiety, or disinterest, when participating in Kiswahi ssons or using technology for academic purposes (Gardner, 2010). The behavioral component i flected in the observable willingness of students to engage in technology-supported learnin ctivities, complete assignments, and collaborate with peers (DiPerna & Elliott, 1999).

Despite the introduction of the Competence-Based Curriculum (CBC) by the Nation Curriculum Development Centre (NCDC) in 2020, which prioritizes learner-centered approache performance in Kiswahili remains generally low across Uganda (NCDC, 2020; UNEB, 202 Students often struggle with comprehension, grammar, vocabulary, and composition, largely d to outdated instructional methods and a lack of real-life communicative practice (MOES, 202 Although the CBC promotes active learning through problem-solving, group work, a experiential tasks, by 2023, NCDC acknowledged that many teachers were still undergoi retooling and capacity-building to implement these approaches (NCDC, 2023) ful Consequently, a hybrid of traditional and learner-centered strategies persists in many schoo undermining the curriculum's transformative potential.

In conclusion, this study conceptualizes Technology-Enhanced Pedagogy (TEP) as independent variable, comprising digital tools and strategies that support experiential, learn centered instruction. Learners' attitudes defined by their thoughts, emotions, and actions tow Kiswahili and digital learning, act as a moderating factor that either enhances or diminishes influence of TEP. The dependent variable, academic competence, is expressed through stude ability to apply core Kiswahili language skills in real-world and academic settings. Together, th variables are grounded in a theoretical framework that draws from experiential and producti models of learning, offering a holistic lens for analyzing language instruction reforms in Ugan secondary schools.

1.1.3 Contextual Perspective

Although the Ministry of Education and Sports (MoES) has implemented several initiat such as curriculum reform, teacher professional development, and the provision of instructi

aterials the anticipated improvement in learners' academic outcomes remains largely unrealized MoES, 2022). One possible contributor is the expansive and content-heavy nature of the Kiswahili yllabus, which often clashes with the limited instructional time allocated in schools (Republic o enya, 2013). Moreover, many teachers continue to blend learner-centered methods wit aditional approaches such as note dictation, "chalk and talk," and grammar translation, whic mits student engagement and communicative skill development (Florah, Gershom, & Merab 22). Even by 2023, the National Curriculum Development Centre (NCDC) was still conductin tooling programs for secondary school teachers, with the hope of achieving full implementatio learner-centered pedagogy (NCDC, 2023).

In response to these instructional challenges, emerging research highlights the promise o echnology-Enhanced Pedagogy (TEP), particularly through Computer-Assisted Instructio CAI), in enhancing student motivation, retention, and active participation in language classroom Rahimovna & Mujadidi, 2023). TEP supports experiential and interactive learning that bridge eoretical instruction with real-world language use. However, as Sanyal and Hisam (2018 ution, the mere availability of digital tools does not guarantee learning gains; the learners titudes, digital readiness, and openness to technology-based instruction are key determinants o ccess.

This study is grounded in the ongoing concern over low proficiency levels in Kiswahi mong students in public secondary schools, particularly within Uganda's education sector an ore specifically in Mbarara City. Constitutionally Kiswahili was declared a co-official languag n Uganda through the 2005 Constitutional Amendment Act Alongside English (Government c Uganda, 2005). Kiswahili, though also a regional lingua franca within the East Africa ommunity, continues to be associated with poor academic performance in Uganda, raisin

ncerns about the effectiveness of current instructional practices and policy implementation Wardhaugh & Fuller, 2015).

Despite ongoing reforms, traditional methods still dominate many Kiswahili classrooms hese include lecture-based instruction, grammar drills, repetition, and rote memorizatio ractices that stifle critical thinking, creativity, and functional language use. Emphasis is ofte laced on test-oriented tasks such as writing set-text essays, with minimal development o roductive skills like speaking and listening in real-life contexts (Kafyulilo et al., 2012). Thi eacher-centered model not only discourages active learner participation but also reinforce urface-level knowledge with limited practical applicability. Hanushek's (1979) Educatio roduction Theory supports the view that student achievement is shaped by multiple inputs ncluding pedagogy, learning resources, and student engagement. Therefore, reliance on outdate ractices undermines other educational investments and contributes to unsatisfactory academi erformance.

This concern is particularly relevant in Mbarara City, where Kiswahili has consistentl nderperformed compared to other subjects. According to the Chief Education Officer (CEC 023), Kiswahili ranks among the lowest-performing subjects in government-aided schools, wit n underperformance rate of approximately 11.2% over the past five years (MoES, 2022). Whil he government has invested in teacher retraining and ICT infrastructure, the gap between polic nd classroom practice persists, partly due to the slow adoption of innovative, learner-centere pproaches by teachers (Florah et al., 2022).The Uganda National Examinations Board (UNEI 023) reports high failure rates in core language areas grammar, spelling, tense usage, an unctuation across both Kiswahili and English. These deficiencies reflect continued dependenc n textbook memorization and teacher-led instruction, resulting in students' inability to expre

iginal ideas. Consequently, negative learner attitudes toward Kiswahili are reinforced ntributing to further academic disengagement.

This entrenched pedagogical inertia hampers the development of transferable, real-worl nguage competencies and obstructs the full implementation of Uganda's competency-base rriculum (Vavrus, Thomas, & Bartlett, 2011). Given these barriers, the present study seeks t plore how TEP can offer a more effective instructional alternative. It also examines whethe udents' perceptions of digital learning influence the efficacy of technology-integrate struction. While digital interventions have been piloted in various educational settings, ther mains a lack of empirical evidence—particularly in Uganda's government secondary schools— how such approaches compare to traditional methods in enhancing Kiswahili academi mpetencies. This study, therefore, responds to both national policy priorities and loca ucational needs by providing evidence-based insights into pedagogical transformation. I ntributes to the broader discourse on curriculum reform, digital integration, and languag struction in Uganda, with the ultimate aim of improving Kiswahili performance in Mbarar ity's government-aided secondary schools.

2 Statement of the problem

Despite Kiswahili being compulsory under Uganda's Competency-Based Curriculum sinc 019, student performance remains low. In the 2023 Uganda Certificate of Education (UCE xams, only 43.7% of candidates passed Kiswahili at credit level or higher (UNEB, 2023). I Mbarara City, performance has stagnated below 40%, falling short of the national 50% benchmar Mbarara City Education Office, 2023). By contrast, English language results have consistentl een higher 62.4% in 2022, 64.1% in 2023, and preliminary 65.0% in 2024 highlighting

nificant proficiency gap (UNEB, 2024).Low achievement of Kiswahili academic competencies its learners' academic progression and employment opportunities, especially in cross-border rkets, and undermines Uganda's national unity and regional integration goals outlined in key licies such as the National Development Plan III and East African Community initiatives lulokozi, 2019; EAC, 2020; Republic of Uganda, 2021).

Although government efforts, including teacher deployment, curriculum reforms, and ICT source support, aim to improve Kiswahili learning, challenges such as inadequate teacher ining, poor infrastructure, limited use of Technology-Enhanced Pedagogy (TEP), and negative rner attitudes persist, affecting motivation and engagement (UNESCO, 2020; MoES, 2021; orah et al., 2022). Traditional, teacher-centered methods continue to dominate classrooms, niting the Competency-Based Curriculum's intended learner-centered approach (Wangia, 2014; ugagga & Oonyu, 2020). Few studies in Uganda have examined the interplay between TEP and rner attitudes in Kiswahili learning, despite evidence from neighboring countries indicating CT-supported experiential learning improves competence and motivation (Jjingo, 2018; Kafyulilc al., 2020). This study addresses this gap by investigating how TEP, moderated by learners titudes, influences Kiswahili academic competencies among secondary students in Mbarara City ming to inform effective pedagogical reforms.

3 Aim and Objectives

3.1 Aim

This study aimed to examine the potential of Technology-Enhanced Pedagogy (TEP) t mprove Kiswahili language academic competencies among students in government-aide econdary schools in Mbarara City, Uganda, and to examine the moderating role of learners

ttitudes in this relationship. Specifically, it investigated how the implementation of TEP influenced students' academic competencies in Kiswahili, and how learners' attitudes towards the subject moderated the effectiveness of these pedagogical interventions.

3.2 Specific Objectives

This study was sought to…."

1. To assess the relationship between Technology-Enhanced Pedagogy (TEP) and academic competencies in Kiswahili among secondary school students in Mbarara City.

2. To examine the relationship between students' attitudes toward Kiswahili and their academic competencies.

3. To investigate the influence of Technology-Enhanced Pedagogy on students' attitudes toward Kiswahili.

4. To evaluate the moderating effect of students' attitudes on the relationship between Technology-Enhanced Pedagogy and academic competencies in Kiswahili among secondary school students in Mbarara City.

1.4 Research Question

To guide the investigation, the study is anchored on the following specific research questions;

1. To what extent does Technology-Enhanced Pedagogy (TEP) influence academic competencie in the Kiswahili language among secondary school students in Mbarara City?

2. What is the relationship between students' attitudes toward Kiswahili and their academi competencies in secondary schools in Mbarara City?

3. How does Technology-Enhanced Pedagogy (TEP) affect students' attitudes toward th Kiswahili language in secondary schools in Mbarara City?

4. Does students' attitude moderate the relationship between Technology-Enhanced Pedagog (TEP) and academic competencies in Kiswahili among secondary school students in Mbara City?

1.5 Hypothesis

H_{01}: There is no statistically significant relationship between students' attitudes toward Kiswahi and their academic competencies

H_{02}: There is no statistically significant relationship between Technology-Enhanced Pedagog (TEP), students' attitudes, and academic competencies in learning Kiswahili among governmen aided secondary school students in Mbarara City.

Significance

The significance of this study lies in its potential to inform and transform Kiswahili guage instruction in Ugandan secondary schools through the integration of technology-hanced pedagogy (TEP).

For students, the study provides valuable insights into how digital instructional strategies bolster academic competencies such as reading, writing, listening, and critical thinking while ultaneously fostering more positive attitudes towards language learning. These improvements expected to enhance motivation, engagement, and autonomous learning.

Teachers stand to benefit from practical evidence on the pedagogical value of TEP, couraging the adoption of interactive, learner-centered approaches that make use of hnological tools to create dynamic and collaborative learning environments.

School administrators and policymakers will find the findings relevant for guiding riculum implementation, teacher professional development, and investment in ICT frastructure. Specifically, the study offers evidence-based recommendations to inform ucational policies and interventions by the Ministry of Education and Sports, curriculum signers, and other education stakeholders.

For researchers and academicians, this study contributes to the existing body of knowledge educational technology and language pedagogy, serving as a foundation for further inquiry into e scalability and impact of TEP in other subjects or contexts. Overall, by examining how TEP derates the relationship between students' attitudes and academic competencies, the study vides actionable strategies for improving Kiswahili language outcomes and advancing ucational quality in Uganda's secondary school system

Scope

This study was conducted in government-aided secondary schools located in Mbarara City situated in the Ankole sub-region of Western Uganda. The focus was specifically on Senior Three students and Kiswahili teachers. This level (Senior Three) represents a critical transition point in Uganda's lower secondary curriculum, as it prepares learners for high-stakes national assessment and acts as a foundation for language competence development before learners get promoted to Senior Four. At this stage, learners are expected to have acquired intermediate proficiency in core subjects including Kiswahili making it a decisive phase for measuring the efficacy of teaching methods such as Technology-Enhanced Pedagogy (TEP).

This context is further underscored by the fact that Kiswahili has recently been made a compulsory subject under the Competency-Based Curriculum (CBC) by the National Curriculum Development Centre (NCDC, 2020). As such, schools and teachers are under increasing pressure to align instructional practices with learner-centered methods promoted by the CBC. However, despite the curriculum's emphasis on learner-centered approaches, teaching practices remain mixed ranging from group discussions to conventional methods such as note dictation and "chalk and talk." As of 2023, many teachers in these government-aided schools were still undergoing schooling through Ministry-led training to implement the CBC fully and transition towards more constructivist, technology-integrated practices (MoES, 2023; NCDC, 2020).

Geographically, the study encompassed both the North and South Divisions of Mbarara City to capture diverse implementation experiences. Government-aided schools were purposively selected due to their relatively consistent access to ICT infrastructure such as computer laboratories and internet connectivity enabled through government and donor-funded programs (e.g., UCC ICT

or Schools Initiative). The schools included in the study were established between 1911 and 202 nd had adopted Kiswahili as a CBC-mandated subject.

Conceptually, the study explored three core variables: TEP, students' attitudes towar Kiswahili, and academic competencies in Kiswahili. Academic competencies wer perationalized through key language skills including reading comprehension, speaking, writin nd listening, as prescribed in the lower secondary Kiswahili syllabus. Critically, the study als xamined the moderating role of students' attitudes in influencing the effectiveness of technolog nhanced pedagogy on learning outcomes an area under-researched in Ugandan educationa ontexts.

.8 Conceptual Framework.

The conceptual framework for this study is grounded in Model 8 of Hayes' (2012 noderation model, which proposes that the strength and direction of the relationship between a ndependent variable and a dependent variable vary depending on the level of a third variabl nown as the moderator. In the context of this research, students' attitudes serve as the moderatc nfluencing the relationship between Technology-Enhanced Pedagogy (TEP) and academi ompetencies in Kiswahili.

As illustrated in Figure 1, the framework posits that TEP has the potential to improv cademic competencies among secondary school learners. However, the extent of this impact i ypothesized to depend on learners' attitudes toward Kiswahili language learning and the use o echnology in education. A positive learner attitude is expected to strengthen the positive influenc f TEP, while a negative attitude may weaken or nullify the potential benefits.

The term **'attitude'** refers to the components, that involves an individual's beliefs, ghts, perceptions, and knowledge about an object or concept in this case, Kiswahili learning. ncompasses what students think or believe about the usefulness, difficulty, relevance, or value earning Kiswahili, particularly when supported by technology-enhanced pedagogy (Erdem, kılı, & Koçyiğit, 2018).

In this study, the **Attitude Toward Foreign Language Learning (A-FLL) Questionnaire** s employed to measure this cognitive dimension, along with affective (emotional/evaluative) l behavioral aspects of attitude. The cognitive component is critical because it shapes how mers intellectually appraise Kiswahili learning, which can influence their motivation and gagement levels (Erdem et al., 2018).

By capturing these three dimensions cognitive, affective, and behavioral, the A-FLL trument provides a holistic understanding of student attitudes toward Kiswahili in a technology- pported learning environment. This comprehensive measure helps to better assess how learners' liefs and perceptions interact with their feelings and actions, ultimately affecting their academic mpetencies (Erdem et al., 2018).

To empirically test the framework, a quasi-experimental research design was used, orporating both pre-test and post-test assessments in control and intervention groups. Learners he experimental group were exposed to various digital instructional tools, including interactive ltimedia, Kahoot, Duolingo, PowerPoint presentations, and educational video games. These ls were carefully selected for their potential to promote learner-centered, interactive, and mpetency-based learning experiences in Kiswahili.

In contrast, the control group continued learning through conventional teaching methods, uch as chalk-and-talk, note dictation, grammar drills, and lecture delivery, without any chnological integration. These traditional pedagogical approaches, historically dominant in ganda classrooms, Bunyi, G. W., Wangia, J., Magoma, C. M., Limboro, C. M., & Akyeampong, 2011, July). emphasize passive learning and rote memorization over real-world language use d critical engagement.

The underlying proposition of the conceptual framework is that when effectively plemented, TEP can significantly improve students' Kiswahili competencies not only by hancing core language skills but also by fostering motivation, engagement, collaborative rning, and practical application of knowledge. The moderating role of students' attitudes is cial in this relationship; learners with a favorable disposition toward Kiswahili and technology e more likely to benefit from TEP interventions than those with negative attitudes.

Additionally, the control group served as a comparative benchmark to evaluate the relative fectiveness of TEP. The study hypothesizes that traditional instructional models, which focus on eoretical delivery and minimal interaction, will produce lower gains in academic competencies an the experimental group exposed to interactive, digital, and student-centered learning.

In this way, the conceptual framework does not merely map theoretical constructs, but also rrors the practical logic of the intervention as implemented in the study. It aligns with Kolb's periential Learning Theory, which underpins the pedagogical model by emphasizing active rning through doing, reflecting, thinking, and applying. TEP strategies operationalized in this dy provide real-life, engaging experiences that allow learners to construct knowledge eaningfully an outcome that conventional methods largely fail to achieve.

Conceptual Framework

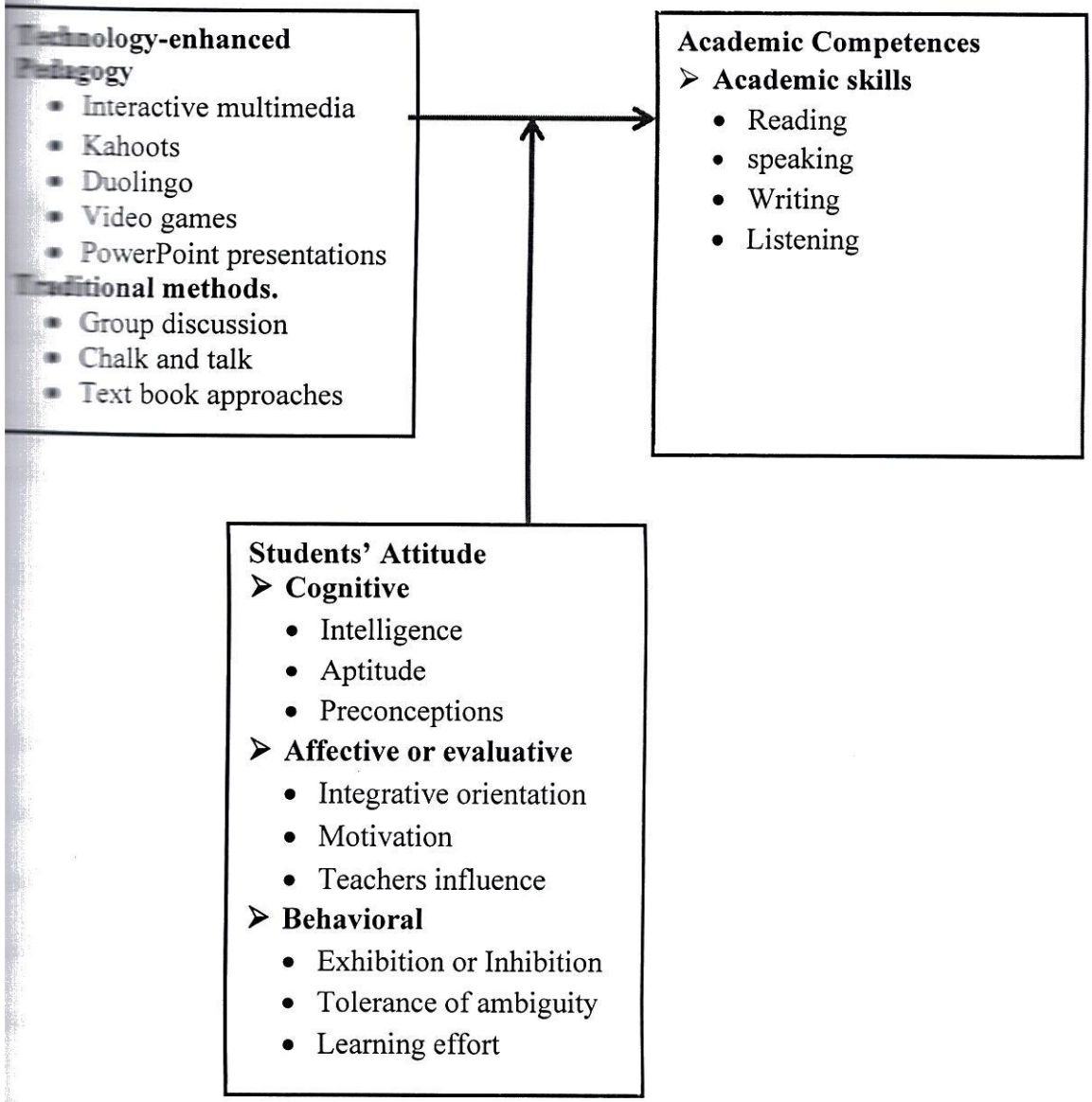


Figure 1: Conceptual framework for the moderating effect of student attitude to the relationship between TEP and academic competencies

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter contains a survey of books, journal articles, and other reading materials related to this study. These materials have been reviewed in relation to the four objectives that were set to be achieved at the end of the study. The chapter starts with four theories that are used to explain the relationship between different variables of the study. The theories corresponding to the three variables underlying the current study were selected based on identified key concepts in a study that appear in the literature (Hesse-Biber, 2010; Vinz, 2022).

2.2 Theoretical Construct

This study is guided by four theoretical frameworks—Social Productivity Theory, Education Productivity Theory, Experiential Learning Theory, and Baron & Kenny's Moderation Model each selected based on key concepts identified in the literature and their relevance to the study variables (Hesse-Biber, 2010; Vinz, 2022). These theories collectively provide a foundation for understanding how technology-enhanced pedagogy, learners' attitudes, and Kiswahili academic copetencies interact and influence learning outcomes.

2.2.1 Educational productivity theory

The Educational Productivity Theory (EPT), originally introduced by Walberg (1981), provides a foundational lens for analyzing the factors that influence students' academic performance. This theory is distinguished by its empirical robustness, having been validated through the meta-synthesis of over 3,000 research studies on school learning and academic

tcomes (DiPerna, Volpe, & Elliott, 2002; Hallinger, 2022). At its core, EPT conceptualizes dent learning as a multiplicative function, where outcomes are shaped by several interdependent riables most notably, learner ability, motivation, and the quality and quantity of instruction. A y insight from the model is the principle of diminishing returns, which posits that excessive put in one domain cannot fully compensate for deficits in another. For instance, if instructional ality is low or learner motivation is lacking, even extended instructional time may produce only rginal learning gains.

Walberg's model classifies learning inputs into three broad domains: student aracteristics, instructional factors, and the psychological environment (Walberg, Fraser, & Welch, 1986). Learner attributes such as prior achievement, intrinsic motivation, and velopmental readiness constitute the first category. The second group encompasses instructional riables, including how much and how well instruction is delivered. The third domain includes ntextual influences such as classroom climate, peer interactions, home support, and exposure to edia, which collectively shape the learner's psychological environment (DiPerna et al., 2002).

In the context of this study, EPT is particularly relevant because it highlights the portance of instructional quality and student engagement, two elements that are often nstrained in traditional teaching environments. Although the Competency-Based Curriculum CBC) had been fully rolled out in government-aided secondary schools by the time this study was nducted (2024–2025), findings suggest that many teachers had not yet fully embraced chnology-Enhanced Pedagogy (TEP), which is a key component of the learner-centered proaches promoted under the CBC framework (NCDC, 2023; Omodan & Ige, 2022). this study

raws more strongly on recent empirical data including teacher interviews, or policy reports to ubstantiate the claim that traditional teacher-centered methods persist in practice (Kafyulilo et al., 021). This underscores the importance of contextualizing findings within the present-day CBC ndscape and using up-to-date sources to support arguments about pedagogical practices.

These conventional approaches often emphasize rote memorization over interactive or xperiential learning and rarely account for individual learning differences or the need for uthentic language use.

When viewed through the EPT lens, such traditional methods represent low-quality inputs, hich, even when delivered frequently, are unlikely to result in significant improvements in cademic competency. This limitation is especially pronounced in the teaching of Kiswahili, where earners require opportunities for real-world language application, like, speaking, listening, and ontextual expression. In this study, EPT is applied to demonstrate how Technology-Enhanced edagogy (TEP), characterized by interactive, learner-centered, and digital instruction, can nhance both instructional quality and learner engagement, thereby boosting academic ompetencies in Kiswahili. Furthermore, the theory accommodates student motivation and attitude s critical moderating factors, aligning with the study's focus on how positive learner dispositions an amplify the impact of pedagogical innovations. Thus, EPT not only provides a theoretical basis or understanding the complex interplay between teaching inputs and learning outcomes but also ffers a valuable framework for evaluating the potential of TEP as a reform-oriented instructional trategy in Ugandan secondary schools.

.2.2 Social functionalist theory

To examine students' attitudes toward Kiswahili language learning, this study draws on ne Social Functionalist Theory (SFT), developed by Keltner, Sauter, Tracy, Wetchler, and Cowen

22). Rooted in contemporary emotion science, SFT was initially [illegible]

inherently social nature of emotions and their role in facilitating interpersonal functioning oss diverse cultural contexts. The theory posits that emotions are not isolated internal eriences, but serve vital functions in meeting six core relational needs: security, trust, fairness, us, commitment, and belonging. These emotional functions are essential for navigating and taining meaningful relationships in learning environments.

This study adopts the Social Functioning Theory (SFT) as articulated by Campos et al. 011) to explain how students' attitudes toward learning Kiswahili are shaped by their emotional d social interactions within the classroom setting. SFT is grounded in four interrelated nciples: emotional experience, which pertains to the internal emotional states learners undergo response to instructional encounters; cognitive appraisal, referring to how learners interpret and aluate their learning context, including task value and relevance; expressive behavior, which compasses the outward behavioral manifestations of students' emotions and attitudes, such as assroom participation or withdrawal; and cultural representation of emotion, which involves the fluence of sociocultural norms on how emotions are expressed and understood within lucational spaces.

In the Ugandan context, particularly within the multicultural setting of government-aided econdary schools in Mbarara City these principles offer a comprehensive lens for examining how motional climates, perceptions of teacher fairness, inclusivity, and peer interactions contribute to udents' attitudes toward Kiswahili language learning. By applying SFT, the study explores ttitude not merely as a personal trait, but as a dynamic construct influenced by emotional,

ognitive, and sociocultural processes embedded in the learning environment (Campos et al., 011).

Despite the implementation of Uganda's Competency-Based Curriculum (CBC), which mphasizes learner-centered and ICT-integrated instruction, many classrooms in Mbarara City econdary schools continue to exhibit features of traditional pedagogical approaches. These nclude teacher-centered methods such as lecture delivery, dictation, and minimal student ngagement through discussion or collaborative learning. Such practices often neglect the motional and relational dimensions of learning that are crucial for fostering positive student ttitudes and motivation—particularly in language education contexts. Research indicates that lassrooms lacking interactive and empathetic teaching strategies can result in emotionally isconnected learning environments, ultimately diminishing learners' sense of inclusion, elonging, and perceived relevance of subjects like Kiswahili (NCDC, 2023; Kyoshabire, 2022). When students experience teaching as rigid and non-participatory, they may develop negative erceptions of the subject, seeing it as irrelevant or unrewarding an outcome that conflicts with the ffective and social principles emphasized in Social Functioning Theory.

In Mbarara City's government secondary schools, the use of conventional teaching ethods including lecture-based delivery, note dictation, chalk-and-talk, minimal use of ICT, and imited learner interaction has often failed to support students' emotional and relational needs as utlined in SFT. These conventional pedagogical approaches have unintentionally fostered lassroom environments that lack fairness, trust, and a sense of belonging, thereby cultivating egative learner attitudes toward Kiswahili as a subject.

By recognizing the bidirectional influences of culture, relationships, and emotions as ısited by SFT, this study underscores the importance of creating emotionally supportive and cially engaging learning environments, which are critical for improving students' attitudes and r informing future instructional practices in the teaching of Kiswahili.

?.3 Experiential learning theory

This study adopts Kolb's Experiential Learning Theory (ELT) as a guiding framework for derstanding the pedagogical value of technology-enhanced learning in developing learners' swahili competencies. ELT posits that effective learning is a dynamic, cyclical process olving four interconnected stages: concrete experience, reflective observation, abstract ıceptualization, and active experimentation (Kolb, 1984; Kolb, 2014). Rather than viewing rning as the passive absorption of information, the theory emphasizes active engagement as rners move between experience and reflection, theory and practice.

Within the framework of this study, Technology-Enhanced Pedagogy (TEP) was employed ın instructional intervention designed to activate each phase of the experiential learning cycle. rners interacted with digital platforms such as Kahoot, Duolingo, PowerPoint, and multimedia s which offer them opportunities to engage in real-time, hands-on tasks (concrete experience). se experiences prompt reflection, encouraging students to process what they encounter, luate outcomes, and think critically about their learning (reflective observation). As students thesize these reflections, they form new ideas or language rules (abstract conceptualization), ch are subsequently tested through additional interactive activities and digital assessments ive experimentation). This iterative process foster deeper understanding and application of vahili language skills.

The adoption of ELT in this context is supported by recent studies highlighting the ;ical benefits of digital learning environments in enhancing language acquisition, ng engagement, and supporting learner agency (Ndwiga, Odundo, Nyagah, & Mbuthia, 'ang, Yang, & Chen, 2023). Moreover, TEP aligns well with ELT's emphasis on learner- lness and constructivist principles, which are particularly effective in second language .on where practice, feedback, and contextual use are essential. In contrast, many Ugandan ry schools Although Uganda's Competency-Based Curriculum (CBC) was designed to aching practices from rote, teacher-centered instruction to active, learner-centered ɔlogies, implementation challenges persist in many classrooms, particularly in ıent-aided secondary schools. While the CBC framework mandates the use of participatory ective instructional strategies, reports from schools in Mbarara City reveal a continued on traditional lecture-based methods with limited integration of digital tools and ıtial learning techniques (NCDC, 2023; Kyoshabire, 2022). These residual practices, declining, often fail to promote student autonomy, suppress creative inquiry, and reduce vance of learning, especially in language subjects like Kiswahili, which require dialogic .on and contextual application.

By situating Technology-Enhanced Pedagogy (TEP) within Kolb's Experiential Learning (ELT), this study highlights not only the digital dimension of teaching innovation but also ical process of concrete experience, reflective observation, abstract conceptualization, and xperimentation. This theoretical lens justifies the need for shifting from didactic teaching nic, learner-driven experiences, in alignment with the CBC's competency-driven approach broader goals of 21st-century education (Kolb, 2015; NCDC, 2023). Thus, TEP, framed

ırough ELT, offers a pedagogically sound model for cultivating deeper learner engagement and ıore meaningful Kiswahili language acquisition.

.2.4 Technology acceptance theory

To further conceptualize the integration and uptake of Technology-Enhanced Pedagogy ΓEP), this study **adopts** the Technology Acceptance Model (TAM), initially proposed by Davis 1989) and later extended by Venkatesh, Morris, Davis, and Davis (2003). TAM posits that two ore beliefs—*perceived usefulness* and *perceived ease of use*—directly influence an individual's ıtention to adopt and utilize technological tools. In educational contexts, these perceptions shape ow teachers and learners engage with digital platforms, thereby influencing how technology ıpports instruction, lesson planning, and assessment (Sharples & Adams, 2014; Muinde & Ibataru, 2019).

Within the present study, TAM provides a framework for understanding factors affecting oth teacher and student readiness to embrace TEP as part of Kiswahili instruction in Ugandan econdary schools. While the availability of technology is a necessary condition, it is insufficient ithout the belief that such tools can meaningfully improve learning or enhance teaching fficiency. Learners who perceive educational technologies as both beneficial and easy to use are ıore likely to participate actively, explore content independently, and develop autonomy in their arning processes.

Conversely, when students hold negative or indifferent attitudes toward technology, even ell-designed digital tools may fail to enhance learning outcomes. This moderating role of attitude entral to this study highlights the importance of considering not only the technical functionality

educational technologies but also the psychological and social factors that govern their ıssroom use.

This study also draws on the Unified Theory of Acceptance and Use of Technology TAUT), which extends TAM by incorporating individual difference variables such as age, nder, prior experience, and facilitating conditions (Venkatesh et al., 2003). These factors :luence how technology is perceived and adopted in schools and are particularly relevant in barara City, where disparities in access, digital literacy, and teacher capacity persist. ıderstanding these contextual and personal variables is essential for maximizing TEP's fectiveness and ensuring equitable learning outcomes across diverse student populations.

When aligned with the Competence-Based Curriculum (CBC) and experiential learning ıjectives, TAM becomes especially valuable for identifying gaps in technology integration. It fers a theoretical foundation for evaluating not only the technical aspects of TEP but also the ititudinal, motivational, and structural factors that shape its implementation in Ugandan condary education.

To provide comprehensive theoretical grounding, this study integrates TAM alongside xperiential Learning Theory (ELT), Social Functionalist Theory (SFT), and the Technology- nhanced Pedagogy (TEP) model. ELT explains how learners construct knowledge through active ıgagement, SFT explores the influence of emotional and relational dynamics on learner attitudes, ıd TAM contextualizes the psychological determinants of technology use. Collectively, these ıeories form a multidimensional framework for investigating how TEP, moderate student :titudes, can enhance academic competencies in Kiswahili.

To assess the relationship between Technology-Enhanced Pedagogy (TEP) and academic competencies in Kiswahili among secondary school students in Mbarara City.

Academic competency, as conceptualized in this study, refers to a learner's ability to effectively apply Kiswahili language skills—reading comprehension, listening, grammar, writing, oral communication—together with key enablers such as motivation, self-efficacy, and positive learning attitudes. This definition draws on the multidimensional model advanced by Gerna and Elliott (2000, 2002), who argued that both cognitive abilities (academic skills) and non-cognitive traits (academic enablers) are integral to educational achievement. In the context of language learning, these two dimensions are interdependent: while mastery of linguistic structures is essential, learners' attitudes, engagement, and confidence often determine their long-term success. The reviewed literature provides both theoretical and empirical foundations that directly address the identified gap in Kiswahili language instruction in Uganda—namely, the persistence of teacher-centered methods, low learner motivation, and limited integration of technology in pedagogy (Kazungu, 2018; Ojwang et al., 2017). By synthesizing findings from diverse contexts, the literature outlines strategies through which Technology-Enhanced Pedagogy (TEP) can improve both the cognitive and affective dimensions of academic competence.

Within this framework, Technology-Enhanced Pedagogy (TEP) functions both as a mechanism for skill acquisition and as a catalyst for strengthening academic enablers. Empirical evidence suggests that integrating digital tools into instruction can significantly improve learner outcomes across subject areas (Carle et al., 2009). In language education, interactive and multimodal platforms accommodate diverse learning styles and provide authentic opportunities for practice. In this study, tools such as PowerPoint presentations for grammar visualization,

uolingo for vocabulary acquisition, and gamified language activities for oral practice were ıployed to enhance Kiswahili competencies. These technologies not only supported content astery but also stimulated learner interest, autonomy, and persistence. The multidimensional ew of academic competence proposed by DiPerna and Elliott (2000, 2002) underscores the ıportance of addressing not only linguistic skills but also non-cognitive enablers such as otivation, self-efficacy, and engagement. This theoretical framework bridges the gap by ghlighting that improving Kiswahili proficiency requires interventions that go beyond grammar ıtruction to include learner attitudes and participation—areas where technology has monstrated significant impact (Lim & Tay, 2003; Schindler et al., 2017).

Technology also plays a pivotal role in promoting academic enablers by facilitating self-ected learning, collaboration, and timely feedback. Prior studies have documented the potential ICT to enhance learner motivation and critical thinking (Lim & Tay, 2003), encourage peer essment (Topping, 2009), and foster problem-solving through digital collaboration (Schindler l., 2017). These affordances are particularly valuable in language contexts, where learners must gage in authentic communication, reflective practice, and iterative skill development Empirical dies on technology integration (Carle et al., 2009; Yang & Wu, 2015) demonstrate that ıractive and multimodal tools can enhance learner engagement, autonomy, and mastery. The iewed evidence shows that such tools are effective across various educational settings, gesting that their adaptation to Kiswahili classrooms in Mbarara City could mitigate the current rreliance on traditional methods. This alignment between proven approaches and local llenges provides a practical pathway for closing the performance and motivation gap in wahili learning.

The reviewed literature provides a strong conceptual foundation for situating TEP as a ɛdagogical innovation capable of enhancing both linguistic competencies and academic enablers ıch as motivation, collaboration, and self-regulation. These enablers have been consistently .entified as critical to holistic academic development, particularly in language education where ɔth cognitive and affective dimensions—technical skills and learner engagement—are central to ıeaningful acquisition and sustained language use (Means et al., 2014; Organisation for Economic o-operation and Development [OECD], 2020). Drawing from established theory and empirical ɛsearch, the present study positions TEP as a multidimensional instructional approach with the ɔtential to improve Kiswahili learning outcomes among secondary school students in Uganda.

.4 To examine the relationship between students' attitudes toward Kiswahili and their cademic competencies.

TEP refers to the purposeful integration of digital tools and platforms such as Duolingo, ıultimedia slides, and locally relevant video content into Kiswahili instruction to foster active ngagement, emotional connection, and learner autonomy. This framing sets the stage for xploring how TEP shapes academic attitudes, which are understood here as learners' internal ispositions toward the subject, including their motivation, interest, and emotional engagement. Existing scholarship consistently shows that Technology-Enhanced Pedagogy (TEP) can ositively influence learners' academic attitudes by fostering autonomy, enhancing engagement, nd increasing the perceived relevance of learning materials (Haleem et al., 2022; Lim & Tay, 003; Sharma, 2021). In language learning contexts, particularly, interactive and culturally elevant digital content has been found to transform learners' perceptions of subjects once onsidered difficult or outdated. However, there remains limited empirical evidence on how these

fective benefits of TEP manifest within Kiswahili instruction in Ugandan secondary schools, here teacher-centered practices and low learner motivation are persistent challenges (Kazungu, 018; Ojwang et al., 2017).

The reviewed literature shows that TEP can positively transform student attitudes by omoting active participation and giving learners greater control over their pace and mode of arning. Studies by Haleem et al. (2022) and Lim and Tay (2003) consistently highlight the otivational benefits of digital interactivity, while Sharma (2021) emphasizes that culturally levant, emotionally engaging materials can make language subjects more relatable and ppealing. This body of work bridges the gap by offering a theoretical and empirical basis for nderstanding how TEP might counteract the negative attitudes toward Kiswahili often observed Ugandan secondary schools, where traditional, teacher-centered methods have been shown to mpen learner enthusiasm (Kazungu, 2018; Ojwang et al., 2017).

Furthermore, while global studies highlight the importance of supportive infrastructure and acher readiness in realizing the full potential of TEP (Miima, 2014), few have examined how eliberate teacher training and curriculum alignment can enable its successful integration in the gandan context. This gap is significant given the ongoing transition to the Competency-Based urriculum, which emphasizes learner engagement, collaboration, and self-directed learning

In doing so, the literature review bridges the gap between global evidence on TEP's role shaping student attitudes and the underexplored realities of Kiswahili instruction in Uganda. By mbining theoretical models of academic attitude, empirical findings from technology integration search, and locally relevant implementation strategies, the review provides a clear rationale for is study's focus. It demonstrates that while TEP's potential to boost academic attitudes is well-

pported internationally, there is limited localized evidence in Uganda's secondary school context rticularly under the Competency-Based Curriculum which this research directly addresses.

Existing scholarship consistently shows that Technology-Enhanced Pedagogy (TEP) can sitively influence learners' academic attitudes by fostering autonomy, enhancing engagement, d increasing the perceived relevance of learning materials (Haleem et al., 2022; Lim & Tay, 03; Sharma, 2021). In language learning contexts, particularly, interactive and culturally levant digital content has been found to transform learners' perceptions of subjects once nsidered difficult or outdated. However, there remains limited empirical evidence on how these fective benefits of TEP manifest within Kiswahili instruction in Ugandan secondary schools, here teacher-centered practices and low learner motivation are persistent challenges (Kazungu, 18; Ojwang et al., 2017).

Furthermore, while global studies highlight the importance of supportive infrastructure and acher readiness in realizing the full potential of TEP (Miima, 2014), few have examined how liberate teacher training and curriculum alignment can enable its successful integration in the gandan context. This gap is significant given the ongoing transition to the Competency-Based urriculum, which emphasizes learner engagement, collaboration, and self-directed learning.

The reviewed literature provides both the theoretical grounding and empirical precedent r anticipating that TEP could enhance learners' academic attitudes and, by extension, their ademic competencies in Kiswahili. Nevertheless, the absence of localized studies limits the neralizability of these findings to Uganda's unique educational environment. This study ldresses that gap by empirically examining how TEP, when implemented alongside targeted

eacher capacity building, influences students' attitudes toward Kiswahili and contributes to the evelopment of their language competencies.

In doing so, the present research situates itself at the intersection of established global vidence and localized educational needs. By applying and contextualizing TEP within Mbarara ity's secondary schools, it contributes to a more nuanced understanding of how digital pedagogy an serve as both an instructional and motivational lever for Kiswahili learning under Uganda's volving curriculum.

.5 To investigate the influence of Technology-Enhanced Pedagogy on students' attitudes oward Kiswahili.

Students' attitudes toward Kiswahili significantly shape their academic competence, articularly in multilingual and second language learning contexts. In this study, attitude is onceptualized as a multidimensional construct encompassing cognitive, affective, and behavioral rientations that collectively influence how learners perceive, engage with, and respond to nstructional content. Positive attitudes support sustained attention, foster motivation, and promote esilience in language learning, key components of academic competence.

The cognitive dimension of attitude relates to learners' mental frameworks, including prior nowledge, self-efficacy, and subject-related beliefs. These mental orientations influence how tudents process Kiswahili content and engage with linguistic structures. In the current study, earners who expressed confidence in their ability to master Kiswahili tended to demonstrate tronger vocabulary retention and sentence construction skills. This aligns with broader literature ndicating that students with a positive cognitive orientation tend to show deeper comprehension

d better academic outcomes (Haleem et al., 2022). While earlier research in Kenya (e.g., Juma Atoni, 2022) highlighted the relationship between students' beliefs and performance in swahili, this study will bridge this gap by observing similar patterns in Mbarara City, where ırners with supportive learning environments and positive self-concepts will need to exhibit ·onger competence levels. However, unlike prior studies, which focused on negative teacher itudes, this study will emphasize how positive teacher modeling, through the use of TEP tools e interactive slides and educational apps, help nurture constructive emotional responses. The havioral component of attitude refers to observable actions such as participation, effort, and illingness to practice language skills. While earlier research (e.g., Atandi et al., 2019; Wilson,)13) emphasized that conventional lecture-based approaches hinder learner engagement, this udy will bridge this gap by incorporating interactive, learner-centered strategies which fostered ·eater persistence and collaborative learning, key indicators of behavioral competence.

Importantly, the study also acknowledges contextual limitations that may inhibit the full xpression of positive attitudes. Factors such as inadequate instructional materials, limited access) ICT infrastructure, and policy gaps identify as persistent barriers. While prior research (e.g., hemutai, 2020) attributes low performance to structural constraints like lack of resources and ıfluence of informal language (e.g., Sheng), this study builds on that understanding by showing ıat integrating TEP can help offset these challenges. In schools where technology is to be ffectively used to support Kiswahili instruction, students are expected to demonstrate more onsistent participation and higher achievement levels.

; The moderating effect of students' attitudes on the relationship between Technology-ıhanced Pedagogy and academic competencies in Kiswahili among secondary school ıdents in Mbarara City.

Attitude has been widely recognized as a crucial moderator in the relationship between :hnology integration and academic outcomes. Venkatesh and Bala (2008), in their refinement of : Technology Acceptance Model (TAM), highlight that individual attitudes toward technology ;nificantly influence perceived usefulness and perceived ease of use. These perceptions bsequently shape behavioral intention and actual technology use, which are key drivers of ccessful technology adoption. Complementing this, Teo (2011) found that teachers' attitudes ward technology directly moderated both their intention to use and actual utilization of digital ols, demonstrating that positive attitudes enhance the effectiveness of technology integration in structional practices.

Despite these insights, existing studies have largely focused on teachers in formal assroom settings, leaving a gap in understanding how learner attitudes specifically influence chnology integration's impact on academic performance, particularly in resource-constrained condary schools. This study builds on the foundational models of Venkatesh and Bala (2008) ıd Teo (2011) by examining the moderating role of student attitudes toward ICT integration and ; consequent effect academic competencies in Kiswahili language outcomes within government condary schools of Mbarara city In doing so, it addresses the contextual nuances and learner erspectives that previous research has underexplored, thus bridging a critical gap in the literature.

In language learning, the attitude's moderating role is particularly important. For example, in, Chen, and Tsai (2014) demonstrated that students with more positive attitudes toward e-

earning technologies showed greater motivation and engagement, which led to better language cquisition outcomes. This indicates that even well-designed technology will have limited impact nless learners hold favorable dispositions toward its use.

Moreover, Hussein, Zhu, and Mahdi (2021) highlighted in their meta-analysis that attitude ıoderates the relationship between e-learning interventions and learner performance, suggesting ıat interventions are most effective when learners are emotionally and cognitively receptive. They rgue that fostering positive attitudes can thus be a strategic focus to maximize the benefits of echnology-enhanced instruction.In light of this literature, the current study situates student ttitude as a key moderating variable that shapes how effectively TEP contributes to Kiswahili cademic competence. Understanding this moderation helps explain variability in learner utcomes and underscores the importance of designing pedagogical interventions that actively ıltivate positive learner dispositions alongside technological innovation.

CHAPTER THREE

METHODOLOGY

.1 Philosophical underpinning

The study adopted a pragmatic research paradigm, which is a philosophical approach that mphasizes the practical application of knowledge and focuses on solving real-world problems Creswell & Plano Clark, 2018; Morgan, 2007). Rather than strictly adhering to positivist quantitative) or constructivist (qualitative) traditions, pragmatism advocates for the use of nultiple methods, guided by the research question rather than by philosophical purity. In this view, he value of a method lies in "what works" in a particular context. Pragmatism also assumes that ruth is not absolute but is shaped through experience and action (Biesta, 2010). This flexible and roblem-centered orientation made it appropriate for the current mixed-methods study, which ought to explore both measurable outcomes and participants' subjective experiences.

The adoption of a pragmatic research paradigm in this study is justified by the complex nd multifaceted nature of the research problem, which involves investigating the interplay etween technology-enhanced pedagogy, student attitudes, and academic competencies in Kiswahili. Pragmatism, as a research philosophy, acknowledges that no single epistemological or ntological stance can sufficiently address diverse and real-world educational problems (Frega, 011; Morgan, 2007). Epistemologically, pragmatism emphasizes knowledge that is actionable nd contextually relevant, drawing on both objective and subjective perspectives to generate neaningful insights. This orientation aligns with the study's goal of producing practical, evidence-ased recommendations for improving Kiswahili instruction in Ugandan secondary schools.

Ontologically, the pragmatic paradigm rejects rigid dichotomies between reality as either ıgular and observable (as in positivism) or multiple and constructed (as in constructivism). stead, it supports the coexistence of multiple realities depending on the context and research jectives (Morgan, 2014). This ontological stance permitted the study to explore measurable ademic outcomes while also accounting for students' lived experiences and perceptions of swahili. Pragmatism, therefore, provided the philosophical freedom to integrate both antitative and qualitative approaches in a way that best suited the research aims, as advocated Davies and Fisher (2018) and Teddlie (2008).

While learner-centered methods have long been emphasized in Uganda's teacher education ıd curriculum policy frameworks, and many teachers strive to apply them in practice, the nsistent and effective implementation of such methods—especially those enhanced by chnology—remains a challenge. In the context of Kiswahili language instruction, some educators ill rely heavily on conventional strategies such as teacher led group discussions, chalk-and-talk, xtbook-based drills. These methods, though not inherently ineffective, may limit learner ıgagement, reduce opportunities for creativity and collaboration, and fall short in accommodating iverse learning needs when not blended with more interactive strategies. The **Competency-Based urriculum (CBC)** introduced by the National Curriculum Development Centre (NCDC) xplicitly calls for learner-centered, participatory, and digitally supported pedagogy (MoES, 2020; ICDC, 2022). However, the full integration of **Technology-Enhanced Pedagogy (TEP)** a critical ever for actualizing learner-centeredness under CBC has not yet been fully realized in many econdary schools. This study therefore builds on these gaps by examining how TEP, alongside earners' attitudes, influences academic competence in Kiswahili.

By adopting a pragmatic paradigm, this study was able to compare how TEP diverges from ıch traditional approaches not only in terms of academic outcomes but also in fostering positive ːudent attitudes. This comparison provided a broader, practice-oriented understanding of what ⁄orks best in Kiswahili instruction, particularly in contexts where resources, teacher preparedness, nd learner motivation are highly variable.

Moreover, pragmatism focuses on methodology as a bridge between philosophical ssumptions and research practice, emphasizing the importance of methodological choices that are ːsponsive to the research questions rather than fixed paradigmatic commitments (Morgan, 2007). his approach was essential for investigating a problem that demanded both statistical analysis of ːademic performance and thematic exploration of attitudes. As such, the pragmatic paradigm ıpported a mixed-methods design that enhanced the credibility, utility, and contextual relevance f the findings. It allowed the researcher to flexibly address both "what works" and "why it works" ı the implementation of technology-enhanced Kiswahili pedagogy in secondary education (HR : Aithal, 2022).

2 Introduction

ı this chapter, the research paradigm, research approach, research design, study population, ımpling strategies, and sample sizes were considered. Additionally, the instruments and how ıey were administered, how the data was managed and analyzed, are also explained.

3 Study design

This study employed a non-randomized quasi-experimental research design, which ovided a systematic framework for investigating the causal relationships among technology-

ıhanced pedagogy, learners' attitudes, and academic competencies in Kiswahili language. ccording to Amedahe (2002), a research design serves as a master plan outlining the procedures ır data collection, measurement, and analysis in a given study. The study employed a **non-ındomized quasi-experimental design** with a **nonequivalent control group pretest-posttest :ructure**. Participants were grouped based on administrative divisions—schools in the South ivision received the intervention (Technology-Enhanced Pedagogy), while those in the North ivision served as the control group. Due to ethical and logistical constraints, random assignment as not feasible. However, both groups were pre-tested to assess baseline equivalence and post-sted to measure changes in academic competencies and attitudes toward Kiswahili."

First, grouping by geographical location minimized the risk of intervention contamination, common threat to internal validity in educational research, whereby learners in close proximity ıay share instructional strategies or experiences.

Second, the choice aligns with cluster-level implementation models used in educational olicy, where interventions are typically rolled out by administrative units rather than by random ıdividual assignment. Third, logistical feasibility played a role, as implementing and monitoring echnology-Enhanced Pedagogy was more manageable within a single division. Although this ɔn-randomized allocation introduces potential baseline differences, the study accounted for these sing Difference-in-Differences (DiD) analysis, a robust statistical method for estimating causal ffects in quasi-experimental settings. According to Shadish, Cook, and Campbell (2002), such a esign is appropriate for evaluating interventions in naturally occurring educational settings, where ındom assignment is often impractical or unethical due to institutional constraints. Therefore, this

proach enabled the assessment of the intervention's effects while respecting the real-world ntext of the schools involved.

Participants were drawn from intact classrooms in government secondary schools of arara city and assigned to experimental and control groups based on existing school structures. is non-random assignment aligns with quasi-experimentation principles, where the researcher ains control over the intervention but does not manipulate group allocation (Creswell & eswell, 2018). The design facilitated pre- and post-intervention measurement, thereby allowing the evaluation of changes in academic competencies over time attributable to the use of hnology-enhanced pedagogy.

The experimental group received instruction in Kiswahili language skills, reading nprehension, writing, listening, and speaking through the integration of interactive multimedia l educational applications. These technology tools, including videos, audio stories, PowerPoint sentations, Kiswahili language video games, and education apps such as *Kahoot* and *Duolingo*, re purposefully selected to enhance vocabulary development, pronunciation, grammar uisition, and reading comprehension. The tools also fostered learner engagement through ual, auditory, and interactive features, while promoting collaborative and self-paced learning vironments (Tambak, Sukenti, Hanafi, Rianawati, & Amril, 2022).

Conversely, the control group received instruction using standard Competency-Based rriculum (CBC) strategies, excluding the deliberate integration of Technology-Enhanced lagogy (TEP). Teaching methods included group discussions, textbook-based learning, and er learner-centered approaches prescribed under CBC guidelines. However, these sessions did incorporate digital tools or multimedia content to support instruction. This design allowed the

udy to isolate the unique contribution of TEP, since both groups operated within the CBC amework. By comparing the outcomes of the control group (CBC without TEP) and the xperimental group (CBC with TEP), the study was able to assess the added value of technology-ıpported instruction on learners' attitudes and academic competencies in Kiswahili. This ɔproach ensured realism and integrity in reflecting the actual pedagogical environment in gandan secondary schools, where CBC is actively implemented across all lower secondary levels NCDC, 2023). It also avoided exaggerating outdated instructional practices, instead recognizing ıe evolving efforts of teachers to align with current curriculum standards while highlighting areas here further pedagogical enhancement—such as through TEP—is still needed.

The design enabled the researcher to isolate the impact of technology-enhanced teaching rategies on students' academic competencies, while also examining how students' attitudes ıoderated the relationship between the pedagogical approach and academic competencies. By ɔmparing pre-test and post-test outcomes across the two groups, the study provided empirical vidence on the effectiveness of technology-enhanced pedagogy through digital tools in enhancing iswahili language acquisition. Moreover, the quasi-experimental design upheld ecological alidity by preserving the authenticity of the school environment, thereby increasing the pplicability of the findings to real-world educational contexts.

.4 Research approach

This study employed a mixed-methods research approach, specifically adopting a equential explanatory design (QUAN → QUAL). The choice of this design was informed by the eed to first quantify the impact of Technology-Enhanced Pedagogy (TEP) on students' academic ɔmpetencies and attitudes, followed by an in-depth exploration of learners' and teachers'

xperiences to provide contextual explanations for the observed results. This approach aligns with ıe argument by Njoroge and Wambugu (2021) that a single data set may not be adequate to fully ldress complex educational research questions. By combining the strengths of both quantitative ıd qualitative paradigms, the study sought to produce more nuanced, valid, and comprehensive ndings.

Within the quantitative strand, the study also deliberately incorporated a comparative mension by assessing two instructional approaches: the technology-enhanced pedagogy (TEP) ıed in the experimental group and the traditional teaching methods applied in the control group.

The control group followed the standard Kiswahili instructional practices common in many gandan government secondary schools, which include lecture-based delivery, note dictation, xtbook exercises, and teacher-led grammar drills. Although the Competency-Based Curriculum CBC) has been officially implemented, several studies reveal that traditional teaching methods ırsist in practice. For example, Kidega and Song (2024) found that challenges such as inadequate acher training, lack of resources, and limited technology access have hindered the full adoption CBC approaches in secondary schools. Likewise, research on ICT integration shows that the e of digital tools in classrooms remains inconsistent, with ICT employed in less than 40% of ssons observed (East African Journal of Information Technology, 2024). These findings ghlight the continued reliance on conventional instructional methods despite curriculum reforms. ıerefore, incorporating these practices as the control condition in this study provides a realistic seline to assess the added value of Technology-Enhanced Pedagogy (TEP) on students' swahili learning outcomes.

By comparing the pre-test and post-test results across both groups, the study evaluated not ıly the academic effectiveness of TEP but also how students' attitudes and competencies evolved fferently under each instructional method. This comparison enriched the mixed-methods ›proach by offering a clearer understanding of the pedagogical gaps TEP aims to address and ovided context for deeper qualitative inquiry during the second phase of the study (Ngugi & beria, 2014; Orodho et al., 2013).

During the quantitative phase, data were collected and analyzed using standardized struments, including pre- and post-tests to measure academic competencies and structured ıestionnaires to assess learners' attitudes toward Kiswahili language learning. The analysis of is phase informed the development of the qualitative phase, which consisted of in-depth ıterviews with Kiswahili teachers and focus group discussions with Senior Three Kiswahili udents. These qualitative tools were designed to explain unexpected patterns, add meaning to atistical trends, and deepen understanding of the pedagogical effects of TEP. As supported by emon and Hayes (2020) and Nunfam (2021), this two-phase structure enhanced the study's ıternal validity through triangulation and yielded a fuller picture of students' academic ›mpetencies and attitudinal shifts within the Mbarara City government secondary schools in ganda.

The integration of both strands occurred during the interpretation phase, where insights om the qualitative data helped clarify and expand on the quantitative findings. The conclusions rawn from the initial quantitative strand informed the development of the qualitative research uestions, which in turn shaped the analysis. This iterative relationship between the two strands trengthened the coherence between the study's objectives, questions, and methods. As Nunfam

021) suggests, such complementarity allows researchers to capitalize on the strengths of both ethods while mitigating their weaknesses. Ultimately, the use of a mixed-methods approach not ıly improved the reliability and validity of the findings but also ensured that the study remained ounded in both measurable outcomes and lived educational experiences.

5 Population

The population of this study comprised Senior Three students enrolled in government-ded secondary schools within Mbarara City, Uganda. This group was purposively selected due its pedagogical significance and direct alignment with the study's objectives. Senior Three presents a crucial academic stage in the Ugandan education system, as learners at this level are ɛpected to consolidate foundational language skills in preparation for the Uganda Certificate of ducation (UCE) examinations administered by the Uganda National Examinations Board JNEB) in Senior Four.

Mbarara City was chosen as the study location because it presents a blend of urban and eri-urban school settings, offering a unique opportunity to explore diverse instructional contexts ıd practices in Kiswahili language teaching. The selection of this specific population and setting ligns with Creswell and Creswell's (2018) assertion that purposive sampling is suitable when articipants or environments are deliberately chosen based on their relevance to the research uestions, pedagogical value, and potential to provide meaningful data.

Senior Three students were specifically chosen because they are developmentally well-ositioned to engage with all four essential language skills—reading, writing, listening, and peaking—which are critical for both academic achievement and effective communication in real-

e contexts (UNEB, 2020). Additionally, learners at this level often possess the cognitive maturity d foundational digital literacy to benefit meaningfully from technology-enhanced instruction, pecially within the framework of the Competency-Based Curriculum. This makes them suitable ndidates for interventions involving Technology-Enhanced Pedagogy (TEP), not because unger learners are incapable, but because S3 represents a key stage where deeper language oficiency is expected and instructional innovation can have measurable academic impact nderson & Krathwohl, 2001). This level also offers a timely window to identify and address arning gaps before students transition into national examination classes in Senior Four.

Mbarara City was strategically selected for its relatively high concentration of government condary schools equipped with basic ICT infrastructure, such as internet access and computer boratories (MoES, 2021). These technological provisions created an enabling environment for e implementation of technology-enhanced pedagogy (TEP). In addition, the city's demographic versity allowed for a meaningful comparative analysis of instructional experiences across ifferent school settings, thereby supporting a realistic and comprehensive evaluation of edagogical innovations in Kiswahili instruction.

To ensure comprehensive coverage, the study employed total population sampling, ncorporating all four schools in the North Division and five in the South Division that offer iswahili. This non-random, purposive sampling method was deemed appropriate due to the small, anageable number of schools and the need to maintain intact classroom groups, as is often equired in quasi-experimental research (Fraenkel, Wallen, & Hyun, 2019). The inclusion of all elevant schools enhanced the ecological validity of the findings by capturing diverse institutional ontexts (Creswell & Creswell, 2018).

Consistent with this approach, all full-time Kiswahili teachers and Senior Three students /ho had formally selected Kiswahili as their preferred subject were included without random ssignment. This preserved the natural learning environment and minimized selection bias, which ; critical in educational research where randomization may be ethically or logistically challenging Campbell & Stanley, 1963). Moreover, the sampling approach aligned with national education riorities, particularly Uganda's policy direction on ICT integration in teaching and learning, thus nsuring the study's relevance to both school-level practice and broader policy development MoES, 2021; Kibanja & Munene, 2019).

.6 Eligibility criteria

All students in the nine government secondary schools in Senior Three at the time of the :ud were eligible to participate, and equal opportunity was provided to both male and female :udents. Therefore, the selection of participants in the study was irrespective of age, sex, area of :hool, or type of school. However, for one to be considered, they had to have a school identity ard during the study period. The teachers involved in this study used both traditional and computer :chnology strategies in teaching Kiswahili academic competencies. It was therefore envisaged nat the study would do a comparison of the two methods of teaching effectively. Government :condary schools were preferred because of their relative stability in terms of routine activities nd teacher retention over time (Mbabazi, Asiimwe & Mwesigye, 2023). Again, secondary schools /ithin Mbarara City have received the highest number of computers in the recent past, compared) any other divisions in Western Uganda (Mbabazi, 2023), and therefore examining the teaching f Kiswahili academic competencies of speaking, reading, listening, and writing aspects using)mputer technologies and traditional methods would be much more convenient.

Sampling technique

This study adopted a multi-stage sampling approach that integrated cluster sampling, :posive sampling, and census techniques, ensuring both methodological rigor and contextual evance for the quantitative and qualitative components.

The sampling frame included all nine government-aided secondary schools in Mbarara y. These schools represent the full spectrum of public secondary education in the region, cutting oss both urban and peri-urban contexts. This broad inclusion allowed the study to examine swahili instruction within diverse educational settings, enhancing the external validity and neralizability of the findings (Fraenkel, Wallen, & Hyun, 2019).

Using cluster sampling, eight of the nine schools were included in the main study, while e school was set aside for piloting the research instruments. Schools were purposively selected ensure inclusion of both single-sex and mixed-gender institutions, reflecting the structural versity of Mbarara City's government-aided schools. This approach facilitated the analysis of w school type may influence the implementation and outcomes of technology-enhanced dagogy (TEP) (Creswell & Creswell, 2018; Shadish, Cook, & Campbell, 2002).

At the learner level, a census sampling technique was employed. All Senior Three students the eight selected schools were targeted, resulting in 158 participants. Senior Three was selected rposively, as this academic level serves as a preparatory stage for the Uganda Certificate of lucation (UCE) examinations in Senior Four, making it appropriate for assessing academic mpetencies in Kiswahili.

All students in this level were included regardless of academic stream or gender. However, ring data analysis, learners above the age of 18 were excluded to comply with ethical standards ncerning research involving minors. These older students continued to receive the intervention ıere applicable but were not part of the final analyzed sample.

To assign participants into comparison groups, schools were grouped according to ıministrative divisions. Schools in the South Division were designated as the experimental group, ıere Technology-Enhanced Pedagogy (TEP) was implemented, while schools in the North ivision formed the control group, continuing with traditional instructional methods.

- 79 students from four South Division schools formed the experimental group
- 79 students from four North Division schools formed the control group

For the qualitative component, Focus Group Discussions (FGDs) were conducted to gain eeper insight into learners' experiences and attitudes toward Kiswahili learning after the TEP ıtervention. Using purposive sampling, four learners were selected from the experimental group, ısed on the criterion that they had fully participated in the TEP sessions. The selected students ere articulate, available, and willing to share their learning experiences, making them suitable ırticipants for in-depth discussions. This purposive approach ensured that the FGD captured rich, ıtervention-specific insights, which complemented the quantitative findings and supported iangulation of results.

Key Informant Interviews (KIIs) – Teacher Sample

Additionally, four Kiswahili teachers each teaching Senior Three in the participating chools—were selected through purposive sampling to participate in key informant interviews.

ıese teachers were chosen because of their direct involvement in Kiswahili instruction at the rget academic level, and their firsthand experience with implementing or observing TEP :ategies. Their insights provided critical contextual understanding of pedagogical practices, allenges, and student engagement.

8 Summary of Sampling Framework

omponent	Sampling Method	Sample Size	Selection Criteria
chools	Cluster + Purposive	8 (out of 9)	Government-aided; urban/peri-urban; school type
tudents Quantitative)	Census	158 (79+79)	All S.3 learners; excluded those >18 years
GDs (Qualitative)	Purposive	6-10 students	From the experimental group; participated in TEP
eacher Interviews	Purposive	4 teachers	Teach S.3 Kiswahili in selected schools

This number emerged naturally from the enrollment records of each school at the time of a collection and was neither predetermined nor influenced by external selection criteria. The lusion of all Kiswahili students ensured comprehensive coverage of the target population and nimized the risk of bias related to participant exclusion.

The distribution of students across schools was as follows: School A (22), School B (14), ɔol C (23), School D (20), School E (22), School F (18), School G (12), and School H (27). ; organic distribution reflected real-life student enrollment patterns and ensured that the study ured variation across school types and geographic divisions without artificial manipulation.

Similarly, Kiswahili teachers were engaged based on their current teaching responsibilities in the participating schools, ensuring that each instructional method, Technology-Enhanced ıgogy (TEP) and conventional teaching, was represented according to the teachers' actual ıgogical practices. Teachers were also included based on their subject specialization and their lability to participate in the intervention and data collection activities. This approach provided uctional authenticity and alignment with the real-world classroom context, which is critical ducational research seeking to evaluate practical interventions.

By relying on the naturally occurring classroom structures and existing school enrollment , the study maintained methodological rigor while enhancing internal and ecological validity. ensured that the findings are not only reliable within the specific study context but also icable to similar school environments in Uganda and the wider East African region undergoing ·driven pedagogical transformation (UNESCO, 2021; MoES, 2021).

ɜample size

The sample size for this study was defined by the actual number of Senior Three students ʼing Kiswahili in eight participating government secondary schools in Mbarara City, yielding al of 158 learners. This number was determined directly from enrollment records of the ʼahili subject and reflects real classroom populations, not derived through probabilistic

ıng. The inclusion of all eligible learners ensured full coverage of the target group, ızing selection bias and enhancing the reliability of the quantitative data.

Although all nine government secondary schools in Mbarara City were initially considered, were retained in the final phase based on practical and pedagogical considerations, cally, the presence of consistent Kiswahili instruction, the availability of ICT infrastructure, ɛ willingness of both administrators and Kiswahili teachers to participate in the intervention trol activities. One school was excluded due to infrastructural constraints and scheduling ɔts that made participation infeasible.

Out of the eight schools, four were assigned to the experimental group, where Technology-ced Pedagogy (TEP) was implemented, and the other four were placed in the control group, conventional teaching methods continued. This 1:1 ratio ensured parity and comparability ɛn the intervention and non-intervention settings. The allocation was guided by teacher bility and their readiness to undergo training in TEP, which was a prerequisite for nenting the intervention.

To account for possible non-responses or incomplete data during pre- and post-testing, a ɔuffer was added to the initial sample, as recommended by Gay, Mills, and Airasian (2009). ɔrecaution enhanced data integrity and ensured that inferential statistical analysis remained

able 1: Distribution of Sampled Students by School and Group Assignment

chool Code	Division	School Type	Group	No. of Students
١	South Division	Single-Sex Boys	Experimental	22
٣	South Division	Mixed	Experimental	14
٢	South Division	Mixed	Experimental	23
٤	South Division	Mixed	Experimental	20
٥	North Division	Mixed	Control	22
٦	North Division	Mixed	Control	18
٧	North Division	Mixed	Control	12
٨	North Division	Single-boys	Control	27
Total	—	—	—	**158**

During the qualitative phase, four Kiswahili teachers from the experimental schools were ngaged in key informant interviews. These teachers were selected based on their instructional oles in delivering TEP, their experience in Kiswahili teaching, and their involvement in the aining program. Focus Group Discussions (FGDs) were also held in the four experimental chools, with 6 to 10 students per group, ensuring representation across gender and school type.

No qualitative data were collected from control schools, as their instructional context had o unique intervention to warrant deeper exploration. As a result, qualitative inquiry remained ocused on the intervention setting to document lived experiences and inform future nplementation of TEP. Moreover, since the experimental group had initially experienced onventional teaching before the TEP intervention, their reflections during interviews and iscussions inherently captured perspectives similar to those of the control group, reducing the eed for separate qualitative data collection from the latter.

10 Data Collection Instruments

10.1 Questionnaire

To effectively address the study objectives, three main data collection instruments were nployed: a structured questionnaire, a standardized Kiswahili achievement test, and qualitative ols including interview guides and focus group discussion (FGD) protocols. These instruments ere strategically applied to gather data from three categories of participants: students, teachers, ıd student focus groups using four distinct methods. Specifically, students completed both the ructured questionnaire, which captured their attitudes toward Kiswahili learning, and the iswahili achievement test, which assessed their academic competencies.

Kiswahili teachers participated in key informant interviews guided by a semi-structured terview schedule to gain in-depth insights into their instructional practices and experiences with ther technology-enhanced or conventional pedagogy, including lecture-based teaching, xtbook-driven instruction, and chalk-and-talk delivery. Notably, teachers in the experimental oup had initially relied on conventional teaching methods before receiving training on ıplementing the Technology-Enhanced Pedagogy (TEP), thereby offering comparative flections on both approaches. This dual exposure enabled them to highlight changes in learner ıgagement, motivation, and performance after the intervention. Students in the experimental oup reported that Technology-Enhanced Pedagogy (TEP) made lessons more engaging and teractive, particularly through multimedia tools such as animations, storytelling videos, and apps ɛe Kahoot and Duolingo, which offered instant feedback and gamified learning experiences. For ɛample, one student remarked that vocabulary lessons were easier to remember when supported

y visual and audio aids, while another shared that digital quizzes helped alleviate anxiety during ssessments.

This multi-instrument and multi-source approach ensured a comprehensive and iangulated understanding of both the quantitative and qualitative dimensions of the study. The ombined reflections from teachers and students provided deeper insight into how pedagogical rategies influenced learner attitudes and academic competencies in Kiswahili, thereby rengthening the practical implications of the findings.

Data collection involved the use of a standardized, self-administered questionnaire issued all participating students. The instrument consisted of two validated tools: the Academic ompetence Evaluation Scales (ACES) developed by DiPerna and Elliott (1999) and the Attitudes ward Foreign Language Learning (A-FLL) scale, originally developed by Yang (1999). These ols were selected for their established validity and reliability in assessing student competencies nd language learning attitudes.

The ACES instrument assessed two broad domains, with the first focusing on **academic kills** in Kiswahili. These skills include **reading comprehension**, **writing**, **speaking**, and **stening**, each representing a core component of language proficiency. Reading comprehension valuates the ability to extract meaning and interpret written texts, writing assesses grammatical ccuracy and the ability to produce coherent compositions, speaking measures oral fluency and ronunciation, and listening captures the capacity to understand spoken Kiswahili in both formal nd informal contexts.

The second domain measured by the ACES instrument pertains to **learners' attitudes** ɔward Kiswahili and technology-enhanced learning. This domain captures the **cognitive, ffective, and behavioral dimensions** of attitude, reflecting students' beliefs about the usefulness f Kiswahili and digital tools (cognitive), their emotional responses such as interest or anxiety ıffective), and their observable engagement in learning activities (behavioral) (Ajzen, 2005; ardner, 2010; DiPerna & Elliott, 1999). Together, these two domains provide a comprehensive ssessment of both **language competencies and attitudinal factors**, which are central to nderstanding the impact of technology-enhanced pedagogy on Kiswahili learning outcomes.

The A-FLL scale, developed by Yang (1999), was used to measure students' attitudes ɔward learning Kiswahili as a foreign language. The tool captures various affective and ıotivational dimensions including self-image, inhibition, risk-taking, ego permeability, ıotivation, and tolerance of ambiguity. The version used in this study incorporated multiple ıbscales such as: cognitive orientation (6 items), extrinsic motivation (3 items), intrinsic ıotivation (7 items), teacher influence (3 items), inhibition (2 items), exhibition (3 items), ɔlerance of ambiguity (3 items), learning effort (5 items), and study habits (5 items).

Together, these instruments provided robust data on student biodata, attitudes toward iswahili, and perceived academic competencies, thus forming the foundation for analysis in this uasi-experimental study.

To evaluate the relevance and appropriateness of the research instrument the tools were andard; however the Content Validity Index (CVI) was computed for each major construct: tudents' Attitudes, Academic Competencies, and the overall scale. The CVI is a quantitative easure used to determine the proportion of items rated as relevant by a panel of expert reviewers.

It offers insight into how well the instrument reflects the intended content domains (Polit & Beck, 2006).

As shown in Table 1 the CVI for the Students' Attitudes construct was 0.83, based on 30 of 36 items being rated as relevant. For Academic Competencies, 60 of 67 items were deemed relevant, resulting in a CVI of 0.88. The overall instrument achieved a CVI of 0.87, with 90 of 104 items considered appropriate by experts.

All values surpassed the widely accepted minimum threshold of 0.70 for content validity in educational and psychological research (Lawshe, 1975; Zamanzadeh et al., 2015). These results affirm that the instrument demonstrated strong content validity and was a valid measure of students' attitudes and academic competencies in the Kiswahili language context. Minor adjustments were made to enhance clarity and alignment with constructs, making the tools fit for data collection in the present study.

Table 2: Content Validity Index for the Study Constructs

Variable	Items Rated Relevant	Total Items	Content Validity Index
Students' Attitudes	30	36	0.83
Academic Competencies	60	68	0.88
Overall	90	104	0.87

Note. CVI values ≥ .70 are considered acceptable for content validity (Zamanzadeh et al., 2015).

To assess the internal consistency of the research instrument, Cronbach's alpha coefficients were calculated for each construct as well as for the overall tool. Cronbach's alpha is a widely accepted reliability metric that evaluates the extent to which items within a scale consistently measure the same underlying construct, with values above 0.70 generally considered acceptable

for social science research (Tavakol & Dennick, 2011). In addition to reliability analysis, exploratory factor analysis (EFA) was conducted to assess construct validity and determine the underlying factor structure of the instrument. EFA helped identify whether the grouped items loaded appropriately onto their intended constructs, ensuring that each set of questionnaire items measured distinct yet coherent dimensions of attitudes or academic competencies. This combined application of reliability and factor analysis enhanced the psychometric robustness of the instrument and ensured that the collected data accurately represented the targeted constructs of the study.

As indicated in Table 3 the Students' Attitudes scale (36 items) had a Cronbach's alpha of .83, reflecting good reliability. The Academic Competencies scale (68 items) demonstrated excellent reliability with an alpha of .96. The overall instrument (104 items) yielded an alpha of .96, indicating high internal consistency. According to the standards for scale reliability in educational research, alpha values above 0.70 are acceptable, and those above .80 indicate strong reliability (Nunnally & Bernstein, 1994). Thus, the instrument used in this study demonstrated sound reliability across all constructs, ensuring the consistency and dependability of responses obtained from participants.

Table 3: Cronbach's Alpha Reliability Coefficients

Variable	Number of Items	Cronbach's Alpha
Students' Attitudes	36	0.83
Academic Competencies	68	0.96
Overall	104	0.96

Note. Alpha values ≥ .70 are generally acceptable for research purposes (Nunnally & Bernstein, 1994).

3.10.2 Interview guide

The data collection instrument used was an interview guide for eliciting responses from immediate supervisors of students on qualitative data, in this case a teacher of Kiswahili. This involved face-to-face interactions between the researcher and the study participants through question and answer. It involved the researcher preparing an interview schedule on the perception of teachers on the effect of TEP compared to conventional pedagogy on the learning achievement of academic competencies in Kiswahili language. The interview was oral, as participants were asked open-ended questions with more probes to get more insights from them. Kiswahili teachers were purposively chosen because the responses during interviews were technical to the subject and best answered by day-to-day interactions with the teacher of Kiswahili. This was also based on the fact that the technique of face-to-face treats the interview as a pipeline for extracting and transmitting information from the interviewee to the interviewer.

3.10.3 Focus-group discussion

A focus-group discussion was conducted, involving students in Senior Three studying Kiswahili as a learning subject. Each group consisted of 6 – 10 students, fostering interactive yet manageable discussions where all participants could freely express themselves. A trained facilitator guided the sessions, using open-ended questions and probing techniques to encourage detailed responses and deeper exploration of key study themes. In the focus-group discussions, participants were drawn from eight government secondary schools, ensuring diversity in exposure to technology-enhanced learning. The selection of participants in each group considered gender balance, and groups covered both mixed and single-sex government secondary schools, to capture varying experiences.

3.11 Data collection procedure

3.11.1 Ethical Considerations and Participant Engagement

To ensure ethical compliance and promote stakeholder collaboration, the researcher obtained initial ethical approval from the Mbarara University of Science and Technology Research Ethics Committee (MUST-REC). This was followed by formal authorization from the Ministry of Education and Sports, the Mbarara City Education Office, and the administrations of the participating schools. The study was then registered with the Uganda National Council for Science and Technology (UNCST), which granted final clearance for data collection.

After receiving ethical approvals, the researcher identified the target participants Kiswahili teachers and Senior Three students from government-aided secondary schools. Introductory meetings were held with school management teams to explain the study's objectives, potential contributions to pedagogical improvement, and the intended use of findings.

During these sessions, participants were informed about the study's voluntary nature, its focus on technology-enhanced pedagogy, and its possible impact on students' attitudes and academic competencies. Written informed consent was obtained from teachers and adult learners. For minors, consent was secured through Head teachers acting as guardians, in line with ethical standards. Participants were assured of confidentiality, the right to withdraw at any time, and the non-intrusive nature of the study, which involved questionnaires and academic assessments. This transparent, community-centered approach helped build trust and foster meaningful participation, ultimately strengthening the study's validity and relevance for broader educational application.

3.12 Intervention Implementation

3.12.1. Pre-Intervention (Baseline Assessment)

Before implementing the intervention, a baseline assessment was conducted to establish the initial academic competencies and attitudes of learners in both the control and experimental groups. All participants completed a standardized Kiswahili achievement test designed to evaluate their foundational knowledge and skills in the subject. Additionally, students responded to two questionnaires: The *Attitude Toward Foreign Language Learning* (A-FLL) and the *Academic Competency Evaluation Scales* (ACES), which measured their initial attitudes toward Kiswahili and their perceived academic competency.

To prepare for the intervention, Kiswahili teachers in the experimental group underwent a two-day training session on Technology-Enhanced Pedagogy (TEP). This training introduced them to various digital tools, including PowerPoint presentations, educational videos, audio recordings, and online Kiswahili language resources. Over the course of three months, these teachers delivered lessons using technology-integrated content that corresponded with the national curriculum on Kiswahili language skills as the teaching menu from the National Curriculum Development Center (NCDC,2020).

The experimental group received instruction through a TEP model that incorporated multimedia presentations, educational applications such as Duolingo and Kahoot, video games, and interactive PowerPoint slides. Teaching strategies emphasized student-centered learning, active participation, collaboration, and self-directed exploration of Kiswahili content. The goal was to enhance learners' motivation, autonomy, and linguistic proficiency by embedding technology into everyday classroom instruction.

In contrast, the control group received instruction through Competency-Based Curriculum (CBC)-aligned methods that emphasized active learning, but without the integration of Technology-Enhanced Pedagogy (TEP). Teachers in this group applied a mix of learner-centered strategies such as group discussions, guided discovery, peer teaching, and contextualized learning activities. However, digital tools and multimedia resources were not incorporated. This CBC-based but non-digital instructional approach provided a realistic and ethically appropriate benchmark against which to assess the added value of TEP in the experimental group.

3.12.2 A written test in Kiswahili

A comprehensive test based on the standards of UNEB, covering aspects of speaking, reading comprehension, writing, and listening skills, was used as a tool to measure academic competencies of students in Kiswahili, for those being taught using technology-enhanced pedagogy. This method involves the use of the components of interactive media for audio-visual, text media and PowerPoint presentations. This same test was administered to those taught using conventional methods, with components of lecture, teacher talk, and question and answer, on the same Kiswahili topics and content. The tests were developed by the researcher and validated by Senior Three teachers of Kiswahili language, who have also participated in the activities of UNEB as examiners of the subject. The tests were then marked by teachers of Kiswahili language,

The Uganda National Examinations Board (UNEB), the official national examining body responsible for setting and administering standardized assessments in Uganda, served as the external examiner in this study. Standardized Kiswahili language tests were administered by UNEB-accredited personnel, and the resulting scores were systematically recorded. These scores were used to capture differences in academic outcomes between the experimental and control

groups, both at baseline (pre-intervention) and after the implementation of the Technology-Enhanced Pedagogy (post-intervention).

3.12.3 Post-Intervention Assessment

At the end of the three-month instructional period, a post-intervention assessment was conducted to evaluate the effectiveness of the teaching approaches employed in both the control and experimental groups. The same standardized Kiswahili achievement test used during the baseline phase was re-administered to all students. This allowed for a direct comparison of academic competencies before and after the intervention, providing empirical evidence of learning gains attributable to the respective pedagogical strategies.

To complement the academic performance data, the *Attitude Toward Foreign Language Learning* (A-FLL) and the *Academic Competency Evaluation Scales* (ACES) questionnaires were also re-administered. These instruments assessed any changes in students' attitudes toward Kiswahili and their perceived academic competencies. Using the same tools as in the pre-test ensured consistency and comparability, allowing the study to accurately measure attitudinal and self-efficacy shifts linked to the intervention.

In addition to these quantitative assessments, qualitative data were collected exclusively from the experimental group. Face-to-face interviews were conducted with Kiswahili teachers who had implemented the Technology-Enhanced Pedagogy (TEP), while Focus Group Discussions (FGDs) were held with a purposively selected sample of students from the same group. These qualitative methods were designed to capture in-depth insights into learners' classroom

experiences, engagement levels, and perceived academic growth, factors that could not be fully explored through standardized tools alone.

The exclusion of the control group from the qualitative inquiry was a deliberate methodological decision informed by the study's quasi-experimental design. Given that conventional teaching methods had already been documented and evaluated during the baseline phase, additional qualitative data from the control group would not have yielded new or relevant insights. Instead, the focus remained on understanding the distinctive experiences, challenges, and outcomes emerging from the TEP intervention.

By triangulating quantitative outcome measures with rich qualitative narratives, the study achieved a more holistic and context-sensitive evaluation of how technology-enhanced pedagogy influences learners' academic competencies and attitudes toward Kiswahili. This mixed-method approach provided robust justification for interpreting both numerical trends and experiential dynamics within the intervention setting.

3.13 Data Management

To maintain participant anonymity and ensure systematic tracking, all completed questionnaires and standardized test scripts were assigned unique serial numbers. These identifiers facilitated organized data handling without linking responses to individual identities. The quantitative data collected from these instruments were entered into the Statistical Package for the Social Sciences (SPSS) Version 26 for analysis.

To enhance the accuracy of data entry, a double-entry system was employed. In this process, the same data was independently entered twice by two different individuals or at two

separate times. The two datasets were then cross-checked for discrepancies. Any mismatches were reviewed against the original hardcopy records and corrected accordingly. This method significantly reduces the risk of human error and improves the reliability of the dataset.

The use of double-entry also contributes to methodological triangulation by ensuring that the quantitative data are not only accurate but verifiable. While triangulation is commonly associated with using multiple methods or data sources, in this case, it refers to internal validation through replication of the data entry process thereby reinforcing data integrity.

Following data entry, a rigorous data cleaning process was conducted. This involved identifying and addressing missing values, detecting outliers, and checking for inconsistencies or invalid entries. Cleaned datasets were backed up electronically and securely stored on encrypted external drives and password-protected cloud platforms. Access to raw data was strictly restricted to the principal researcher and designated academic supervisors to uphold ethical standards and protect the confidentiality of all participants.

Quantitative Data Management

All completed questionnaires and test scripts were assigned unique serial numbers to maintain participant anonymity and facilitate traceability. The data collected from these instruments were entered into the Statistical Package for the Social Sciences (SPSS) Version 26. To ensure accuracy, a double-entry system was employed, followed by thorough data cleaning processes that involved checking for outliers, missing values, and inconsistencies. Electronic data backups were securely stored on encrypted external drives and password-protected cloud storage

platforms. Access to the raw data was restricted exclusively to the researcher and academic supervisors, safeguarding the confidentiality of participant information.

Qualitative Data Management

Audio recordings from teacher interviews and student focus group discussions (FGDs) within the experimental group were transcribed verbatim to preserve the authenticity and richness of participants' narratives. Each transcript was carefully anonymized to remove any personally identifiable information, ensuring participant confidentiality. The anonymized transcripts were then stored securely in encrypted digital folders accessible only to the researcher and academic supervisors.

A thematic analysis approach was employed to interpret the qualitative data. The initial phase involved manual coding, where emerging themes and subthemes were identified inductively by closely reading the transcripts line by line. This manual process allowed the researcher to remain immersed in the data and capture nuanced meanings. To enhance the consistency, reliability, and trustworthiness of the coding process, the identified codes and themes were later cross-verified using qualitative data analysis software (NVivo). This software-assisted validation minimized potential researcher bias and ensured analytical rigor.

In addition to transcripts, field notes and reflective memos played a critical role in providing contextual depth. Field notes were taken during classroom observations of the experimental group to capture non-verbal cues, teaching behaviors, student reactions, and the general learning atmosphere. These notes offered real-time, descriptive accounts that enriched the analysis and allowed for triangulation with interview and FGD data.

Reflective memos were written throughout the data collection and analysis phases. These memos documented the researcher's evolving interpretations, analytical decisions, and reflections on emerging patterns, contradictions, or methodological concerns. Memos served as a bridge between data collection and analysis by making the researcher's thought process transparent and traceable. For instance, after observing a session where students used an interactive digital quiz tool, a memo was written to capture the observed excitement, the type of student engagement, and preliminary thoughts on how this might relate to shifts in learner motivation.

Together, field notes and memos functioned as essential tools for *methodological transparency*, enabling a deeper understanding of the context behind participant responses and facilitating analytic reflexivity. These strategies helped maintain a clear audit trail of how data interpretations were developed, thereby enhancing the credibility, dependability, and conformability of the qualitative findings.

Overall, these meticulous qualitative data management procedures, ranging from secure storage and verbatim transcription to thematic coding, memoing, and triangulation, ensured the data were handled with integrity and used ethically and effectively to generate valid insights into the impact of technology-enhanced pedagogy on Kiswahili language learning.

3.14 Data Analysis

Quantitative data were entered in SPSS version 26.0, cleaned, and later analyzed. Recordings from the teachers were transcribed, and the transcripts were used for the proceeding steps. The social-demographic characteristics of students were analyzed using descriptive statistics, including frequencies and percentages, measures of central tendency, and variation. For

each of the four specific objectives, a suitable tool for data analysis was chosen, and these are highlighted as follows:

Objective 1 was to establish the extent to which technology-enhanced pedagogy (TEP) impacts students' academic competencies in Kiswahili. To achieve this, an independent samples *t*-test was employed because it was suitable for measuring the effectiveness of pedagogical interventions when comparing the means of two independent groups, experimental and control, especially in cases where the population standard deviation is unknown. The *t*-test allowed for the determination of whether any observed differences in post-intervention academic competencies were statistically significant, thereby providing a reliable measure of the impact of TEP (Thukral, Kovac, & Paturu, 2023).

Objective 2examine the relationship between students' attitudes toward Kiswahili and their academic competencies an independent samples *t*-test was employed because it is appropriate for comparing the means of two independent groups when the population standard deviation is unknown. The *t*-test was particularly suitable for determining whether any statistically significant difference existed in students' attitudes towards Kiswahili and their academic competencies between the experimental and control groups after the intervention. This approach effectively measured the pedagogical impact on learner attitudes in a controlled quasi-experimental design (Thukral, Kovac, & Paturu, 2023).

Objective 3 aimed at analyzing the relationship between students' attitudes and their academic competencies in Kiswahili language learning across the two groups. An independent samples *t*-test was again employed, as it is appropriate for comparing mean differences between groups when the population standard deviation is unknown. Although the change in attitudes was

less pronounced compared to the change in academic competencies, the *t*-test remained suitable for detecting any statistically significant differences in how students' attitudes correlated with their performance outcomes (Thukral, Kovac, & Paturu, 2023).

Objective 4 was to evaluate the moderating effect of students' attitudes on the relationship between technology-enhanced teaching methods and academic competencies in Kiswahili language learning. In this case, students' attitude functioned as a moderator variable, meaning it had the potential to influence the strength or direction of the relationship between the pedagogical approach and academic outcomes. To assess this, moderated regression analysis was employed, which is appropriate for testing interaction effects between independent and moderator variables. This method allowed the study to determine whether the impact of technology-enhanced pedagogy on academic competencies varied depending on the level of students' attitudes (Baron & Kenny, 1986).

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter presents the results of a quasi-experimental study conducted to assess the impact of Technology-Enhanced Pedagogy (TEP), students' attitudes, and academic competencies in Kiswahili language among secondary school students in Mbarara City, Southwestern Uganda. The findings are organized around four research objectives:

This chapter presents the results of a quasi-experimental study conducted to assess the impact of Technology-Enhanced Pedagogy (TEP) on students' attitudes toward Kiswahili and their academic competencies in the subject among secondary school learners in Mbarara City, Southwestern Uganda. The findings are organized around four research objectives:

1. To establish the impact of technology-enhanced pedagogy on academic competencies in Kiswahili. This objective explored how the integration of digital tools contributes to improving students' academic competencies in Kiswahili.

2. To determine the effect of technology-enhanced pedagogy on students' attitudes toward Kiswahili. This objective examined how the use of digital resources influences students' perceptions, motivation, and interest in Kiswahili, potentially improving their engagement and enthusiasm toward the language.

3. To analyze the relationship between students' attitudes and their academic competencies in Kiswahili. This section explored how students' attitudes, whether positive or negative, toward

Kiswahili, affect their academic competencies, shedding light on the importance of fostering positive attitudes for enhanced learning outcomes.

4. To evaluate the moderating role of students' attitudes on the relationship between technology-enhanced pedagogy and academic competencies. in the fourth objective, the study intended to evaluate the moderating effect of students' attitudes on the relationship between technology-enhanced pedagogy and academic competencies in Kiswahili among secondary school students in Mbarara City. This objective assessed how the attitudes of student's influence and potentially enhance the relationship between the application of TEP and their academic achievements in Kiswahili, examining whether technology can catalyze improving both students' attitudes and their academic competencies.

Each section of this chapter systematically presents the results corresponding to these objectives, offering a detailed interpretation to address the research questions and hypotheses of the study.

4.2 Baseline Characteristics of Respondents

The study involved three categories of participants. The primary group comprised 158 Senior Three students offering Kiswahili. Out of these, 41 participated in focus-group discussions. Additionally, 4 Kiswahili teachers, selected from participating schools, acted as key informants. This section presents their demographic information as a foundation for interpreting study findings.

4.3 Baseline Characteristics of Student Participants

This section presents the baseline demographic and background characteristics of the 158 student participants (79 in the experimental group and 79 in the control group) who completed the questionnaires before the intervention. The purpose was to describe and compare the groups to assess initial equivalence, a key requirement in quasi-experimental designs. Variables captured include sex, age, residence, religion, ethnicity, primary caregiver, mode of transport to school, schooling status, academic attitudes, academic competence, and Kiswahili test scores.

Analyzing baseline characteristics before the intervention allows for a clearer understanding of the learners' starting point, thereby strengthening the internal validity of the quasi-experimental design. This pre-intervention assessment enables the identification and control of confounding variables, ensuring that any observed changes in attitudes or academic competencies in Kiswahili are more likely attributable to the TEP intervention. It is a critical step for drawing meaningful and credible conclusions about the efficacy of integrating technology into language instruction.

Table 4 presents the baseline characteristics of the 79 students in the experimental group who participated in the study by completing questionnaires and test scores. The key characteristics considered include sex, age, residence, religion, enthenisity primary caretaker, mode of transport to school, and schooling status. These variables were essential in establishing the background profile of participants before the intervention. Frequencies and percentages were computed to summarize each characteristic, providing a foundational understanding of the experimental group.

Table 4: Baseline characteristics of 158 participants for intervention and control groups

Characteristics	Control (North division) N=79	Experimental (South division) N=79	p-value
Sex			
Female	18 (23)	35 (44)	0.004**
Male	61 (77)	44 (56)	
Age (years) M ±SD	17.1 ±1.0	16.8 ±0.9	0.050*
15-17 years	54 (68.0)	65 (82.0)	0.042*
≥18 years	25 (32.0)	14 (18.0)	
Residence			
Rural	26 (33)	33 (42)	0.250
Urban	53 (67)	46 (58)	
Religion			
Catholic	24 (30)	22 (28)	0.900
Protestant	38 (48)	38 (48)	
Muslim	8 (10)	7 (9)	
Others	9 (11)	12 (15)	
Ethnicity			
Other	26 (33)	11 (14)	0.005**
Banyankole	53 (67)	68 (86)	
Caretaker			
Parent(s)	29 (37)	62 (78)	<0.001**
Others	50 (63)	17 (22)	*
Means of transport to school			
Walking	20 (25)	20 (25)	0.980
Car	39 (49)	40 (51)	
Others	20 (25)	19 (24)	
Number of friends	8.3 (3.6)	7.9 (5.4)	0.540
Schooling status			
Day	16 (20)	18 (23)	0.700
Boarding	63 (80)	61 (77)	

A comparative analysis of the baseline characteristics of students in the control group (North Division) and the experimental group (South Division), each comprising 79 participants, reveals significant demographic variations. Notably, the experimental group had a higher proportion of females (44%) than the control group (23%), while the control group had more males (77%) than the experimental group (56%), a difference that was statistically significant ($p = 0.004$). Additionally, age differed significantly between the two groups; the control group had a higher mean age (17.1 ± 1.0 years) than the experimental group (16.8 ± 0.9 years), with a greater proportion of younger students (15–17 years) found in the experimental group (82%) than in the control group (68%) ($p = 0.050$ and $p = 0.042$, respectively).

In terms of residence and religion, both groups were relatively balanced. Urban dwellers dominated both groups, 67% in the control and 58% in the experimental group, though the difference was not statistically significant ($p = 0.250$). Similarly, the distribution of religious affiliation was almost identical between groups, with Catholics, Protestants, Muslims, and other denominations fairly equally represented, and the differences not reaching statistical significance ($p = 0.900$). This suggests that for these particular background factors, the groups were well matched and unlikely to introduce confounding effects into the intervention outcomes.

However, significant disparities were observed in ethnicity, affiliation and caregiver status. The experimental group had a markedly higher representation of Banyankole students (86%)than in the control group (67%), while the control group had a larger proportion of students from other ethnicity 33%) ($p = 0.005$). Furthermore, caregiver status showed a highly significant difference ($p < 0.001$), with 78% of the experimental group being under the care of their parents, compared to only 37% in the control group. This indicates that the experimental group might have benefited

from greater parental involvement, a factor potentially associated with improved acade outcomes.

Despite these differences, the two groups were largely similar in their means of transp to school, number of friends, and schooling status. No statistically significant differences w found in transportation methods ($p = 0.980$), with nearly equal distributions across walking, use cars, and other means. Likewise, the average number of friends (8.3 in control vs. 7.9 experimental, $p = 0.540$) and schooling status (80% boarding in control vs. 77% in experimen $p = 0.700$) did not differ significantly. These similarities provide a basis for comparability several important aspects of student life.

Table 5: Baseline Academic Competency, Test Scores, and Attitude Before the Interventi

Table 5 presents a baseline overview of learners' academic performance and dispositic prior to the Technology-Enhanced Pedagogy (TEP) intervention. Key academic variables assess included Academic Competency Elements (ACEs), Kiswahili test scores, and students' attituc toward the subject. Comparing the experimental and control groups was essential for establishi group equivalence and ensuring that any post-intervention differences could be attributed to TI rather than pre-existing disparities.

Baseline Academic Competency, Test Scores, and Attitude Before the Intervention

Variable	Group	M ± SD	p-value
Academic Competency (ACEs)	Experimental	180.3 ± 54.1	<0.001**
	Control	205.1 ± 56.8	
Test Scores (%)	Experimental	37.6 ± 10.0	0.630
	Control	35.9 ± 6.1	
Attitude	Experimental	1.0 ± 5.9	0.001**
	Control	0.7 ± 5.8	

At baseline, the experimental group had a mean ACEs score of 180.3 (SD = 54.1), while the control group scored slightly higher at 205.1 (SD = 56.8), with a p-value of <0.001, indicating a statistically significant difference. Test scores were similar between groups: 37.6% (SD = 10.0) in the experimental group and 35.9% (SD = 6.1) in the control group, p = 0.630, showing no significant difference. Students' attitudes toward Kiswahili were comparable, with mean scores of 1.0 (SD = 5.9) for the experimental group and 0.7 (SD = 5.8) for the control group, p = 0.001.

Despite some baseline differences in ACEs and attitudes, these variations were controlled through the study's quasi-experimental design using the Difference-in-Differences (DiD) analytical framework. The DiD approach compares changes over time between the experimental and control groups, effectively adjusting for initial differences and isolating the net effect of TEP on academic competency, test performance, and attitudes. This ensures that post-intervention improvements in the experimental group can be confidently attributed to the implementation of technology-enhanced pedagogy rather than pre-existing disparities.

4.4 Baseline Characteristics of Participants in Focus-group Discussions

Table 6 presents the sex and age distribution of the 41 students who participated in the focus group discussions, drawn from the total study sample of 158.

Table 6: Characteristics of 41 Student Participants in Focus Group Discussions

Variable	Number (%)
Sex	
Male	15 (36.6)
Female	26 (63.4)
Age (years)	
16	14 (34.1)
17	16 (39.0)
18 and above	11 (26.8)

The focus group discussions (FGDs) were conducted with a purposive sample of 41 students to gather qualitative insights into learners' experiences and perspectives on Kiswahili language learning and the application of technology-enhanced pedagogy. The selection of participants was strategically based on key demographic variables to ensure diverse representation and balanced viewpoints.

In terms of sex, the FGDs included both male and female students, with females comprising the majority. Specifically, 26 participants (63.4%) were female, while 15 (36.6%) were male. This gender representation was intentional to capture possible differences in language learning attitudes, participation, and responsiveness to technology-mediated instruction between male and female learners.

Regarding age distribution, participants were grouped into three age categories: 16 years, 17 years, and 18 years and above. The largest proportion of students were aged 17 years, accounting for 16 participants (39.0%), followed by those aged 16 years at 14 participants (34.1%). Students aged 18 and above constituted 11 participants (26.8%). This age spread allowed the study to explore how maturity and academic level may influence students' engagement with Kiswahili and their openness to digital learning strategies.

By including a balanced range of participants based on sex and age, the FGDs provided a rich context for exploring the nuances of learners' attitudes, perceived challenges, and suggested improvements in Kiswahili language instruction. These demographic characteristics were critical in identifying patterns and variations in student's experiences across different age and gender groups, ultimately enriching the study's qualitative findings.

The table supports the triangulation of findings between quantitative outcomes (such as academic competency scores and attitude shifts) and qualitative insights. This strengthens the study's methodological rigor, showing that feedback was drawn from a well-defined, relevant subset of learners who directly experienced the intervention, thereby ensuring that the conclusions and recommendations are rooted in both statistical trends and lived experiences.

Table 7, shows the characteristics of sex and age of the four teachers selected from the different schools, who participated as key informants. Out of the 4 participants, the majority were male, comprising 75.0% (n = 3), and no single age group had a majority representation.

Table 7: Characteristics of the 4 key informants after intervention 9mn1)

In addition, Table 7 shows the characteristics of the four teachers who participated as key informants. Among them, the majority were male (75.0%, n = 3), and no single age group dominated, indicating a fairly balanced distribution across age categories.

Characteristics	Number (%)
Sex	
Male	3 (75.0)
Female	1 (25.0)
Age (Years)	
27	1 (25.0)
35	1 (25.0)
36	1 (25.0)
38	1 (25.0)

Out of the four teachers that participated in the study, three were male (75%) and one female (25%), with ages distributed across a range of 27 to 38 years; none of the age groups dominated, suggesting a fairly even spread in teaching experience and generational perspectives. Including the teachers in the study is critical for understanding the context and credibility of the qualitative data gathered through key informant interviews following the intervention.

The selection of these teachers as key informants was purposeful and strategic, aimed at ensuring that rich, experience-based insights were gathered from individuals directly involved in the implementation of Technology-Enhanced Pedagogy (TEP). Teachers were chosen based on their roles in delivering Kiswahili lessons within the experimental schools, as well as their observed engagement with the technology-based instructional strategies. Their inclusion offers first-hand perspectives on the feasibility, challenges, and observed learner outcomes associated with TEP, which are essential for interpreting and validating the study's quantitative findings.

Moreover, the diversity in age contributes to the breadth of viewpoints captured, as age may influence familiarity with technology, openness to pedagogical innovation, and classroom management styles. The variation across both sex and age allows for the emergence of balanced themes in the qualitative analysis and prevents over-representation of a single demographic lens. Therefore, this table not only provides transparency regarding who the key informants were but also strengthens the overall validity and trustworthiness of the study by confirming that insights were drawn from informed and diverse educational practitioners.

4.5 Impact of Technology-Enhanced Pedagogy on Academic Competencies

This section presents the effect of Technology-Enhanced Pedagogy (TEP) on students' academic competencies in Kiswahili. The analysis compared baseline and endline scores for both the experimental and control groups, focusing on Academic Competency Scores (ACEs) and performance in Kiswahili tests. As presented in Table 8, the experimental group demonstrated a marked improvement in both ACEs and test scores after the intervention, while the control group showed only modest or negligible changes. These findings suggest that the implementation of TEP had a significant positive impact on learners' academic outcomes in Kiswahili.

Table 8: Categorical Comparisons

The results, as shown in Table 8, revealed significant differences in Academic Competency Scores (ACEs) and test performance attributable to the intervention

Academic Competencies	TEP	Baseline (M±SD)	Endline (M±SD)	Difference	p
ACEs	Experimental	**180.3** ±54.1	272.8±30.5	92.5	<0.001***
	Control	205.1±56.8	224.6±22.9	19.5	0.016*
Tests (%)	Experimental	**37.6**±10.0	45.6±10.5	7.9	<0.001***
	Control	**35.9** ±6.1	36.0± 6.1	0.1	0.582

In the experimental group, the mean ACEs improved markedly from M = 180.3, SD = 54.1 at baseline to M = 272.8, SD = 30.5 at endline, reflecting a substantial gain of 92.5 points, which was statistically significant ($p < 0.001$*). In contrast, the control group recorded a modest improvement in ACEs, increasing from M = 205.1, SD = 56.8 to M = 224.6, SD = 22.9, a difference of 19.5 points, which was also statistically significant (*$p = 0.016$), though much smaller than the experimental group's gain.

Similarly, test performance scores (%) in the experimental group increased significantly from M = 37.6%, SD = 10.0 to M = 45.6%, SD = 10.5, a mean increase of 7.9 percentage points

($p < 0.001$*). Conversely, the control group showed negligible improvement in test scores, with a baseline mean of M = 35.9%, SD = 6.1, and an endline mean of M = 36.0%, SD = 6.1, a minimal gain of 0.1 percentage points, which was statistically insignificant ($p = 0.582$).

These findings suggest that the implementation of TEP had a statistically significant and practically meaningful impact on students' academic competency development, particularly in the experimental group. The notable improvement in both ACEs and test scores among experimental learners indicates the effectiveness of technology-enhanced teaching strategies in fostering deeper understanding and academic performance in Kiswahili language learning.

Table 9: Impact differences attributed to TEP on academic competencies

A Difference-in-Differences (DiD) regression analysis was performed to evaluate the impact of the Technology-Enhanced Pedagogy (TEP) intervention on students' academic competencies, using Academic Competency Scores (ACEs) and Test Scores as outcome variables. As indicated in the regression summary table:

Outcome Variable	**Group**	**Baseline (M)**	**Endline (M)**	**Change (Endline - Baseline)**	**DiD**	***p*-value**
Academic Competency Scores (ACEs)	Experimental	180.3	272.8	**+92.5**		< 0.001***
	Control	205.1	224.6	**+19.5**	**73.0**	
Test Scores (%)	Experimental	37.6	45.6	**+7.9**		< 0.001***
	Control	35.9	36.0	**+0.1**	**7.8**	

The Difference-in-Differences (DiD) approach, calculated as (Experimental Endline − Experimental Baseline) − (Control Endline − Control Baseline), was used to assess the net effect of the intervention. While the p-values indicate the statistical significance of the within-group changes, the overall significance of the DiD was determined using regression models. These findings underscore the effectiveness of technology-based instructional methods in enhancing

academic outcomes, highlighting their potential for improving secondary school education in Kiswahili language learning.

The Difference-in-Differences (DiD) analysis, computed as (Experimental Endline - Experimental Baseline) - (Control Endline - Control Baseline), was conducted to isolate the effect of the Technology-Enhanced Pedagogy (TEP) intervention on students' academic competencies by comparing the change over time between the experimental and control groups.

As summarized in Table 9, the DiD results demonstrate that the intervention had a significant and positive effect on both Academic Competency Scores (ACEs) and test performance. P-values indicate the statistical significance of the within-group changes, which were determined using regression models. These findings underscore the potential of technology-enhanced instructional methods to improve educational outcomes in secondary schools.

For ACEs, learners in the experimental group improved by 92.5 points from baseline to end line, compared to a 19.5-point improvement in the control group. The DiD estimate, calculated as the difference between these two changes (92.5 – 19.5 = 73.0), indicates that the TEP intervention was associated with a net gain of 73.0 points in academic competency beyond the natural or background improvement observed in the control group. This suggests a strong and meaningful impact of the technology-enhanced instructional approach on learners' overall academic development.

Similarly, test scores (%) increased by 7.9 percentage points in the experimental group, compared to a negligible 0.1 percentage point gain in the control group. The resulting DiD of 7.8 percentage points confirms that the observed improvement in test performance can be attributed primarily to the implementation of TEP. The statistical significance of the within-group

changes ($p < 0.001$ for the experimental group) reinforces the effectiveness of the intervention. Overall, the DiD analysis provides robust evidence that Technology-Enhanced Pedagogy significantly improved learners' academic competencies in the experimental group, validating its integration into secondary school Kiswahili instruction. These results affirm the value of integrating technology into Kiswahili instruction in secondary schools.

The qualitative findings further reinforce the quantitative outcomes, offering contextual insights into learners' experiences with the intervention.

Theme 1: Technology increases access and engagement

Subtheme 1: Digital resources improve listening and speaking

"We listen to Kiswahili audios, and it helps us pronounce words better.", **Participant:** Female, 18 years, focus-group discussion, School 1

Subtheme 2: Research skills enhanced through technology

"We search for Kiswahili meanings on computers, which improves our vocabulary." **Participant:** Male, 18 years, focus-group discussion, School 2

Theme 2: Challenges in adopting technology

Subtheme 1: Limited access to computers

"We have to wait for free time in the lab, and sometimes the computers are few." **Participant:** Male, 17 years, focus-group discussion, School 3

Subtheme 2: Lack of teacher training on technology use

"Some teachers don't know how to use computers, so they still use chalk." **Participant:** Male, 35 years, key informant, School 3

Overall, the study findings demonstrate a significant positive impact of TEP on academic performance and language competency in Kiswahili among secondary school students in Mbarara City. The quantitative results show that students in the experimental group, who were exposed to technology-assisted learning, exhibited substantial improvement in exam test scores and overall language competency compared to their counterparts in the control group. The difference-in-differences analysis revealed a statistically significant increase in test scores ($p < .001$) and competency levels ($p < .001$), confirming the effectiveness of digital learning tools.

The qualitative findings further support the quantitative findings highlighting how technology increases student engagement and accessibility to learning resources. Students reported improvements in listening, speaking, and vocabulary development due to access to digital Kiswahili materials. However, the study also identified challenges, including limited access to computers and inadequate teacher training on technology use, which hinder the full adoption of digital pedagogies.

4.6 Impact of Technology-enhanced Pedagogy on Students' Attitudes towards Kiswahili

To assess the impact of the intervention on students' academic attitudes, a paired-samples t-test was conducted on students' attitudes, and the results are shown in

Table 10: Impact of TEP on students' academic attitudes for 158 participants

Group	N	Pre-intervention (M ± SD)	Post-intervention (M ± SD)	t (df)	P-value
Experimental	79	1.0 ± 5.9	3.7 ± 7.0	2.5 (78)	0.013*
Control	79	0.7 ± 5.8	0.8 ± 4.3	1.7(78)	0.095

*p <0.05

Purpose of the test:

The researchers wanted to see whether the Technology-Enhanced Pedagogy (TEP) intervention changed students' attitudes toward learning Kiswahili. They measured attitudes before (pre-intervention) and after (post-intervention) the TEP program.

Statistical method used:

A paired-samples t-test compares the means of the same group at two different points in time. Here, it tests whether the change in students' attitudes from pre- to post-intervention is statistically significant.

Experimental group results:

- Pre-intervention mean (M ± SD): 1.0 ± 5.9
- Post-intervention mean (M ± SD): 3.7 ± 7.0
- $t(78) = 2.5$, $p = 0.013$

Interpretation: The mean attitude score increased from 1.0 to 3.7. The t-value of 2.5 and p-value of 0.013 (< 0.05) indicate this improvement is statistically significant. So, the TEP intervention positively influenced students' attitudes in the experimental group.

Control group results:

- Pre-intervention mean: 0.7 ± 5.8
- Post-intervention mean: 0.8 ± 4.3
- $t(78) = 1.7$, $p = 0.095$

Interpretation: The mean attitude score barely changed ($0.7 \rightarrow 0.8$), and the p-value of 0.095 (> 0.05) indicates this change is not statistically significant. Since the control group used traditional teaching, their attitudes did not improve meaningfully.

Conclusion:

The paired-samples t-test shows that TEP significantly improved students' attitudes toward Kiswahili, while traditional methods did not produce a notable change.

For the experimental group (N = 79), the pre-intervention mean was 1.0 (SD = 5.9) and the post-intervention mean was 3.7 (SD = 7.0). The results showed a significant improvement in academic attitudes, $t(78) = 2.5$, $p = 0.013$. In contrast, for the control group (N = 79), the pre-intervention mean was 0.7 (SD = 5.8) and the post-intervention mean was 0.8 (SD = 4.3), with no

significant change observed, t (78) = 1.7, p = 0.095. The findings imply that TEP significantly improved students' academic attitudes. Various themes, subthemes, and quotes were presented.

Theme 1: Positive attitudes toward Kiswahili learning through technology

TEP has significantly influenced students' attitudes toward learning Kiswahili in secondary schools across Mbarara City. The use of computers, projectors, and audio tools has created a more engaging and interactive learning environment.

Subtheme 1: Increased Engagement and Motivation

Technology has positively impacted students' motivation to learn Kiswahili by making lessons more interactive and relatable. The integration of tools such as computers and audio recordings has transformed the traditional classroom dynamic. From the key informant interview, a teacher from School 4 noted, *"From the time I started using computers and using games, I have found it good because it is not time-consuming, and our students should use computers."* This indicates that the technology not only aids efficiency but also aligns with modern educational trends. A student (R19) from the same school, during the focus-group discussion, shared, *"I feel very okay speaking Kiswahili, it has enabled me to communicate easily with the community."* This reflects how technological tools enhance students' motivation by connecting classroom learning with real-life applications.

Subtheme 2: Enhanced Language Confidence and Participation

Students exhibit increased confidence in their Kiswahili abilities when exposed to digital tools, which offer opportunities for self-paced and exploratory learning hence aiding communication competencies. From the key informant interview, a teacher at School 3

highlighted, *"Students enjoy listening to audio clips, speeches, and news reports; they become more attentive."* The auditory reinforcement helps students overcome initial hesitations. A student R14 from the School 4, during the focus-group discussion, added that *"I came to this school without knowing how to greet, but now I feel confident speaking Kiswahili."* This suggests that technology reduces the fear of making mistakes, and thus encouraging participation.

Theme 2: Challenges and Adaptation in Technology-Enhanced Pedagogy

Despite the positive impact of technology, several challenges hinder its full implementation. These obstacles require strategic solutions to sustain and enhance the effectiveness of digital tools in Kiswahili instruction.

Subtheme 1: Limited Access to Digital Tools

A major barrier to effective technology integration is the insufficient availability of computers and digital devices in many schools. From the key informant interview, a teacher from School 3 mentioned, *"We face challenges like a lack of enough computers and limited time in the lab due to competing subjects."* This shortage limits the number of students who can simultaneously engage in technology-driven learning. A participant from School 4, during the focus-group discussion, echoed this concern, stating, *"Sometimes we have to wait long to access computers for our research."* Such delays disrupt learning momentum and reduce engagement.

Subtheme 2: Training and Technical Knowledge Gaps

The effective use of technology requires both students and teachers to have basic computer skills. However, this remains a challenge, particularly for students from less technologically

advanced backgrounds. A teacher from School 1, during the key informants interview, observed, *"Some students find it hard to use computers as they come from rural areas with limited exposure."* The gap in prior experience makes the initial transition to technology-enhanced learning more difficult. A participant from School 4, during the focus-group discussion described the learning experience as a positive change despite initial difficulties: *"At first, I didn't know how to write or greet in Kiswahili, but now I can write essays after using computers."* This highlights the potential for growth if students are given adequate training and time to practice. These interactions demonstrate that TEP fosters positive attitudes toward Kiswahili learning by increasing motivation, participation, and confidence. However, challenges related to resource availability and technical skills need to be addressed.

4.7 Relationship between students' attitude and their academic competencies

Table 15 presents a comparative analysis of students' academic attitudes and competencies in the experimental and control groups following the implementation of Technology-Enhanced Pedagogy (TEP), based on data from 158 participants. The table assesses the association between students' attitudes toward Kiswahili (negative vs. positive) and their academic competency levels (low vs. high) and evaluates whether this relationship differs between the experimental group, which received the TEP intervention, and the control group, which continued with traditional teaching methods strictly without TEP components.

Table 11: Relationship between students' attitude and academic competencies (N=158)

	Competency		Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Attitude	**Low n (%)**	**High n (%)**				
Negative	5 (67.1)	7 (32.9)	Reference			
Positive	8 (36.8)	8 (63.2)	3.49 (1.8 – 6.7)	< 0.001**	6.0(2.3-15.9)	< 0.001**

Adjusted for baseline variables and socio-demographic characteristics. ***p<0.001.

The analysis revealed a statistically significant relationship between students' attitudes and their academic competencies in learning the Kiswahili language. Among students with a negative attitude, only 32.9% demonstrated high competency. Conversely, 63.2% of students with a positive attitude exhibited high competency, while 36.8% showed low competency. The unadjusted odds ratio indicated that students with a positive attitude were approximately 3.5 times more likely to attain high academic competency compared to those with a negative attitude (OR = 3.5; 95% CI: 1.8–6.7; $p < 0.001$). After adjusting for potential confounding variables, including socio-demographics (sex, age, residence, religion, tribe, caregiver status, means of transport, peer relationships, and schooling background), baseline measures (attitude, competency), and endline test scores, the association remained significant. The adjusted odds ratio rose to 6.0 (95% CI: 2.3–

15.9; $p < 0.001$), demonstrating a strong and independent effect of students' positive attitudes on their academic competencies. These results indicate that students' attitude affects competency, potentially fostering improved academic outcomes among students with a positive attitude. The qualitative findings to triangulate the quantitative findings are also provided in themes, subthemes, and quotes.

Theme 1: Attitude Shapes Learning Engagement

Subtheme 1: Positive Attitude Drives Active Participation

"I love Kiswahili; I always try to speak it, even if I make mistakes." **Participant:** Female, 17 years, FGD, School 1

Subtheme 1.2: Negative Attitude Limits Confidence

"Some students think Kiswahili is for the army, so they don't take it seriously" **Participant:** Male, 18 years, focus-group discussion, School 3

Theme 2: Motivation and Self-Perception Influence Academic Success

Subtheme 2: Motivation from Career Aspirations

"I want to be a journalist, so I must learn Kiswahili." **Participant:** Female, 16 years, focus-group discussion, School 3

Subtheme 2: Self-Confidence in Language Ability Affects Performance

"At first, I feared making mistakes, but now I try speaking without worrying." **Participant:** Male, 17 years, focus-group discussion, School 3

4.8 Moderating effect of students' attitude on the relationship between technology-enhanced methods of teaching and academic competencies

This section specifically examines how students' attitudes toward TEP influence the effectiveness of the intervention in improving academic performance in Kiswahili. In essence, students' attitudes act as a moderating factor that can enhance or diminish the benefits of technology-based teaching methods.

The analysis shows that students' attitudes significantly shape the outcomes of TEP. In the experimental group, learners with negative attitudes toward TEP scored, on average, 59.2 points lower than their counterparts in the control group ($p = 0.001$), suggesting that without a positive disposition toward technology-enhanced learning, the intervention may not only fail to improve competency but could even adversely affect performance. Conversely, positive attitudes toward TEP were associated with an improvement of 26.8 points in academic scores relative to students with negative attitudes in the experimental group (interaction effect, $p = 0.05$). Although marginally significant, this result indicates that a positive attitude enhances the efficacy of TEP, enabling students to gain more from technology-supported instruction.

Interestingly, in the control group, students' attitudes alone did not significantly influence academic performance. The coefficient for positive attitude was 7.0 with a p-value of 0.481, indicating no substantial difference in scores between students with positive or negative attitudes

under traditional teaching methods. This suggests that while attitudes alone are not sufficient to impact learning outcomes in conventional classrooms, they are crucial when implementing innovative, technology-based pedagogies.

Overall, these findings underscore the critical role of students' attitudes as a moderating factor in the effectiveness of TEP. To maximize the benefits of technology-enhanced instruction in Kiswahili, it is essential to cultivate positive attitudes among learners through motivational strategies, orientation sessions, and engaging instructional designs. Without fostering such receptivity, students may not fully benefit from TEP, potentially resulting in lower performance than peers exposed to conventional teaching methods.

Table 12: Moderating effect of students' attitude on the relationship between technology-enhanced methods of teaching and academic competencies

Variable	Beta (β)	SE	t-value	p-value
TEP (Experimental Group)	59.2	9.5	6.2	<0.001**
Positive Attitude	7.0	9.9	0.7	0.481
IV#MV (Interaction Term)	26.8	13.8	2.0	0.05*
Constant	226.9	5.7	40.1	<0.001**

*p≤0.05

A visual representation showing the moderating effect of students' attitudes on the relationship between TEP and academic competencies in Kiswahili language is illustrated in

Figure 2. In the graph, the dashed line represents test scores of students with low attitudes, whereas the solid line represents test scores of students with high attitudes toward learning the Kiswahili language. This implies that as the use of technology-enhanced methods increases, academic competency improves more rapidly for students with high positive attitudes than for those with low attitudes. This suggests that students' attitudes amplify the effectiveness of TEP, i.e., attitude significantly moderates the TEP competency relationship.

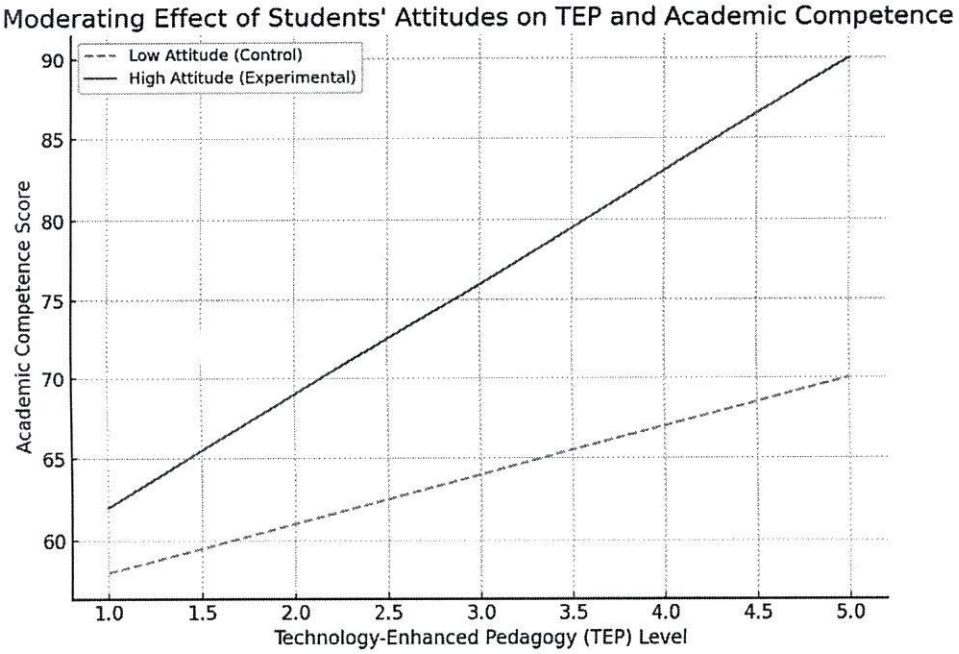


Figure 2: The moderating effect of students' attitudes on the relationship between technology-enhanced methods of teaching and academic competencies in Kiswahili language

Theme 1: Traditional Methods Lack Engagement

Subtheme 1: Chalk-and-Talk is Less Interactive

Participants reported that traditional chalk-and-talk methods limited learner participation. One noted, *"Before computers with games, videos, and audio in teaching, students were not active*

in class (Female, 38 years, key informant interview, School 3). This highlights that without interactive tools such as **Kahoot quizzes** or **PowerPoint presentations**, learning often became monotonous, with students remaining passive listeners.

Subtheme 2: Conventional Teaching Encourages Rote Memorization

Learners also associated traditional learning with cramming. As one explained, *"With books, we just cram. But with computers, we hear real Kiswahili"* (Male, 18 years, focus-group discussion, School 3). In contrast, exposure to **Kiswahili videos** and **Duolingo practice exercises** offered authentic contexts and pronunciation models, enabling deeper understanding beyond rote memorization.

Theme 2: Technology Enhances Learning Outcomes

Subtheme 1: Multimedia Learning Boosts Retention

Multimedia resources were praised for improving memory retention. A participant shared, *"Seeing videos of Kiswahili speakers makes it easier to learn"* (Female, 17 years, focus-group discussion, School 1). Tools such as **Kiswahili YouTube videos**, **PowerPoint slides with audio-visual examples**, and **interactive animations** provided multi-sensory experiences, making abstract concepts more concrete and easier to recall.

Subtheme 2: Digital Writing Tools Improve Accuracy

Technology was also seen as a way to refine writing skills. A teacher emphasized, *"Computers correct our Kiswahili spellings"* (Male, 27 years, key informant interview, School 1). Platforms like **Duolingo** reinforced vocabulary and grammar through instant feedback, while

PowerPoint exercises allowed teachers to design spelling and writing drills. Such digital supports improved accuracy compared to traditional pen-and-paper methods.

Theme 3: Positive Attitude Enhances Digital Learning

Subtheme 1: Willingness to Experiment with Language

Students expressed enthusiasm for practicing Kiswahili through digital platforms. One stated, *"I now try speaking Kiswahili because the computer lets me practice"* (Male, 18 years, focus-group discussion, School 3). Applications such as **Duolingo** encouraged learners to experiment with new words, while **Kahoot competitions** motivated them to use the language interactively and without fear of mistakes.

Subtheme 2: Technology Encourages Self-Paced Learning

Digital tools also supported individualized learning. A student remarked, *"With a computer, I can learn at my own speed"* (Female, 16 years, focus-group discussion, School 1). Platforms like **Duolingo** allowed learners to progress at different paces, while **PowerPoint presentations** and **recorded Kiswahili videos** could be revisited multiple times, offering flexibility and reinforcing autonomy in learning.

Theme 4: Resistance to Change Limits Technology Adoption

Subtheme 1: Fear of Technology Slows Learning

Not all students felt confident using digital resources. One participant noted, *"Some students are scared to use computers"* (Female, 18 years, focus-group discussion, School 1). This

shows that despite the availability of tools like **Kahoot** and **PowerPoint**, some learners required more digital literacy training to overcome fear and maximize benefits.

Subtheme 2: Skepticism Toward New Pedagogy

Teachers, too, showed some reluctance to embrace digital methods. A participant explained, *"Some teachers still prefer chalk because they are used to it"* (Male, 36 years, key informant interview, School 2). This suggests that although **Kahoot games, multimedia lessons, and Kiswahili videos** created lively and engaging environments, entrenched reliance on traditional methods slowed their adoption. Continuous professional development and mindset shifts are therefore crucial to bridge this gap.

4.9 Summary

Chapter Four presents the findings of a quasi-experimental study that investigated the impact of Technology-Enhanced Pedagogy (TEP) (independent variable) on students' academic competencies in Kiswahili (dependent variable), with students' attitudes toward Kiswahili serving as a moderating variable. The study employed both quantitative and qualitative methods to assess how technology-integrated instruction influences learner outcomes and how this effect is shaped by learners' dispositions toward the subject.

Quantitative findings revealed that students in the experimental group (N = 79) who received the TEP intervention demonstrated statistically significant gains in Kiswahili competencies compared to the control group (N = 79). Improvements were observed across all core language skills: reading comprehension, writing, speaking, and listening. For example, learners engaged with interactive digital storybooks, listening exercises, writing apps, and oral

presentation tasks, which enhanced their vocabulary, grammar, comprehension, and oral fluency. These gains were strongest among students with positive attitudes toward Kiswahili, confirming the moderating role of attitude. The experimental group showed significant improvement in attitudes from pre-intervention ($M = 1.0$, $SD = 5.9$) to post-intervention ($M = 3.7$, $SD = 7.0$; $t = 2.5$, $p = 0.013$), whereas the control group did not exhibit significant change (pre-intervention $M = -0.7$, $SD = 5.8$; post-intervention $M = 0.8$, $SD = 4.3$; $t = 1.7$, $p = 0.095$).

Qualitative findings from interviews and focus groups reinforced these results. Teachers and students reported that traditional "chalk-and-talk" methods encouraged rote memorization, whereas TEP promoted interactive, multimodal learning. Activities such as collaborative reading, group writing exercises, listening tasks via digital media, and speaking presentations fostered engagement and improved both attitudes and competencies. Students who experienced TEP indicated that Kiswahili became more accessible, enjoyable, and meaningful, demonstrating how attitudes moderate the effectiveness of instructional innovations.

In conclusion, Technology-Enhanced Pedagogy significantly improved students' academic competencies in reading, writing, speaking, and listening, with the magnitude of improvement influenced by learner attitudes. Positive attitudes enhanced engagement and outcomes, whereas negative attitudes limited the effectiveness of TEP. These findings emphasize that academic success in Kiswahili depends not only on innovative teaching methods but also on learner-related factors such as motivation, engagement, and disposition.

CHAPTER FIVE

DISCUSSION

5.1 Impact of TEP on Academic Competencies in Kiswahili Language

Experiential Learning Theory:

The quantitative results revealed a **positive relationship between Technology-Enhanced Pedagogy (TEP) and academic competencies in Kiswahili,** with learners exposed to digital methods performing better than those relying solely on conventional approaches. This aligns with the qualitative findings under **Theme 1,** where participants emphasized that chalk-and-talk methods restricted engagement and promoted rote memorization. As one learner explained, *"With books, we just cram. But with computers, we hear real Kiswahili."* The use of **Kiswahili videos, Duolingo, and PowerPoint presentations** provided authentic and interactive contexts, reinforcing the quantitative evidence that technology-supported learners develop stronger comprehension and retention.

The study demonstrated a notable improvement in students' academic competencies in Kiswahili following the implementation of Technology-Enhanced Pedagogy (TEP). Learners exposed to digital tools such as interactive computers, audio-visual content, projectors, and Kiswahili-based applications showed enhanced abilities in listening, reading, writing, and speaking. This finding aligns with Experiential Learning Theory (Kolb, 1984), which emphasizes that learners acquire knowledge through active engagement and reflection. By interacting directly with digital content, students experienced, reflected on, and applied language skills in meaningful ways. Teachers reported that the integration of technology clarified complex aspects such as grammar, vocabulary, and syntax, improving comprehension and retention. Moreover, the

interactive nature of digital resources promoted learner engagement and motivation, illustrating the interplay of Education Productivity Theory (Walberg, 1981), where quality instructional inputs enhance learning outcomes, and Social Productivity Theory (Vygotsky, 1978), where collaborative and social interaction amplifies knowledge acquisition.

Learners exposed to digital tools such as interactive computers, audio-visual content, projectors, and Kiswahili-based applications showed enhanced abilities in listening, reading, writing, and speaking. Teachers reported that the integration of technology clarified complex language aspects such as grammar, vocabulary, and syntax, resulting in improved comprehension and retention. The interactive nature of digital resources promoted learner engagement and motivation, suggesting a dual benefit of academic improvement and positive attitude shifts. These findings affirm the value of integrating technology into Kiswahili instruction to support the development of core language skills and foster a more enthusiastic learning environment.

The results of this study align well with existing educational research. According to DiPerna and Elliott's (2002) Model of Academic Competency, posits that academic success is driven not only by academic skills but also by enablers such as motivation, engagement, interpersonal skills, and study skills. academic success is driven by both academic skills and enablers such as motivation and engagement. The present findings validate this framework by showing that technology use not only strengthened language abilities but also increased learners' willingness to participate actively in lessons. Tools such as digital storybooks, Kiswahili games, and multimedia content contributed to higher-order thinking and language acquisition. These outcomes are consistent with previous findings by Carle, Jaffee, and Miller (2009), and Schindler

et al. (2017), who highlighted the power of technology in enhancing literacy and communication skills through engaging and interactive experiences.

Moreover, technology was instrumental in fostering critical thinking and problem-solving skills central to academic competency. The digital learning environment encouraged learners to reflect, make decisions, and solve language-based challenges collaboratively. For example, the use of Kiswahili listening tasks via YouTube and comprehension exercises on smart devices required students to engage more deeply with content. These findings reflect the work of Sung et al. (2015) and Şendağ and Odabaşı (2009), who emphasized the capacity of technology to cultivate analytical thinking in learners. In essence, TEP not only supported language acquisition but also contributed to learners' cognitive development.

The study also confirmed that TEP is particularly effective in overcoming pedagogical challenges prevalent in Kiswahili instruction. Previous research by Ojwang, Oduori, and Murunga (202) cited poor pedagogy and low student engagement as barriers to Kiswahili learning. The current study addressed these challenges by employing technology to introduce process-oriented, engaging methods of instruction. Despite the constraints typical of developing contexts such as limited infrastructure, teachers in Mbarara City Uganda were able to effectively integrate available digital tools, resulting in better student performance and participation. These findings reinforce those of Cennamo et al. (2014), who emphasized the potential of ICT to bridge educational disparities when implemented thoughtfully.

Finally, the study uncovered an unexpected yet meaningful outcome: an increase in students' enthusiasm for Kiswahili. Although academic gains were anticipated, the degree of learner engagement, especially in writing and speaking tasks, was remarkable. This suggests that

beyond improving competencies, technology creates a more stimulating and motivating classroom culture. However, it is essential to recognize that the study's focus on a specific subject and location limits generalizability. Future research should explore the long-term impacts of TEP across diverse regions, subjects, and learner populations. Investigating barriers such as teacher preparedness, infrastructure, and policy support will also be critical to ensuring sustainable and equitable technology integration in language education.

5.2 Impact of TEP towards Students' Academic Attitudes in Kiswahili Language

The quantitative results showed some variance in attitudes, with a subset of learners expressing **neutral or negative perceptions toward technology**. The qualitative findings in **Theme 4** explain this resistance: some learners expressed fear of technology (*"Some students are scared to use computers"*), while some teachers resisted pedagogical change (*"Some teachers still prefer chalk because they are used to it"*). This highlights an implementation gap. While tools such as **Kahoot and multimedia presentations** were shown to increase motivation and competence, their impact was limited where digital literacy and teacher readiness were low.

The study revealed that Technology-Enhanced Pedagogy (TEP) had a notable influence on students' academic attitudes towards learning Kiswahili. The integration of digital tools into classroom instruction created a more engaging and interactive learning environment that catered to students' diverse learning preferences. Multimedia content, including videos, interactive apps, and audio materials, made the learning process more enjoyable, relevant, and accessible, leading to increased confidence among learners. Students reported that lessons became more relatable and stimulating, transforming Kiswahili from a traditionally challenging subject into one perceived as exciting and achievable.

These findings align closely with **Social Productivity Theory (Vygotsky, 1978)**, which emphasizes that social interaction and collaborative engagement are central to cognitive development and learning. In the context of TEP, digital tools facilitated peer interaction, discussion, and collaborative problem-solving, allowing students to construct knowledge together rather than in isolation. For example, learners engaged in group activities using Kiswahili apps, shared digital storyboards, or peer-reviewed writing tasks. This social engagement not only enhanced comprehension and retention but also positively shaped students' attitudes, as they were more motivated to participate when learning was collaborative and interactive.

Moreover, the study observed that students who were initially less confident or had previously struggled with Kiswahili experienced the greatest attitudinal shift. This outcome illustrates Vygotsky's principle that **learning is socially mediated**: peers, teachers, and interactive tools act as scaffolds, supporting learners as they internalize new knowledge and build positive dispositions toward the subject. However, the study also noted that students with limited access to digital devices or low familiarity with technology were less able to benefit from these social interactions, highlighting the importance of equitable access for maximizing the attitudinal benefits of TEP.

In essence, TEP not only improved engagement and learning outcomes but also fostered positive attitudes toward Kiswahili by leveraging **socially mediated learning experiences**, confirming the relevance of Social Productivity Theory in understanding how peer interaction and collaborative digital learning influence students' academic attitudes.

The findings align with a growing body of literature emphasizing the role of technology in enhancing student motivation and engagement. For instance, **Nima and Dorji (2025)** highlighted

that the integration of interactive digital tools, such as the Nearpod platform, positively influenced students' motivation to learn and increased their participation in the learning process. Similarly, **Tan (2024)** demonstrated that factors like self-directed learning and online communication self-efficacy significantly influence students' motivation to learn and their engagement in online learning environments. In line with these findings, the current study demonstrates how the introduction of technology into Kiswahili instruction enriched the classroom experience, resulting in improved learner enthusiasm and emotional investment in the subject. The flexibility provided by digital platforms also enabled students to learn at their own pace and revisit complex concepts, which is particularly valuable in language learning contexts where repetition and contextual understanding are crucial.

Moreover, the study's outcomes resonate with the work of Haleem et al. (2022), who argue that personalized and interactive digital learning fosters stronger academic interest and motivation. Students in the experimental group benefited from various forms of multimedia that catered to visual, auditory, and kinesthetic learning styles. As a result, their overall attitudes toward Kiswahili improved, not just in terms of performance but also in emotional connection and willingness to participate in class activities. The data suggests that by diversifying instructional delivery, TEP helped bridge the gap between learners with different capabilities and preferences, encouraging more active participation and peer collaboration.

The notion of increased interactivity is further supported by Miima (2014), who emphasizes that digital tools introduce a level of flexibility and engagement rarely achieved through traditional methods. In this study, students were exposed to technology-driven activities such as collaborative projects, digital storytelling, and language-based simulations, which allowed

them to internalize linguistic concepts in more meaningful ways. These interactive approaches appeared to enhance students' sense of ownership over their learning process, fostering deeper engagement and more favorable attitudes toward language acquisition. The opportunity to apply Kiswahili in practical, real-world contexts through digital simulations and storytelling platforms helped make the subject more relevant, thereby enhancing learners' emotional and cognitive connection to the language.

Additionally, the study adds to the discourse on immersive learning, as highlighted by Shiyo (2023), who advocates for the use of interactive apps and virtual learning tools to create emotionally resonant and context-rich learning experiences. In the case of Kiswahili, technology-enabled exposure to real-life linguistic environments such as video dialogues, culturally grounded animations, and audio exercises likely contributed to a deeper appreciation of the language. These immersive experiences made learning not only more engaging but also culturally meaningful, which is essential for fostering positive attitudes in language education. Despite infrastructural limitations in some schools, the intervention demonstrated that even modest technological integration can yield substantial improvements in learners' perceptions and enthusiasm toward academic subjects.

Nevertheless, while the positive impacts of TEP are promising, the study also underscores the importance of teacher preparedness and resource availability. As noted by Shiyo (2023) and Miima (2014), the success of technology integration hinges on the competency and confidence of teachers in utilizing digital tools effectively. The success observed in Mbarara City is partly attributed to adequate teacher training and support provided during the intervention. To sustain

and scale such outcomes, it is critical to prioritize continuous professional development for educators, ensuring they are well-equipped to navigate the challenges of digital pedagogy.

5.3 Relationship Between Students' Attitude and Academic Competencies in Kiswahili Language

The survey results showed a significant association between positive attitudes toward Kiswahili and higher academic competence scores. The qualitative data deepens this by showing why students with positive attitudes achieved better outcomes. Under Theme 3, Positive Attitude Enhances Digital Learning, learners noted that platforms like Kahoot quizzes and Duolingo exercises encouraged experimentation and risk-taking with the language, while self-paced tools such as PowerPoint and recorded videos supported individualized learning. One participant remarked, "With a computer, I can learn at my own speed." This triangulates with the quantitative evidence, confirming that attitude mediates the effect of technology on competence: students who embraced digital learning were more likely to achieve higher scores.

The main findings of this study reveal a strong and positive relationship between students' attitudes and their academic competency in Kiswahili. Students with favorable attitudes exhibited higher proficiency in reading comprehension, writing, and speaking, driven by their motivation and engagement. This observation aligns with Education Productivity Theory (Walberg, 1981), which posits that learning outcomes are influenced by the quality of instructional inputs, learning processes, and student engagement. In this context, students' positive attitudes enhanced the effectiveness of technology-enhanced pedagogy (TEP), allowing instructional resources—such as multimedia content, interactive apps, and Kiswahili-based digital tools to yield higher academic returns.

Additionally, these findings reflect Social Productivity Theory (Vygotsky, 1978), which emphasizes that collaborative learning and peer interaction are essential for cognitive development. Students who engaged with peers through digital collaborative tasks such as group storytelling, peer feedback, and shared language games benefited from socially mediated learning, reinforcing their understanding and fostering positive attitudes toward Kiswahili. The combination of supportive instructional resources and social interaction created a conducive environment for both enhanced competencies and positive learner dispositions.

This study extends existing literature by providing empirical evidence specific to government-aided schools in Mbarara City, Uganda, where data on the link between attitude and performance in Kiswahili is limited. The findings underscore the urgency for interventions that cultivate positive learner attitudes, particularly in multilingual contexts where Kiswahili is learned as a second or third language. Prior research corroborates this trend: Juma and Atoni (2022) found that students in Vihiga County, Kenya, who demonstrated positive attitudes toward Kiswahili consistently outperformed peers with indifferent or negative attitudes. This supports the notion that attitudinal factors interact with instructional quality to determine learning outcomes, a relationship central to Education Productivity Theory (Walberg, 1981),toward Kiswahili consistently outperformed those with negative or indifferent views. What differentiates the present study, however, is its focus on the moderating effect of pedagogy particularly technology-enhanced instruction on this relationship. While Juma and Atoni emphasized gendered attitude trends, with female students showing stronger positivity, the current study reveals that although female learners exhibited slightly higher engagement, the gender difference in performance was not statistically significant. This suggests a need to re-examine how both attitude and instructional methods interact across gender lines.

Suter and Busienei (2013) emphasized the role of teacher attitudes in influencing learners' erceptions, particularly in the domain of oral literature in Kiswahili. Their study showed that :achers' disinterest directly discouraged student engagement, leading to lower performance. This nding aligns with the current study's suggestion that positive student attitudes alone may not be ıfficient unless matched by equally supportive pedagogical environments. The present study uilds on this by identifying technology-enhanced pedagogy as a potential enabler of such nvironments. It thus contributes to filling a gap in existing research by linking instructional ıethods to the attitude-performance relationship more explicitly.

While Atandi, Gisore, and Ntabo (2019) highlighted the preference among students for ıteractive learning methods over traditional lectures, By offering interactive learning experiences, igital tools not only improve engagement but also reinforce positive attitudes toward Kiswahili. his study, therefore, advances the conversation from pedagogical preference to pedagogical ffectiveness, bridging a crucial gap in the understanding of how teaching strategies shape :arners' attitudes and competencies.

The findings also resonate with studies on second language acquisition, such as those by hamber (1999) and Ombui (2012), who noted that positive attitudes are critical for success in :arning a second language. The present study, however, situates these theories in a localized gandan context, showing that despite Kiswahili's national and regional importance, learners' :titudes can still vary widely due to contextual factors such as school policy, access to resources, ıd language exposure. By doing so, this research bridges the gap between generalized theories of :cond language learning and their specific applicability in East African secondary education :ttings.

Although the present findings align with a range of earlier studies, they also expose several underexplored areas. Notably, few studies have empirically examined how technology moderates the link between attitude and performance in Kiswahili learning. Additionally, limited research has been conducted on attitude formation within multilingual classrooms where learners speak other dominant local languages. The present study fills some of these gaps by identifying pedagogical strategies and demographic patterns that influence outcomes. Future research should delve deeper into longitudinal impacts of tech-enhanced teaching and explore how socio-cultural variables interact with attitudes to shape language learning success. This will ensure more inclusive and responsive Kiswahili instruction across diverse educational landscapes.

5.4 Moderating effect of students' attitude on the relationship between technology-enhanced methods of teaching and academic competencies

The study demonstrated that students' attitudes significantly moderated the relationship between TEP and academic competencies. Learners with positive attitudes toward Kiswahili were more receptive to digital tools, engaged more actively, and achieved higher academic proficiency. Those with negative or indifferent attitudes benefited less from the same interventions.the integration of results shows that **technology enhances Kiswahili learning when accompanied by positive attitudes and supportive pedagogy**. Quantitative data confirms the statistical relationships, while qualitative evidence provides contextual meaning: digital tools such as **Duolingo, Kahoot, PowerPoint, and Kiswahili videos** fostered engagement, improved retention, and supported self-paced learning. However, resistance from both learners and teachers limited full adoption, explaining why not all students in the quantitative study demonstrated strong competence gains.

This finding aligns with the **Technology Acceptance Model (TAM) (Davis, 1989)**, which posits that perceived usefulness and perceived ease of use influence behavioral intention to adopt technology and, ultimately, actual performance outcomes. Students with favorable attitudes viewed TEP as valuable and manageable, resulting in greater engagement and improved competencies.

Moreover, **Baron & Kenny's Moderation Model (1986)** further clarifies this relationship by demonstrating that attitude functions as a moderator: the effectiveness of TEP on academic performance depends on students' dispositions toward the language and the technology. Integrating TAM with this moderation model highlights the need for interventions that enhance both positive attitudes and technological proficiency to maximize academic outcomes in Kiswahili.

The findings of this study demonstrate that **Technology-Enhanced Pedagogy (TEP)** significantly improves students' academic competencies in Kiswahili, including **reading, writing, speaking, and listening skills**. Digital tools such as multimedia videos, interactive applications, and audio resources created engaging, interactive learning environments that enhanced comprehension, retention, and language accuracy. Compared to traditional methods, which relied heavily on rote memorization, TEP promoted active learning, collaboration, and critical thinking, leading to more meaningful and lasting language acquisition.

A key insight from the study is the **moderating role of students' attitudes** toward Kiswahili. Positive attitudes amplified the effectiveness of TEP, with motivated and engaged learners achieving higher academic outcomes, while students with negative or indifferent attitudes benefited less. This underscores that technology alone is insufficient; its success depends on

learners' intrinsic motivation, engagement, and willingness to participate. Teacher facilitation also played a critical role in optimizing the benefits of technology-enhanced instruction, highlighting the interdependence of pedagogical innovation and learner disposition.

Overall, the study confirms that **successful integration of TEP requires both innovative teaching methods and strategies that foster positive learner attitudes**. Educational interventions should combine digital tools with supportive, interactive approaches that cultivate engagement and motivation. These findings provide practical guidance for improving Kiswahili instruction in secondary schools, particularly in resource-constrained settings, and emphasize the need for continued research on technology integration tailored to learner attitudes and contextual factors.

CONCLUSION AND RECOMMENDATIONS

6.1 Impact of TEP on Academic Competencies in Kiswahili Language among Secondary School Students

The study demonstrated that Technology-Enhanced Pedagogy (TEP) had a significant and positive impact on students' academic competencies in Kiswahili. Learners in the experimental group registered substantial gains in Academic Competency Scores (M = 180.3 to 272.8, +92.5 points, $p < .001$), compared to the modest improvement observed in the control group (M = 205.1 to 224.6, +19.5 points, $p = .016$). Similarly, test scores improved significantly in the experimental group (+7.9 percentage points, $p < .001$), while the control group showed no meaningful change (+0.1, $p = .582$). The Difference-in-Differences (DiD) analysis confirmed that these gains were attributable to TEP, with net effects of +73.0 points in academic competencies and +7.8 percentage points in test performance. These findings affirm that integrating technology into Kiswahili instruction enhances learners' mastery of academic competencies and fosters improved performance outcomes.

Conclusion 1: The integration of TEP substantially improved learners' academic competencies and test scores in Kiswahili, highlighting the central role of teachers as facilitators of technology-supported learning.

Recommendation 1: Professional development programs should be prioritized to build teachers' pedagogical and technological capacity. Training should emphasize the *pedagogical use of technology* rather than mere technical competence, ensuring that teachers can design and deliver

interactive and engaging lessons. The Ministry of Education and school administrators should institutionalize regular training to enhance teachers' readiness for technology-driven instruction.

Conclusion 2: Sustainable improvements in academic competencies require adequate technological infrastructure and supportive policies.

Recommendation 2: Policymakers should invest in affordable digital devices, reliable internet connectivity, and maintenance support, particularly in government-aided schools. Clear policy guidelines should also be developed to ensure equitable access to technology across urban and rural contexts, thereby sustaining and scaling up the benefits of TEP.

Conclusion 3: Learners with stronger parental and caregiver support appeared to benefit more from the intervention, indicating the role of the home environment in reinforcing school-based technology integration.

Recommendation 3: Schools should engage parents and communities through sensitization programs that highlight the value of TEP. Such initiatives would encourage parents to provide complementary support at home, including digital access and structured learning routines, thereby amplifying the effectiveness of classroom-based technology.

Conclusion 4: Although the study confirmed the potential of TEP to improve Kiswahili learning outcomes, its long-term sustainability and adaptability across other subjects remain untested. **Recommendation 4:** Further longitudinal research is needed to assess the lasting impact of TEP and its applicability to other subject areas. Continuous monitoring and evaluation frameworks should be established to track challenges, document learner progress, and identify best practices for scaling TEP across diverse educational contexts.

6.2 Impact of TEP on Students' Attitudes towards Kiswahili Language in Secondary Schools

For the experimental group (N = 79), the pre-intervention mean was 1.0 (SD = 5.9) and the post-intervention mean was 3.7 (SD = 7.0). The results showed a significant improvement in academic attitudes, $t(78) = 2.5$, $p = 0.013$. In contrast, for the control group (N = 79), the pre-intervention mean was 0.7 (SD = 5.8) and the post-intervention mean was 0.8 (SD = 4.3), with no significant change observed, $t(78) = 1.7$, $p = 0.095$. These findings indicate that TEP significantly improved students' academic attitudes toward Kiswahili.

Theme 1: Positive Attitudes toward Kiswahili Learning through Technology

Technology-enhanced pedagogy (TEP) significantly influenced students' attitudes toward learning Kiswahili in secondary schools across Mbarara City. The use of computers, projectors, and audio tools created a more engaging and interactive learning environment.

Subtheme 1: Increased Engagement and Motivation

Technology motivated students by making lessons interactive and relatable. A teacher from School 4 explained, *"From the time I started using computers and games, I have found it good because it is not time-consuming, and our students should use computers."* Likewise, a student (R19) noted, *"I feel very okay speaking Kiswahili, it has enabled me to communicate easily with the community."* These insights highlight how technology increases motivation by connecting classroom learning to real-life contexts.

Subtheme 2: Enhanced Language Confidence and Participation

Students exhibited increased confidence when using digital tools that encouraged exploratory learning and communication skills. A teacher at School 3 noted, *"Students enjoy listening to audio clips, speeches, and news reports; they become more attentive."* Similarly, a student (R14) remarked, *"I came to this school without knowing how to greet, but now I feel confident speaking Kiswahili."* These statements confirm that technology reduces fear of mistakes, thereby encouraging participation and active learning.

Theme 2: Challenges and Adaptation in Technology-Enhanced Pedagogy

While TEP yielded significant benefits, some challenges emerged, including adaptation to digital tools and access constraints. Nonetheless, students demonstrated resilience in embracing the new learning modes.

Conclusion

The results clearly demonstrate that TEP has a **positive and significant impact** on students' academic attitudes toward Kiswahili. The integration of multimedia tools, interactive learning resources, and digital platforms fostered a stimulating learning environment that enhanced student motivation, confidence, and engagement. These findings provide evidence that technology can shift students' perceptions of Kiswahili, a subject often perceived as difficult, into a more approachable and enjoyable learning experience.

More broadly, the findings imply that technology is not just an instructional aid but also a catalyst for attitudinal change and improved language competence. By embracing digital tools, teachers can create student-centered, interactive classrooms that foster enthusiasm for Kiswahili

nd other subjects. Future studies should further explore which technological strategies yield the ıost effective results, ensuring scalability and sustainability of such interventions in diverse :hool contexts.

‹ecommendations

'olicy and Curriculum Integration:

The Ministry of Education and curriculum developers should mainstream technology-nhanced approaches in Kiswahili instruction to ensure learner-centered, engaging, and ompetency-based pedagogy.

'eacher Training and Professional Development:

Schools and education authorities should provide continuous professional development to quip teachers with digital literacy skills and pedagogical strategies for effectively using ıultimedia tools in Kiswahili teaching.

‹esource Allocation:

Government and school administrations should invest in adequate infrastructure, such as omputers, projectors, audio-visual equipment, and stable internet, to support technology-nhanced learning in both urban and rural schools.

Student-Centered Learning Approaches:

Teachers should integrate digital resources (e.g., audio clips, games, news reports) to build students' language confidence and encourage active participation in Kiswahili learning.

Further Research

Future studies should examine the long-term effects of TEP on language acquisition and academic achievement, as well as compare the effectiveness of different technological tools in enhancing student attitudes.

6.3 Relationship Between Students' Attitude and Academic Competencies in Kiswahili Language

The study established a strong and statistically significant relationship between students' attitudes toward Kiswahili and their academic competencies. Students with a positive attitude were significantly more likely to achieve high competency, with an unadjusted odds ratio of 3.5 (95% CI: 1.8–6.7, $p < 0.001$) and an adjusted odds ratio of 6.0 (95% CI: 2.3–15.9, $p < 0.001$) after controlling for socio-demographic and baseline variables. This indicates that a positive attitude independently predicts higher academic achievement in Kiswahili.

Qualitative findings further reinforced this relationship. Students with positive attitudes were more engaged, actively participated in class activities, and demonstrated confidence in using Kiswahili, while those with negative attitudes were less confident and less motivated. Additionally, motivation linked to career aspirations (e.g., pursuing journalism) emerged as a factor influencing engagement and competency. Overall, the results confirm that students' attitudes are a key

determinant of academic performance, highlighting the importance of fostering positive dispositions toward learning Kiswahili.

Recommendations

Promote Positive Learning Attitudes:

Teachers should implement strategies that cultivate positive attitudes toward Kiswahili, including interactive learning, real-life applications, and encouragement of active participation. Class activities that make Kiswahili relevant to students' lives and career goals can enhance motivation and engagement.

Integrate Technology-Enhanced Pedagogy (TEP):

Given the strong link between attitude and competency, schools should continue using technology-based instructional approaches, such as multimedia tools, audio recordings, and interactive platforms, which have been shown to boost both attitudes and academic performance.

Parental and Community Engagement:

Schools should sensitize parents and communities about the importance of fostering positive attitudes toward Kiswahili. Support at home—such as encouraging practice, valuing language learning, and providing resources—can reinforce positive classroom experiences.

Career-Oriented Motivation:

Teachers and career counselors should connect Kiswahili learning to students' future career aspirations, showing how language proficiency can open opportunities in journalism,

diplomacy, education, and other fields. This approach can strengthen intrinsic motivation and academic engagement.

Further Research:

Future studies should explore interventions specifically designed to improve students' attitudes toward Kiswahili and measure their long-term effects on competency. Research could also examine whether these findings generalize across other subjects and different educational contexts.

6.4 Moderating Effect of Student's Attitude on the Relationship Between technology-enhanced pedagogy and Academic Competencies

The analysis shows that students' attitudes significantly shape the outcomes of TEP. In the experimental group, learners with negative attitudes toward TEP scored, on average, 59.2 points lower than their counterparts in the control group ($p = 0.001$), suggesting that without a positive disposition toward technology-enhanced learning, the intervention may not only fail to improve competency but could even adversely affect performance. Conversely, positive attitudes toward TEP were associated with an improvement of 26.8 points in academic scores relative to students with negative attitudes in the experimental group (interaction effect, $p = 0.05$). Although marginally significant, this result indicates that a positive attitude enhances the efficacy of TEP, enabling students to gain more from technology-supported instruction.

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disposition toward technology-enhanced learning, the intervention may not only fail to improve competency but could even adversely affect performance. Conversely, positive attitudes toward TEP were associated with an improvement of 26.8 points in academic scores relative to students with negative attitudes in the experimental group (interaction effect, $p = 0.05$). Although marginally significant, this result indicates that a positive attitude enhances the efficacy of TEP, enabling students to gain more from technology-supported instruction.

The study demonstrates that students' attitudes toward Technology-Enhanced Pedagogy (TEP) play a critical moderating role in determining academic outcomes in Kiswahili. While TEP generally improves competencies, learners with negative attitudes toward technology-based instruction performed significantly worse than their peers in traditional classrooms, highlighting that TEP alone is insufficient without learner receptivity. Conversely, students with positive attitudes benefited substantially from TEP, showing improved academic performance compared to those with negative attitudes.

Qualitative findings corroborate this moderation effect. Students and teachers reported that traditional teaching methods, particularly chalk-and-talk, were less engaging and encouraged rote memorization, limiting active participation. Conversely, TEP, through multimedia, digital writing tools, and interactive exercises, enhanced learning outcomes, improved retention, and allowed for self-paced practice. Positive attitudes enabled students to experiment with language and actively engage with digital tools, while resistance or fear of technology hindered adoption and learning.

Together, these results highlight that students' attitudes are critical for maximizing the benefits of technology-based instruction. TEP is most effective when learners are motivated,

Teacher Training on Attitude-Sensitive Pedagogy:

Professional development programs should equip teachers with skills to identify negative attitudes, address learner resistance, and design TEP activities that are both accessible and motivating.

Parental and Community Involvement:

Schools should involve parents and guardians in promoting supportive attitudes toward technology in learning. Awareness campaigns can help families understand the benefits of TEP, encouraging complementary support at home.

Future Research:

Longitudinal studies should investigate how students' attitudes toward TEP evolve over time and whether interventions aimed at improving attitudes can sustain or enhance academic performance in Kiswahili and other subjects.

6.5 Limitations of the Study

This study primarily relied on self-reported data from students through questionnaires and focus group discussions, which introduced response bias. Participants provided socially desirable answers, especially regarding their attitudes toward Kiswahili and technology use, which affected the authenticity and accuracy of the findings. Moreover, the subjective nature of attitude measurement did not fully capture the complex nuances of learners' true perceptions and experiences especially those in the control group.

Secondly, the intervention was implemented over a relatively short period, which did not allow sufficient time to observe the long-term effects of technology-enhanced pedagogy on academic competencies. Some pedagogical impacts, such as changes in learning habits or deeper language proficiency, require sustained engagement and extended observation for a long period of time beyond the study period. This time limitation constrained the depth of observable outcomes related to both academic performance and attitude shifts.

Finally, the study was limited to government secondary schools within Mbarara City, which affected the generalizability of the results. Differences in resources, teacher capacity, and student demographics between rural and urban or private schools were not captured, potentially narrowing the applicability of the findings. Future studies could expand the sample scope and duration, and consider integrating mixed methods such as classroom observations and performance tracking to strengthen the robustness and applicability of the results.

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APPENDICES

Appendix 1: Questionnaire for Students of Kiswahili Language

Dear respondent,

I am Emilly Arishaba a PhD student at Mbarara University of Science and Technology carrying out research about technology-enhanced pedagogy, students' attitude, and academic competencies in Kiswahili language among secondary school students in Mbarara City, South-western Uganda. The objective of this study is to get your opinion(s) on how you feel about technology-enhanced pedagogy, students' attitudes, and academic competencies in Kiswahili language among secondary school students.

Kindly respond to the following questions faithfully and honestly, and your opinions will be treated with utmost confidentiality.

Section A: Demographic Characteristics

1. Sex ☐ Female ☐ Male
2. Age (complete years) ☐ 15 ☐ 16 ☐ 17 ☐ 18 and above
3. Class of study ☐ S3
4. District of residence ☐ Rural ☐ Urban
5. What is your religion? ☐ Catholic ☐ Protestant ☐ Muslim ☐ Pentecostal ☐ Seventh-day Adventist ☐ Other .....
6. To which ethnic group do you belong? ☐ Munyankole ☐ Other .....
7. Any living biological parents ☐ Father and mother ☐ Father only ☐ Mother only ☐ None
8. What is your primary caregiver? ☐ My parent(s) ☐Others .....
9. Means of transport to school ☐ Walking ☐ Bicycle ☐ Motorcycle ☐ Car ☐ Others .....
10. Number of close friends ☐ 0 – 2 ☐ 3 – 4 ☐ 5 – 6 ☐ 7 and above
11. Nature of schooling ☐ Day ☐ Boarding

Section B: Language Learning Attitudes

Fill out the following questionnaire, ticking the box indicating whether you tend to agree or to disagree with the statement. This is for yourself, so answer as honestly as you can

#	Statement	Agree	Disagree
1	I think I'm a good pretty Kiswahili language learner		
2	I find it easy "to put myself in other people's shoes and imagine how they feel"		
3	I feel a resistance from within in when I try to speak Kiswahili language even if I have practiced		
4	You have to understand Kiswahili people culture and value system before you can be really sure whether some actions are right or wrong		
5	I want to learn the language of the community where I'll live so that I can fit in and participate in the life of the community as much as possible		
6	I kind of enjoy figuring things about as I go a long and always being ready to throw away my old ideas or to modify my model of how things work		
7	I find it hard to make Kiswahili conversation even with people who speak my own language much less another one		
8	I'd call myself a risk-taker, at least when not in dangerous or life - threatening situations.		
9	I think I need to learn Kiswahili language to do my job well.		
10	As long as I can accomplish goals that are important to me, using Kiswahili language I already know, I think it would be a waste of my time to spend a year or more learning yet another language		
11	I don't worry a lot about making Kiswahili gramma mistakes. I just go for it		
12	Learning Kiswahili language may be important to me but I expect it to be really hard.		
13	It annoys me when people don't give me a clear-cut answer, but just beat around the bush		
14	It would be nice to learn Kiswahili language, but fortunately most of the world learn English as a second language, so I don't really need to learn another language well		
15	I know I'll get something wrong and that people probably laugh but that doesn't really bother me much		
16	I think it is more important to be accurate than speak quickly		
17	I don't mind being up in front of people speaking or performing		

18	There is a right and a wrong way to do almost everything and I need to figure out which is which and do it right.		
19	I like to mimic other accents, and people say I do it well		
20	My language learning aptitude is probably pretty high.		
21	I see many issues in shades of gray. When I have to make up my mind about something and act on it I do so, but I often have a nagging question left in my mind about my choice.		
22	I think that I could learn pretty much any language I really put my mind to, given the right circumstances		
23	Speaking the language of the community where I'll be living will let me help people more than I could otherwise.		
24	I can do impersonation of famous people well even if I would never make it on stage		
25	In school, if I didn't know for sure, I'd sometimes answer out loud in class anyway		
26	I end up trembling and practically in a cold sweat when I have to talk in front of people.		
27	I often think out loud, trying out my ideas on other people		
28	I think I sound weird if I try to put on an accent and sound like somebody else		
29	You sound say "yes" straight out if you mean yes and "no "if yes mean no. Not to do so is dishonest		
30	I would find it hard to be an actor and become convincing in a role different from myself		
31	I took a foreign language in school but didn't do well, so I think I just don't have a gift in that area		
32	I don't have a clue about how to learn language		
33	Iam who I am can't be like anybody else and don't particularly want to try to act as though I could		
34	When playing a game, I tend to be more conservative and try not to lose rather than take a big risk in order to try to win		
35	I want to have everything worked out in my own head before I answer.		
36	The important thing is to be able to get idea across to another person in Kiswahili language, it doesn't really matter if I learn their language if they know mine.		

Scoring your Attitudes

Go back to the questionnaire and in each box you checked, write 1 if you agreed and –1 if you disagreed for the following questions:

Numbers 1 – 9	Agree +1	Disagree -1
Numbers 10 – 18	Agree -1	Disagree +1
Numbers 19 – 27	Agree +1	Disagree -1
Numbers 28 – 26	Agree -1	Disagree +1

Now copy the value you just wrote for each question into the columns below and add up the total for each column. That is your score for each factor.

Self-image	**Inhibition**	**Risk-taking**	**Ego permeability**	**Motivation**	**Ambiguity**
1.	3.	8.	2.	5.	4.
12.	7.	16.	19.	9.	6.
20.	11.	25.	24.	10.	13.
22.	15.	27.	28.	14.	18.
31.	17.	34.	30.	23.	21.
32.	26.	35.	33.	36.	29.
Total	Total	Total	Total	Total	Total

A positive total number shows that your answers indicated that you possess this trait or attitude. A negative total number shows your answers indicate a lack of this trait. The relative strength of the attitude is shown by the range of numbers, as follows.

+6	**+5**	**+4**	**+3**	**+2**	**+1**	**-1**	**-2**	**-3**	**-4**	**-5**	**-6**
Strongly hold		Moderately hold		Slightly hold		Slightly lack		Moderately lack		Strongly lack	

Note: A negative score for an attitude is not necessarily correlated with negative effect on your language learning. A strong positive score for Inhibition, for instance, is generally thought to be more problematical than a negative score. On the following pages each of these factors is discussed in detail.

Section C: Academic Competency

Reading and Language Comprehension Skills	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
1.I understand what I read in Kiswahili comprehensions					
2.I try to read unfamiliar words by sounding out each of the letters separately to myself in Kiswahili Language					
3.I know the meaning of many Kiswahili vocabulary words					
4.I identify the main idea of what I am reading in Kiswahili					
5.I read at a steady pace especially after Kiswahili audial have been played					
6.I correctly spell Kiswahili words well without assistance					
7.I use punctuation (period, commas, question marks etc.) in Kiswahili correctly					
8.I use Kiswahili grammar (verb tense, noun-verb agreement, etc.) correctly					
9.Other people understand what I write in Kiswahili Language					
10.Other people understand what I mean when I speak in Kiswahili					
11.I learn from what I read in Kiswahili Language					
Writing Skills					
1.I write Kiswahili words and sentences correctly					
2.I write Kiswahili letters and interpret it correctly					
3.I recognize and write similarities between verbs and adverbs					
4.I correctly solve Kiswahili spelling errors in my head					
5.I use my Kiswahili writing skills in my day-to-day life					
6.I reorganize difficult Kiswahili jumbled story into simple and organized steps to make a meaningful story					
7.I know which rules to use to write Kiswahili texts					
Listening Skills					
1.I understand how learning something new in Kiswahili fits with what I already know					
2.I learn from watching or listening Kiswahili words to know what happens around me					
3.I compare similarities or differences among Kiswahili things or ideas					
4. I organize objects or ideas into meaning write ups like Kiswahili articles.					

5.I use what I already know to solve new problems					
6.I identify mistakes in information					
7.I can list reasons for or against an opinion					
8.I identify patterns from information					
9.I examine both sides of an argument					
10.I explore problems or issues					
11.I develop good solutions to problems					
12.I test hypotheses					
Interpersonal Skills					
1.I follow classroom rules					
2.I am able to correct my behavior when my teacher asks					
3.I tell people when I am unhappy about something					
4.I listen to suggestions from my teacher					
5.I work well in large groups of students					
6.I get along well with other adults in the classroom					
7.I listen to what others have to say					
8.I get along with people who are different from me					
9.I work effectively in small groups of students					
10 .I get along well with other students in my class					
Engagement Skills					
1.I ask questions about tests or projects					
2.I participate in Kiswahili class discussions					
3.I volunteer an answer when I think I am right					
4.I am a leader in my Kiswahili class					
5.I volunteer to read in Kiswahili language aloud in class					
6.I start Kiswahili conversations with my classmates					
7.I ask Kiswahili questions when I am confused					
8.I share my ideas when my teacher calls on me					
Motivation skills					
1.I like to learn about Kiswahili new vocabulary					
2.I like Kiswahili assignments that challenge me					
3.I try to produce good work in Kiswahili Language					
4.I try to improve my work with each Kiswahili assignment					
5.I try my hardest on everything I do in school					
6.I look for ways to challenge myself in school					
7.I hold myself responsible for my own learning					
8.I set goals for myself in my classes					
9.I stay on Kiswahili tasks when doing schoolwork					
Study Skills					
1.I complete my Kiswahili homework					
2.I correct my own work without being asked					
3.I turn in my class work on time					

4.I take notes in class					
5.I review my class materials					
6.I turn in my homework on time					
7.I take care of my materials (Kiswahili books, desk(s), and locker)					
8.I follow directions on Kiswahili assignments					
9.I study for Kiswahili competency tests					
10.I prepare for class					
11. I pay attention in class					

Appendix 2: Kiswahili Language Test

A comprehensive standardized Kiswahili Language Test covering aspects of writing, reading, grammar, and comprehension.

MTIHANI WA KIDATO CHA TATU

KARATASI YA KWAZA (P/336/1)

MUDA; WA SAA moja. (1 hour)

Maagizo: Jibu maswali yote.

SEHEMU A (SECTION A)

2 Ya some taarifa ifuatayo na baadaye ujibu maswali yatakayofuata.

Madawa ya kulevya ni hatari sana katika maisha ya binadamu. haya yanathari maisha ya watu wanaoyatumia na wasioyatumia.Kila sehemu unakokwenda, kila jamii yaelekea kupiga marufuku matumizi ya madawa haya yakubaliwe nawale wanaoyataka wayatumie.

Maswali.

(a) Je wewe umewahi kuona madawa yoyote ya kulevya?

(b) Unaweza kukumbuka aina ya watu wowote wanao tumia madawa haya?

(c) Jaribu kufikiria mifano ya madawa yakulevya unoajua katika jamii yako andika chini hapo?

(d) Jadili matatizo yanayopatikana kutokana na kutumia madawa haya.

(e) (i) Pendekeza kichwa cha habari,

3 (a) Tunga sentensi tano ukitumia msamiati wa madawa ya kulevya unao yaojua.

(i)

(ii)

(iii)

(iv)

(v)

(b) **picha zinazo onyesha madawa yakulevya.**

illustration-drug-abusing-concept-poster-templete

1,Tambua picha hizo kwa makina na badaye utamuke sentensi kumi kwa kutumia maneno haya(oral test)

Miraa

Bangi

Sigara

Kuba

Shisha

Kokeini

Marijuana.

Heroine

Ugoro

Tumbako.

3 Sikiriza mazungumuzo baina ya daktari na mlevi katika hospitarini badaye u jibu maswali yatako ulizwa.(listening test with an audio)

Mhasiriwa; Hujambo daktari

Daktari; Sijambo.hebu nikusaidie namna gani

Mhasiriwa; Mwili wangu unaumwa, umedhoofika,sina ladha yakukula chakula,meno yangu yote yameoza ,namengine yametolea kwasababu yamapigano nawatu

Dktari; Nakuona hata macho yako ni mekundu,huna damu mwilini,mikono na miguu yako imevimba.Unafikiri kwa nini afya yako imedhoofika?

Mhasiriwa; Hujui nime vuta bangi na sigara vya kutosha,gundi nimeinusa,miraa natafuna kama mbuzi kaanzia asubuhi mpaka jioni.

Daktari; Subiri kwanza. Umekuwa mraibu wa hivyo vyote.

Mhasiriwa; Ndiyo daktari, Hata mke wangu amenitoroka.Anasema kuwa ninatumia dawa za kulala sana kama maiti

Daktari; Sasa familia yako imekutoroka

Mhasiriwa; Ndiyo daktari

Daktari Haya twende kwe wodi upate dawa yakupumzika.

Mhasiriwa; Ahsante Daktari.

Maswali kuhusu mazungumzo

1 Ni nini kicwa cha mahojiano

2 Mazungumzo ni baina ya na nani na nani

3 Mugonja ana taka daktari amusaidie na nini

4 Kwanini mke wa mhasiriwa ali enda zake

5 Ni madawa yapi yaliyo sababisha ugonjwa wa muhasiriwa.

Mwisho.

Appendix 3: Teaching Menu for Kiswahili Academic Competencies

The activities involved in teaching Kiswahili took place for eight weeks using TEP, focusing on the use of computers. For each week there was one lesson for 80 minutes, where the last week was dedicated for assessment. The key benefits of using technology-enhanced pedagogy, especially computers in Kiswahili instruction, are:

1. **Interactivity**: Engages students with interactive content and allows for instant feedback.
2. **Flexibility**: Provides opportunities for self-paced learning, especially with grammar exercises and vocabulary building.
3. **Collaboration**: Online tools allow for peer-to-peer interaction and feedback, enhancing speaking and writing skills.

The main objective was to develop and enhance Kiswahili academic competencies using computer-based learning tools. This focused on improving students' reading comprehension, writing, grammar, listening, and speaking skills.

Lesson 1: Introduction to Kiswahili and Computer-Aided Language Learning

Objective: Introduce students to Kiswahili learning with a focus on how to use computers effectively.

Computer Tools: Microsoft Word, PowerPoint, and Google Classroom.

Activities:

- PowerPoint presentation on the structure of the Kiswahili language.
- Students use Google Classroom to access course content and assignments.

Lesson 2: Reading Comprehension Using E-Books

Objective: Improve students' reading comprehension through digital reading materials.

Computer Tools: Adobe Acrobat Reader (for PDFs), Google Books, Kindle for PC, YouTube.

Activities:

- Assign a Kiswahili short story or article in PDF form.
- Students read the text on their computers and highlight unfamiliar words.
- Use Google Docs to discuss reading comprehension questions and annotate the text.

Lesson 3: Enhancing Listening Skills Using Audio Resources

Objective: Develop listening skills through Kiswahili audio lessons.

Computer Tools: VLC Media Player, Audacity, YouTube.

Activity:

- Play Kiswahili podcasts or radio recordings (available on platforms like YouTube).
- Students listen to selected audio and use Audacity to replay sections and slow down speech for better understanding.
- Comprehension questions are answered in Google Forms.

Lesson 4: Speaking Skills Using Speech-to-Text Tools

Objective: Enhance speaking proficiency using speech-recognition software.

Computer tools: Google Docs (voice typing feature), voice recorders, and group discussions.

Activities:

- Students record themselves speaking Kiswahili using a voice recorder app or computer mic.
- Use Google Docs' Voice Typing feature to convert speech into text, allowing students to review their spoken language accuracy.

Lesson 5: Grammar Practice Through Interactive Software

Objective: Improve understanding of Kiswahili grammar using computer-based drills.

Computer Tools: Duolingo for Schools, BBC Languages, Grammarly (for spelling and grammar checks).

Activity:

- Use Duolingo for daily Kiswahili grammar exercises. Track student progress and create custom quizzes.
- Students complete interactive quizzes on Kiswahili verb conjugation and sentence structure using BBC languages or similar websites.
- Peer review of grammar using Grammarly to check Kiswahili sentence correctness and give feedback in the Classroom.

Lesson 6: Vocabulary Development Using Flashcards

Objective: Build and enhance Kiswahili vocabulary.

Computer Tools: **Quizlet, Memrise** (desktop versions).

Activity:

- Students create and share digital flashcards of new Kiswahili vocabulary on Quizlet.
- Pair/group activities with vocabulary games on Memorise.
- Track vocabulary acquisition progress with PowerPoint presentations.

Lesson 7: Writing Essays and Text-Based Assignments

Objective: Improve Kiswahili writing skills through essay writing.

Computer Tools: Microsoft Word, Google Docs, Grammarly.

Activity:

- Students write a Kiswahili essay (250-500 words) on a given topic using Microsoft Word.
- Use Grammarly to check grammar and spelling mistakes.
- Students peer review each other's essays in Google Docs, providing feedback.

Lesson 8: Assessment and Feedback

Objective: Assess students' progress across the four language competencies.

Computer Tools: Google Forms, Kahoot, Google Classroom.

Activity:

- Create a comprehensive Kiswahili assessment (multiple choice, short answer, and listening sections) using Google Forms.
- Use Kahoot for a live class quiz on grammar and vocabulary.
- Provide feedback on students' performance through Google Classroom.

Final Remarks

This menu integrates technology-enhanced pedagogy, especially computers as a central tool in teaching Kiswahili language competencies, promoting digital literacy while enhancing language skills. Students will benefit from exposure to real-world applications of Kiswahili through technology, while instructors will have access to a wide range of tools for assessment and feedback.

Appendix 3: Teaching menu for Technology-enhanced pedagogy

Teaching guide for teachers in the experimental group on how to teach using technology-enhanced pedagogy.

YouTube videos

How it works

- The teacher down load videos showing all the vocabulary concerning drug abuses. Like 'miraa. bangi, sigara, tumbako, kokeini. kuba, heroin, shisha, ugoro dawa za usingizi, dawa za kusisimua' and also show to students pictures of people taking these drugs.
- The teacher down loads a video showing negative effects of the drugs.it stimulate learner's feelings and in a drama session they start acting it.
- When it comes to speaking Kiswahili, YouTube videos can provide the proper intonations in Kiswahili Language.
- Students observe and imitate how a native speaker speaks.
- The students can practice their intonation through YouTube by pausing the video or turning the sound down.

Usefulness of the method

- Engages all students in their learning categories like in conversation, reading and writing, in drama and also in critical thinking.
- These video plays helps to learn more vocabulary with the help of pictures.
- It improves pronunciations especially for Kiswahili words like the native speakers
- It enhances intonation especially when the students observe and imitate how native speakers pronounce Kiswahili phrases.
- Refines fluency by promoting comprehension fostering autonomy.

PowerPoint presentations on the PC

How it works

- Create presentations from scratch or templet.
- Add text, images, art, and videos
- Add transition, animation, and cinematic motion

- Add transition, animation, and cinematic motion
- Save to one drive, to get to your computer.
- Through projection of color, images, and video mode; sound and music for the auditory mode.
- The teacher prepares a presentation on a topic showing a Kiswahili conversation between a doctor and patient who got psychological illness after abusing the drugs for long.
- On a power point presentation and, the teacher projects it to the students seated in a class room. The students sees these presentations on a topic of Kiswahili conversations. This helps students to learn in a fun way. Later on they can make drama out of the dialogue

Usefulness of the method

- Engages all students in in multiple learning styles.
- Increasing visual impact.
- Improving students focus on the writing skills, speaking, vocabulary and grammar through presentations.

Audio recordings

How it works

- The teacher can down load song files and music videos for teaching Kiswahili vocabulary., records them stores them a CD or flash disc then later puts them in a computer for the students to listen and see.
- The teacher can record audios made by students using CD prayer for example students involved in a Kiswahili dialogue. Or singing a Kiswahili poem and later on presents them to students.
- The teacher can also download Kiswahili books played on a CD player or downloaded to the laptop or on the MP3 player. And shows to the students and they later on they read for themselves the text after seeing them on the laptop.
- The teacher can also down load audios for Kiswahili texts about the topic especially a topic in book three, 'Kiswahili kwa shule za sekondari Kitabu cha mwanafunzi. Shairi (poem) learner's listens to poem, they imitate the poem and read after a recording has been played.

- The teacher can create interactive learning materials with images, using video clips of Kiswahili poems. And using the PC shows students.
- The teacher has to make sure the sound quality is ok for every learner, use clear and concise Kiswahili sentences and then lastly be aware of the visual quality.
- The teacher can use dictation assignments.
- Students can listen to the recordings several times on their own pace and write down the right spelling of the words in it.
- As a teacher; you can record a dictation exercise in a minute, and students practice.
- Listening assignments teachers can record their voice instantly to create a listening exercise.you can add interactive questions of all kinds.
- Improve pronounciaton.as a teacher you can you the voice recording function the recorder your voice and teach your students pronunciations the right way.
- A Teacher can use flash cards so students can also add audio with the right pronunciations of the words that students have to learn
- Story-telling, you can create a fun setting, and make a story out of your assignment. Students will be more motivated when th instruction or assignments come with a story that occurs in their own living environment.
- Give good examples using a voice recording to assignments, so students know what is expected of them and can start working without worrying if they are right or wrong.

Usefulness of the method

- When students are able to hear and understand lessons clearly, they are more likely to remember the information later on.
- This is because audio can provide important cues that help reinforce memory, such as tone of, inflection, and emphasis.
- Students develop listening and critical thinking skills better. Since audio- visual materials combine both seeing and listening.
- Audio recordings can provide different models of spoken Kiswahili.
- Using audio recordings also adds variety to lessons, and some students will enjoy being in a class that uses technology enhanced pedagogy.

- It enhances the critical thinking skills and the listening skills.
- Through pronunciations students develop speaking skills with right tones and words
- Students get motivated and engage.

Now read a case study about a teacher who uses audio recordings of Kiswahili in the classroom.

Ms. Vumilia loves Kiswahili, and always tries to improve her Kiswahil abilities. whenever she can, she reads Kiswahili books and magazines, and she watches Kiswahili TV programs and moves. She knows that she learns a lot through listening to programs and watching movies. She has learned Kiswahili words and phrases, her pronunciation has improved, and she can understand people from Kiswahili speaking countries better. She believes that it is important for students of Kiswahili language to listen to as much of that language as possible, from as many different people as possible.

On my mobile phone I take a recording of a Kiswahili news topic in class. With the use portable speakers that I can use for audio recordings, so that all students can hear. Before I play the recording, I plug the so speaker wires into my mobile phone. That way the volume is loud enough for the whole class to hear.

Before I play the recording of the news, I ask my students what the latest news i.e. ask them this news in Kiswahili but allow them to reply in any language they feel comfortable using while talking. Not many of them listen to the news in English. But this activity gets them thinking about the topic of the news. I can then introduce them to some new words that appear in the news items. This prepares them for the recording they are going to listen to. For example, I might say something like; (Now you are going to listen to some news items. For the moment, just listen and write down how many news items you hear. Don't worry if you can't understand every word! That's completely normal .I`m going to play the recording more than once.)

I then play the audio recording. I know that it is difficult to listen to a lot of English at one time, so I keep it short. I play just three or four items and play them twice, I say ;(Now work in pairs.

Compare how many news items you heard. Was it two? Three? Four? Five? Then write down the topic of each news items you heard.)

I ask the students to work in pairs, because that way all students get a chance to think and talk about what they heard. If I ask student one by one, only a few members of the class will participate. I give my students a few minutes to discuss and write down what they heard. Then I ask them to say how many news items they heard, and to say in English what each one was about I try to get them to speak English, but I really want to know if they have understood the general meaning of the recordings. So if they don't reply in Kiswahili, I ask them in their home language what they have understood.

New words

One was about the rupee, am not sure what they said

The last story was about the president of Tanzania, he went to Kenya

There were three news items

One was about the floods.

Once I knew the students understood what the news items were about, I wanted them to listen out for more information about each news item.

So I played the recording again. Before I played it, I asked my students some questions about each news item. I played the recording, and this time my students tried to listen out for the answers to my questions. After playing the recording, I gave the students two or three minutes to discuss the answers to the questions I asked in pairs. Then I asked them to answer the questions. Sometimes I asked them to answer the questions and play recording again. At the end of the lesson, I played the recording again. By this time, the student understood much more of the recordings.

I now do this activity regularly in my classes, about once a week. It is quite simple to do as I can follow the same procedure with all news item, so don't have to prepare much before the classes. My students are getting better at listening to English, and they are learning many new words and phrases. They are also feeling much more confident about listening to and using Kiswahili, and they are preparing for work or study in the future.

Appendix 5: Interview guide for Teachers of Kiswahili Language - Intervention group

1. In your opinion, describe the extent to which students' attitudes impact on academic competencies in Kiswahili language in this secondary school [mention name of school]
2. In your view, describe the extent to which technology- enhanced pedagogy impacts on academic competencies in Kiswahili language in this secondary school [mention name of school]
3. What was the effect of technology- enhanced pedagogy on the relationship between students' attitude and academic competencies in teaching Kiswahili language in this secondary school [mention name of school]?
4. In your opinion, what are your suggestions (if any) for the areas of improvement for the contribution of technology- enhanced pedagogy on the relationship between students' attitude and academic competencies in teaching of Kiswahili language [mention name of school]?

Appendix 4: Consent Form

MBARARA UNIVERSITY OF SCIENCE AND TECHNOLOGY
RESEARCH ETHICS COMMITTEE
P.O. Box 1410 Mbarara, Tel: +256-48-543-3795,
Fax: +256-48542-0782
E-mail: irc@must.ac.ug, mustirb@gmail.com

INFORMED CONSENT FORM

This document outlines the research study and expectations for potential participants. It should be written in layman terms and typed on MUST-REC letterhead.

Instructions

1. *The wording of this document should be directed to the potential participant not MUST-REC.*
2. *If a technical term must be used, then define it the first time it is used and any acronyms or abbreviations used should be spelled out the first time they are used.*
3. *All the sections of this document must be completed without any editing or deletions.*
4. *Please use a typing font that is easily distinguishable from the questions of this form. Preferably the font size should be 12.*

Study title *– This should be the same as on all other documents related to the study.*

Learner's attitude, Technology-enhanced pedagogy, and Academic Competences in Kiswahili **Language among Government-aided Secondary School students of Mbarara City. A Quasi Experimental Study**

Principal Investigator(s)

Arishaba Emilly.

Leave blank for REC office MUST-REC Stamp	**REC OFFICE USE ONLY:** APPROVAL DATE: 20/03/2024 APPROVED CONSENT IRB VERSION NUMBER: 2024-03- PI NAME: Arishaba Emilly IRB NO: MUST-2023-1316

Introduction

What you should know about this study:

1. *You are being asked to join a research study.*
2. *This consent form explains the research study and your part in the study.*
3. *Please read it carefully and take as much time as you need.*
4. *You are a volunteer. You can choose not to take part and if you join, you may quit at any time. There will be no penalty if you decide to quit the study.*

Brief background to the study

There are limited academic competences, due to poor teaching methods and learners attitude in most subjects, like in Kiswahili language, however the Government of Uganda has tried to do everything possible to promote Kiswahili language by posting teachers of Kiswahili countrywide, providing instructional materials to all schools, retooled Kiswahili teachers on the use of instructional pedagogies, and made Kiswahili language compulsory in schools, but still the development of Kiswahili academic competences remain law.

Despite the urgency of academic competences, no known study has been conducted in Uganda on the impact of Learners attitude, technology enhanced pedagogies and academic competences and consequently the magnitude on their relationship in all education settings. This explains as to why this study intends to examine the impact of Learners attitude, technology enhanced teaching pedagogy, towards improving academic competences in Kiswahili language in the public secondary schools in Mbarara.

Purpose of the research project *Include a statement that the study involves research, estimated number of participants, an explanation of the purpose(s) of the research procedure and the expected duration of the subject's participation.*

The study intends to examine the impact of Learners attitude, technology enhanced teaching pedagogy, towards improving academic competences in Kiswahili language in the public secondary schools in Mbarara and consequently the magnitude of the technology enhanced pedagogy on the relationship between learner's attitude and academic competences in all education setting.

The study will be carried out among 9 government aided secondary schools of Mbarara city with high student enrolment (ranging from 400 to 2000 per school). You will be given questionnaire to fill which will take place for 30minutes and after you will be given a pretest which will take place for 30minutes too.

Leave blank for REC office only MUST-REC Stamp:	REC OFFICE USE ONLY: APPROVAL DATE: 20/03/2024 APPROVED CONSENT IRB VERSION NUMBER: PI NAME: Arishaba Emilly IRB NO: MUST - 2023 - 1316

Why you are being asked to participate?

You have been selected to participate in the study because you are a Kiswahili teacher in government aided secondary school which makes you aright participant for my study on Kiswahili competences. Learn more about research problem and improve the competences in Kiswahili language.

Procedures

Provide a description of the procedures to be followed and identification of any procedures that are experimental, clinical etc. If there is need for storage of biological (body) specimens, explain why, and include a statement requesting for consent to store the specimens and state the duration of storage.

A researcher will administer an interview guide for eliciting responses from you as Kiswahili teachers who is an immediate supervisor of students.

Risks or discomforts

Describe any reasonably foreseeable risks or discomforts-physical, psychological, social, legal or other associated with the procedure, and include information about their likelihood and seriousness. Discuss the procedures for protecting against or minimizing any potential risks to the subject. Discuss the risks in relation to the anticipated benefits to the subjects and to society.

There are anticipated risk for participation in the study but in case you are an comfortable for answering any question in the study you are free to skip the question or not provide a response.

Benefits

Describe any benefits to the subject or other benefits that may reasonably be expected from the research. If the subject is not likely to benefit personally from the experimental protocol note this in the statement of benefits.

The study will benefit the students especially as they will be taught using technology pedagogies on Kiswahili competences which will be used to integrate knowledge to other subjects.it will also benefit school administrators and teachers to use technology pedagogical skills to improve teaching and learning. Policy makers will also use the findings of the study to design teaching pedagogies.



Leave blank for REC office only:	* REC OFFICE USE ONLY:
MUST-REC Stamp:	APPROVAL DATE: 28/03/2024 APPROVED CONSENT IRB VERSION NUMBER: 28-03-24 PI NAME: Amabile E Mary IRB NO: MUST-2023-1316

Incentives or rewards for participating

It is assumed that there are no costs to subjects enrolled in research protocols. Any payments to be made to the subject, e.g., travel expenses, token of appreciation for time spent, must also be stated, including when the payment will be made.

Your participation is voluntary and you will not be given incentives for participation.

Protecting data confidentiality

Provide a statement describing the extent, if any, to which confidentiality or records identifying the subjects will be maintained. If data is in form of tape recordings, photographs, movies or videotapes, researcher should describe period of time they will be retained before destruction. Showing or playing of such data must be disclosed, including instructional purposes.

Information will be kept confidential and with utmost respect. Your names will not appear anywhere in the interview guide but codes will be used to differentiate responses provided.

Protecting subject privacy during data collection

Describe how the privacy of the participant will be ensured during the process of data collection. Since human beings will be involved as participants in this study, great care will be taken to ensure that their rights are protected. Human dignity will be strictly respected and the study will not at any moment reveal the identity of the respondents.
Furthermore, maximum confidentiality will be observed throughout the study.

Your will be interviewed individually and at your convenience to maintain privacy.

Right to refuse or withdraw

Include a statement that participation is voluntary and that refusal to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled.

Your participation is voluntary. You have a right to refuse or withdrew participation.no penalty will be given for refusing to participate.

What happens if you leave the study?

Leave blank for REC office only: MUST-REC Stamp:	REC OFFICE USE ONLY: APPROVAL DATE: 20/02/2024 APPROVED CONSENT IRB VERSION NUMBER: 2024-02-16 PI NAME: Arishaba E.Willy IRB NO: MUST-2023-1316

Include a statement that the subject may discontinue participation at any time without penalty or loss of benefits.

You may choose to withdraw from the study or keep in study no penalty for not participating

The researcher also will agree with the participants that they have the right to withdraw from the study at any point in time, and that it will be their prerogative to participate or not. Pseudonyms will be used in respect of the participants and the schools that will be selected for this study.

Who do I ask/call if I have questions or a problem?

Researcher; Arishaba Emily
Contact; 0782151731/0702241534 .

Include contact for the researcher and Chairperson, MUST-REC.
Assoc. Prof. Paul Alele,
Chairman, MUST-REC
P.O. Box 1410 Mbarara
Tel: 0485433795/0773573372

What does your signature or thumbprint on this consent form mean?

Your signature on this form means
• You have been informed about this study's purpose, procedures, possible benefits and risks • You have been given the chance to ask questions before you sign You have voluntarily agreed to be in this study

NUWAGIRA CHRISTOPHER.

Name of adult participant

Name of person obtaining data

Signature Arishaba ARISHABA EMILY 4/06/2024

Leave blank for REC office MUST-REC Stamp:	REC OFFICE USE ONLY: 20/03/2024 APPROVAL DATE: APPROVED CONSENT IRB VERSION NUMBER: 2024-03- PI NAME: Arishaba EMILY IRB NO: MUST-2023-1316

Appendix 5: Assent Form

MBARARA UNIVERSITY OF SCIENCE AND TECHNOLOGY
RESEARCH ETHICS COMMITTEE
P.O. Box 1410 Mbarara, Tel: +256-48-543-3795, Fax: +256-48-542-0782
E-mail: irc@must.ac.ug, mustirb@gmail.com

CHILD ASSENT FORM

Study Title: **Learners attitude, technology enhanced pedagogy and academic competences in Kiswahili language among government aided secondary school learners at Mbarara city: A quasi experimental**

Principal Investigator(s):

Emily Arishaba

INTRODUCTION.

I am a student of Mbarara University of Science and Technology. **Learners attitude, technology enhanced pedagogy and academic competences in Kiswahili language among government aided secondary school learners at Mbarara city: A quasi experimental**
There has been low achievement of academic competences in Kiswahili language due to poor teaching pedagogies and learner's attitude in secondary schools of mbarara city.it is from this point that the researcher wants to establish the impact of learners attitude, technology enhanced pedagogy to achieve Kiswahili academic competences in mbarara city secondary schools.

You should know that:

- You do not have to be in this study if you do not want to. You will not have any problems with anyone if you say no or don't feel like participating.
- You may stop being in this study at any time and no one will punish you.
- Your parent(s)/guardian were/was asked if it is fine for you to be in this study. Even if they say yes, it is still your choice to take part or not.
- You can ask whatever questions you might have, now or later. If you think of any question (s) later, you or your parents can contact me. My telephone contact is on the form that your parent/guardian has been given.

Sign this form only if you have

Leave blank for REC office stamp	**REC OFFICE USE ONLY:**
MUST-REC Stamp	APPROVAL DATE: 20/03/2024 APPROVED CONSENT IRB VERSION NUMBER: 2024-03-18 PI NAME: ARISHABA EMILY IRB NO: MUST - 2023 - 1316

- Understood what you will be doing in this study
- Had all your questions answered
- Talked to your parent(s)/legal guardian about this study
- Agreed to take part in this study

Head teacher permission obtained: Yes☐ No☐

Child's voluntary response to participate in the study: Yes ☐ No☐

Promise	OWEMBABAZI PROMISE	14/06/2024
Your signature	Printed name	Date

Ahimbisibwe HAM.		14/06/2024
Name of headteacher.		

Researcher explaining the study		
Arishaba	Arishaba Emily	14/06/2024
Signature	Printed name	Date

Leave blank for REC office use MUST-REC Stamp	REC OFFICE USE ONLY: APPROVAL DATE: 20/03/2024 APPROVED CONSENT IRB VERSION NUMBER: 2024-03-18 PI NAME: ARISHABA EMILY IRB NO: MUST-2023-1316

Appendix 6: Introduction to collect Research data

MBARARA UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF SCIENCE
P.O. Box 1410, Mbarara, Uganda. Tel: +256 4854 20851, Fax: +256 4854 20782
OFFICE OF THE DEAN

Our Ref: 2020/PhD/042/PS

5th April 2024

.....

.....

.....

Dear Sir/Madam,

INTRODUCTION TO COLLECT RESEARCH DATA

I write to introduce to you Ms Emilly Arishaba Registration Number 2020/PhP/042/PS, a registered Student at Mbarara University of Science and Technology (MUST) under the Faculty of Science. She is studying a PhD in Curriculum Studies in the Department of Educational Foundations and Psychology.

As part of her graduation load, Ms Arishaba is expected to carry out Research and write a Thesis Report as part of the fulfilment for the award of the degree.

Her Research Title: ***"Learners Attitude, Technology Enhanced Pedagogy and Academic Competencies in Kiswahili Language among Government Aided Secondary School Learners in Mbarara City: Quasi Experimental study"***.

Under the supervision of Dr. Charles Muwonge and Dr, Sudi Balimutajjo, her Research Title was approved by MUST Research Ethical Committee on 20th March 2024.

The student has identified your organization as one of the best places to collect data that is most appropriate for her study. The data is for academic purposes only and she is well equipped with ethical issues.

Any assistance to that effect is highly appreciated.

Yours sincerely

Assoc. Prof. Julius B. Lejju (PhD)
D E A N

Mbarara University of Science and Technology
Dean - Faculty of Science
P.O. Box 1410, Mbarara

Email: dean.science@must.ac.ug Website: http://www.must.ac.ug

Appendix 7: Proposal Approval Form

APPENDIX B: Proposal Approval Form

MBARARA UNIVERSITY OF SCIENCE AND TECHNOLOGY

PROPOSAL APPROVAL FORM

To: The Director of Research and Graduate Training

Name. ARISHABA EMILLY

Registration number. 2022 | PhD | 042 | PS

Programme. DOCTOR OF PHYILOSOPHY IN CURRICULUM STUDIES

Department. EDUCATIONAL FOUNDATION AND PSYCHOLOGY

Faculty/Institute. FACULTY OF SCIENCE

Academic Year. 2023 | 2024

Semester. I

This is to certify that the proposal titled:

LEARNER'S ATTITUDE, TECHNOLOGY ENHANCED PEDAGOGY AND ACADEMIC COMPETENCIES IN KISWAHILI LANGUAGE AMONG SECONDARY SCHOOL LEARNERS IN MBARARA CITY.

was approved for a study leading to the award of

DOCTOR OF PHILOSOPHY (PhD) in CURRICULUM STUDIES

of Mbarara University of Science and Technology

Signature/Stamp..... 5/03/2024

HEAD OF DEPARTMENT

MBARARA UNIVERSITY P.O. BOX 1410, MBARARA 13 MAR 2024 DEPARTMENT OF EDUCATIONAL FOUNDATIONS & PSYCHOLOGY

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Appendix 8: REC Approval Letter

MBARARA UNIVERSITY OF SCIENCE AND TECHNOLOGY

RESEARCH ETHICS COMMITTEE

Mbarara University of Science & Technology
P. O. Box 1410, Mbarara
RESEARCH ETHICS COMMITTEE
20 MAR 2025
APPROVED
VALID UNTIL DATE SHOWN ABOVE

20/03/2024

To: Emilly Arishaba

Mbarara University of Science and Technology
0782151731

Type: Initial Review

Re: MUST-2023-1316: Learner's attitude, Technology-enhanced pedagogy, and Academic Competences in Kiswahili Language among Government-aided Secondary School Learners: A Quasi Experimental Study

I am pleased to inform you that at the **164th** convened meeting on **01/02/2024**, the MUST Research Ethics Committee meeting voted to approve the above referenced application.
Approval of the research is for the period of **20/03/2024** to **20/03/2025.**

As Principal Investigator of the research, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and addenda to the protocol or the consent form must be submitted to the REC for re-review and approval **prior** to the activation of the changes.
3. Reports of unanticipated problems involving risks to participants or any new information which could change the risk benefit: ratio must be submitted to the REC.
4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by participants and/or witnesses should be retained on file. The REC may conduct audits of all study records, and consent documentation may be part of such audits.
5. Continuing review application must be submitted to the REC **eight weeks** prior to the expiration date of **20/03/2025** in order to continue the study beyond the approved period. Failure to submit a continuing review application in a timely fashion may result in suspension or termination of the study.
6. The REC application number assigned to the research should be cited in any correspondence with the REC of record.
7. You are required to register the research protocol with the Uganda National Council for Science and Technology (UNCST) for final clearance to undertake the study in Uganda.

The following is the list of all documents approved in this application by MUST Research Ethics Committee:

No.	Document Title	Language	Version Number	Version Date
1	teachers informed consent	English	2	2024-03-18
2	child assent	English	1	2024-03-18
3	Protocol	English	version 3	2024-03-18
4	Data collection tools	English	version 1	2024-01-02

Yours Sincerely

Dr. Paul Alele
For: MUST Research Ethics Committee



Appendix 9: Student Registration Card

MBARARA UNIVERSITY OF SCIENCE & TECHNOLOGY

REGISTRATION CARD

FULL NAME	ARISHABA EMILLY
STUDENT NUMBER	2200601322
REGISTRATION NO	2022/PhD/042/PS
PROGRAM	PHDCS
ACADEMIC YEAR	2022/2023
STUDY YEAR	1
CURRENT SEMESTER	1
REGISTERED BY	MR. ISMAIL BAHATI



Issued By: Ismail

Signature and Stamp:

DIRECTORATE OF RESEARCH AND GRADUATE TRAINING * MBARARA UNIVERSITY OF SCIENCE AND TECHNOLOGY * SUCCEED WE MUST * BOX 1410, MBARARA

3/3/2023