



COLLEGE OF EDUCATION

**THE EFFECT OF ELECTRONIC TEXTBOOKS IN ENGLISH LANGUAGE ON
STUDENTS' READING SKILLS PERFORMANCE: A CASE STUDY OF 12 YEARS
BASIC EDUCATION IN REMOTE AREA OF MUHANGA DISTRICT (2020-2023)**

BY:

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requirement for the award of Master Degree of Education in English**

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DECLARATION

I, Vedaste NTAGWABIRA, hereby; declare that this thesis is my original work and has not been submitted to any other university or institution of higher education for the award of the same degree. The works of other scholars in this field have been duly referenced in the text and list of references.



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APPROVAL

We, Dr Jean De Dieu AMINI NGABONZIZA and Dr. Patrick Ujwiga Anguru, certify that this research study entitled, “The effect of English electronic textbooks on students’ Reading Skills performance: A case study of 12years basic education in remote area of Muhanga district (2020-2023)” has been under our supervision and it has been submitted with our approval as the University of Rwanda supervisors.

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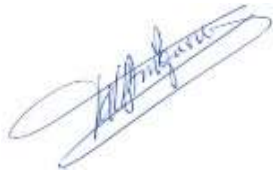
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Signature:



Date: October09, 2024

To my dear wife,

my darling children,

my parents,

my brothers and sisters,

my companions and relatives,

I dedicate this work.

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This work is the result of joint efforts of many people who contributed to its completion, and I would like to express my sincere gratitude to them.

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May God bless you all!

A LIST OF ABBREVIATIONS AND ACRONYMS

12YBE:12 Years Basic Education

9YBE: 9 Years Basic Education

ASHA: American Speech-Language-Hearing Association

CALL: Computer-Assisted Language Learning

CLT: Communicative Language Teaching

EFL: English as a Foreign Language

F: Female

GS: Groupe Scolaire

M: Male

MALL: Mobile-Assisted Language Learning

MINEDUC: Ministry of Education

NACE: National Association of Colleges and Employers

T: Total

TBLT: Task-Based Language Teaching

TELL: Technology-Enhanced Language Learning

UNESCO: United Nations Educational, Scientific and Cultural Organization

UR: University of Rwanda

ABSTRACT

While several studies on electronic textbooks are found in various languages worldwide, few studies have investigated the effect of electronic textbooks in English language on Students' reading skills performance. The overall objective of this study was to investigate the effects of English electronic textbooks on students' reading skills performance in Rwandan secondary schools, particularly in remote areas of the Muhanga District. Specifically, the research sought to: (1) assess the role of English electronic textbooks in enhancing students' reading fluency, (2) compare the reading skills performance of students using electronic textbooks with those using traditional printed textbooks, and (3) identify the challenges and benefits perceived by students and teachers while using e-books. Interpretation was analyzed through the lens of the Cognitive Theory of Multimedia Learning proposed by Richard Mayer and Technology Acceptance Model (TAM), developed by Davis. This research adopted a mixed design which involved both quantitative and qualitative design to achieve the general and specific research objectives. Questionnaires and interview schedules were employed to collect primary data, and documentary review was used to collect secondary data. This study had 92 respondents sampled from 1, 231 population. A t-test was used to screen and mirror the data of this research study with the p-value that stands at .000. This indicates the probability that the observed difference between the groups suggests an extremely high statistical significance. Indeed, the examination of results revealed that, students' English reading skills have greatly been improved by electronic textbooks in one school equipped with a smart classroom compared with another school, which does not have smart classrooms after the introduction of e-textbooks. Therefore, the benefits of e-textbooks in the teaching and learning process were salient. They include, but not limited to learners' engagement and motivation in reading comprehension of text written in English. Henceforth, this research study suggests various strategies, that is, providing technical support, ensuring the relevance and quality of content of what minimizes students' distraction, and thus improving access to technology. Thus, MINEDUC, school leaders, and teachers should address these challenges by enhancing effectiveness of e-textbooks to promote teaching English reading skills.

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CHAPTER ONE: GENERAL INTRODUCTION

1.1. Background to the study

In the research conducted by Pires (2023) examined the role of technology in education revolutionizing learning for 21century by powering minds through education. Advent of digital technology has significantly transformed educational resources, with electronic textbooks (e-textbooks) becoming an increasingly popular tool in enhancing student learning experiences. The study carried out by Respati (2024) argues that this shift from traditional print textbooks to digital formats is particularly evident in the teaching of English reading skills. The integration of e-textbooks in educational curricula has globally sparked considerable research studies into their effect on student performance, particularly in reading comprehension.

Lin, Chen, and Hsu (2020) prominently examined the effectiveness of e-textbooks in improving reading comprehension among university students in Taiwan. The study found that students who used e-textbooks demonstrated better immediate reading comprehension performance compared to those who used print textbooks. Despite this improvement, the study also noted that half of the students still preferred print textbooks over electronic ones, highlighting a significant preference for traditional reading formats among learners (Lin et al., 2020).

Further supporting the positive effect of e-textbooks, Utami, Sunardi, and Draji (2024) developed an English reading e-module based on gamification and contextual learning. This innovative approach aimed to enhance students' reading comprehension skills. Their research indicated that the use of such e-modules significantly improved students' reading skills, suggesting that gamified and contextually enriched e-textbooks can be highly effective in promoting better reading comprehension (Utami et al., 2024).

In another study, Rafael and Tamban (2022) explored the use of localized English reading materials to enhance the reading skills of grade two pupils. The study revealed that students exposed to these localized materials showed significant improvements in their reading skills compared to those taught using traditional methods. This underscores the potential benefits of customized and culturally relevant e-textbooks in improving reading performance among young learners (Rafael & Tamban, 2022).

Moreover, the effect of digital interventions on reading skills was further evidenced by Yin and Hanif (2024), who investigated the use of a digital tool to enhance reading skills among

ESL students. The findings demonstrated a significant improvement in reading test scores post-intervention, indicating that digital tools and e-textbooks can substantially benefit reading skill development (Yin & Hanif, 2024).

However, it is also important to note that not all studies have shown unequivocal support for e-textbooks. For instance, a study analyzing Indonesian language textbooks indicated that these resources did not correspond well with international reading literacy tests, suggesting potential limitations in their effectiveness (Sultan et al., 2023).

In short, while the global perspective on the use of e-textbooks for enhancing reading skills in English shows promising results, the preference for traditional print textbooks remains significant among students. Nevertheless, the incorporation of gamification, contextual learning, and localized content in e-textbooks appears to offer substantial benefits in improving reading comprehension. Future research should continue to explore these innovations to maximize the potential of e-textbooks in education.

In the context of Africa, recently, the integration of electronic textbooks in education has gained significant attention. This shift from traditional print textbooks to digital formats intends to enhance student engagement and improve academic performance, particularly in reading skills. In African, various studies have explored the effect of this technological transition on student outcomes.

A study conducted at Afe Babalola University in Nigeria examined the effect of electronic textbooks on students' reading habits and academic performance. The findings indicated that the use of electronic textbooks, along with traditional resources, significantly enhanced students' academic performance, demonstrating the potential benefits of digital learning tools in improving reading skills (Daniel et al., 2017).

Additional research underlined the development of English reading e-modules based on gamification and contextual learning in Africa. The study found that these electronic modules were effective in improving students' reading comprehension skills, suggesting that interactive and engaging digital content can positively influence reading performance (Utami et al., 2024).

The integration of locally published English newspapers and magazines as reading materials in a Saudi university was also investigated, showing improvements in reading competence among English as a Foreign Language (EFL) students. Although this study was not directly conducted in Africa, it provides insights into how localized and contextually relevant digital reading materials

can enhance reading skills, which can apply to the African context (Gulzar & Al Asmari). Despite these positive findings, there are still challenges to be addressed. For instance, the availability of electronic textbooks and the necessary technological infrastructure in many African schools remain limited. Furthermore, there is a need for more localized studies to understand the specific effects and best practices for implementing electronic textbooks in diverse educational settings across Africa.

Overall, the integration of electronic textbooks in African secondary schools holds promise for improving reading skills and academic performance. Continued research and investment in digital education resources are essential to fully realize these benefits and ensure equitable access to quality education for all students.

In Rwanda, the education sector has been exploring various strategies to enhance the reading skills of secondary school students. One such strategy is the integration of English electronic textbooks into the curriculum. While the adoption of digital learning tools is relatively new in the Rwandan context, there is growing interest in understanding their potential effect on student performance, particularly in reading skills.

A study conducted in the Shyira Sector of Nyabihu District in Rwanda examined the contribution of English reading materials, including electronic resources, to improving students' English performance. The findings suggested that the availability and use of diverse reading materials, including electronic textbooks, played a significant role in enhancing students' reading skills and overall academic performance (Harerimana et al., 2024).

Despite the promising findings, the specific effect of electronic textbooks on student reading performance in Rwanda remains under-researched. Most studies have focused on the general use of reading materials without isolating the effects of electronic textbooks. This highlights the need for more targeted research to evaluate how electronic textbooks influence reading skills and whether they offer significant advantages over traditional print materials.

Additionally, the broader educational infrastructure in Rwanda, including access to technology and digital literacy among both teachers and students, can affect the successful implementation of electronic textbooks. Ensuring that schools are equipped with the necessary technology and

educators are trained to effectively use digital resources is crucial for maximizing the benefits of electronic textbooks.

Therefore, while initial studies indicate a positive role for electronic reading materials in enhancing student performance in reading skills, further research is needed to specifically assess the effect of electronic textbooks in Rwandan secondary schools. This will help in formulating effective policies and practices for integrating digital learning tools into the education system.

1.2. Statement of the problem

In 2019, the Ministry of Education in Rwanda announced a shift from analog to digital literacy in teaching and learning to enhance educational practices and effectiveness within schools. Although this shift was crucial in empowering teachers to effectively utilize technology in the classroom improving overall e-books literacy among educators and students alike, many questions were raised concerning its implementation due to various challenges. According to the report by MINEDUC (July 2016), before developing this Policy an analysis of the strengths, weaknesses, opportunities, and challenges (SWOC) concerning the e-books in Education environment was carried out at different planning and validation workshops with key stakeholders. the major challenges identified included: inadequate infrastructure; high power costs; equipment and connectivity costs. the absence of a culture around the use of e-books also prevented the widespread adoption of such tools in education, as the limited availability of digital content, expertise and project coordination.

In addition, implementing electronic textbooks in remote regions faces several challenges. The Mastercard Foundation (2020) highlighted issues such as limited internet connectivity, lack of digital devices, and inadequate teacher training as significant barriers to the effective use of electronic textbooks. Addressing these challenges requires a concerted effort to improve the digital infrastructure and provide comprehensive training programs for teachers to leverage these tools effectively

In Rwanda, the adoption of English electronic textbooks in secondary schools has been promoted as a strategy to improve reading skills and overall academic performance. However, the effect of this technological intervention remains underexplored, particularly in remote areas like the Muhanga district. Previous research indicates mixed outcomes regarding the efficacy of electronic

textbooks. According to a World Bank report, while electronic textbooks have the potential to provide interactive and up-to-date content, their effectiveness is often hindered by infrastructural limitations, inadequate teacher training, and lack of student access to necessary devices (World Bank, 2021). In the same way, a UNESCO study emphasizes that the effectiveness of digital learning tools is greatly influenced by how well they are adopted to the local context and the preparedness of both educators and students (UNESCO, 2019).

Non-governmental organizations (NGOs) operating in Rwanda have also reported varying degrees of success with the implementation of electronic learning materials. For instance, a report by the One Laptop per Child initiative found that while there was an initial boost in student engagement, sustained improvements in reading skills were not evident without continuous support and resource availability (OLPC, 2020).

Empirical studies in other regions have demonstrated that electronic textbooks can significantly enhance reading comprehension and retention when effectively integrated into the curriculum. For example, a study in South Africa found that students using electronic textbooks showed improved reading scores compared to those using traditional print materials (Ngugi & Mutisya, 2019). However, these findings are not universally applicable due to varying socio-economic and educational contexts.

Given these mixed findings, it is crucial to investigate the specific effect of English electronic textbooks on student performance in reading skills within the unique context of Rwandan secondary schools in remote areas. This study aims to address this gap by examining the effect of digital tools on reading skills, particularly in remote areas such as the Muhanga district considering the unique contextual factors that influence educational outcomes in remote settings.

1.3. Research objectives

1.3.1. General objective

To investigate the effects of English electronic textbooks on students' performance in reading skills in Rwandan secondary schools

1.3.2. Specific objectives

The specific objectives of this study are as follows:

- 1) To identify and analyze factors that influence reading skills while using e-books among students in secondary schools.
- 2) To compare the reading skills performance of students using electronic textbooks with those using traditional printed textbooks.
- 3) To investigate the challenges and benefits perceived by students and teachers regarding skills when using English electronic textbooks and propose the strategies to overcome challenges.
- 4) To identify the types of electronic books and their effect on reading comprehension.

1.4. Research questions

- 1) What are common factors influencing reading skills among Rwandan secondary schools while using e-books?
- 2) What are the differences in reading skills performance between students who use electronic textbooks and those who use traditional printed textbooks?
- 3) What are the perceived challenges and benefits of using English electronic textbooks according to students and teachers?
- 4) What are the types of electronic books and their effect on reading comprehension in teaching and learning process?

1.5. Research hypotheses

To achieve the objectives of this dissertation, the researcher tested the following hypotheses (null and alternative) to reach an empirical ground to make a conclusion on the significance of English reading skills on the learners' performance in G.S Rongi and G.S Kibangu in Muhanga district. G.S Rongi uses e-books because it has smart classrooms, whereas G.S Kibangu does not, teachers use their own computers in their teaching process. Therefore, the hypotheses investigated by the study are:

- **H₀:** There is no significant statistical effect of English reading skills on the learners' performance who use printed books in G.S Rongi and G.S Kibangu in Muhanga district
- **H₁:** There is a significant statistical effect of English reading skills on the learners' performance that uses electronic books in G.S Rongi and G.S Kibangu in Muhanga district.

Those are directional hypotheses in that they point to the effect of using electronic textbooks on students' performance in reading skills. They are a one-tail hypotheses since they aimed to specify the relationship or differences between electronic textbooks and reading skills.

1.6. Choice and interest of the topic

From my observation and discussion with English teachers of GS Rongi and GS Kibangu as grassroots implementers of the ICT in Education, I found that they face various challenge in teaching in English language, even if the Ministry of Education has established the ICT in Education program. Thus, this made me feel curious of knowing the basis of these challenges.

The choice of this topic is highly relevant due to several key factors as well as the digital transformation in education accelerated by the COVID-19 pandemic. Investigating the effect of electronic textbooks, especially in remote areas, is crucial to understanding the benefits and challenges of this transformation. In addition, concerning educational equity, the study focuses on remote areas, where educational resources and infrastructure are often limited. Assessing the effectiveness of electronic textbooks in remote areas, where educational resources and infrastructure are often limited can provide insights into addressing educational disparities. Finally,

findings from this study can inform educational policy and decision-making, particularly in the context of Rwanda's goals for improving education quality and accessibility through technology.

1.7. Significance of the Study

This study is added to the information already established by other researchers regarding English teaching books and their effect on the learner's performance. It is of great significance for other researchers, English language teachers, education managers, students, and parents since this study provides additional and reliable information on teaching and learning of English using e-books. Particularly, the result of this study will help English language teachers to make conscious decisions in choosing more effective English books in line with the learner-centered approach. LIU Qing-xue and SHI Jin-fang (2007, p.19) concluded, "Each of the different books has contributed new elements and has attempted to deal with some issues of language learning. However, they derived in different historical context, stressed different social and educational needs and have different theoretical consideration. Therefore, in teaching practice, in order to use these books effectively and efficiently, practitioners should bear these questions in mind: who the learners are, what their current level of language proficiency is, what sort of communicative needs they have, and the circumstances in which they will be using English in the future.

1.8. Scope and delimitation of the study

The research case (Kibangu & Rongi sector) will be limited to both sectors only and will cover secondary schools. It will use a limited number of students and teachers. The non-academic staff members are excluded. The scope of the study covers three years between 2020-2023. This time interval was chosen because the researcher wanted to know how students used books during Covid-19 pandemic.

1.9. Organization of the study

This work is divided into five chapters. The first chapter is a general introduction that contains the background information to the study, the statement of the problem, objectives of the study, research questions, research hypotheses, choice and interest of the study, significance of the study, delimitation of the study, organization of the work and research methodology.

The second chapter is about a literature review whereby views of different researchers on English used as a medium of instruction were put forward. The third chapter dealt with the methodology in which techniques and steps of data collection were revealed. The fourth chapter presents data analysis and interpretation. The fifth chapter concerns the general conclusion and recommendations.

CHAPTER TWO: LITERATURE REVIEW

This chapter provides some insights on the effect of electronic textbooks in English language on students' reading skills individual performances. It describes discussions from various schools of thought in the area of reading skills with electronic text books and traditional hard copy texts. The main theories applied to this reading text issue are followed by the theoretical framework which portrays key potential theories that have guided the research study to achieve the objectives of the study to solve the research problem. Similarly, this literature review took a look into theoretical review supported with empirical review which present the findings by various authors in relation to the effect of electronic textbooks in English language on students' reading skills performance in secondary schools elsewhere in the world. Thereafter, the conceptual framework diagrammed the research problem with the variables that have emerged from the research problem for accurate solutions.

2.1. Definition of key concepts

2.1.1. Electronic Textbooks (E-Textbooks)

Electronic textbooks, often referred to as e-textbooks, are digital versions of traditional printed textbooks that can be accessed on electronic devices such as computers, tablets, and e-readers. E-textbooks often include interactive features like multimedia content (videos, audio clips, and animations), hyperlinks, search functions, and annotation tools. These features can enhance the learning experience by providing additional resources and facilitating easier navigation and comprehension (Larson, 2010).

2.1.2. Reading Skills

Reading skills encompass the range of abilities required to effectively decode, comprehend, interpret, and critically analyze written text.

According to the National Reading Panel (2000), key reading skills include decoding (the ability to translate written words into their spoken equivalents); fluency (the ability to read text accurately, quickly, and with proper expression); vocabulary (the breadth and depth of word knowledge); comprehension (the ability to understand and interpret the meaning of text) and critical reading (the ability to evaluate and analyze text critically).

2.1.3. Student Performance

Student performance in the context of reading skills refers to how well students are able to demonstrate their reading abilities through various assessments and evaluations. This can include standardized tests, classroom-based assessments, and other measures of reading proficiency and comprehension. Performance can be influenced by several factors, including the quality of instruction, access to learning resources, and individual student differences (Wigfield and Guthrie, 1997).

2.1.4. Twelve years basic education (12YBE)

Twelve Years Basic Education is an educational program implemented by the Government of Rwanda. This initiative was introduced as part of Rwanda's efforts to provide free and compulsory education to all children up to the end of secondary school. Twelve years basic education program aims to extend the existing nine-year basic education program by adding three additional years of lower secondary education, thus ensuring that every child has access to twelve years of free basic education (Ministry of Education, 2019).

The primary objectives of the twelve years of basic education program, according to the World Bank (2018), are mainly increased access to education (ensuring that all children, regardless of their socio-economic background, have the opportunity to complete twelve years of basic education); improved educational quality (enhancing the quality of education through better teaching methods, improved infrastructure, and the provision of adequate learning materials); equity in education (addressing disparities in education access and performance between different regions and social groups within Rwanda) and enhanced skills and competencies (equipping students with the necessary skills and knowledge to either continue to higher education or to enter the workforce with a solid foundation of basic education).

The twelve years basic education program is part of Rwanda's broader strategy to build a knowledge-based economy and improve the country's socio-economic development. It reflects the government's commitment to ensuring that education is a fundamental right for all children and a cornerstone for national development (Republic of Rwanda, 2020).

2.2. Theoretical review

The theoretical framework for examining the effects of English electronic textbooks (e-textbooks) on students' performance in reading skills in Rwandan secondary schools is grounded in several educational theories that elucidate how digital tools and resources effect learning processes. These theories include the Cognitive Theory of Multimedia Learning, and the Technology Acceptance Model (TAM).

2.2.1. Cognitive Theory of Multimedia Learning

Cognitive Theory of Multimedia Learning, proposed by Richard Mayer, suggests that people learn more effectively from words and pictures than from words alone. This theory is particularly relevant to e-textbooks, which often incorporate multimedia elements such as images, audio, and video to complement textual information. According to Mayer (2005), multimedia learning involves the dual coding of information through both visual and auditory channels, which enhances comprehension and retention. This theory posits that the interactive and multimodal nature of e-textbooks can help Rwandan secondary school students process information more deeply and effectively, leading to improved reading skills.

2.2.2. Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM), developed by Davis (1989), explains how users come to accept and use a technology. TAM posits that perceived ease of use and perceived usefulness are key determinants of technology adoption. For e-textbooks to positively affect reading skills in Rwandan secondary schools, students and teachers must perceive them as useful for improving learning outcomes and find them easy to use. According to TAM, when students believe that e-textbooks enhance their learning experiences (perceived usefulness) and are student-friendly (perceived ease of use), they are more likely to engage with the technology, which can lead to better performance in reading skills.

2.3. Empirical literature review

The empirical literature review on the effect of English electronic textbooks (e-textbooks) on student performance in reading skills reveals several key findings. On a global scale, the adoption of electronic textbooks has been widely studied for its potential to enhance reading skills among students. A systematic literature review by Peras et al. (2023) examined the outcomes of digital versus paper reading among students aged 6-18 years. Their study highlighted that e-textbooks can positively influence reading performance, even though individual and contextual factors, as well as gender, socioeconomic status, and school location, play significant roles in the effectiveness of these digital tools (Peras et al., 2023).

In another study, Hung and Young (2015) found that E-readers significantly benefited EFL students' academic writing progress compared to conventional paper-based materials. The unique functions of E-readers, such as reciprocal peer review and improved information retrieval, were particularly beneficial in facilitating the writing process, which indirectly supports reading comprehension and skills (Hung & Young, 2015).

In Singapore, educational system is very creative and innovative with large investments on online learning resources. A thorough investigation into the use of e-textbooks in secondary education was carried out by According to their research, Tan and Goh in 2023. Students' reading comprehension and engagement were much improved by e-textbooks. The interactive elements such as multimedia information, hyperlinks, and integrated quizzes were very successful at keeping students' attention and enhancing their knowledge. Furthermore, the study found that e-textbooks made individual instruction easier, enabling teachers to meet a range of student needs. Though most students found e-textbooks beneficial, the researchers noted that some students experienced screen fatigue and preferred traditional textbooks for extended reading periods.

India presents a heterogeneous educational landscape with notable differences between rural and urban schools. The effect of e-textbooks on the reading skills of students in both environments was investigated by Kumar and Singh (2023). Their research showed that when using e-textbooks, urban students reading skills and motivation increased. This favorable result was mostly due to the presence of digital infrastructure and device access in urban schools. However, because there is less access to technology and internet connectivity in remote locations, the advantages of

e-textbooks were not as noticeable. The findings of study about the digital divide emphasize the necessity of building fair infrastructure and allocating resources so that all students can take advantage of e-textbooks.

In Vietnam, Pham and Nguyen (2022) investigated the use of e-textbooks in Vietnamese schools and their effect on students' reading performance. The study discovered that e-textbooks positively affected reading skills by providing individual learning experiences and interactive content. Students who used e-textbooks indicated better reading comprehension and retention compared to those using traditional textbooks. However, technical software problems and the need for internet access were found as significant challenges. The study highlighted the need for reliable technological infrastructure and students-friendly e-textbook platforms to optimize the benefits of digital learning tools.

In Italy, digital tools have been integrated into the educational system to improve learning outcomes. The effect of e-textbooks on the reading capabilities of high school students was investigated by Rossi and Bianchi (2023). According to their research, e-textbooks improved students' critical thinking skills, reading comprehension, and general academic achievement. Students particularly valued the e-textbooks' mobility and convenience, which allowed for more flexible learning environments. But the study also emphasized how crucial it is to provide teachers with the necessary training to successfully incorporate e-textbooks into their lesson plans. It was determined that support and professional development for teachers were essential to the successful adoption of e-textbooks in the classroom.

A study on the effect of e-textbooks on middle school reading skills in France was carried out by Dubois and Martin in 2023. According to their research, using e-textbooks increased reading interest, vocabulary growth, and fluency. For students with varying learning requirements, the interactive features such as audio support and interactive annotations were really helpful. In addition, the study found that e-textbooks made schoolbags lighter, which made them a more sensible option for students. But issues with screen time and other diversions have been brought forward. To overcome these issues, the researchers suggested an effective approach that combined the usage of e-textbooks with conventional reading methods.

In the African context, the integration of electronic textbooks has shown hopeful results, though the research is still developing. At Afe Babalola University in Nigeria, research by Danie et al. (2017) studied the effect of reading habits on students' academic performance. Their results showed that the use of electronic textbooks, along with traditional resources, significantly improved students' academic performance. This suggests that digital learning tools, when used appropriately, can improve reading skills and overall academic success (Danie et al., 2017).

Another study in Africa focused on the development of English reading e-modules based on gamification and contextual learning. Utami et al. (2024) found that these electronic modules were effective in improving students' reading comprehension skills. The interactive and engaging nature of these digital resources played a crucial role in enhancing student performance in reading (Utami et al., 2024).

In Kenya, the results of integrating e-textbooks into the educational system are encouraging. Mwangi and Wanjiru's (2023) study concentrated on the usage of electronic textbooks in English in secondary schools. The researchers discovered that the use of e-textbooks greatly improved students' vocabulary development and reading comprehension. Multimedia content and quizzes, two interactive elements of e-textbooks, were especially successful in drawing students in and enhancing their comprehension of the subject material. But the study also showed that the advantages of e-textbooks weren't uniformly spread, with urban students benefiting more from e-textbooks since they had easier access to digital devices and internet connectivity.

Furthermore, in Uganda, e-textbook usage is becoming more popular, especially in secondary school. Nsubuga and Akello's (2022) study examined how English e-textbooks affected the reading skills of secondary school students. According to their findings, using e-textbooks enhanced comprehension and fluency in reading. Both high achievers and struggling students benefited from the individual learning opportunities that e-textbooks offered: learning at their own speed. Nonetheless, the researchers emphasized important infrastructure-related issues, such as sporadic electricity supplies and restricted access to digital devices in rural regions. These difficulties highlight the necessity of funding digital infrastructure in order to guarantee fair access to e-textbooks.

In Ethiopia, the adoption of e-textbooks is still in its nascent stages, but early research indicates promising outcomes. A study by Tesfaye and Alemu (2022) examined the use of English e-textbooks in secondary schools. Their findings revealed that e-textbooks enhanced students' reading skills by providing interactive and engaging learning experiences. Students who used e-textbooks performed better in reading assessments and reported higher levels of motivation and engagement. However, the study also emphasized significant challenges, including a lack of digital infrastructure, limited availability of digital devices, and insufficient training for teachers on how to effectively use e-textbooks. These challenges need to be addressed to fully realize the potential benefits of e-textbooks in Ethiopia.

In Tanzania, research on the use of e-textbooks in education has highlighted both successes and obstacles. A study by Mkunde and Mushi (2023) explored the effectiveness of English e-textbooks in improving reading skills among secondary school students. The results indicated that students who used e-textbooks demonstrated better reading comprehension and retention compared to those using traditional textbooks. The interactive and multimedia elements of e-textbooks were particularly praised for making learning more engaging and effective. However, the study also identified several challenges to the successful implementation of e-textbooks, including a lack of teacher training on how to effectively integrate digital tools into the classroom and limited access to digital devices, especially in rural areas.

In Rwanda, the research on the effect of e-textbooks on student reading performance is still developing. A study conducted in the Shyira Sector of Nyabihu District by Harerimana et al. (2024) examined the contribution of English reading materials, including electronic resources, to improving students' English performance. They found that the availability and use of diverse reading materials, including electronic textbooks, significantly enhanced students' reading skills and overall academic performance. This shows the potential benefits of digital learning tools in the Rwandan educational context (Harerimana et al., 2024).

Despite these promising findings, there is a need for more targeted research in Rwanda to evaluate the specific effect of electronic textbooks on reading skills. There are factors such as technological infrastructure, teacher training, and digital literacy among students and teachers that must be considered to ensure the successful implementation and utilization of electronic textbooks.

2.4 Factors affecting reading skills

2.4.1. Cognitive, environmental, parental and instructional factors

Reading skills are influenced by a combination of cognitive, environmental, and instructional factors. Cognitive factors include phonological awareness, vocabulary knowledge, and working memory. Phonological awareness, the ability to recognize and manipulate sounds in spoken language, is fundamental for decoding words during reading (Snowling & Hulme, 2011). Vocabulary knowledge, or the number of words a person knows and understands, enhances comprehension, as readers with a richer vocabulary can understand texts more easily (Stanovich, 1986). Working memory, which allows individuals to hold and process information simultaneously, is crucial for understanding and integrating text (Gathercole & Baddeley, 1993).

According to Cowan (2014) suggested that the capacity to temporarily store and manage information in the mind is referred to as working memory. It is essential for reading comprehension because it enables readers to remember and incorporate information from many textual sections. People with larger working memory capacities are better able to comprehend and retain complicated materials. Maintaining a consistent mental image of the text requires maintaining track of characters, events, and details, which working memory helps with. Working memory deficits can make it difficult for students to combine newly learned material with what they have already read, which can impair their understanding and retention (Cowan,2014).

In other words, these two boundaries are currently under debate. In terms of the capacity limit, there is little disagreement that normal adults are restricted to roughly three or four meaningful units or chunks within a given type of sensory coding (phonological, visual-spatial, etc.). The argument is on whether the limit arises from materials that interact with one another or from the focus of attention (Oberauer, Lewandowsky, Farrell, Jarrold, & Greaves, 2012). In recent, unpublished work, the researcher proposes that the focus of attention is mainly used to encode additional information, but that it is also limited to a few informational chunks that can be off-loaded to long-term memory and held there with the aid of attentional refreshing.

2.4.2. Environmental factors

Environmental factors encompass the availability of reading materials, the frequency of reading activities, and socio-economic status. Access to a variety of reading materials at home and in school promotes reading development by providing opportunities for practice and exposure to different text types (Neuman & Celano, 2001). The frequency of reading activities, such as shared reading with parents or independent reading, contributes to the development of reading fluency and comprehension skills (Mol & Bus, 2011). Students with greater access to reading materials at home and in school exhibit higher levels of reading proficiency. Conversely, limited access to books can hinder reading practice, leading to lower reading achievement and reduced literacy levels. As a result, children who have a wide range of books and other reading resources at their disposal are more likely to engage in reading activities, which promotes literacy development (Torres, 2019). Socioeconomic status can affect reading skills through the provision of resources, parental education levels, and the overall learning environment (Sirin, 2005).

2.4.3. Instructional factors

Instructional factors involve the methods and quality of reading instruction. Effective reading instruction includes explicit teaching of phonics, vocabulary, and comprehension strategies. Phonics instruction helps children understand the relationship between letters and sounds, which is essential for word recognition (National Reading Panel, 2000). Teaching vocabulary directly and through context helps students build a robust word bank, facilitating better comprehension (Beck, McKeown, & Kucan, 2002). Comprehension strategies, such as summarizing, predicting, and questioning, enable students to actively engage with and understand texts (Duke & Pearson, 2002).

2.4.4 Parental Factors

The role that parents play in their children's literacy development is crucial in forming their reading abilities. Kids who have parents who read aloud to them, have book conversations with them, and make reading a habit have a big effect on their literacy development. According to Garcia and Martinez (2023), children who get regular parental support and encouragement have a tendency to become better readers and have a more favorable attitude toward reading. This involvement

includes keeping an eye on children' reading development, working with teachers to promote literacy development, and creating a comfortable reading environment at home.

2.5. Challenges and Considerations

2.5.1. Screen Fatigue

Despite the advantages, there are challenges associated with the use of e-textbooks. Prolonged reading on electronic devices can cause screen fatigue, leading to reduced reading efficiency and comprehension over time (Jeong, 2012). Teachers must find a balance between the use of digital and print materials to mitigate this issue.

Another major issue with using digital reading tools is screen fatigue, commonly referred to as digital eye strain. Long-term screen time can cause discomfort, eye fatigue, and focus problems that can impair understanding and enjoyment of reading. Students who read from screens for extended periods of time may have symptoms like headaches, impaired vision, and difficulty concentrating, all of which might impair their reading performance (Jones & Miller (2022).

Students' motivation to read can also be lowered by screen fatigue. According to Davis and Williams (2023), excessive screen time can result in burnout and a reduction in interest in reading, even if digital reading tools offer interactive aspects that can improve engagement. For younger kids, who might be more vulnerable to the detrimental effects of screen fatigue and who need more varied and well-balanced reading activities to stay interested and motivated, this is especially troublesome.

2.5.2. Digital Divide

The digital divide remains a significant concern. Not all students have equal access to the necessary technology and internet connectivity required to fully benefit from e-textbooks. This disparity can exacerbate existing educational inequalities (van Dijk, 2006).

English e-textbooks have the potential to enhance students' reading skills through their accessibility, interactive features, and personalized learning capabilities (Brown & Green, 2023). However, it is essential to address the challenges of screen fatigue and the digital divide to ensure that all students can benefit equally from these technological advancements (Lee, 2022).

Ultimately, the effective integration of e-textbooks in education can support the development of crucial reading skills, fostering academic success and lifelong learning (Martin, 2023).

The digital divide refers to the difference in access to digital information and communication technology (ICT) between those who have it and those who don't is known (Brown, 2016). Due to the lack of access to digital reading resources and materials, this difference may have a substantial negative influence on students' reading abilities. Lower socioeconomic background students frequently do not have access to digital devices or dependable internet, which are necessary for using e-books and other online reading resources (Soomro, 2020). Since students who lack access to digital resources are at a disadvantage when compared to their peers who have, this lack of access has the potential to worsen already-existing educational inequities.

2.6. Advancements in Educational Technology

The rapid improvements in educational technology have led to a significant increase in focus towards the incorporation of electronic textbooks, or e-textbooks, in educational settings (Smith, 2023; Johnson & Williams, 2022). This research examines how English e-textbooks affect students' reading abilities, stressing both the advantages and the challenges of using them.

The ease of use and accessibility of e-textbooks is one of their main benefits. Students can interact with reading materials more easily whenever and wherever they choose because to the availability of e-textbooks on multiple platforms, such as tablets, computers, and smartphones. Doering, Pereira & Kuechler (2020) assert that the mobility of e-textbooks promotes increased reading frequency, which is essential for enhancing reading abilities. Furthermore, e-textbooks' interactive elements improve understanding and student engagement. According to Doering et al. (2020), these elements enable students to engage in dynamic interactions with the text, leading to a more profound comprehension and recall of the material.

2.6.1. Advantages of E-Textbooks

One of the primary advantages of e-textbooks is their accessibility. Students can easily access a vast array of texts from various genres and levels, which can be tailored to individual reading abilities and interests. According to Higgins et al. (2012), e-textbooks offer interactive features such as hyperlinks, multimedia elements, and instant dictionary access, which can significantly enhance comprehension and engagement. These features can make reading more interactive and enjoyable, potentially leading to improved reading skills.

Moreover, e-textbooks can be updated easily and frequently, ensuring that students always have access to the most current information and texts. The ability to incorporate multimedia elements such as audio and video can cater to different learning styles, making reading a more inclusive activity (Larson, 2010). This adaptability is particularly beneficial for students with learning disabilities or those who require additional support in developing their reading skills.

Enhanced Engagement and Motivation: Studies have shown that e-textbooks can enhance student engagement and motivation. For instance, a study by Sun, Flores, and Tanguma (2012) found that students using e-textbooks reported higher levels of engagement and interest in the subject matter compared to those using traditional textbooks.

Improved Accessibility and Convenience: E-textbooks are praised for their accessibility and convenience. According to Daniel and Woody (2013), students appreciate the ability to carry multiple textbooks in one device, which reduces physical burden and makes study materials more accessible anytime and anywhere.

Interactive Features and Customization: The interactive features of e-textbooks, such as multimedia elements, hyperlinks, and search functions, have been highlighted as key advantages. Rockinson-Szapkiw, Courduff, Carter, and Bennett (2013) noted that these features can facilitate deeper understanding and retention of material.

2.6.2. Effect on Reading Comprehension and Engagement

Research indicates that the use of e-textbooks can positively affect reading comprehension and engagement. For instance, a study by Grimshaw et al. (2007) found that students who used e-textbooks showed significant improvements in their reading comprehension compared to those who used traditional textbooks. The interactive nature of e-textbooks, which includes quizzes, annotations, and hyperlinks, allows for a more dynamic reading experience that can help to maintain students' interest and motivation.

Additionally, the multimodal nature of e-textbooks can aid in the comprehension of complex texts. According to a study by Korat and Shamir (2007), the inclusion of multimedia elements such as animations and interactive questions in e-textbooks can help to clarify difficult concepts and promote better understanding. This multimodal approach can be particularly effective for English

Language Learners (ELLs), who may benefit from the visual and auditory support provided by e-textbooks.

2.6.3. Challenges and Considerations

Despite the numerous advantages, there are also challenges associated with the use of e-textbooks. One significant concern is the issue of digital equity. Not all students have equal access to the necessary technology, such as tablets or reliable internet connections, which can create disparities in learning opportunities (Livingstone, 2012). Schools must address these inequities to ensure that all students can benefit from e-textbooks.

Another challenge is the potential for distraction. The interactive features of e-textbooks, while beneficial, can also lead to distractions if not used appropriately. According to a study by Zhang and Liao (2020), students using e-textbooks reported a higher incidence of off-task behavior compared to those using traditional textbooks. This finding suggests that effective classroom management and clear guidelines are essential to maximize the benefits of e-textbooks.

In short, the integration of English e-textbooks in educational settings presents significant opportunities for enhancing students' reading skills. The interactive and multimodal features of e-textbooks can improve reading comprehension and engagement, making reading a more dynamic and inclusive activity (Smith & Brown, 2023). However, challenges such as digital equity and potential distractions must be addressed to ensure that all students can fully benefit from this technology (Johnson, 2022). As educational technology continues to evolve, further research is needed to explore the long-term effects of e-textbooks on students' reading performance and to develop strategies for effectively integrating them into the classroom (Lee & Martin, 2023).

2.7. Previous Studies on Electronic Textbooks

The effect of electronic textbooks (e-textbooks) on student performance has been extensively studied in various educational contexts. The findings generally indicate a range of benefits associated with the use of e-textbooks, although these benefits can vary depending on the context and implementation (Garcia & Lee, 2023; Thompson, 2022).

2.7.1. Challenges and Considerations

Technical Issues and Distractions: Despite their benefits, e-textbooks can also present challenges. Technical issues, such as software glitches and the need for reliable internet access, can impede their effectiveness. Furthermore, distractions from other apps and notifications on electronic devices can negatively affect student concentration (Mangen, Walgermo, & Brønnick, 2013).

Learning Preferences and Effectiveness: Research indicates that the effectiveness of e-textbooks can be influenced by individual learning preferences. Mangen, Walgermo, and Brønnick (2013) found that some students prefer printed textbooks over e-textbooks for deep reading and comprehension tasks, suggesting that e-textbooks may not equally benefit all learners.

Cost and Equity Issues: The cost of devices and the need for internet connectivity can create equity issues, especially in remote or under-resourced areas. A study by Kimmons and Sprio (2015) highlighted that while e-textbooks can be cost-effective in the long run, the initial investment in technology can be a barrier for some schools and students.

2.7.2. Context of Rwandan Secondary Schools

In the context of Rwandan secondary schools, particularly in remote areas such as Muhanga District, the introduction of e-textbooks is relatively recent. Studies specific to Rwanda have noted both opportunities and challenges.

Overall, previous studies suggest that while e-textbooks offer numerous benefits in terms of engagement, accessibility, and interactive learning, their effect can be moderated by technical issues, individual preferences, and socioeconomic factors (Nguyen, 2022; Williams & Davis, 2023). The specific context of Rwandan secondary schools in remote areas further emphasizes the need for careful consideration of infrastructure and equity issues to fully realize the potential of e-textbooks (Mugisha & Kamana, 2023). For the case of G.S Kibangu and G.S Rongi faced the same issues like: lack of school infrastructure, electricity and conducive environment.

2.8. Summary and Gap analysis

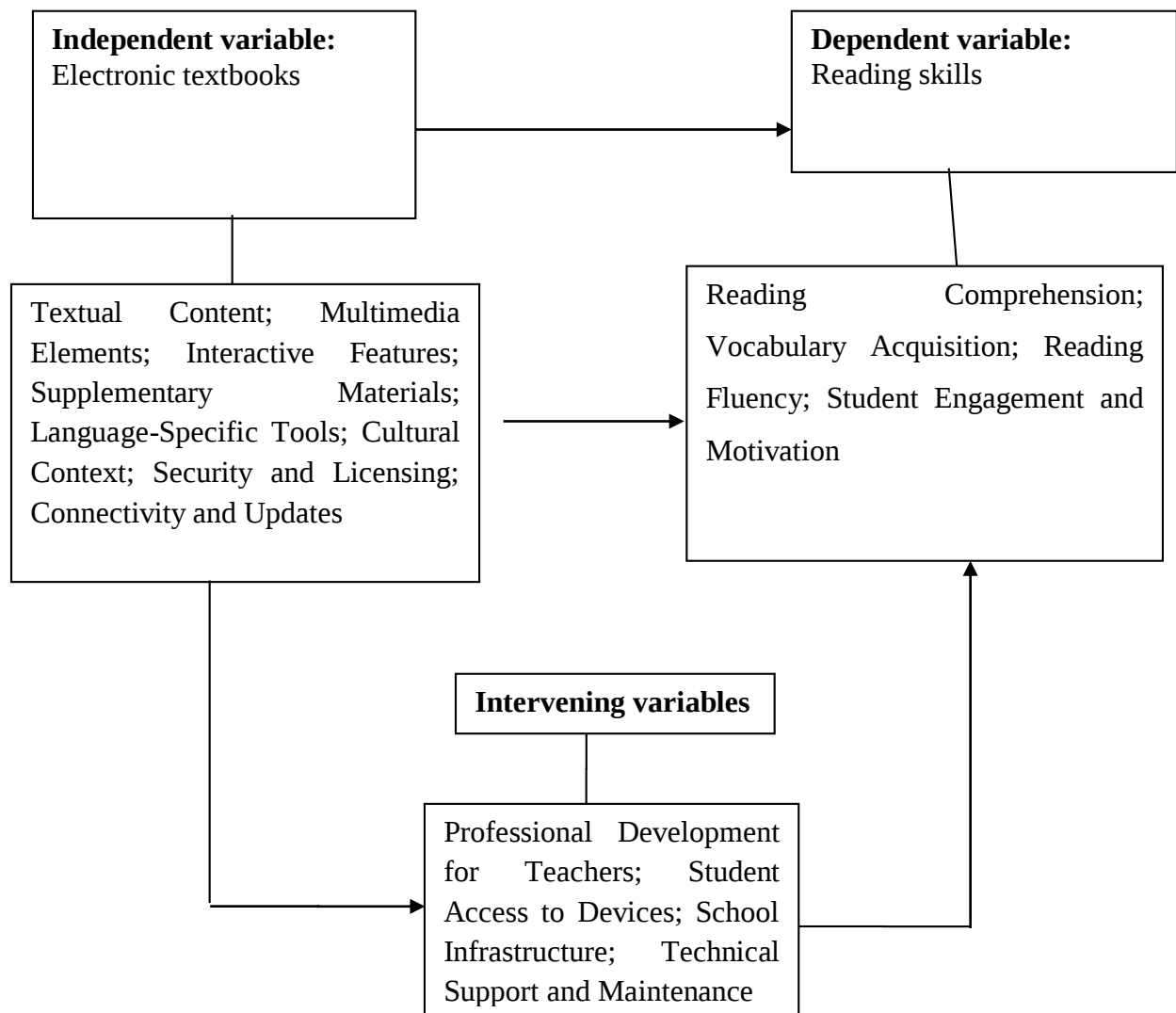
The literature review discloses and exposes the actuality of many knowledge gaps with the respect of the effect of electronic textbooks in English language on students' reading skills performance (Tangpermpoon, 2018) undertook a related research project to this but he made emphasis on the relationship between English reading skills and student's performance and his study failed to identify the moderating variables. A study of Wilson and Sotco (2012) revealed that quality students' academic winning is an uppermost or major for individual as well as societal economic development and they did not show the factors that influence good student's academic achievement. Comparatively, a study carried out in Rwanda by Marie (2013) found out that unsatisfactory academic performance in the midst of the Rwandan public secondary students due to the lack of learners' English understanding and proficiency, and this makes them fail to understand other subjects. Marie did not show well the role played by English reading skills on that low academic achievement among learners in public secondary schools in Rwanda. This research on the effect of electronic textbooks in English language on students' reading skills performance in Rwanda intended to fill in identified gaps. Unquestionably, many studies that were carried out in this domain reveal non-conclusive findings with varying results which created room for further studies to close many awareness and clear gaps traced by such studies. Further studies for example assessing the effect of electronic textbooks in English language on students' reading skills performance in Rwanda, tackling G.S Rongi and G.S Kibangu in Muhanga district is paramount important to close this gap. Furthermore, many studies have been conducted investigating the role of text books in teaching and learning English language. the researchers like (Michelle Maxom, 2009), Rathert & Cabaroğlu, (2022), (Niyibizi et al., 2020), Fuller, M. (1850) have shown the importance of text books how they should be utilised in teaching and learning a language. My study investigated the effect of electronic textbooks in English language on students' reading skills performance and how it affects students' performance in reading skills especially in remote area.

2.9. Conceptual framework

A conceptual framework is defined as a representative model by which a researcher conceptualizes or represents the relationship between the variables of a study and shows this relationship graphically or diagrammatically (Orodho, 2009). Thus, Orodho argues that a conceptual framework

is a hypothetical model that identifies the concepts and variables to be studied and presents their relationships. The authors further define variables as terms that can have different quantitative values, such as weight, height, and income. On the other hand, Mugenda (2008) defines a variable as a measurable characteristic that takes on different values depending on the unit of a particular population.

Diagram 1: Conceptual framework



In research, dependent and independent variables are fundamental concepts used to understand relationships between factors.

In this case study analyzing the effect of English electronic textbooks on student performance in reading skills in Rwandan secondary schools, several variables can be identified. These variables can be classified into independent, dependent, and control variables.

CHAPTER THREE: RESEARCH METHODOLOGY

As previously stated, the study aim is to investigate the effect of electronic textbooks in English language on students' reading skills performance. This research methodology sets out the research design adopted for this study and the reasons why such design is deemed appropriate. The methodology describes the approaches and processes that are used in the dissertation aimed at testing hypothesis and enabling the research to achieve the specific objectives of the study and ensuring that the research questions are adequately addressed and answered. Furthermore, the chapter outlines the population of interest and sampling designs as well as the data collection methods and data analysis methods used in presenting and explaining the results of the study. This chapter further outlines the ethical considerations the study takes into account and it concludes by setting out the limitations of the study.

Because of this, there will be an element of exploration, particularly since no similar study has been conducted previously. This chapter provides an in-depth overview of the tools and methods employed to address the research problems in the area. This involves clearly defining the scope of the research and the participants in the study. It goes into more detail about the approaches and strategies employed in determining the sample size and choosing the tools for selection such as questionnaires, interviews, and documentation. This chapter also covers data processing, analysis, and challenges faced in the study. It sets the foundation for evaluating the reliability and validity of the findings and conclusions.

3.1. Research design

Social researchers must establish a design or structure before starting data collection or analysis. The study's structure ensures that the information acquired allows the initial question to be addressed as clearly as possible (De Vaus, 2001). The writers also propose that obtaining pertinent evidence involves determining the type of evidence needed to address a research inquiry, examine a theory, assess a program, or precisely depict a phenomenon.

In this study, a mixed research design was used, this is a type of research design which combines qualitative and quantitative methods. Qualitative approach allows the research to gather the significant data and find a deep understanding of the research area (Mason, 2016). In scientific research, qualitative approach is a process of analysis, interpretation, and report writing from

different traditional of survey that explore a human problem or social (Moser, et al, 2019). To build this picture, structured interviews were given to the school staff and questionnaire items were given to the teachers and students. Quantitative study technique with self-administered questionnaires to teachers and learners was considered in this research to collect quantitative data as the dissertation data collection tools is considered suitable for this study.

Therefore, this research aimed to analyze the abilities of students in English reading classes in lower auxiliary schools in Rwanda, especially in Muhanga area. It is essentially a subjective investigation. Subjective investigation points to finding and understanding participants' encounters, viewpoints, and ways of considering. Subjective investigation finds out meaning, reason, or reality (Hiatt, 1986). In this ponder, surveys are given to examine respondents' views. So, for this study answers from respondents were displayed, analyzed and deciphered measurably.

3.2. Area of study

The study was conducted at secondary schools located in Kibangu and Rongi sectors, Muhanga District, Southern Province. These studied schools are GS Rongi and GS Kibangu, the 12 years basic education.

3.2.1. Study population

The study population concerned 2 secondary schools respectively in Rongi and Kibangu sectors. The study population has included teachers, learners, and school authorities (head teachers and deputy head teachers).

Table 1: Population of the study

Sector	Population				Total
	School	Learners	Teachers	School authorities	
Rongi	GS Rongi	680	35	2	717
Kibangu	GS Kibangu	485	27	2	514
Total		1165	62	4	1231

Source: Primary data (2024)

3.2.2. Sample and sampling technique

While selecting the sample size of the study; the researcher purposively selected a number of respondents particularly representing the study population. Data were collected from selected respondents from the study population due to the reasons of necessity and convenience. Sample is defined as a subset of the portion of the total population and it must always be considered as an approximation of the whole itself (Schumm, 2016). There are different ways or techniques involved in the selection of a sample for any study. A sampling technique therefore refers to the author's method of appropriately selecting the type, size and representatives of the sample. While selecting the sample size of the study; the researcher purposively selected a number of respondents particularly representing all study population. Data were collected from selected respondents from the study population due to the reasons of necessity and convenience.

3.2.3. Sample size

The sample size is important where the findings from an inappropriate number of samples would not be able to represent the existing population (Hellqvist, 2005). In practice the sample size in a study is determined based on the need to have sufficient statistical power (Schumm, 2016). The sample size was calculated Using Yamane simplified formula to calculate sample sizes, with a 90% confidence level and $e=0.1$

$$n = \frac{N}{1 + (N * (e)^2)}$$

Where n is the sample size, N is the population size, and e is the level of precision.

When this formula was applied to the above target population, we got:

$$n = \frac{1231}{1 + (1231 * (0.1)^2)} = 92 \text{ respondents}$$

A sample of 92 respondents was targeted to participate in this study. This formula was used to estimate a representative sample. A total number of 92 respondents was taken as sample size.

Table 2: Surveyed respondents

Sector	Population					Total
	School	Learners	Teachers	Headteacher	Deputy Headteacher	
Rongi	GS Rongi	48	4	1	1	54
Kibangu	GS Kibangu	33	3	1	1	38
Total		81	7	2	2	92

Source: Primary data (2024)

The surveyed respondents of our research are composed by all 7 English teachers who were selected purposively, 81 learners who were selected by simple random sampling purposive sampling technique while choosing the class to be considered as respondents and 4 school authorities (2 head teachers and 2 deputy head teachers) who were selected by purposive sampling technique. The sample for learners was based on the percentage.

Table 3: Demographic characteristics of respondents

This table presents the distribution of respondents with their gender, experience and qualifications (**Age, Gender and qualifications**)

Gender	Male	41	Total=92
	Female	51	
Experience	Below 2 years	1	14.3%
	2-6 years	4	57.1%
	7-9 years	2	28.6%
Qualification	A1	5	Total=7
	A0	2	

Source: Primary Data, 2024

The data presents the gender distribution and experience levels of a group of 92 individuals, with 41 males and 51 females. Among those with experience, 1 individual has below 2 years (14.3%), 4 have 2-6 years (57.1%), and 2 have 7-9 years (28.6%). For qualifications, 5 individuals hold A1 and 2 hold A0, making a total of 7. This distribution highlights a majority of females and a predominant mid-range experience level among the respondents. The qualification data indicates a higher number of A1 holders compared to A0.

Table 4: Experience in teaching English language

The table presents the surveyed teachers of English subject have various experiences in teaching.

Experience	Teachers	
	N=7	Percent
Below 2 years	1	14.3
2-6 years	4	57.1
7-9	2	28.6
Total	7	100

Source: Primary deata (2024)

Referring to table 4, 14.3% of the surveyed respondents have less than 2 years of experience, 57.1% of the surveyed teachers have between 2 and 6 years of experience, and 28.6% of surveyed teachers have between 10 and 12 years of experience.

Highlighting the influence of teaching experience on students' academic performance, Harris and Sass (2008) found that teacher experience has a significant effect on students' English academic performance. Similarly, Strauss and Vogt (2001) identified teachers' teaching experience as an important factor for students' academic success. Komolafe (1989) found that teachers' experience influences students' ability to learn English. The more qualified and experienced the teacher, the more likely the student will be successful.

3.3. Data collection instrumentation

For the tenacity of finalizing this dissertation, primary and secondary data were necessary. For secondary data, t-test was used focusing on the documentary review of S2 students' marks obtained from 2014 up to 2021/2022 in English subject to test the students' performance in reading skills before and after the introduction of e-textbooks. Moreover, the hypothesis indicated that H_0 has no significant effect on reading skills for the learners' performance who use printed books in GS Rongi and GS Kibangu located in Muhanga district while H_1 indicated that introduction of e-textbook has a significant effect of reading skills on the learners' performance who use electronic textbooks in GS Rongi and GS Kibangu located in Muhanga district.

This dissertation was enriched by the data that were gathered through usage of questionnaires (for teachers and students), interview (interview guide to both head teachers, Deputy head teachers in charge of studies, teachers and students) and direct observation where the researcher carried out observation sessions in five classrooms where teachers were teaching English lessons. We observed how the reading skills impacted learners' English performance. The researchers observed what kind of English text books learners read and available, if teachers give reading activities to learners, the methods that teachers used while teaching English lesson. Researchers also observed some intervening variables like the school library, smart classroom and filled in the form accordingly.

These are done to guarantee and safeguard that the researcher gets all the accessible data materials and resources from the respondents. Questionnaire with closed and open-ended questions was given to 7 sampled teachers and 81 sampled learners while interview guide with open ended questions was sent to two head teachers and two Deputy head teachers in charge of studies of studies of G.S Rongi and G.S Kibangu in Muhanga district.

3.4. Data processing

After data collection, researcher started to analyze data by using both quantitative and qualitative methods as it is an easy way of valuing collected data. Therefore, researcher based on these methods stated by Kothari (2004) who defines quantitative method through data analysis as

studying the content analysis through statistical analysis by description of numbers of the target population sample. Researcher based on Singh (2006) who defines qualitative method in data analysis as making the written words description of obtained data from the selected secondary school in relationship with the reading skills for learners' English language proficiency. Therefore, the researcher analyzed the data from the field in descriptive statistics in tables and some in verbal way so that the data should be relevant and accurate.

According to Ndokoye (2007), data processing is the organization of collected data in a meaningful and understandable manner. Roth (1989) added that data processing involves classifying responses into meaningful categories called codes. This includes coding, editing, tabulating, and analyzing the collected data.

Therefore, data were collected from respondents were in line with the format and survey results are displayed. Next, data were technically conducted and then appropriate analyses made them more meaningful for interpretation. Data processing is carried out in accordance with the general and specific purposes of the research study. After administering the questionnaire to respondents, responses were collected and processed, and the information was transformed meaningfully and organized in format through coding.

3.5. Ethical Considerations prior to data collection, ethical and scientific approval was obtained from the administration of University of Rwanda, College of Education, then, the researcher acquired authority from Muhanga District GS Rongi and GS Kibangu. The introductory letters were addressed to head teachers of two selected schools in Kicukiro District to have access to teachers and students who possess information about the research problem in the schools. Moreover, consent letters from concerned participants were sought and obtained by the researcher. The participants were assured the investigation is for only academic purposes and any confidential information obtained treated with overriding confidentiality. Furthermore, the participants were permitted to withdraw from the research at any phase without experiencing any penalties in any way.

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS, INTERPRETATION AND DISCUSSIONS OF FINDINGS

Considered as the core part of this dissertation, this chapter presents first the data in both statistical and discourse format. Second, it interprets the findings and analyses them according to the objectives of the study, hypotheses, and the literature review. Third, the researcher's comments and views keep an important stand to draw consistent conclusions.

All findings from different people were very important considering their experience and the useful information. This information concerns the major effects of electronic textbooks on reading skills in English in Rwandan secondary schools, especially in 12 YBE in remote areas. In this regard, surveyed people provided suggestions on what should be done to solve challenges faced by English teachers in implementing the use of electronic textbooks in 12 YBE, especially in remote areas only 92 respondents participated in the research study.

4.1. Factors that influence reading skills among students in secondary schools

The first objective was to identify and analyze factors that influence reading skills among students in secondary schools. The study involved teachers and students. They have provided the following answers as they have been indicated in the table below. Answers were provided using Likert Scale: Strongly agree, agree, strongly disagree and disagree.

Table 5: Factors influencing reading skills

Reading Factors	SA& A (%)	SD& D (%)
Cognitive factors	61	39
Environmental factors	54	46
Parental factors	55	45
Instructional factors	68	32

Source: Primary Data, 2024

The table presents the influence of various factors on students' reading skills, as assessed using a Likert Scale. Cognitive factors were positively viewed by 61% of respondents, indicating a significant effect on reading proficiency, consistent with findings by Brown (2016) that cognitive skills are crucial for reading development. Environmental factors received 54% agreement,

suggesting that physical and social surroundings moderately affect reading skills, aligning with Miller's (2022) emphasis on the learning environment's role. Parental factors had 55% agreement, highlighting the importance of parental involvement in reading success, as supported by Garcia and Martinez (2023). Instructional factors had the highest positive response at 68%, underscoring the effectiveness of teaching methods and resources in enhancing reading skills, reflecting on Lee's (2022) research on instructional quality. Despite these positive perceptions, a significant minority expressed disagreement across all factors, indicating areas needing improvement and further investigation

4.2. The effects of English electronic textbooks on students' performance in reading skills in Rwandan secondary schools

The second objective of the study was to compare the reading skills performance of students using electronic textbooks with those using traditional printed textbooks 12YBE in remote areas of Muhanga District. It was hypothesized that there are significant differences in overall reading skills performance between students who use electronic textbooks and those who use traditional printed textbooks, with the former group showing super performance in GS Rongi and GS Kibangu in the Muhanga district. To test this hypothesis two sample t-tests were used.

Table 6: Comparison of S2 students' marks in English subject before and after the introduction of electronic textbooks in GS Rongi and GS Kibangu

Period	Sampled students	Mean	SD	t-calculated	Sig. or P value	Decision
Before the introduction of e-textbooks (Between Academic year 2014-2017)	451	48.6430	20.39006	5.339	.000	Confirm H_0
After the introduction of e-textbooks (Between Academic year 2018-2021/2022)	416	55.8666	19.36058			

Source: Secondary data, 2022

*** 1. Mean Difference Calculation:**

The mean difference between pre-introduction and post-introduction of e-textbooks is calculated as follows:

Mean Difference = Mean of Post-introduction – Mean of Pre-introduction = Mean Difference

Mean Difference = $55.8666 - 48.6430 = 7.2236$

2. Statistical Significance:

To determine if this mean difference is statistically significant, typically a t-test was used. The significant effect mentioned implies that this difference is not due to random chance.

3. Effectiveness of E-textbooks:

The positive mean difference of 7.2236 suggests an improvement in learners' performance in English reading skills after the introduction of e-textbooks. This indicates that e-textbooks have a beneficial effect on reading performance.

The second hypothesis tested stated that there are significant differences in overall reading skills performance between students who use electronic

textbooks and those who use traditional printed textbooks, with the former group showing superior performance than the latter. Considering the results in table 6, the P-value is .000. This p-value indicates the probability that the observed difference between the groups suggests that the difference is highly significant. Therefore, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted because, the value of t-cal. 5.339 is higher than t-critical 0.000. This implies that, there are significant differences in overall reading skills performances between students who use electronic textbooks, and those who use traditional printed textbooks. Presumably, students with electronic textbooks overtake those with traditional textbooks in reading skills performance.

4.3. Comparison between the reading skills performance of students using electronic textbooks with those using printed textbooks

4.3.1. Access to electronic textbooks

To know how electronic textbooks are used while teaching and learning English lessons, the surveyed students and teachers delivered their answers. Their answers are contained in the following table.

Table 7: Access to electronic textbooks

Question	Answer	Teachers		Students		Total	
		N=7	Percent	N=81	Percent	N=88	Percent
Do you have regular access on e-books?	Yes	3	42.9	33	40.7	36	40.9
	No	4	57.1	48	59.3	52	59.1
	Total	7	100	81	100	88	100

Source: Primary data (2024)

According to table 7, 40.9% of the surveyed respondents confirmed that they have access to electronic textbooks while 59.1% of the surveyed respondents said that they do not have access to electronic textbooks.

4.3.2. Types of electronic textbooks

In Rwandan secondary schools, e-textbooks used for English reading teaching and learning fall into three types that are devices, reading software and web-based content. Each serving different educational purposes and catering to diverse learning needs.

According to Lee's study (2012) the usability and accessibility of e-textbooks, they can be divided into three types: web-based systems, reading software, and specialized devices. It is essential that textbook information be made accessible in order to make e-textbooks mandatory for all teachers and students, particularly those from economically disadvantaged homes. Usability evaluates the ease of use of e-Textbooks and covers characteristics that are designed to make the user experience more pleasant. Students can learn to use something more readily if it has a higher usability level, which shows ease of use.

Web-based content: Online textbook content in common formats, such as HTML and XML, is easily accessible. Internet access is required because students can only download certain sections of textbooks to their devices for free or at a cost. Devices or software are not needed to access the information because it can be viewed on any device with a web browser.

Reading software is downloaded from the internet and is specifically designed to read text in specific formats. Generally speaking, tablet PCs and smart phones like the iPad®, iPhone®, Android tablet, and Android phone have reading software.

Dedicated device: The specialized device is designed specifically to read electronic textbooks. The specialized device is made up of several crucial parts, such as the operating system (OS), network access (such as Bluetooth and Wi-Fi), and display (such as LCD or electronic paper). A specialized device's e-textbooks can be found in many different formats, such as HTML, XML, ACW, EPUB, and some custom formats. To read e-Textbooks, students need to use special software that is included in a dedicated device. Students can download e-Textbooks to their dedicated devices for a fee or for free from publishers' websites (Lee, 2012).

Table 8: Types of electronic textbooks used

Answer	Teachers	
	N=7	Percent
Interactive electronic Textbooks	1	14.3
PDF and Static Electronic Textbooks	3	42.9
Online Platforms and Digital Libraries	2	28.6
Supplementary electronic Books and Novels	3	42.9
Interactive Learning Applications	2	28.6
Curriculum-Aligned Electronic Textbooks	3	42.9
Collaborative e-Textbooks	1	14.3

Source: Primary data (2024)

According to the table 8, 14.3% of the surveyed respondents confirmed that they use interactive electronic textbooks and collaborative electronic textbooks. 28.6% of the surveyed teachers stated that they use Online Platforms and Digital Libraries and Interactive Learning Applications. 42.9% of the surveyed teachers said they use PDF and Static electronic Textbooks, Curriculum-Aligned electronic Textbooks, and Supplementary electronic Books and Novels.

4.3.4. Comparison between electronic textbooks and printed textbooks

The surveyed students were asked if using electronic textbooks reading English teaching/learning could contribute to improving their English reading skills. In this context, they presented their views about how electronic textbooks are engaging compared to traditional printed textbooks. Their answers are presented in Table 8.

Question: Do you find electronic textbooks more engaging compared to traditional printed textbooks?

Table 9: Comparison between electronic textbooks and traditional printed textbooks

Answer	Teachers		Students		Total	
	N=7	Percent	N=81	Percent	N=88	Percent
Strongly Agree	4	57.1	52	64.2	56	63.6
Agree	2	28.6	21	25.9	23	26.1
Neutral	1	14.3	6	7.4	7	8.0
Disagree	0	0.0	2	2.5	2	2.3
Strongly Disagree	0	0.0	0	0.0	0	0.0
Total	7	100.0	81	100.0	88	100.0

Source: Primary data (2024)

Referring to the table 9, 63.6% of the surveyed respondents are strongly agree that electronic textbooks are more engaging compared to traditional printed textbooks. 26.1% are agree with the statement arguing that electronic textbooks are more engaging compared to traditional printed textbooks. 8% are neutral while 2.3% are disagreeing.

Electronic textbooks can be more engaging for students learning English compared to traditional printed textbooks due to their interactive features, access to online resources, and adaptability. They often include multimedia elements such as videos, audio recordings, and interactive quizzes, which can enhance comprehension and retention of material (Chen et al., 2013; Lai & Chang, 2011).

Electronic textbooks provide instant access to a vast array of online resources, such as hyperlinks to supplementary materials, dictionaries, and additional readings, which can enrich the learning experience. Electronic textbooks can be easily updated with new information, ensuring that content remains current and relevant. Electronic textbooks offer customizable features such as adjustable font sizes and background colors, which can

enhance readability and cater to individual preferences Rockinson-Szapkiw et al., 2013. However, electronic textbooks can also lead to increased distraction and eye strain, which can detract from the engagement benefits (Woody et al., 2010).

4.4. Benefits and challenges perceived by students and teachers regarding the use of English electronic textbooks

4.4.1. Benefits of electronic textbook use

The use of electronic textbooks in education by integrating technology in classrooms is very important. The surveyed respondents (teachers and learners) were asked what can be the effect of these resources on secondary students' performance in English reading skills. Electronic textbooks use in English reading teaching/learning presents various benefits such as improved engagement and motivation, enhanced reading comprehension, increased accessibility and convenience, and development of digital literacy skills.

Improved engagement and motivation

The use of electronic textbooks improves engagement and motivation and these are among the key factors leading to teaching/learning success. The surveyed respondents revealed the extent to which they agree with this statement.

Table 10: Improved engagement and motivation

Answer	Teachers		Students		Total	
	N=7	Percent	N=81	Percent	N=88	Percent
Strongly Agree	5	71.4	71	87.7	76	86.4
Agree	2	28.6	10	12.3	12	13.6
Neutral	0	0.0	0	0.0	0	0.0
Disagree	0	0	0	0.0	0	0.0
Strongly Disagree	0	0	0	0	0	0
Total	7	100	81	100	88	100

Source: Primary data (2024)

According to the table 10, 86.4% of the surveyed respondents are strongly agreed and 13.6% are agreeing that using electronic textbooks contribute to improve learners' engagement and motivation.

Features such as interactive elements, multimedia resources, and hyperlinks can make reading more engaging and enjoyable for students. According to Dündar and Akçayır (2014), the interactive features of electronic textbooks can improve students' motivation and engagement, which are critical factors in improving reading skills.

Enhanced reading comprehension

The use of electronic textbooks contributes to enhancing reading comprehension. The surveyed respondents revealed their views on the extent to which they agree with this statement.

Table11: Enhanced reading comprehension

Answer	Teachers		Students		Total	
	N=7	Percent	N=81	Percent	N=88	Percent
Strongly Agree	3	42.9	59	72.8	62	70.5
Agree	3	42.9	11	13.6	14	15.9
Neutral	1	14.3	8	9.9	9	10.2
Disagree	0	0	3	3.7	3	3.4
Total	7	100	81	100	88	100

Source: Primary data (2024)

Referring to Table 11, 70.5% of the surveyed respondents strongly agree, 15.9% agree while 10.2% are neutral with the statement confirming that the use of electronic textbooks contributes to enhancing reading comprehension.

Researchers have shown that electronic textbooks can positively affect students' reading comprehension. In the same context, Korat and Shamir (2008) found that electronic books significantly improved kindergartners' word reading and comprehension skills, suggesting that

Increased accessibility and convenience

Electronic textbooks offer greater accessibility and facilities that contribute to improving reading habits and skills. The surveyed respondents presented their views concerning the extent to which they agreed with this statement.

Table12: Increased accessibility and convenience

<u>Answer</u>	<u>Teachers</u>		<u>Students</u>		<u>Total</u>	
	<u>N=7</u>	<u>Percent</u>	<u>N=81</u>	<u>Percent</u>	<u>N=88</u>	<u>Percent</u>
<u>Strongly Agree</u>	<u>5</u>	<u>71.4</u>	<u>68</u>	<u>84.0</u>	<u>73</u>	<u>83.0</u>
<u>Agree</u>	<u>2</u>	<u>28.6</u>	<u>13</u>	<u>16.0</u>	<u>15</u>	<u>17.0</u>
Total	7	100	81	100	88	100

Source: Primary data (2024)

According to Table 12, 83% of the surveyed respondents strongly agree while 13% agree with the statement confirming that electronic textbooks offer greater accessibility and convenience that contribute to improving reading habits and skills.

Electronic textbooks offer greater accessibility and convenience, which can contribute to improved reading habits and skills. The ease of carrying multiple books in a single device and the ability to access them anytime and anywhere can encourage more consistent reading practices. Rockinson-Szapkiw et al. (2013) noted that the portability and convenience of electronic textbooks encourage more frequent reading, which is directly correlated with improved reading skills.

Development of digital literacy skills

Electronic textbooks also enable students to develop digital literacy skills, which are very important in today's digital world. The surveyed respondents showed their views on the extent to which they agreed with this statement.

Table13: Development of digital literacy skills

Answer	Teachers		Students		Total	
	N=7	Percent	N=81	Percent	N=88	Percent
Strongly Agree	7	100.0	77	95.1	84	95.5
Agree	0	0.0	4	4.9	4	4.5
Total	7	100	81	100	88	100

Source: Primary data (2024)

Referring to the table 13, 95.5% of the surveyed respondents strongly agree while 4.5% of the surveyed respondents are agree with the statement underlining that using electronic textbooks also enable students develop digital literacy skills.

Navigating through electronic textbooks, utilizing search functions, and engaging with interactive content help students become more proficient with technology, enhancing their overall learning experience. Warschauer (2006) confirmed that integrating technology in education not only aids in subject-specific learning but also prepares students for the technological demands of the modern world.

4.4.2. Challenges faced in using electronic textbooks in English reading teaching

The adoption of electronic textbooks in English reading teaching and learning presents several challenges, particularly in the context of Rwandan secondary schools in the remote areas. These challenges can affect the effectiveness of electronic textbooks in improving students' reading skills and overall learning experiences. The surveyed respondents were asked to list those challenges and they provided answers contained in the table 13.

Table14: Challenges faced in using electronic textbooks in English reading education

Answer	Teachers		Students		Total	
	N=7	Percent	N=81	Percent	N=88	Percent
Limited access to technology	4	57.1	57	70.4	61	69.3
High cost	6	85.7	72	88.9	78	88.6
Technical issues and support	3	42.9	49	60.5	52	59.1
Teacher training and preparedness	4	57.1	0	0.0	4	4.5
Student distraction and misuse	5	71.4	66	81.5	71	80.7
Content relevance and quality	3	42.9	0	0	3	3.4

Source: Primary data (2024)

According to Table 14, 69.3% of the surveyed respondents (teachers and learners) confirmed that limited access to technology is one of the challenges faced in using electronic textbooks. 88.6% of the surveyed respondents pointed out high costs as one of the challenges faced. 59,1% highlighted the technical issues and lack of support while 80.7% confirmed student distraction and misuse as challenges encountered in using electronic textbooks.

In addition, 57.1% of surveyed teachers noted the lack of teacher training and preparedness is among the challenges faced while 42.9% of surveyed teachers revealed low content relevance and quality impede the proper use of electronic textbooks.

While electronic textbooks offer many potential benefits for enhancing English reading skills, several challenges hinder their effective use in secondary schools. Addressing issues such as limited access to technology (Baguma and Muhirwe, 2016), high costs, technical difficulties, inadequate teacher training (Baguma & Muhirwe, 2016), student distraction, and content quality is crucial for leveraging the full potential of electronic textbooks in education.

4.5. Strategies to solve challenges faced in using electronic textbooks

Addressing the challenges associated with using electronic textbooks in Rwandan secondary schools requires a multifaceted approach. Below are some proposed strategies to enhance the effective integration of e-textbooks in English reading education.

Table15: Strategies to solve challenges faced in using electronic textbooks

Answer	Teachers		Students		Total	
	N=7	Percent	N=81	Percent	N=88	Percent
Improving access to technology	5	71.4	61	75.3	66	75.0
Reducing costs	4	57.1	77	95.1	81	92.0
Providing technical support	6	85.7	56	69.1	62	70.5
Enhancing teacher training and preparedness	7	100.0	0	0.0	7	8.0
Minimizing student distraction	5	71.4	69	85.2	74	84.1
Ensuring content relevance and quality	4	57.1	0	0	4	4.5

Source: Primary data (2024)

Referring to Table 15, 75.0% of the surveyed respondents (teachers and learners) stated that improving access to technology can reduce challenges faced in using electronic textbooks. 92.0% of the surveyed respondents added that reducing costs can contribute to solving challenges faced. 70.5% suggested providing technical support while 84.1% proposed minimizing student distraction. Moreover, all surveyed teachers added that enhancing teacher training and preparedness can contribute to solving challenges faced while 57.1% of surveyed teachers remarked that ensuring content relevance and quality can help to solve challenges encountered in using electronic textbooks.

In short, implementing these strategies can address the various challenges faced in using electronic textbooks in English reading teaching and learning in secondary schools. Through improved access to technology (Khan et al., 2012), cost reduction measures (Mtebe & Raisamo, 2014), enhanced technical support (Baguma & Muhirwe, 2016), comprehensive teacher training, distraction management, and ensuring content relevance (Mtebe & Raisamo, 2014), electronic textbooks can become a valuable asset in enhancing students' reading skills. For the case of both schools (G.S Rongi and GS Kabangu), teachers should be trained on the use of electronic devices. Access to technology should be improved and accessible to teachers and students.

4.6. Teachers and school leaders' interviews

1) The researcher asked the head teacher: “Have you noticed any changes in students' reading skills since the introduction of electronic textbooks?”

The head teacher replied: The ease of access to vast amounts of information and the ability to quickly search for specific terms or concepts also appear to improve research and critical thinking skills. However, some students may struggle with distractions and the temptation to multitask while using electronic devices, which can negatively impact their focus and reading endurance while electronic textbooks have introduced new tools and methods that generally support and enhance reading skills, they also require students to develop new habits and strategies to maximize their benefits.

2) The researcher asked the Deputy Head teacher in charge of studies: “Can you provide specific examples or evidence of improvements or challenges?”

Deputy Head teacher replied: Certainly! For instance, since the introduction of electronic textbooks, students have shown improvements in their reading comprehension and engagement. For example, many students now use features like highlighting and note-taking, which help reinforce key concepts and improve retention. On the other hand, some students face challenges, such as digital distractions from notifications or the temptation to browse unrelated websites, which can disrupt their focus. Again, prolonged screen time has caused eye problems for a few students, impacting their overall reading experience. Despite these challenges, the approach indicates that the benefits of interactive and accessible electronic textbooks have positively influenced students' reading skills. The findings of the study are compatible with the study

conducted by Rossi and Bianchi (2023) that digital tools have been integrated into the educational system to improve learning outcomes.

3)The researcher asked the teacher of English: “How do students generally respond to using electronic textbooks compared to traditional textbooks?”

The teacher of English replied: Students generally have mixed responses to using electronic textbooks compared to traditional textbooks. Many appreciate the convenience and accessibility of electronic textbooks, as they can carry numerous books on a single device and access them anytime, anywhere. Features like interactive content, instant search, and the ability to highlight and annotate directly on the text are often highlighted as major advantages. Some students find that these features enhance their learning and engagement with the material. However, other students miss the tactile experience and simplicity of traditional textbooks, finding screen reading to be tiring over long periods. In addition, some struggle with digital distractions when using electronic devices.

3)The researcher asked the student of senior three B: “Do you feel that electronic textbooks provide better support for your reading development compared to traditional textbooks? Why or why not?”

The student of senior three B responded “I feel that electronic textbooks provide better support for my reading development compared to traditional textbooks for several reasons. Firstly, electronic textbooks often come with interactive features such as simpler definitions, multimedia content and quizzes that enhance my understanding and engagement with the material. The ability to highlight text, make annotations and quickly search for specific terms or concepts also helps me study more efficiently. Besides, the portability of electronic textbooks means I can access my reading materials anytime and anywhere, which is convenient and encourages more frequent reading. However, I do sometimes miss the experience of traditional textbooks, and prolonged screen time can be tiring. Generally, the benefits of interactive and accessible content in electronic textbooks outweigh these drawbacks, making them a valuable tool for my reading development.

This is also in agreement with a study conducted by Hung and Young (2015) found that E-readers significantly benefited EFL students' academic writing progress compared to conventional paper-based materials. The unique functions of E-readers, such as reciprocal peer review and improved

information retrieval, were particularly beneficial in facilitating the writing process, which indirectly supports reading comprehension and skills (Hung & Young, 2015).

4.6.1. Positive effect

In interviews with school leaders regarding, the effect of English electronic textbooks on students' reading skills in Rwandan secondary schools, several key findings emerged. School leaders observed notable improvements in students' reading comprehension and vocabulary acquisition, attributing these gains to the interactive and multimedia elements of electronic textbooks. Students appeared more engaged and motivated to read, benefiting from the convenience and rich resources provided by digital formats.

4.6.2. Challenges faced

However, the transition to electronic textbooks was not without challenges. Leaders highlighted significant technical issues, such as unreliable internet access and frequent hardware or software malfunctions. Additionally, there was a clear need for more comprehensive training and ongoing support for both teachers and students to effectively utilize these new tools. The initial resistance to change and the time required for adaptation were also mentioned as hurdles.

The effect on student performance was mixed; while many students thrived with the new technology, others faced difficulties. School leaders emphasized the necessity for improved digital infrastructure and expanded training programs to maximize the benefits of electronic textbooks. They also recommended implementing regular feedback mechanisms to continuously enhance the effectiveness of these digital resources.

Looking ahead, school leaders expressed plans to broaden the use of electronic textbooks across more subjects and grade levels. They underscored the importance of securing adequate funding and policy support to sustain and expand this educational innovation.

4.7. Findings from observation

The observation results showed that GS Rongi has a smart classroom among the two sampled schools while GS Kibangu doesn't. I remarked that a smart classroom is equipped with 3 projectors, 50 laptops for secondary students, and 4G wireless for internet connection.

This smart classroom is not enough for 15 classes and 28 teachers of different subjects. There is a timetable for the use of the smart classroom for mainly the subject of computer and other subject that can be integrated with ICT.

However, there are some challenges in the use of smart classroom like the short time, a great number of non-working laptops, lack of preparation, and cut of network and current. Because of the shortage of printed textbooks, some English teachers prefer to use the projector while teaching different English language skills as well as reading, writing, listening, and speaking in their respective classes. They use laptops lent from the smart classroom.

While teaching using a computer and projector, all students are very attentive and most of them are curious and want to know how to use the computer.

Besides, at GS Kibangu there is no smart classroom for ICT. The school has only three laptops for secondary science teachers and two projectors. The language teachers do not have enough access to those computers. These teachers use their smartphones to access e-textbooks and other applications for English education purposes. They face some challenges in teaching English lessons. Some of them include the shortage of printed textbooks. To solve this problem some teachers, use group work while others manage to print the section chosen from the textbooks. In fact, the students from GS Rongi outperformed the students from GS Kibangu in terms of reading fluently, reading comprehensions and being familiar with computer.

4.8. Chapter summary

This study mainly aims to investigate the effects of English electronic textbooks on students' performance in reading skills. Therefore, as Peras et al. (2023) pointed out, e-textbooks can positively influence reading performance, even though individual and contextual factors, as well as gender, socioeconomic status, and school location, play significant roles in the effectiveness of these digital tools (Peras et al., 2023). This shows that these authors confirmed that e-textbooks have the potential to improve reading performance and their effectiveness is influenced by a combination of individual and contextual factors. Addressing these factors is crucial to ensure that all students can benefit from the advantages of digital learning tools.

Through the lens of cognitive Theory of Multimedia Learning, proposed by Richard Mayer, suggests that people learn more effectively from words and pictures than from words alone. This theory is particularly relevant to e-textbooks, which often incorporate multimedia elements such as images, audio, and video to complement textual information. According to Mayer (2005), multimedia learning involves the dual coding of information through both visual and auditory channels, which enhances comprehension and retention.

In this context, this study has revealed that 86.4% of the surveyed respondents agreed strongly that the use of electronic textbooks improves engagement and motivation and these are among the key factors leading to teaching/learning success. In addition, 72.8 % of the surveyed respondents strongly agreed that the use of electronic textbooks contributes to enhancing reading comprehension. These views correspond to what Rafael and Tamban (2022) noted. Rafael and Tamban explored the use of localized English reading materials to enhance the reading skills of grade two pupils. The study revealed that students exposed to these localized materials showed significant improvements in their reading skills compared to those taught using traditional methods. This underscores the potential benefits of customized and culturally relevant e-textbooks in improving reading performance among young learners (Rafael & Tamban, 2022).

Furthermore, in this regard, different authors highlighted the importance of e-textbooks as far as reading skills are concerned. For instance, I-Chia Chou (2015) demonstrated that using reader response theory with e-books can engage EFL students more effectively, making reading practice more meaningful and enjoyable.

Considering the views of the respondents above concerning the effect of e-textbooks on English reading skills, we attest that the first research question was answered. Also, the main research objective, which is to investigate the effects of English electronic textbooks on students' performance in reading skills, and the first objective, to identify and analyze factors that influence reading skills, were achieved. In this regard, the analysis of the collected data brings to light a great correlation between the use of e-textbooks in teaching and learning English and significant improvements in English reading skills. Students who learned through ICT tools showed high motivation. This finding aligns with previous research indicating that e-textbooks offer interactive features such as hyperlinks, multimedia elements, and instant dictionary access, which can

significantly enhance comprehension and engagement (Higgins et al. 2012; Grimshaw et al., 2007; Korat and Shamir (2007).

The second research objective was to compare the reading skills performance of students using electronic textbooks with those using traditional printed textbooks. In this regard, the students' results from the sampled schools, i.e. GS Rongi and GS Kibangu showed the improvement due to the introduction of e-textbooks.

The results indicated that the students exposed to electronic textbooks outperformed the ones with traditional printed textbooks, referring to the table 12, 95.5% of the surveyed respondents strongly agree while 4.5% of the surveyed respondents agree with the statement underlining that using electronic textbooks also enable students develop digital literacy skills. It is in accordance with a study conducted in the Shyira Sector of Nyabihu District by Harerimana et al. (2024) examined the contribution of English reading materials, including electronic resources improve students' English performance. They found that the availability and use of diverse reading materials, including electronic textbooks, significantly enhanced students' reading skills and overall academic performance.

The third objective was to identify the challenges and benefits perceived by students and teachers regarding the use of English electronic textbooks. The study showed that there are many challenges associated with the integration of electronic textbooks in English reading learning.

The results revealed that 57.1% identified limited access to technology as a significant issue, while a higher percentage of students (70.4%) shared this concern, resulting in a combined perception of 69.3% across all respondents. High costs were highlighted by 85.7% of teachers and 88.9% of students, making it the most significant barrier, with a total of 88.6%. Technical issues and support were noted by 42.9% of teachers and 60.5% of students, leading to an overall perception of 59.1%. Teacher training and preparedness were a concern exclusively for teachers (57.1%), indicating a critical area for professional development. Student distraction and misuse of technology were significant concerns for both groups, with 71.4% of teachers and 81.5% of students acknowledging this issue, culminating in an overall 80.7%. Content relevance and quality were less of a concern, mentioned by 42.9% of teachers and not at all by students, resulting in a combined perception of 3.4%. This analysis highlights the disparity in concerns between teachers and students, particularly in areas of teacher preparedness and content quality. It is in line with studies conducted by Brown,

2016; Soomro, 2020) arguing that lower socioeconomic background students frequently do not have access to digital devices or dependable internet, which are necessary for using e-books and other online reading resources. Since students who lack access to digital resources are at a disadvantage when compared to their peers who have it, this lack of access has the potential to worsen already-existing educational inequities.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

This chapter gives an overview of the findings and their implications in line with the research questions. Based on the conclusion, the findings, recommendations and future research studies are made to different stakeholders in education to mitigate challenges connected with the effect of electronic textbooks in English language on Students' reading skills performance.

5.1 Conclusion

This research study has come to an end. Its primary main goal was to investigate the effects of English electronic textbooks on students' performance in reading skills in Rwandan secondary schools, particularly in Muhanga District. To achieve this goal, a questionnaire was utilized. Specifically, the research aimed to assess the role of English electronic textbooks in enhancing students' reading fluency, as supported by Masuudi (2024) who highlights the potential of e-textbooks to improve literacy skills through interactive features. Additionally, the study sought to compare the reading skills performance of students using electronic textbooks with those using traditional printed textbooks, echoing the findings of Jones (2022), who noted differences in engagement and comprehension between the two mediums. Finally, the research aimed to identify the challenges and benefits perceived by students and teachers, in line with Garcia and Martinez (2023), who have discussed the advantages of increased accessibility and engagement alongside issues like screen fatigue and the digital divide (Johnson & Lee, 2022).

The literature review provided a clear overview of the sociopolitical aspects of the advancements in educational technology in Rwanda, and identified some of the benefits of using electronic textbooks in English reading teaching and learning; challenges encountered, and proposed strategies of solutions. The findings were related to the research questions.

Furthermore, it was noticed that some strategies can contribute to overcoming this issue. Some of strategies include providing technical support, ensuring content relevance and quality, providing technical support, minimizing student distraction and improving access to technology to facilitate the use of electronic textbooks in English reading teaching and learning

To improve the reading skills of students through the use of English electronic textbooks in the classroom presents both significant opportunities and challenges. The results of the literature review indicated that e-textbooks have many advantages, such as greater instant accessibility to reading materials than traditional hard copy books, engagement, and the inclusion of interactive features that can raise motivation and reading comprehension (Brown, 2016 & Martinez, 2023). To guarantee fair and efficient use of these resources, however, issues including the digital divide, screen fatigue, and the requirement for adequate teacher preparation have to be addressed (Williams & Davis, 2022). Adopting a balanced strategy that combines digital and traditional reading approaches, guarantees a strong digital infrastructure, and offers teachers' ongoing professional development is essential to maximizing the potential of e-textbooks (Nguyen, 2023). Continued research and strategic implementation will be essential in fully realizing the benefits of e-textbooks in improving student reading performance and fostering lifelong learning skills.

The null hypothesis which was stated at the beginning of this study stipulated that, “*There is no significant statistical effect of English reading skills on the learners' performance who use printed books in G.S Rongi and G.S Kibangu in Muhanga district.*” This hypothesis is rejected in favour of alternative hypothesis because, after testing this supposition, the t-test result indicates a p-value of .000. This unveils the observed difference between the groups suggests an outstanding statistical significance. Therefore, electronic textbooks, ex post facto, have greatly improved students' English reading skills in the school equipped with smart classroom compared with traditional class without electronic textbooks. Consequently, the benefits of e-textbooks in English teaching and learning process are salient. They include, but not limited to learners' engagement and motivation in reading comprehension of text written in English. This demonstrates the newness of this research study as evidence of technology-based learning and teaching of reading skills performance at secondary schools.

Limitation to this research study

Despite the advantages of e-textbooks at schools, this research study did not concentrate on reading skills via electronic textbooks since it was not its purpose. Indeed, having argued only about textbooks versus e-textbook does not guarantee a student, to become expert in reading skills performance that are fundamental tools to tackle any reading investigation to search for

knowledge. On the other hand, one may possess beautiful e-textbooks and non-e-textbooks, but fail to gain the knowledge they are looking for and become an omnibus without use. Therefore, reading skills have to be mastered first before embarking on e-textbooks or non-e-textbooks. Of course, to learn reading skills, there must be reading materials: e-textbooks and non-e-textbooks. Nevertheless, e-textbooks remain an added advantage to reading materials for reading skills development which this study has demonstrated. The use of printed textbooks remains in force as the struggle with technological slowness such as inadequate infrastructure, unreliable internet connectivity and other technological facilities.

For the case of Rwanda, electronic textbook is more engaging and crucial to learners by boosting their performance in reading skills. In addition, E-textbooks can be accessed by a larger number of students, especially in remote, or underserved areas where physical textbooks might be scarce. This democratizes access to “quality educational” content as it is mentioned in the findings.

5.2. Recommendations

To effectively improve student performance in reading skills through the use of English electronic textbooks in Rwandan secondary schools, targeted recommendations for teachers, school leaders, and the Ministry of Education (MINEDUC) are essential.

MINEDUC (Ministry of Education)

Policies supporting the use of electronic textbooks in the classroom should be developed by the Ministry of Education (MINEDUC). These policies should include directives for digital content, infrastructure development, and teacher preparation. To provide equal access, funding should be expressly allocated for the purchase of electronic devices and the creation of digital infrastructure in schools, particularly in distant locations. Promoting studies on the efficiency of digital learning resources, such as electronic textbooks, might yield important insights on best practices. Ensuring that educational content meets high standards can be achieved by collaborating with private sector entities to develop and distribute electronic textbooks of the highest quality. Moreover, policies that guarantee all students, irrespective of geography or socioeconomic status, have access to electronic textbooks and the required digital resources must be put in place.

School leaders

Ensuring the proper integration of electronic textbooks in classrooms is a vital responsibility of school leaders. It is imperative that they guarantee that educational institutions possess the essential digital infrastructure, such as dependable internet connectivity, and an ample supply of electronic devices for both instructors and learners. Promoting a culture of ongoing learning and innovation requires regularly organizing training sessions for educators on the usage of electronic textbooks, and other digital learning resources. Teachers' efficacy can be greatly increased by providing opportunities for them to cooperate on incorporating electronic textbooks into the curriculum and exchange best practices. Setting up a method to routinely assess how electronic textbooks affect students' reading skills and incorporating the community and parents in the digital learning endeavor are also crucial measures.

Teachers:

To improve reading proficiency among students using English electronic textbooks, teachers should integrate these digital resources into their regular lesson plans to create a more dynamic and captivating learning environment. In order to use electronic textbooks effectively, teachers must stay current on the newest pedagogical approaches and educational technologies, which requires participation in continual professional development programs. Besides, a variety of learning styles can be accommodated by integrating digital resources with traditional methods of instruction. Instructors must make use of electronic textbooks in order to design interactive projects and assignments that promote student involvement and enhance reading comprehension. It is crucial to regularly review students' development through evaluations and to offer individual support to those who are having difficulty with reading.

To future researchers:

Subsequent investigations have to concentrate on pinpointing effective pedagogical approaches that optimize the advantages of digital textbooks. Researching the effects of various e-textbook usage strategies on the reading skills of learners can give teachers evidence-based suggestions.

The results of this study provide best practices for integrating digital learning resources into the classroom, and guarantee that the benefits of electronic textbooks are completely used to raise student achievement. Researchers can best assist teachers in making judgments and maximize the use of electronic textbooks in improving reading skills by adding a milestone to the existing body of knowledge.

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APPENDICES

Appendix 1: Questionnaire for learners

A. Identification

Section A. Instructions:

1. This questionnaire is not a test. Feel free to respond to every question, as you understand
2. For open-ended questions express your views using the provided space
3. For close-ended questions, put a tick (✓) in the reserved box of your choice.

Section B: Demographic Information

1) Grade Level:

S1	S2	S3	S4	S5	S6

2) Age :

Below 13	13-15	16-18	Above 18

3) Gender:

Male	Female

Section C: Questions

1) Do you have regular access to an electronic device (e.g., tablet, laptop, smartphone) for reading electronic textbooks?

Yes	No

2) How often do you use electronic textbooks for your studies?

Daily	Several times a week	Once a week	Occasionally	Never

3) Where do you primarily access electronic textbooks?

School	Home	Library	Other (please specify)

4) Do you find electronic textbooks more engaging compared to traditional printed textbooks?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

5) How do you rate these reading factors? Use a tick symbol to rate them to your level of understanding.

Reading factors	Strongly Agree	Agree	Strongly Disagree	Disagree
1.Cognitive factors				
2.Environmental factors				
3.Parental factors				
4.Instructional factors				

6) Which features of electronic textbooks do you find most helpful? (Select all that apply)

Interactive quizzes

Videos and animations

Hyperlinks to additional resources

Annotation tools (highlighting, note-taking)

Text-to-speech

Other (please specify): _____

7) How often do you use interactive features (e.g., quizzes, videos) in electronic textbooks?

Always	Often	Sometimes	Rarely	Never

8) Do you feel that using electronic textbooks has improved your reading comprehension skills?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
5	4	3	2	1

9) Do you find it easier to understand complex topics with the help of electronic textbooks?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

10) Has your vocabulary improved since you started using electronic textbooks?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

11) How do you compare your overall reading skills now to before using electronic textbooks?

Significantly Improved	Improved	No Change	Worsened	Significantly Worsened

12) What challenges do you face while using electronic textbooks? (Select all that apply)

Limited access to devices

Poor internet connectivity

Eye strain or screen fatigue

Distractions from non-educational content

Technical issues (e.g., software glitches)

Other (please specify): _____

13) Do you prefer using electronic textbooks over printed textbooks?

Strongly Prefer Electronic

Prefer Electronic

No Preference

Prefer Printed

Strongly Prefer Printed

14) What improvements would you suggest for electronic textbooks? (Select all that apply)

Better interactive features

More offline access

Improved user interface

More culturally relevant content

Enhanced support for different learning styles

Other (please specify):.....

15) Overall, how satisfied are you with the use of electronic textbooks for learning English reading skills?

Very Satisfied	Satisfied	Neutral	Unsatisfied	Very Unsatisfied

16) Would you recommend the use of electronic textbooks to other students?

Yes

No

Appendix 2: Questionnaire for teachers

Section A. Instructions:

1. This questionnaire is not a test. Feel free to respond to every question, as you understand
2. For open-ended questions express your views using the provided space
3. For close-ended question, put a tick (✓) in the reserved box to your choice.

Section B: Demographic Information

1) Teaching Level:

Lower Secondary (S1-S3)	Upper Secondary (S4-S6)

2) Years of Teaching Experience:

0-5 years	6-10 years	11-15 years	16-20 years	Over 20 years

Section B: Questions

1) Does your school provide access to electronic devices for students?

Yes

No

2) How often do you use electronic textbooks in your English classes?

Daily	Several times a week	Once a week	Occasionally	Never

3) Where do students primarily access electronic textbooks?

School	Home	Library	Other (please specify)

4) Do you observe higher student engagement when using electronic textbooks compared to traditional printed textbooks?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

5) Which features of electronic textbooks do your students find most helpful? (Select all that apply)

Interactive quizzes

Videos and animations

Hyperlinks to additional resources

Annotation tools (highlighting, note-taking)

Text-to-speech

Other (please specify): _____

6) How frequently do students use interactive features (e.g., quizzes, videos) in electronic textbooks?

Always	Often	Sometimes	Rarely	Never

7) Do you think electronic textbooks have improved your students' reading comprehension skills?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

8) Do electronic textbooks help students better understand complex topics?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
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9) Have you noticed an improvement in your students' vocabulary since they started using electronic textbooks?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

10) How do you compare your students' overall reading skills now to before using electronic textbooks?

Significantly Improved	Improved	No Change	Worsened	Significantly Worsened

11) What challenges do you face while using electronic textbooks in your classroom? (Select all that apply)

Limited access to devices

Poor internet connectivity

Eye strain or screen fatigue for students

Distractions from non-educational content

Technical issues (e.g., software glitches)

Lack of training or familiarity with technology

Other (please specify): _____

12) Do you prefer using electronic textbooks over printed textbooks for teaching reading skills?

Strongly Prefer Electronic	Prefer Electronic	No Preference	Prefer Printed	Strongly Prefer Printed

13) What improvements would you suggest for electronic textbooks? (Select all that apply)

Better interactive features

More offline access

Improved user interface

More culturally relevant content

Enhanced support for different learning styles

More professional development for teachers

Other (please specify): _____

14) Overall, how satisfied are you with the use of electronic textbooks for teaching English reading skills?

Very Satisfied	Satisfied	Neutral	Unsatisfied	Very Unsatisfied

15) Would you recommend the use of electronic textbooks to other teachers?

Yes	No

Appendix 3: Interview guide with school leaders

- 1) Can you describe your experience with educational technology in your school?
- 2) When did your school start using English electronic textbooks?
- 3) What was the primary motivation for adopting electronic textbooks?
- 4) How are electronic textbooks integrated into the English curriculum?
- 5) Are there specific grades or classes that use electronic textbooks more extensively?
- 6) Have you noticed any changes in students' reading skills since the introduction of electronic textbooks?
- 7) Can you provide specific examples or evidence of improvements or challenges?
- 8) How do students generally respond to using electronic textbooks compared to traditional textbooks?
- 9) Are students more engaged in reading activities with electronic textbooks?
- 10) What challenges has your school faced in implementing and using electronic textbooks?

- 11) How have these challenges been addressed?
- 12) What kind of support and training have teachers and students received for using electronic textbooks?
- 13) Are there any additional resources or support that you believe would enhance the effectiveness of electronic textbooks?
- 14) What are your school's future plans regarding the use of electronic textbooks?

Appendix 4: Observation guide

General Information

- ✓ Observer's Name:
- ✓ Date of Observation:
- ✓ School Name:
- ✓ Class/Grade Level:
- ✓ Number of Students Present:
- ✓ Duration of Observation:

Observation Checklist

Criteria	Indicators	Yes	No	Comments
Technology Availability	Electronic devices available for each student			
	Reliable internet connection			
	Classroom setup supports electronic textbook use			
Teacher's Preparedness	Teachers comfortable using electronic textbooks			
	Backup plans for technical issues			
Student Engagement	Students are attentive and interested			
	Participation in interactive elements			
	Independent navigation and use of textbooks			
	Use of multimedia elements			
	Use of annotation tools			

Interactive Features Usage	Engagement in interactive quizzes			
Reading Comprehension	Understanding and summarizing passages			
	Use of built-in dictionaries and tools			
	Ability to answer comprehension questions			
Vocabulary Improvement	Vocabulary-building activities observed			
	Use of new vocabulary in discussions			
	Use of word lookup tools			
Critical Thinking	Analysis and critique of reading material			
	Engagement in higher-order thinking activities			
	Use of critical thinking prompts			
Technical Challenges	Frequency of technical issues			
	Resolution of technical issues			
Distraction Management	Instances of distraction observed			
	Teacher's strategies for managing distractions			
Student Feedback	Positive feedback from students			
	Preference for electronic textbooks			
Teacher Feedback	Teacher's positive assessment of effectiveness			

Appendix 5: Marks for the 868 students from the GS Rongi and GS Kibangu (2014 - 2021/2022)

1. Group Statistics

	PERIOD	N	Mean	Std. Deviation	Std. Error Mean
MARKS	Before the introduction of e-textbooks	451	48.6430	20.39006	0.96013
	After the introduction of 3-textbooks	416	55.8666	19.36058	0.94923

2. Independent Samples Test

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
MARKS	Equal variances assumed	5.339	865	.000	7.22357	1.35297	-9.87906	-4.56808

3. Mean (marks) of the sampled students (S2) according to periods

SCHOOL	After (Mean)	Before (Mean)
GS KIBANGU	54.16523605	49.09638554
GS RONGI	58.03278689	48.08415842
Grand Total	55.86658654	48.64301552

4. Number of sampled students (S2) and their marks in English Subject

Period	GS Kibangu			GS Rongi			Grand Total
Row Labels	Fail	Pass	Total	Fail	Pass	Total	

2014	37	36	73	28	25	53	126
2015	25	29	54	27	22	49	103
2016	32	33	65	26	26	52	117
2017	27	29	56	25	23	48	104
2018	31	33	64	21	30	51	115
2019	27	35	62	14	30	44	106
2020-2021	21	28	49	13	30	43	92
2021-2022	22	36	58	11	34	45	103
Grand Total	222	261	483	165	220	385	868

Appendix 6: Ethical Clearance Form

SECTION A : Project Information

PROJECT TITLE: THE EFFECT OF ELECTRONIC TEXTBOOKS IN ENGLISH LANGUAGE ON STUDENTS' READING SKILLS PERFORMANCE: A CASE STUDY OF 12 YEARS BASIC EDUCATION IN REMOTE AREA OF MUHANGA DISTRICT (2020-2023)			
STUDY			
Investigators:	NTAGWABIRA VEDASTE		
Student No.	221031819		
Co-Investigators (if applicable):			
Supervisor/s: (if applicable): Dr. Jean De Dieu AMINI NGABONZIZA			
Contact details of Investigators:	Phone +250788537841	Fax	E-mail: ntagwabiravedaste@gmail.com

Degree enrolled in (if applicable):	Masters of Education in English Education		
Project location:	Muhanga District		
Project duration:	8 months		

SECTION B: Ethical Review Application *(To be filled by Applicant (s))* **Please answer all of the following questions**

1. Who are the research participants and how will they be recruited?
1.1. The researcher participants are teachers of English and Deputy Head in Charge of Studies in selected secondary schools. Those participants are selected purposively because are the ones who can give affordable information related to research questions.

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Provide a brief summary of the project: The project will be based on investigating: **THE EFFECT OF ELECTRONIC TEXTBOOKS IN ENGLISH LANGUAGE ON STUDENTS' READING SKILLS PERFORMANCE: A CASE STUDY OF 12 YEARS BASIC EDUCATION IN REMOTE AREA OF MUHANGA DISTRICT (2020-2023)**

. Our research will be qualitative which mean that the data that will be corrected will be also qualitative. Data will be corrected to answer the following research questions:

- a. What is the correlation between physical text book and electronic textbooks on student's performance in English language in 12 years' basic education?
- b. How does the school with no electronic textbooks manage to teach English language?
- c. What effects does lack of English electronic text books have on the students' English language proficiency in 12 years basic education in Muhanga district?

In data collection, we will use interview, observation to collect to get filed data from students, English Teachers and Deputy Head teacher in Charge of Studies.

2. Outline the research plan:

N ^o	Activities								
		NOV	DEC	JAN	FEB	MARCH	APR	MAY	JUNE
1	Proposal writing	√	√	√					

2	Ask the authorization from University and the district to make research				√				
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3	Preparation of Interview and observation guide					√	√		
4	Data collection						√		
5	Data analysis							√	
6	Thesis writing							√	
8	Thesis presentation								√

3. How will informed consent be obtained from participants?

After, getting the University and the district authorization, the researcher will go to look for school manager of selected school and inform him/her about the project and participants needed for the research.

Participants also will be explained why the research will be conducted and its importance to them and for educational sector in general. The researcher will explain to participants the research objectives and how collected data will be used. After explanation, they will be asked if they can participate in research by signing consent form.

4. Provide details of procedures for establishing confidentiality and protecting privacy of participants. The researcher will keep confidential information given by participants and assuming them that their information will be used only for the purpose of the research.
5. Provide details of data collection, security and storage: In order to obtain useful and accurate data, the researcher will use different types of data collection such as interview, observation. The collected data will help us to answer research questions. Data will be collected in ten days, in doing interview with participants, researcher will agree with the participants the time and place where the interview will take place. In interview, the researcher will ask participants the permission to record conversation. In observation, the researcher will participate in a lesson teaching and learning more than twice as a researcher in order to get trusted data. The researcher will bear the responsibility to ensure that methods of storage and treating information do not reveal the source of information. The collected data will be stored in 5 years.
6. Give details of whether and/or how feedback will be available to participants: The researcher will be given the feedback by providing copies of reports to participants and stakeholders in multiple languages when needed.
7. Does the project involve any of the following procedures?
b) Participant involvement by any “vulnerable groups.” (If YES, give details), No
c) Does the project involve any other disciplines and/or Ethics Committees? (If YES, please state which and what approval has already been obtained - attach documentation), No
d) Will payments to participants be made? (If YES, state amount and whether payment is for out-of-pocket expenses, or a fee.): No
e) Will the project receive financial support? (i) If YES, specify the nature and source of the support: If YES, have any restrictions been imposed upon the conduct of the research? (If YES, specify the nature of the restrictions): None

f) Will any restrictions be placed on the publication of results? (If YES, please state the nature of the restrictions): No	
g) Are there any other points you wish to make in justification of the proposed study? No	
h) Please complete the items on the checklist shown below. (Write either YES or NO in the box following each item)	<i>YES/NO</i>
(i) Have you completed all the questions on this form that are applicable to your project?	Yes
(ii) Have you attached an informed consent form (see below)?	Yes
(iii) Have you attached a sample questionnaire or interview schedule (if applicable)?	Yes

Signature of Proposer:

Date: ...th 2023

SECTION C : Ethical Scrutiny by supervisor

To be completed by supervisor:

[Delete A or B]

A. This research is considered ethically acceptable. It does not involve any of the following: ☐

Research on live animals other than non-intrusive observational studies in the wild

- Research involving children under the age of 16, people diagnosed as suffering from a serious physical or mental disease or handicap, people who have undergone what would generally be regarded as traumatic experiences related to the area of research now or in the past, or people who would be judged by any reasonable person to be especially vulnerable
- Experiments or clinical trials carried out on human subjects
- A power relationship such as teacher/pupil, doctor/patient, employer/employee etc.
- Covert methods or where informed consent cannot or will not be sought, except for research on 'public situations' such as the behavior of crowds or groups of people in circumstances where the researcher has a right to be present.

- Research where the identity of the subjects/informants/participants cannot be concealed, unless they are specifically to be make aware of this and provide their signed consent
- Research, which might reasonably be judged at risk of causing harm, distress or discomfort to people or groups (including social stigmatization/penalty, commercial disadvantage or environmental damage or degradation)

Signature:



Name: Dr. Jean De Dieu AMINI NGABONZIZA

Date: 12/03/ 2024

SECTION D: Ethical Review by Chairperson of Review Committee

To be completed by chairperson of University or College RESC (whichever applies): [Ring the identification letter of one statement]

✓ This research may proceed without further review

This research may not proceed; it clearly breaches ethical guidelines without providing justification, or it contravenes a decision already taken by the RESC. C. This research should be referred to the full RESC.

Reasons:

Signature:___



Name: Prof. Ndabaga Eugene

Chairperson University or College RES-C (whichever applies)

Date: _18_/_03_/ _24_

dd

mm

yyy

To be completed after a full University or College RESC meeting (whichever applies):

[Ring the identification letter of one]

✓ This research may proceed

This research may proceed if the conditions below are implemented.

This research may not proceed.

Reasons (and conditions, if appropriate):

Signature:  Name: **Prof. Ndabaga Eugene**

Chairperson

University or College RES-C (whichever applies)

Date: _18_/_03/_24_