

UNIVERSITY OF EDUCATION, WINNEBA

**The use of technology in teaching reading in kindergarten classrooms in
Ayawaso Central Municipality**

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the School of Graduate Studies in partial fulfilment**

**of the requirement for the award of the degree of
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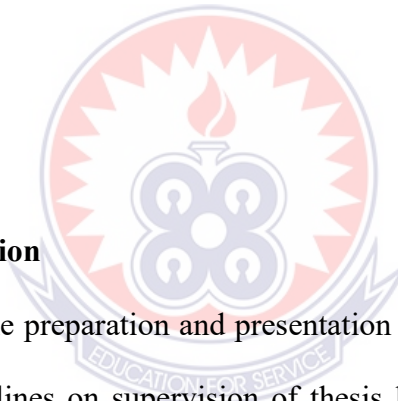
DECLARATION

Student's Declaration

I, **Frank Amanor Awuku**, declare that this thesis, with the exception of quotations and references contained in published works which have been identified and acknowledged, is wholly my own original work and it has not been submitted, either in part or whole, for another work elsewhere.

Signature:

Date:



Supervisor's Declaration

I hereby declare that the preparation and presentation of this thesis was supervised in accordance with guidelines on supervision of thesis laid down by the University of Education, Winneba.

Supervisor: Professor Michael Subbey

Signature:

Date:

DEDICATION

To my three lovely children, Deborah Enam Napon, Kazia Eyram Awuku and Elysha Deladem Awuku whose obedient conduct gave me the peace to complete this course successfully. May the Lord bless and raise them higher than I have obtained.



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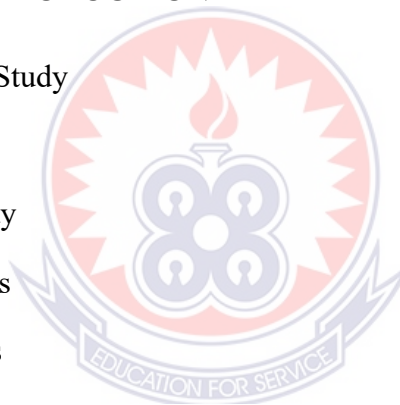
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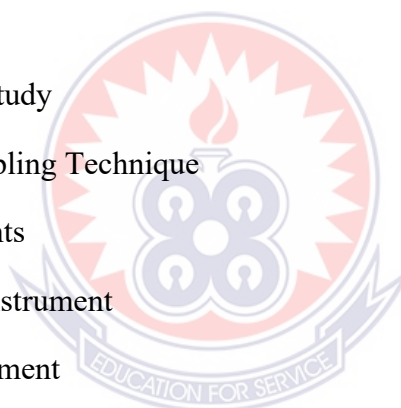
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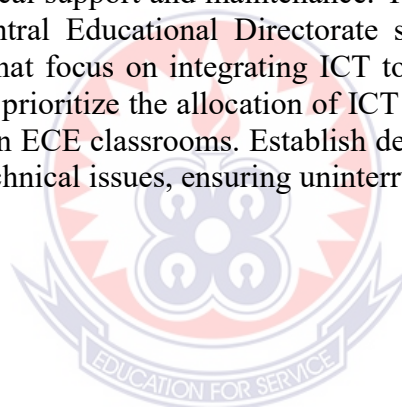
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ABSTRACT

The study explores the use of information and communication technology (ICT) tools in teaching reading in early childhood education in Ghana using kindergartens in the Ayawaso Central Municipality. The case study design was adopted for the study. The study used the purposive sampling technique to select twelve (12) kindergarten teachers. The instruments used for the collection of data were a semi-structured interview guide and observational checklists. The data from the interview were analysed thematically while content analysis was used for the observation data. The study revealed that few schools have integrated ICT tools, such as desktop computer workstations, phones, sound boxes, tablets, and educational software into their reading instruction, while most of them primarily rely on traditional teaching methods. Also, emerging technologies such as virtual reality (VR) and augmented reality (AR), interactive whiteboards, projectors, and e-books applications are gaining traction, albeit at a slower pace as well as some teachers demonstrating knowledge and proficiency, while others express a higher level of comfort and experience with specific ICT tools, such as educational apps on tablets. Moreover, some challenges include limited access to ICT resources, outdated or malfunctioning devices, a lack of teacher training, and issues related to technical support and maintenance. The study therefore recommends that the Ayawaso Central Educational Directorate should develop and implement training programmes that focus on integrating ICT tools into reading instruction for ECE teachers and also prioritize the allocation of ICT resources and maintenance and repair of ICT devices in ECE classrooms. Establish dedicated technical support teams to promptly address technical issues, ensuring uninterrupted teaching and learning.



CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Technological advancement has been rapid in recent years. This advancement has influenced every sector of society including the educational sector. There is no doubt that these new technologies promise to transform the traditional classroom into a digital classroom aimed at giving learners more enjoyable learning experience (Garavaglia et al., 2013). The idea to introduce computers and their associated ICT into the educational system usher students into the information era and present the possibilities to broaden learners' experiences (Mandoga, Matswetu, & Mhishi, 2013). As a result of its interactive nature, the needs and interests of school children are met through the practical methods of constructively directing their own learning activities (Ukwueze & Ajala, 2014).

Across the globe, the introduction of ICT into early childhood education or kindergartens has been widespread. In the United Kingdom (UK) for instance, ICT has for several years been a key part of early childhood education since it is observed that it essentially leads the way in developing best practice in the use of ICT to support positive learning experiences for pupils (Becta, 2004).

In New Zealand, the Council for Educational Research indicated that ICT is beneficial in early childhood education, this is because it has an influence on the people already and the environments that surround children's learning and welfare (New Zealand Council for Educational Research, 2004). This suggests that children should be supported and encouraged from their earliest years to discover and identify the uses of technology in their everyday lives (Siraj-Blatchford & Siraj-Blatchford, 2006). Also,

as noted by Asante (2014), to support children's learning activities, they should be made to use computers and programmed toys. According to the author, children must be offered the opportunity to explore and play with computers as well as other ICT tools including projectors, tablets, and puppets. Such learning forms act as the foundation for more structured use of applications later on, hence, the need for ICT to be integrated across the curriculum (Asante, 2014).

On the other hand, it is indicated that teacher reading in ICT is key to its successful integration into the educational system (Hafifah & Sulisty, 2020). This reading has been described as ability to utilise digital technology, communications tools, and/or networks to access, assimilate, manage, evaluate, and create information to function in a knowledge setting (ICT Reading Panel, 2002). Similarly, Hockly (2012) posits that ICT reading suggests that one possesses knowledge in elements including information, media, and technology skills required to face the 21st-century education era. Accordingly, some earlier studies undertaken on the subject indicated that teachers should perceive the significance of ICT, update the technology issues, and equip themselves with the capacity of teaching savvy-students (Ahmed & Nasser, 2015; Prinsloo & Sasman, 2015). These studies further indicated that more essentially, teachers should be able to make use of ICT tools by applying it in teaching to increase achievements of the learners and make them ready in facing the multimedia technological expansion and digital reading age (Ahmed & Nasser, 2015; Prinsloo & Sasman, 2015). In another perspective, researchers like Aesaert et al. (2015); Yu et al. (2020); and Zhu et al. (2019), have reported that instructors' ICT-related dispositions such as their ICT self-efficacy, frequent ICT usage in collaboration with others, usage of ICT in instruction, and ICT attitude do affect students' information reading.

In Africa, a number of countries have for some years now integrated ICT into early childhood education (ECE), both in public and private schools, though some concerns have been expressed about teacher reading in the various ICT tools which is significant in influencing students' reading in ICT (UNESCO, 2012; Chigona et al., 2014; Lembani et al., 2019; Ukwueze & Ajala, 2014). The need for effective integration of ICT into the educational system in African countries became very necessary at the emergence of the COVID-19 pandemic recently. In Ghana for instance, it became critical for teachers and students in the higher level to resort to virtual learning after the government of Ghana announced the suspension of all school operations for close to a year as parts of the efforts to stop the spread of the virus (Cromwell, 2020). However, online learning challenges in Sub-Saharan Africa due to the unavailability of ICT facilities, the closure of schools disrupted the learning of students and deprived students the opportunities for growth and development (Asunka, 2008; UNESCO, 2020).

As a result of the importance of ICT in kindergartens through to the tertiary level and the key role it can play in shaping the skills of students for the future, Government of Ghana (GoG) developed a national ICT policy and has invested a lot of resources to make ICT education accessible to all Ghanaian students across the country (Ministry of Education, 2013). While schools are expected to plan and facilitate the use of computers and related technologies, teacher reading is imperative in helping teaching and learning and other activities in education in different ways (Soma et al., 2021). This calls for more investigations into the use of ICT tools in teaching reading in education, especially at early childhood centres.

1.2 Problem Statement

There are quite several studies carried out elsewhere which have indicated that for some years now, there are small groups of early childhood instructors who have been

implementing and integrating ICT within their teaching and learning contexts (Hafifah & Sulisty, 2020; Harendita, 2013; Birch & Irvine, 2009). While these innovative practices have been observed to contribute to increasing the profile of early childhood education both locally and internationally, several issues like unavailability of ICT tools, lack of internet connectivity and lack of teacher reading hinder its comprehensive integration in schools in several countries which Ghana is not an exception (Adarkwah, 2021; Ukwueze & Ajala, 2014). There is no doubt that specific challenge of the qualitative and quantitative gaps between the students' and the instructor's comprehension of the significance of ICT in teaching and learning observed in Dale et al. (2002) still exists currently.

Though Asante (2014) reports that Ghana is making an effort when it comes to ICT, for instance, with some 106% mobile penetration and internet usage penetration increasing to 40.7%; this improvement is not seen to reflect in education for it to be significant to most Ghanaian students. Moreover, while a number of earlier studies have examined ICT integration in higher educational levels in Ghana (Asante, 2014; Soma et al., 2021; Edumadze & Owusu, 2013; Adarkwah, 2021), little is known about the use of ICT tools even at basic level Peprah (2016). Indicating a gap in research about the use of ICT tools in teaching reading in early childhood education. Furthermore, personal observation suggests that while no study has focused on the Ayawaso Central Municipality, there a number of classrooms both public and private within the study area with absence of these ICT tools and even the few that were found are underutilized it was also realised that interment connectivity was a need.

Through personal classroom observations, informal interviews, and interactions with some kindergarten teachers during monitoring visits, the researcher has witnessed a

limited and inconsistent use of ICT tools in early reading instruction. In several public schools within the municipality, many teachers continue to rely predominantly on traditional chalk-and-talk methods, even though basic ICT tools such as projectors, tablets, read along and reading-based software are available in some schools.

From these field experiences, the researcher observed that while some teachers expressed interest in using ICT tools, they have inadequate training and confidence to integrate them effectively. Others were uncertain about the relevance and benefits of these tools in improving reading skills at the foundational level. In a few cases where technology was used, it was often restricted to simple audio-visual presentations with minimal interaction or follow-up activities to reinforce learning. These empirical insights suggest a significant gap between the availability of ICT tools and their practical integration into kindergarten reading lessons.

Furthermore, conversations with headteachers and early childhood coordinators revealed that many teachers faced challenges such as inadequate access to digital resources, unstable electricity supply, lack of technical support, and insufficient professional development in the use of educational technology. This situation is particularly concerning given the emphasis placed by the Ghana Education Service and the National Council for Curriculum and Assessment (NaCCA) on the use of learner-centered and interactive approaches, including technology, to enhance early reading development.

The absence and the underutilization of these tools make the integration of ICT in the teaching of reading difficult in the early childhood education environment difficult in the Ayawaso Central Educational Municipality.

Consequently, this study aims at examining the use of ICT tools in teaching reading in early childhood education using the Ayawaso Central Educational Municipality.

1.3 Purpose of the Study

The purpose of the study was to explore teachers' use of information and communication technology (ICT) tools in teaching reading in early childhood education in Ghana using kindergartens in the Ayawaso Central Municipality.

1.4 Research Objectives

The study is guided by the following objectives;

1. Ascertain the kindergarten teachers' attitudes of the use of ICT tools in teaching reading in the Ayawaso Municipality.
2. Explore the ICT tools kindergarten teachers' perceived useful in the Ayawaso municipality in teaching reading.
3. Determine the frequency of ICT tool usage in kindergarten reading lessons in the Ayawaso Central Municipality
4. Identify the challenges kindergarten teachers encounter when integrating ICT tools into reading instruction

1.5 Research Questions

The following questions seek answers to the study:

1. What are the attitudes of kindergarten teachers toward the use of ICT tools in teaching reading in the Ayawaso Municipality?

2. Which ICT tools do kindergarten teachers perceive as useful for teaching reading in the Ayawaso Municipality?
3. How frequently do kindergarten teachers use ICT tools in reading lessons in the Ayawaso Central Municipality?
4. What challenges do kindergarten teachers face in integrating ICT tools into reading instruction?

1.6 Significance of the Study

The findings from the study will allow educators to explore innovative approaches for enhancing children's reading skills. By leveraging digital platforms, interactive apps, and multimedia resources, educators can create engaging learning experiences that cater to diverse learning styles and promote reading proficiency. Studying the use of ICT tools in early childhood reading instruction helps address the need to prepare children with the digital competencies required for the 21st century. It allows educators to scaffold children's development of digital navigation, information retrieval, and critical evaluation skills, laying a foundation for lifelong learning and digital citizenship.

Findings from such studies can guide policymakers in formulating guidelines, allocating resources, and implementing initiatives to support the integration of technology in early childhood education. Additionally, insights gained from research can inform educators' instructional practices, professional development efforts, and curriculum design to optimize children's reading learning experiences. The result of the research will reveal and inform the Ghana Education Service (GES), the Ministry of Education (MoE), Training Colleges, and schools about the extent to which teachers use ICT in teaching in kindergarten in Ghana. The outcome informs all the stakeholders about the types of ICT tools used in teaching reading in kindergarten in Ghana in

general. Moreover, the findings from this study inform all the stakeholders about teachers' knowledge level in the use of ICT tools in early kindergarten classrooms in Ghana. Additionally, the findings from this study inform the Ghana Education Service, and the Ministry of Education (MOE) about challenges ECE teachers encounter in the use of ICT tools in teaching in preschool classrooms in Ghana. Furthermore, the literature provided in this study serve as a foundation for further studies into teachers' use of ICT tools in kindergarten classrooms and other educational levels in Ghana and Africa in general.

1.7 Limitations of the Study

One of the limitations was related to the sampling method. The researcher employed purposive sampling to select 12 head teachers from the 32 kindergarten centres within the Ayawaso Central Municipality for interviews. However, due to the busy schedules of some head teachers, only 10 could be reached for participation in the study. This incident reduced the number of sampled respondents from 12 to 10. Despite this reduction, the researcher was able to collect sufficient data to support the study's objectives.

1.8 Delimitations of the study

This study was delimited to Ayawaso Central Educational Municipality in the Greater Accra Region of Ghana. In terms of participants in this study, kindergarten teachers in public schools in the Municipality were recruited to provide data. Moreover, the focus of this study was on the use of ICT tools in teaching reading in early childhood education.

1.9 Operational definition of Terms

Teachers – Refers to trained and certified educators responsible for instructing and facilitating learning among kindergarten pupils in Ayawaso Central Municipality.

Use of Information and Communication Technology (ICT) Tools – The practical application of digital devices, software, and online resources by teachers in the teaching and learning process to enhance reading skills in kindergarten.

ICT Tools – Digital and electronic devices or applications used in education, including but not limited to computers, smartphones, projectors, learning management systems, e-books, and multimedia resources that support reading instruction.

Teaching Reading – The process of helping young learners develop foundational reading, writing, speaking, and listening skills through various instructional methods, including the use of ICT tools.

Technology - Technology means information communication and technology tools.

Kindergarten – The early childhood education level that serves children aged four to six years, focusing on foundational learning experiences in reading, numeracy, and social development.

1.10 Organization of the Study

The whole study is organized into five chapters. Chapter one is the introductory chapter; this entails the background to the study, statement of the problem, the purpose to the study, the objectives, research questions, significance of the study, delimitations and operational definition of terms. Chapter two contains a review of relevant literature to the study. It focused on the following themes; theoretical framework, conceptual framework, early childhood education, extent to which ECE teachers use ICT in teaching reading in kindergarten, the types of ICT tools used in teaching reading in kindergarten, teachers' level of knowledge in the use of ICT tools in teaching reading in preschool classroom and challenges ECE teachers encounter in the use of ICT tools in teaching in the preschool classrooms. Chapter three describes the methodology and

procedures used in the study. This includes a description of the research paradigm, research approach, research design, the study area, the population, sampling and sample techniques, research instruments, data collection procedures and data analysis plan. Chapter four contains the result of the study. It presents a detailed description of the findings and discussions of the study. Finally, chapter five consists of summary of key findings of the study, conclusions of the study, recommendations of the study, limitations of the study, and suggestions for further/ future research.



CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The researcher reviews relevant literature related to the use of ICT tools in teaching reading in early childhood education (ECE). Journal articles, books, online articles, documents, reports, dissertations, and conference papers are the various sources for the review. The use of Information and Communication Technology (ICT) tools in teaching and learning has been a growing area of interest in the field of education. In early childhood education, ICT has been used to teach reading skills to children in different countries. This literature review provides an overview of the use of ICT tools in teaching reading in early childhood education in Ayawaso Central Municipal in Ghana.

This chapter reviewed the literature under the following themes:

- Theoretical framework
- Conceptual framework
- Early Childhood Education
- The Concept of Reading
- Reading Components
- Teachers use of ICT in teaching reading in schools
- The types of ICT tools used in teaching reading in kindergarten
- Teachers' level of knowledge in the use of ICT tools in teaching reading in preschool classrooms.
- The challenges ECE teachers encounter in the use of ICT tools in teaching reading in the preschool classrooms.

2.1 Theoretical Framework

The theory underpinning this study was Technology Acceptance Model (TAM) which is discussed under this section:

2.1.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was originally discussed by Davis (1985). The TAM suggests that a possibility of an adoption of innovation was dependent on a person's anticipations and attitude toward the innovation (Davis, 1985). Two concepts have been discussed in the model which were said to be the focal point of the TAM. The first was the way potential adopters of the innovation viewed the innovation in terms of its simplicity when implementing it. The second was its potential usefulness of the innovation in terms of the level to which it would enhance the adopter's job-related or personal performance (Straub, 2009). In the view of Davis (1985), with these concepts, perceived usefulness was directly influenced by ease of use, in that there was higher possibility that users would adopt an innovation and realised higher productivity when they viewed it to be simple to use and beneficial (Davis, 1985).

Ajzen (1985) also argued that, when it comes to the TAM, behavioural intention should be taken into consideration. According to the author, what was meant by behavioural intention was the level of people's preference and their level of willingness prior to adopting technology behaviours. Nevertheless, researchers like Marangunić and Granić (2015); and Liu et al. (2019) have asserted that the most substantial variables predicating behavioral intention in a direct or indirect way were the anticipated convenience (perceived usefulness) of innovation and anticipated comfort (perceived ease) of use of a particular innovation. Davis (1989) explains that perceived usefulness was assumed to be how much innovation adopters were convinced that applying technology would enhance the results of their work. In relation to this, it could be

argued that if early childhood or preschool instructors perceived the benefits and serviceability when using ICT in teaching and learning (namely, perceived usefulness), their intention toward these innovative tools and systems would be stronger (Hong et al., 2021). Some studies that had applied the TAM include Valdehita et al. (2019); and Rafique et al. (2020). These researchers investigated the substantial influence of perceived usefulness and perceived ease of use on adopters' using intention toward technology. In educational surroundings particularly, studies had reported that educators' perceived usefulness and perceived ease of use are certainly associated with their adoption intention of ICT in teaching activities (Pynoo et al., 2012; Scherer et al., 2019). This theory was thus relevant to this study on the use of ICT tools in teacher reading in early childhood education in Ghana. The TAM was applied to explain the extent to which ECE teachers use ICT in teaching reading in kindergarten in Ayawso Central Municipality, the types of ICT tools used in teaching, teachers' knowledge level in the use of ICT in kindergarten, and the challenges ECE teachers encounter in the use of ICT reading tools in teaching in the kindergarten at the study environment.

Application of TAM to ICT Use in Teaching Children Reading: The Technology Acceptance Model (TAM) provides a valuable framework for understanding educators' and children's acceptance and adoption of ICT tools in reading instruction. By examining the key constructs of TAM in the context of early childhood education, researchers can gain insights into the factors influencing the effective integration of technology in reading teaching practices. In the context of teaching children reading, perceived usefulness refers to educators' beliefs about the extent to which ICT tools enhance children's reading skills and learning outcomes. Research suggests that educators perceive ICT tools as valuable resources for supporting reading instruction, facilitating differentiated learning experiences, and promoting engagement and

motivation among young learners (Ally, 2004; Wachira & Keengwe, 2011). For example, interactive educational software, digital libraries, and multimedia resources are perceived as effective tools for developing children's reading, writing, and comprehension abilities (Graham & Perin, 2007). Educators recognize the potential of ICT tools to provide personalized learning experiences tailored to individual children's needs, interests, and learning styles, thereby enhancing the effectiveness of reading instruction (Huang & Liaw, 2005).

Perceived ease of use refers to educators' perceptions of the simplicity and usability of ICT tools in reading instruction. Research indicates that educators' comfort level with technology and their proficiency in using ICT tools influence their willingness to integrate technology into their teaching practices (Teo, 2009; Ertmer, Ottenbreit-Leftwich, & York, 2007). Educators who perceive ICT tools as user-friendly and intuitive are more likely to incorporate technology into their reading instruction, whereas those who perceive technology as complex or difficult to use may be hesitant to adopt ICT tools in their teaching practices (Schrum & Levin, 2009). Therefore, providing educators with training, technical support, and professional development opportunities is essential for enhancing their perceived ease of use and promoting the effective integration of ICT tools in reading instruction (Chai, Koh, & Tsai, 2010).

Attitude towards ICT tools in teaching reading encompasses educators' overall evaluations and predispositions towards technology integration. Research suggests that educators' attitudes towards ICT tools significantly influence their intentions to use technology in reading instruction (Mumtaz, 2000). Positive attitudes towards technology are associated with greater enthusiasm, motivation, and willingness to experiment with innovative teaching practices (Drent & Meelissen, 2008). Conversely, negative attitudes towards technology may hinder educators' adoption of ICT tools and

impede their efforts to incorporate technology into their reading teaching practices (Mouza, 2008). Therefore, fostering positive attitudes towards ICT tools through professional development, peer collaboration, and supportive organizational cultures is essential for promoting technology integration in early childhood reading education (Ottenbreit-Leftwich et al., 2010). Research indicates that educators' behavioral intentions to use technology are influenced by their perceived usefulness, perceived ease of use, and attitude towards ICT tools (Teo, 2011). Educators who perceive ICT tools as beneficial, easy to use, and aligned with their teaching goals are more likely to have positive intentions to integrate technology into their reading instruction (Rogers, 2003). Therefore, interventions aimed at enhancing educators' perceptions of the usefulness and ease of use of ICT tools, as well as fostering positive attitudes towards technology, are crucial for promoting their behavioral intention to use ICT tools in teaching children reading (Venkatesh et al., 2003).

2.1.2 Practical Implications of the Technology Acceptance Model (TAM) on Teaching Reading Skills

2.1.2.1 Designing User-Friendly ICT Tools

TAM emphasizes the significance of perceived ease of use in influencing technology adoption (Davis, 1989). Therefore, when designing ICT tools for reading instruction, developers must prioritize user-friendly interfaces and functionalities (Venkatesh & Davis, 2000). Intuitive design features, clear navigation, and easily accessible functions enhance educators' comfort and proficiency in using these tools, thus facilitating their adoption into teaching practices.

For instance, educational software and applications should employ simple and intuitive interfaces that minimize the learning curve for educators. Tools like interactive e-books should offer clear instructions and navigation cues to support seamless user experience.

Such user-centric design considerations contribute to enhancing educators' perceived ease of use, thereby increasing their willingness to integrate ICT tools into reading instruction.

2.1.3 Providing Training and Support

To address educators' proficiency in using ICT tools, comprehensive training and ongoing support are essential (Venkatesh et al., 2003). Professional development workshops, tutorials, and peer mentoring programs can equip educators with the necessary skills and confidence to effectively integrate ICT tools into reading instruction (Davis, 1989).

For example, workshops can provide hands-on training on utilizing specific software or applications for reading activities. Tutorials and online resources offer educators opportunities for self-paced learning and troubleshooting. Peer mentoring programs enable educators to learn from colleagues' experiences and best practices. By investing in training and support initiatives, educational institutions empower educators to leverage technology to enhance reading teaching practices.

2.1.4 Aligning Technology with Pedagogical Goals

TAM underscores the importance of perceived usefulness in determining technology acceptance (Davis, 1989). Therefore, ICT tools selected for reading instruction should align with pedagogical objectives and curriculum standards (Venkatesh & Davis, 2000). Tools that facilitate differentiated instruction, promote active engagement, and support skill development are perceived as beneficial additions to educators' teaching repertoire.

For instance, educational software that offers adaptive learning pathways can cater to students' diverse learning needs and abilities. Digital storytelling platforms provide

opportunities for creative expression and language development. By aligning ICT tools with pedagogical goals, educators can maximize their effectiveness in enhancing reading skills among students.

2.1.5 Promoting Positive Attitudes Towards Technology

Attitude towards technology plays a crucial role in educators' intentions to use ICT tools (Davis, 1989). Therefore, fostering positive attitudes towards technology is paramount for successful integration into reading instruction (Venkatesh et al., 2003). Educational institutions can promote positive attitudes through professional development initiatives, organizational support, and recognition of educators' efforts in technology integration.

For example, professional development workshops can highlight the benefits of technology-enhanced reading instruction, showcasing successful implementation examples and sharing innovative teaching strategies. Creating a supportive organizational culture that values experimentation and celebrates educators' technological initiatives encourages risk-taking and innovation. By promoting positive attitudes towards technology, educational institutions can cultivate a conducive environment for effective technology integration in reading instruction.

2.1.6 Evaluating and Monitoring Implementation

Regular evaluation and monitoring of technology implementation are essential for assessing effectiveness and identifying areas for improvement (Davis, 1989). Educational institutions should establish evaluation mechanisms to gather feedback from educators, students, and stakeholders regarding the use of ICT tools in reading instruction (Venkatesh & Davis, 2000). Data collected can inform decision-making processes and guide adjustments to instructional practices.

For instance, surveys and focus group discussions can solicit feedback from educators about their experiences with ICT tools, including perceived benefits, challenges encountered, and areas for improvement. Observations of classroom interactions and student engagement provide insights into the effectiveness of technology integration in reading instruction. By evaluating and monitoring implementation, educational institutions can refine strategies and allocate resources effectively to support technology-enhanced reading teaching practices.

2.1.7 Adapting to Evolving Technology

Technology is constantly evolving, and educators must remain adaptable to incorporate new tools and innovations into reading instruction (Davis, 1989). Staying informed about emerging trends and developments in educational technology enables educators to make informed decisions about technology integration (Venkatesh et al., 2003). Professional development initiatives should prioritize ongoing learning and skill development to keep educators abreast of new technologies and their potential applications in reading instruction.

For example, educators can participate in workshops, conferences, and online courses to explore emerging technologies and best practices in educational technology. Collaborative networks and communities of practice provide opportunities for sharing experiences, resources, and insights about innovative technology integration strategies. By adapting to evolving technology, educators can leverage new tools and resources to enhance reading instruction and meet the diverse needs of students.

2.2 Conceptual Framework

Presented in figure 2.2 is the conceptual framework of the study which examines the instructional practices teachers use integrating ICT in the teaching of reading in KG.

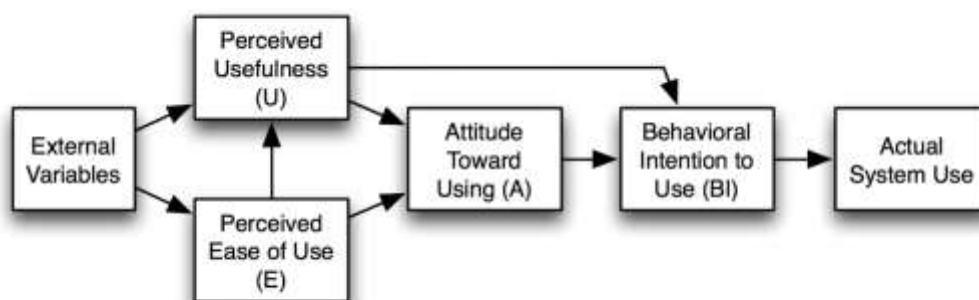


Figure 2.1 Conceptual framework for the study: Development ICT skills in teaching reading in the KG

2.3 Early Childhood Education

Early childhood education (ECE) is described as the period in a child's life from his/her birth until they are eight years (Kapur, 2018). According to Akbari and McCuaig (2014), ECE denotes programmes designed for young children based on an explicit curriculum delivered by professional instructors and aimed at supporting children's learning and development. Locations or settings for ECE include but not limited to nursery schools, child care centres, kindergartens, and kindergarten (Akbari & McCuaig, 2014). While children may learn on their own or with assistance from instructors or parents at various ECE centres, attendance should be regular for effective child development (Kapur, 2018; Akbari & McCuaig, 2014).

According to Warren (2007), one of the most significant stages in children's development is ECE. The author states that all persons in the society irrespective of their occupations and backgrounds acknowledges the significance of ECE. In every child's life, the first three years are regarded to be critical (Warren, 2007; Adamson,

2008). This is when the child develops the relationships that lead to advancement (Warren, 2007). It is imperative for all children to acquire significant knowledge through ECE to implement the functions of growth and development and recognise the significance of education whether their parents are educated or not (Adamson, 2008; Warren, 2007). Effective ECE creates considerable awareness of various strategies among children in terms of their development and they will be able to contribute significantly in their educational activities (Adamson, 2008; Akbari & McCuaig, 2014). To a major extent, for the effective growth and development of the children, parents should be dedicated and responsible in that direction (Akbari & McCuaig, 2014).

Reviewing the Current State of ICT Integration in Early Childhood Education in Ghana: According to the UNESCO Institute for Statistics (UIS) (2020), only 3% of children in Ghana have access to early childhood education that meets the minimum standards. The situation is worse in rural areas where access to early childhood education is limited, and ICT infrastructure is inadequate. The Ghana Education Service (GES) (2018) indicates that only a few schools in Ghana have ICT infrastructure and resources, limiting the integration of ICT tools in teaching reading.

2.3.1 The Concept of Reading

The conceptions of reading and for that matter reading development that guide the work of renowned researchers and educators vary along a number of dimensions, in ways that are often inherent in the thinking and writing of their proponents. The definition generated by the Department of Education and Skills (DES) in the National Strategy to Improve Reading and Numeracy among Children and Young People 2011-2020 notes that: reading includes the capacity to read, understand and critically appreciate various forms of communication including spoken language, printed text, broadcast media, and digital media. While the definition is broad, critically, it does recognise the importance

of conceptualising reading to include reading, writing, communication and oral language in both print-based and digitized format. For the purpose of this work, the researcher was looking at the use ICT in the teaching of reading at the KG. Level in Ayawaso Central Educational Municipality.

According to The Early Years Learning Framework for Australia (EYLF) of the Department of Education Employment and Workplace (DEEWR, 2009) defines reading as the capacity, confidence and disposition to use language in all its forms. Reading incorporates a range of modes of communication including music, movement, dance, storytelling, visual arts, media and drama, as well as talking, listening, viewing, reading and writing. Contemporary texts include electronic and print-based media. In an increasingly technological world, the ability to critically analyse texts is a key component of reading (p. 38). Reading involves students in listening to, reading, viewing, speaking, writing and creating oral, print, visual and digital texts, and using and modifying language for different purposes in a range of contexts.

The Progress in International Reading Study (PIRLS) conducted with fourth grade students define reading as the ability to understand and use those written language forms required by society and valued by the individual. Young readers can construct meaning from a variety of texts. They read to learn, to participate in communities of readers in school and in everyday life, and for enjoyment (Mullis, Martin, Kennedy & Foy, 2007).

Reading can be viewed as the product of an array of component skills, all of which are necessary to high-level performance. For example, phonological awareness, letter knowledge, automaticity in reading letter sequences, and lexical access could be identified key component reading skills. Holistic thinkers see meaning-making as the

central defining feature of good reading, are inclined to think of reading as a single, integrated capacity, and often deplore attention to isolated components in reading instruction or assessment. Reading can be viewed as an individual cognitive accomplishment, as an activity that is exemplified by curling up with a book.' Alternately, it can also be described as an essentially interactive, collaborative activity embedded in social purposes, even when the act of reading itself is solitary. The solitary view sees reading and writing as primarily an inside-the-head psycholinguistic process, a process that involves the development of new neural pathways and organizations and that is subject to risk of failure due to factors of anatomy or neural processing.

Reading can be seen as dependent on instruction, with the corollary that quality of instruction is key. This view emphasizes the developmental nature of reading- the passage of children through successive stages of reading, in each of which the reading and writing tasks change qualitatively and the role of the instructor has to change accordingly (Chall, 1996).

Young children, before they have had any formal reading instruction, display many capacities and skills which can be viewed as directly relevant to their reading development. Beliefs about exactly which of those capacities are crucial pre reading skills, and which should be promoted by parents and preschool teachers, are, of course, determined by one's view of the nature of reading itself. There is general consensus that early emerging reading-relevant skills include the capacity to recite the alphabet, to name and print letters, to spell simple words including one's own name, to recognize letters and signs in the environment, to identify books by their titles, and to handle books and other reading artifacts appropriately. These sorts of capacities are seen by more Holistic thinkers as evidence that children are participating in authentic reading

activities, enacting the reading practices they see their parents engaging in, or displaying cultural routines their parents value (Teale & Sulzby, 2010).

Despite the lack of consensus on what reading is, most contemporary definitions do include reading, writing, speaking and listening, and, usually, viewing or visual reading. Many definitions also include critical thinking, critical reading, flexibility and the ability to choose appropriate means of communication for particular contexts or purposes. The ability to use and produce a variety of text forms, including electronic and multimodal texts, is increasingly seen as an element of reading, and some definitions even include dance, music and movement.

The Education for all Global Monitoring Report cited in UNESCO (2014) classifies reading into four groups:

- Reading as an autonomous set of skills
- Reading as applied, practiced and situated
- Reading as a learning process and
- Reading as a text
- Reading as Skills

The most common understanding of reading is that it is a set of tangible skills – particularly the cognitive skills of reading and writing – that are independent of the context in which they are acquired and the background of the person who acquires them. Scholars continue to disagree on the best way to acquire reading, with some advocating the phonetic ‘approach and others reading for meaning’, resulting in what has sometimes been called the reading wars’ (Adams, 2009).

The emphasis on meaning has recently given way to a scientific ‘attention to phonetics, word recognition, spelling and vocabulary. This approach has lately turned to research in the cognitive sciences on important features of human memory (e.g. how the brain processes reading patterns) and to techniques such as phonological awareness training and giving increasingly faster reading tasks (Abadzi, 2004).

The word reading has begun to be used in a much broader, metaphorical sense, to refer to other skills and competencies, for example information reading ‘, visual reading ‘, media reading ‘and scientific reading‘. International organizations – notably the OECD through publications such as *Reading in the Information Age* and *Reading Skills for the Knowledge Society*, have given impetus to the use of such terms, eventually giving rise to a new French term, *littératie* (Fernandez, 2005).

The meaning of these concepts tends to be diverse and shifting, ranging from the view of reading as a set of largely technical skills to the idea that these skills should be applied in critical ways to examine one’s surroundings (e.g. the workplace and the media) and push for social change (Hull, 2003). For instance, *information reading* ‘broadly refers to the ability to access and use a variety of information sources to solve an information need. Yet, it can also be defined as the development of a complex set of critical skills that allow people to express, explore, question, communicate and understand the flow of ideas among individuals and groups in quickly changing technological environments.

2.3.2 Reading as Applied, Practiced and Situated

Acknowledging the limitations of a skills-based approach to reading, some scholars have tried to focus on the application of these skills in relevant ways. One of the first coordinated efforts to do so was through the development of the notion of functional reading. In the 1960s and 1970s, this concept initially emphasized the impact of reading

on socio-economic development. Views of functional reading often assumed reading could be taught as a universal set of skills (applicable everywhere) and that there was only one reading, which everyone should learn in the same way. Reading was seen as neutral and independent of social context. This understanding evolved as scholars argued that the ways in which reading is practiced vary by social and cultural context (Barton, 1994).

Ethnographic research into reading practices in particular settings was particularly instrumental in the development of this approach, typically known as New Reading Studies (NLS) (Gee, 1991). Rather than see reading as a technical skill independent of context, the NLS approach argues it is a social practice, embedded in social settings and, further, that even a presumably objective 'skill such as numeracy can be socially situated. Among key concepts in this view of reading are reading events (any occasion in which a piece of writing is integral to the nature of the participants interactions and their interpretative processes) and reading practices (the social practices and conceptions of reading and writing) (Street, 1984). The reading as applied, practiced and situated approach questions the validity of designations of individuals as literate or illiterate, as many who are labelled illiterate are found to make significant use of reading practices for specific purposes in their everyday lives (Doronilla, 1996).

i. Reading as a Learning Process

As individuals learn, they become literate. This idea is at the core of a third approach, which views reading as an active and broad-based learning process, rather than as a product of a more limited and focused educational intervention. Building on the scholarship of Dewey and Piaget, constructivist educators focus on ways in which individual learners, especially children, make sense of their learning experiences. In the

field of adult education, some scholars see personal experience as a central resource for learning. Experience is one of Knowles's (1980), five principles of andragogy', or adult learning theory, in which he argues for a learner-centred educational process, with critical reflection as central.

Street (1984), developed an experiential learning cycle, with concrete experience as the starting point for learning, based on critical reflection. More recently, social psychologists and anthropologists have used terms such as collaborative learning', distributed learning' and communities of practice' to shift the focus away from the individual mind and towards more social practices building on newer understandings of reading (Lave & Wenger, 2014). For example, Rogers (2003), distinguishes between task-conscious 'learning, typically evaluated by test-based task completion, and learning-conscious learning', which is assessed from the perspective of the learner. The more traditional learning methods of children (task-conscious 'test learning) are often used for adults, as is evident in many adult reading programmes. To this end the use and the integration of ICT into the teaching of reading at all levels which especially includes the KG by some privileged schools have been interesting and innovative from the traditional method.

In francophone Africa, scholars such as Joseph Ki-Zerbo from Burkina Faso have documented mobilization for an Africanized 'reading that would directly respond to the pressing communication needs of the continent. This movement has motivated the introduction of Freirean methodologies by several NGOs (Fernandez, 2005). His ideas have been used as pedagogical tools to support learners who have been oppressed, excluded or disadvantaged, due to gender, ethnicity or socio-economic status.

ii. Reading as Text

A fourth way of understanding reading is to look at it in terms of the subject matter (Bhola, 2016) and the nature of the texts that are produced and consumed by literate individuals. Texts vary by subject and genre (e.g. textbooks, technical/professional publications and fiction), by complexity of the language used and by ideological content (explicit or hidden). This approach pays particular attention to the analysis of discrete passages of text, referred to by socio-linguists as discourse '. Influenced by broader social theories, it locates reading within wider communicative and sociopolitical practices that construct, legitimate and reproduce existing power structures (Gee, 2010).

Language represents one of several modes through which communication is conducted (Kress & van Leeuwen, 2001). The broader policy question raised by this work is whether the types of reading taught in schools and adult programmes are relevant to the present and future lives of learners (Armbuster, Gee & Bakin, (2001). In summary, these four approaches broadly reflect the evolution of the meaning of reading 'in different disciplinary traditions. While international policy has not evolved in direct response to these views, there has been a mutual influence between evolving theories and policy-oriented approaches to reading.

iii. Reading Components

The National Reading Panel (in accordance with the No Child Left Behind Act) in an extensive research to determine the most effective way to teach students how to read, research revealed that when five components are effectively taught, they lead to the highest chance of reading success. The 5 Pillars of Successful Reading Instruction Info graphic presents the five essential components of successful reading instruction:

1. Phonemic Awareness
2. Phonics
3. Fluency
4. Vocabulary
5. Comprehension

The National Institute of Reading report as cited in Otto (2006) indicated that, the foundational reading and writing skills that develop from birth to age five have a clear and consistently strong relationship with later conventional reading skills. They outlined six components which includes concept of print, print knowledge, reading readiness, oral language, writing and phonological awareness.

Heroman and Jones (2004), opines that reading components comprises of reading as a source of enjoyment, vocabulary, oral language, phonological awareness, knowledge of prints, letters and words and comprehension. The standard based curriculum by the National Council for Curriculum and Assessment (2019), outline the following as the components- oral language, print awareness, listening comprehension and vocabulary integration, phonemic awareness, phonics and writing. The teaching of these components leveraging on ICT tools will better make teaching and learning fun and help learners to easily develop reading skills.

2.3.3 Oral language

Oral Language is the child's first, most important, and most frequently used structured medium of communication. It is the primary means through which each individual child will be enabled to structure, to evaluate, to describe and to control his/her experience. In addition, and most significantly, oral language is the primary mediator of culture, the way in which children locate themselves in the world, and define themselves with it and within it (Goodman, 2001).

Language learning is another area that is important for cognitive development. Vygostky believed that through working on a child's language, it will at the same time advance his or her cognitive development (Mooney, 2000). In order to do this, kindergarten classrooms need to place more emphasis on play and oral language development. This can be done better by the use of information and communication tools. Oral language is about communicating with other people; it involves a process of utilizing thinking, knowledge and skills in order to speak and listen effectively. As such, it is central to the lives of all people. Oral language permeates every facet of the primary school curriculum. The development of oral language is given an importance as great as that of reading and writing, at every level, in the curriculum. It has an equal weighting with them in the integrated language process.

Oral language concerns a child's vocabulary as well as his or her ability to speak clearly and fluently and understand conversations with others (Luckin, 2008).

The early years are a period in which young children are using language to learn not only about their world but also how language can be used to serve many purposes. This knowledge is referred to as pragmatic knowledge (Otto, 2006). One component of pragmatic knowledge is conversational skills. Ninio and Snow (1999) assert that how well children develop conversational skills can influence how well they interact with others. To a certain degree, children pick up this knowledge naturally, but an astute teacher or parent plays a vital role in assisting children in their ability to be good conversationalists.

Conversing with children is not the only way to increase vocabulary, however strategies teachers use while reading with and to children can also build their word banks. Asking open ended questions (questions in which there is no right or wrong answer and to which the adult does not know the answer) helps teachers assess children's comprehension but also helps them learn more vocabulary words. Kerry (1982) asserts

that the vast majority (approximately 80%) of teacher talk in classrooms is focused on tasks: giving instructions, providing information, or correcting behaviour or information. Of this talk, 80% of it consists of low-level questions that ask children to recall information rather than open-ended questions requiring children to think at higher levels. A very important consideration in using any questioning technique is the wait time given to children as they formulate their response.

In addition to giving children ample time to formulate answers, how teachers respond at that point can encourage or discourage future participation in discussions (Otto, 2006). Attentive body language, expanding children's responses, asking clarifying questions, and using reflective listening techniques are ways to support children's continued participation in current and future dialogues (Otto, 2006).

The obvious partner to participating in talk is the ability to listen. Conversation is a two-way communication experience. Although children's oral, or expressive, language often gets emphasized, receptive language, or listening, is equally important. Naturally, the ability to listen is also a key component in learning. It is the way children take in information through hearing and interpret that information. Children (and adults) can be taught to be good listeners. A primary way of helping children participate as listeners and speakers in conversations is for teachers to model good listening and speaking techniques themselves.

Oral language development precedes reading and then parallels it; both oral and written language is developmental language processes that are mutually supportive and develop over time. Parents' interactive strategies, particularly the quality of their language that they share with their children and the books they read aloud, are strongly related with their children's language development (Hart & Risley, 2006). What understandings

about reading do young children acquire through oral language? Snow, Burns, & Griffin (1998) identify the following:

- Basic language components that both oral and written language hold in common (lexical, syntactic, and interpretive processes)
- Conceptual memory (vocabulary, topic knowledge)
- Cognitive mechanisms (working memory)

Listening and speaking are embedded throughout the school day and modelled by the teacher. Learners should have ample time to learn new strategies and practice foundational language skills of listening and speaking explicitly. It is important for learners to express their thoughts and listen to others for new perspectives and understanding (GES, 2014). The strategies mentioned above can be done alternatively by the use of automated toys or audio-visual materials. These can be used with or without the teacher and the learners will develop the skills the activity is intended to.

2.3.4 Print awareness

Knowledge of prints refers to all the concepts related to how print is organized and used to convey meaning. Children begin to understand that print carries meaning but that written language is different from oral language. They develop an understanding that

- a. Print serves a number of purposes in our society (functions of print).
- b. Print has distinct features and forms (forms of print).
- c. Print is organized in a particular way (print conventions).

Concepts of print include learning book handling behaviours and directionality of print that we read from top to bottom and left to right, one line at a time. From early experiences with print, children learn that symbols and letters are associated with particular meaning. These print concepts evolve further as children mature and come to

understand elements of literature through exposure in academic content and in reading for pleasure as well. They learn the elements of literature, such as author, title, characters, illustrator etc.

Early research by Reid (1966) determined that young children lacked a precise concept of the purposes for reading and writing and the instructional language used to describe these acts. Clay (2009) found that a large majority of children did not clearly understand many of the concepts about print upon entering school.

The ability to discriminate words and letters was found to be dependent upon the development of print concepts, and print awareness was linked to word-reading acquisition through grapheme-phoneme correspondence. Conversely, Huba (1996) found that print concept knowledge as measured by an experimenter constructed test was unrelated to success on sight word and decoding-like tasks. children's development of print concepts are correlated with reading achievement (Lomax & McGee, 1987), no clear evidence portends a cause effect relationship between the development of print concepts and the acquisition of reading ability among emergent readers. Research by Goodman (2001) supports the contention that many children can acquire print concepts from environmental print rather than from formal instruction. He found that children learned as much about print concepts from little story books 'as from letter sound instruction. The innovation and the development of information, communication and technology apps and tools have made the teaching and development of the skills above very easy. Teacher's must learn and use the apps and the tools to develop the learners print concept skills.

2.3.5 Vocabulary

The role of vocabulary in reading comprehension is an intriguing and complex one; to construct a mental representation of text, that is, to understand text meaning, one will

have to be able to decode the printed message (Adams, 2004). Inability to recognize words in text and the presence of high density of unknown words in a text may impair comprehension (Nation, 2010). Beck, Shedd, and Simon (1987: 148) remark that given the complexity of processing involved in comprehending text, a level of word knowledge may be needed'. Fast and efficient word recognition, word encoding and lexical access are necessary for higher level of meaning construction (Adams, 2004). The difference between skilled and less skilled readers is usually attributed to slower and inefficient lexical access and semantic processing (Bernhardt, 2005). Consistent and reliable correlations between vocabulary and comprehension have been found in numerous factorial analytic studies (Anderson & Freebody 1983). Readability indexes, not surprisingly, include vocabulary as a major component, suggesting that word difficulty affects text comprehension (Stahl, 2003). Stahl (2003: 246) emphasizes that studies from readability formulae have found that the most important factor in determining the difficulty of a text is the difficulty of the words '. Vocabulary is thus a reliable predictor of reading comprehension.

Anderson and Freebody (1983: 367) state that people who do not know the meanings of very many words are most probably poor readers'. They added that one's level of vocabulary is highly predictive, if not deterministic, of one's level of reading comprehension. Within the context of second language research in reading, findings on the reading processes and vocabulary threshold have consistently shown the significant contribution and the importance of vocabulary knowledge in reading comprehension performance.

Coxhead and Nation (2001), in expanding Richards 'framework, has conceptualized aspects of word knowledge that it includes receptive and productive use. Basically, vocabulary knowledge is categorized into three broad dimensions: form, meaning, and

use. Mastery of these aspects of word knowledge is believed to enable the learners to attain native-like competency and fluency (Schmitt & Meara, 1997).

Chapelle (2011) has proposed that vocabulary ability can be investigated along the following three components: (1) the context of language use; (2) vocabulary knowledge and processes; and (3) the meta cognitive strategies required for vocabulary use in context. Chapelle (2011) suggested that vocabulary be investigated with reference to a specific context and argues that because of differences in field, tenor and mode, learners' vocabulary would differ depending on whether they are reading a newspaper at home, or listening to a chemistry lecture in a classroom'. It appears reasonable then that, since word meaning and use vary in different contexts and situations of language use, investigating and testing vocabulary ability should be taken not only from a purely linguistic perspective but also from a social perspective. Children need to learn new words and learn about the structure of language through talking with peers and adults, enjoying songs, rhymes, finger plays, hearing new words, and listening to print read aloud and talking about new words.

2.3.6 Phonemic awareness

Phonemic awareness is the ability to hear, identify, move or change sounds, called phonemes, in spoken words. Phonemic awareness is an important basic skill that gets learners ready to develop into readers. Phonemic awareness is usually taught during kindergarten and beginning first grade. Phonemic awareness includes six basic components (Elish-Piper, 2010). Phonemic awareness needs to be understood as one small aspect of phonological awareness, which itself is part of a bigger notion called metalinguistic awareness. Although the terms phonological awareness and phonemic awareness are sometimes used interchangeably, they do have slightly different meanings. Phonological awareness is the larger of the two ideas; it is the awareness of various sound aspects of language (as distinct from its meaning). Phonemic awareness

is more specific: the ability to detect each phoneme (the smallest unit of speech) in words.

Phonological awareness can be further divided into smaller components such as abilities to hear alliteration, rhyming words, word boundaries, and parts of words (e.g., syllables, beginnings and onsets, endings, and phonemes, the smallest units of speech). Two key aspects of phonological awareness comprise phonemic awareness: (a) the ability to segment words into phonemes and (b) the ability to blend phonemes into words.

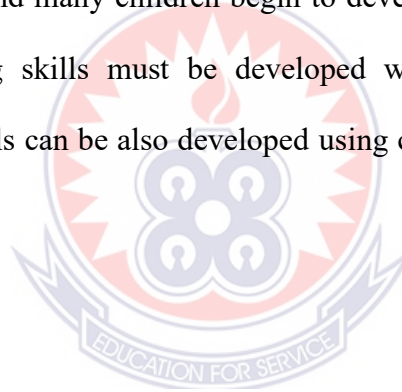
Children who have phonemic awareness are able to segment (break apart) a word into phonemes in order to write the word and to blend (put together) phonemes in order to read a word. Children with phonemic awareness, and who also have some knowledge of letter-sound relationships, are able to come up with an approximate spelling of a word (an invented spelling) or an approximate pronunciation, which must be checked with context and meaning cues in order to make sense of what is being read.

Although phonological and phonemic awareness are both important in learning to read, phonemic awareness tends to receive more attention because it is considered by some to be of critical importance in learning to read (Adams, 2009). Phonemic awareness helps children learn to read and write, and learning to read and write helps children develop phonemic awareness (Weaver, 1998).

Phonemic awareness can be divided into two major, very different perspectives of the reading process: a psychological-cognitive perspective and a language reading-oriented perspective. Psychological-cognitive research focuses on word reading while language reading-oriented research focuses on comprehension of text. Some of the confusion

teachers face is that many claims are based on a very narrow, skills-based perspective (Simner, 1998) that takes into account only clinical, experimental research. Much of this research may not apply to children in classroom settings (Chapman, 2011).

Phonemic awareness is an important factor, but it is only one of many abilities that children need in order to learn to read and write. As Gee (2001) have noted, children who fare well in school reading have had language and reading rich preschool experiences that provide many opportunities for talk, experiences with oral and written stories, appropriate verbal interactions with adults during storybook readings, and opportunities to draw and write. In kindergarten classrooms that engage children in language and reading rich experiences, children's phonological awareness becomes increasingly refined, and many children begin to develop phonemic awareness. This component of reading skills must be developed within kindergarten or the KG environment. This skills can be also developed using computers, projectors, speakers, tablets etc.



2.3.7 Phonics

Phonics instruction is a necessary component of reading instruction, but not sufficient by itself to teach children to read (Winkworth, Davis, Ellis & Adams, 1994). An essential part of learning to read and write is the understanding that letters and combinations of letters make up particular sounds and words. Without knowing letter sound correspondences, learners are deprived of a fundamental means of recognising and producing known words and of figuring out new ones when reading and writing (Fletcher, 2011). Phonics teaching needs to begin early in Kindergarten and be provided in short, regular, fast-paced teaching sessions (around 20 minutes overall with time distributed as best judged by the teacher).

Phonics is simply a tool that a school adopts for the teachers to use while they help students learn the fundamentals of the English language as well as it is only a —means to an end on the road to successful reading. McNair (2007) includes a basic definition of phonics which is that it is instruction in letter-sound relationships. It is concluded by Goodman (2001) that it takes a teacher to be involved and active in the students learning in order to use the phonics instruction or any other instructional tool effectively that has been brought into the classroom. The teacher needs to be actively instructing the strategy or method so they can make changes as necessary to drive student success. Eshiet (2015) reported that several studies have shown that phonic is very appropriate to teacher and learners on how to read and write. She maintained that phonics is adopted by the United Kingdom's National Reading Panel as an effective means to make early learners to become literates. Interestingly all these phonic activities have been developed in ICT Apps that can be downloaded from the internet and used for learners to develop their reading skill.

2.3.8 Comprehension

Comprehension involves the process of simultaneously extracting and constructing meaning (Shanahan & Lonigan, 2010). Listening to others read helps develop Metacognition skills, such as an appreciation for how a story is developed and familiarity with the concept of print (Bredenkamp, 2011). Kindergarten children can comprehend on a higher level when teachers/families read aloud and expose the children to vocabulary and language patterns that are part of everyday speech. This, in turn, helps them understand the story elements and entices them to become better listeners. The children benefit from hearing an experienced reading when it is regularly exercised. Like many dispositions and skills, comprehension strategies can build habits of the mind that help kindergarten children interact with texts in active and purposeful

ways. Comprehension strategies provide children with a demonstration of phrased and fluent reading (Jalongo, 2013).

Reading comprehension develops the listener's interest in books and desire to be a reader. At story time, the pleasure of a good book gives kindergarten children a reason to think, and that pleasure can then lead them to better comprehend what they are hearing. When the children experience a story, they do far more than just understand each word; they create a mental picture of what they are hearing. Because listeners are so intimately involved with the story, reading aloud to/with children can begin to develop skills and strategies that lead to comprehension of texts required of competent readers and writers' (Combs, 2006, p. 137). As kindergarten children learn to listen to stories with understanding, they practice comprehension strategies that will also help them to read stories with understanding.

According to Pearson and Duke (2002), comprehension instruction is best when it focuses on a few well-taught, well-learned strategies' (p. 236). In other words, children need comprehension instruction to internalize the use of comprehension strategies. The value of teaching comprehension strategies is long and consistently endorsed by reading researchers (Pressley, 2002). Comprehension instruction, using evidenced based strategies, has consistently proven its worth. Children must have explicit comprehension instruction and multiple exposures to experience the varied and meaningful uses of print. The goal for comprehension instruction is for teachers/families to integrate the early reading instructional approaches that are appropriate and engaging for kindergarten children and that are explicit and intentional to offer a strong foundation for later reading success. Providing meaningful comprehension activities that children can take advantage of in the classroom can certainly advance their learning of the story elements. The magic of teacher storytelling not only improves a child's listening but also broadens the children's interpretation of

texts. Teachers are able to not only connect stories to real-life experiences but also broaden children's interests and open a new world of discovery.

Some kindergarten children come to school knowing far fewer comprehension strategies than their peers (Bredekamp, 2011). It is important that teachers intentionally think about how to provide the children with many opportunities to enhance reading comprehension. They need to teach the children a variety of comprehension strategies that will help them understand and retain what they read and thus become independent, resourceful readers. The strategies includes read aloud, think aloud, demonstrations, dialogue reading, reading favourite and picture books. Constructing meaning while reading can be demanding intellectual work, and teachers/families that get their children's interest may be more effective in helping them to develop good reading comprehension skills. Reading comprehension enriches kindergarten children's language skills, a critical building block on the road to successful reading and writing.

2.3.9 Measuring Reading and Digital Reading Development

According to Kern (2000), reading is the use of social techniques for producing and deciphering meaning through text. A learner who concentrates on text comprehension reads for knowledge and acquires reading in the process. Children should learn to read in order to be able to read to learn (Robinson et al. 2013). Many arguments exist regarding the optimal age for children to begin reading and the best way for early reading development to take shape (Fletcher-Flinn 2015).

Early reading development frequently distinguishes between skills related to meaning and codes (Lonigan et al. 2011). Print and alphabet knowledge, phonological awareness, and other skills are examples of code-related abilities (Owodally 2015). Grammar proficiency, oral storytelling ability, and vocabulary are examples of meaning-related skills (Westerveld et al. 2015). In primary and secondary education,

the body of knowledge regarding the causes, correlates, and predictors of children's reading success and failure has grown significantly in the last several years. This understanding has prompted the creation of both standardized and non-standardized techniques for assessing young children's reading development (Lonigan et al. 2011).

A popular approach to evaluating reading development that is not standardized involves using checklists, rating scales, and child-made portfolios as well as teacher observations and assessments related to reading development. The lack of standardization in the procedures means that not every child's skill demonstration will be measured in the same way. A prevalent criticism of non-standardized approaches is that teacher observations are frequently unstructured rather than organized, leading to skill measurements that solely represent the instructor's assessment of the student (Brown and Rolfe 2005).

A popular standardized method for reading development assessment is the dynamic indicators of basic early reading skills test (DIBELS; Kamii and Manning 2005). The DIBELS mainly focuses on code-related skills. It consists of the following subtests: initial sounds fluency, letter naming fluency, phonemic segmentation fluency, nonsense word fluency, and word use fluency. The suitability of the DIBELS, and other standardized instruments, for measurement of early childhood reading development, has generated considerable debate (Myers et al. 1996; National Research Council 2000). There have been complaints raised concerning the amount of time needed for this kind of evaluation, other influences that can impede precise ability assessment, and young children's poor test-taking skills. Because of these worries, the substance of the study has been modified from standardized examinations to conform to the guidelines of the local curriculum. The alphabet recognition, phonological awareness, and print awareness were the only three essential reading development skills

that were measured in this study. To ensure that the child assessments were honest, meaningful items were devised.

The increasing use of technology in children's everyday life has stimulated the emergence of digital reading which has also been referred to as computer, technology, information, media, and communication literacies (Martin and Grudziecki, 2006). All these terms share the view that they involve technology other than text. Throughout this paper, we use the term digital reading to refer to the use of social practices of creating and interpreting meaning through texts with technology (e.g., Kern 2000). According to Ng (2015), a digitally literate person is a competent user of three dimensions of digital technology: technical, cognitive, and socio-emotional. The dimension of technical skills is the most developed area of digital skills measurement. It includes knowledge of devices and operating skills with a focus on technical usage of computer (Ba et al. 2002), online abilities (Sonck et al. 2011), exploring tablets (Marsh 2016), and operational use of digital devices (Eshet-Alkalai and Chajut 2009; Eshet-Alkali and Amichai-Hamburger 2004; Eshet 2012). However, there is little research related to the assessment of cognitive or socio-emotional dimensions of digital reading.

The present study considers cognitive and socio-emotional skills dimensions because they are important prerequisites of digital reading. This choice is also in line with a definition of digital reading in early childhood education that has emphasized the use of digital and non-digital practices in using different digital technologies (Burnett et al. 2014; Sefton-Green et al. 2016). The cognitive skills dimension of digital reading includes critical thinking and multimodality, which infers that communication and representation is more than just about language. The socio-emotional skills dimension includes communicative and social skills. We did not assess technical skills development in this study because available tests are too complex for young children,

and we wanted to stay away from highly specific facets of technical skills and investigate more general cognitive and socio-emotional dimensions.

Measurement for both reading and digital reading development in the present study has taken into account two critical considerations: (1) a focus on content and determining what should be measured, in order to be able to assess the effectiveness of designed activities; (2) establishing a procedure which was not time-limited in order not to put children in stressful situations.

2.4 Empirical Review

2.4.1 The extent to which ECE teachers use ICT in teaching reading in schools

Researchers have made diverse observations regarding the extent to which ECE teachers use ICT in teaching reading in various schools. The study conducted by Hafifah and Sulisty (2020) in Indonesia for instance, examined ICT use in English Language Teaching (ELT) in higher education settings. The authors surveyed 280 English lecturers who were recruited from various universities in the country. Data collected from these respondents' using questionnaires were taken through correlation analysis and the findings indicated that ICT reading level of over 60 percent of the lecturers were above average. It was also found that though the respondents face challenges with internet connection and lack of ICT training, they use ICT frequently in their daily lectures. The study found that the respondents' ICT reading levels, internet frequency usage, and ICTs integration in language lecturing were because of training experiences. Findings indicated further that lecturers' ICT reading levels would increase when they frequently implement it in teaching students.

In a study carried out in south-western Sweden, Masoumi (2015) examined how kindergarten is integrating ICT in instructing the pupils. Through observations and

interviews, the researcher reported that there is evidence-supporting assertions that ICT can improve preschool practices by providing a variety of complementary opportunities to enhance and transform existing curricula. Findings from the three kindergartens surveyed revealed that ICTs have been adopted in distinctive ways such as used as a tool to enrich existing practices, as a cultural facilitator, as a means to get pupils entertained, as well as a communication and documentation tool. The study found however, that there still some teachers who are of the view that ICT is not appropriate for preschool pupils. The study further suggested that addressing the attitude and believes of such teachers will aid in effective implementation of ICT in schools.

In the study carried out by Ukwueze and Ajala (2014), they investigated to establish the relationship between ICT teaching and learning outcomes, attention sustained and retained ICT knowledge among early childhood pupils. This research was carried out in Nsukka urban of Enugu State, Nigeria where the researchers used a sample of 50 preschool teachers drawn from five nursery schools in the study area. After analysis of data obtained using survey and questionnaires, it deduced that for ICT implementation to be successful in kindergarten, teachers have some significant roles to play. The finding from the study showed that despite some challenges reported by teachers, the use of various ICT tools improves pupils' competence and skills, hence, indicating that ICT supports children's efficient studies.

Natia and Al-hassan (2015) in their study assessed the level of ICT promotion in basic schools in Ghana through school administration, and teaching and learning. The researchers used data provided by Connect for Change Education Ghana Alliance for analysis. In all, data were collected from six hundred and twenty-eight (628) schools in this cross-sectional study. They included three hundred and thirty-three (333) primary and two hundred and ninety-five (295) Junior High Schools (JHS) across Northern,

Upper East, Upper West and Volta. Findings from the analysis showed that there are relatively limited computers in basic schools (4%) compared to the JHS (10%). The findings revealed that while 69% of female tutors use ICT tools, 50% only of male educators use ICT tools to teach in the various schools studied. Further observation made in the study suggested that teachers' ability to use computers in teaching reading is limited because of lack of access to internet, power fluctuation, insufficient number of computers and technical skills. This suggests that a lot should be done to support teachers in their ICT use in teaching reading in schools in Ghana.

Studies have shown the enormous benefits that the use of ICT tools in teaching reading in early childhood education has several benefits. ICT tools such as e-books, interactive whiteboards, and educational software can enhance reading instruction and promote reading development in young children. They offer opportunities for children to engage in interactive and multimodal learning experiences that are engaging and fun. According to Agyei and Voogt (2018), the use of ICT tools in reading instruction can improve children's reading and writing skills by promoting phonemic awareness, word recognition, vocabulary development, and comprehension.

2.5 The types of ICT tools used in teaching reading in kindergarten

In the ICT literature, researchers have indicated various kinds of ICT tools teachers could use in teaching reading in schools. Masoumi (2015) posit for instance that interactive whiteboards have frequently been used as display tools for showing video clips, images and texts without any manipulation of their interactive functionalities. There is the indication that ICTs seem to be fastened onto the educational practices that are already in existence (Siraj-Blatchford & Siraj-Blatchford, 2006). Some researchers have noted that there are available tools for teachers to adopt to instruct pupils including pictures, video, animations, and sound (Palfrey & Gasser, 2008; Preston & Mowbray,

2008). According to McPake et al. (2012), the most predominant kind of ICT in ECE is the personal computer (PC). Instructors and administrators mostly use this as a display or documentation tool.

Oladunjoye (2013) investigated the use of ICT tools among teachers in two kindergartens in Stockholm. Data collection was through observation of pupils and interviews with teachers included in the study. In all, sixty (60) pupils were observed to be able to put data together as well as four (4) kindergarten instructors and one preschool teaching assistant were interviewed to collect data regarding their ICT use in teaching. Analysis of the data revealed that the main ICT tool used in instructing kindergarten children was an iPad that enhanced and facilitated the development of reading skills in the learners. The findings suggested that teachers had positive attitude towards the use of ICT tools in teaching students in the kindergartens. The findings presented a proof of how pupils created their own learning setting by keenly engaging in their reading, writing, and comprehension skills using the ICT tool. The observation made in the study indicated that the ICT tool enhanced the pupils' social interaction and developed intra-action activities, to an extent that ultimately led to the development in their learning.

According to Thomas and Kobayashi (2014), currently, individuals including teachers to perform various functions in instructing students use PCs. This is because in this recent technologically driven world, many countries are adding computer reading, reading and writing reading as skills needed by students to succeed professionally (Thomas & Kobayashi, 2014). Ghavifek et al. (2016) indicated in their study that ICT tools that are integrated in teaching and learning could be categorized into three types, thus, input resources, output devices and others. According to the researchers, input tools include but not limited to PCs, tablets, student response systems, applications

software, visualizer or document camera. Projector, monitors, interactive boards, display, and television are output devices. The others include digital recorders, digital camera, switchers and other technological tools. The integration of these various ICT devices can aid in improving student learning and enhance teaching methods with better resources (Ghavifek et al., 2016). The resources include computer laboratories in schools, internet connection/WiFi, and PCs for teachers (Ghavifek et al., 2016; Barfi et al., 2020).

2.6 Teachers' level of knowledge in the use of ICT tools in teaching reading in preschool classrooms

It has been argued by Gorder (2008) that the experience of an instructor is significantly associated with the real adoption of technology in teaching and learning. Researchers like Baek et al. (2008) reported that instructors who have had several years of experience in the profession are less ready to integrate ICT into their teaching. In the study conducted by Mafang'ha, M. (2016), it was observed that positive attitude of teachers, their competence in ICT use, availability of ICT facilities and tools, professional development and accessibility of technical support determine the use of ICT in teaching in second cycle schools in Tanzania. Bordbar (2005) emphasizes that instructors' proficiency in the use of computers is a key predictor of ICT use in teaching. Similarly, Peralta and Costa (2007) in their study observed that teachers who have greater confidence in their ability to use computers effectively in teaching are those with more experience with computers.

Early reading development lays the groundwork for children's language acquisition, cognitive development, and overall academic achievement (Whitehurst & Lonigan, 1998). Preschool years represent a critical period for fostering emergent reading skills, including phonological awareness, vocabulary development, print awareness, and

comprehension strategies (Neuman & Dickinson, 2011). Effective reading instruction during this period not only prepares children for formal reading instruction but also nurtures a lifelong love for learning and reading.

The integration of ICT tools in early childhood reading instruction offers unique opportunities to engage young learners, personalize learning experiences, and scaffold reading development (Plowman & McPake, 2013). Educational apps, interactive whiteboards, digital storybooks, and multimedia resources can provide interactive, multimodal learning experiences that cater to diverse learning styles and preferences (Marsh, 2017). Moreover, ICT tools enable educators to differentiate instruction, provide immediate feedback, and create authentic contexts for reading learning.

Existing studies often explore general attitudes toward technology use or examine the impact of specific ICT interventions on children's learning outcomes, but few studies delve into preschool teachers' pedagogical beliefs, practices, and knowledge regarding the integration of ICT tools in reading instruction (Plowman & McPake, 2013). Additionally, there is limited research examining the contextual factors that may influence preschool teachers' adoption and utilization of ICT tools in reading instruction, such as access to technology, institutional support, and professional development opportunities.

The observation made by Ghavifekr et al. (2014) suggested that the use of ICT in teaching and learning in the classroom in Western countries is encouraging since three decades ago. As a result of swift transformation in ICT, teachers need to focus on learning how to use technology whereby they will be exposed to various ICT skills aspects of personal matters until the professional application (Sabanci & Omeroglu, 2015). The competence in ICT is referred to as reading in ICT, which includes

acquaintance with the basic concepts and operation of ICT (Copriady, 2015; Sabanci & Omeroglu, 2015). The aspects contained in ICT reading which teachers must be aware of to be able adopt it effectively include computer usage, basic concepts of ICT, word processing, file management, spreadsheet, database, creating documents, presentations, as well as information and communication (Copriady, 2015; Norton & Wiburg, 2003).

Kamaruddin et al. (2017) studied sixty (60) ECE teachers in Malaysia to examine how they are integrating ICT in their teaching of the pupils. The study was undertaken in the district of Hulu Bernam, Selangor where the respondents were randomly selected from 10 private kindergarten. The results from the analysis of data showed that the level of computer skills and knowledge of the preschool teachers is at low level. It was also found that among the teachers studied, integration of ICT in teaching and learning in the early childhood schools was low. Moreover, teachers were observed to have a favourable attitude towards the significance of ICT in teaching and learning. The integration of ICT in teaching reading in the ECE centres in Ayawaso Central is low and this is what the researcher seeks to find out.

2.7 The challenges ECE teachers encounter in the use of ICT tools in teaching in the preschool classrooms

Despite the significance of the integration of ICT in schools, Koehler et al. (2013) the adoption of ICT for instruction is associated with numerous challenges and the introduction of new technologies daily further complicates its adoption. In the view of Koehler et al. (2013), the challenges could be categorized into main factors, thus, resources, knowledge and skills, institution and subject culture. Although the KG curriculum seeks the integration of ICT in the engagement of learners in the classroom the above situation exist in the preschool environment.

According to Empirica (2006), lack of access ICT tools is the major hindrance to the integration of ICT in schools. It is also indicated that insufficient technological resources that challenge ICT in teaching in schools include outdated and inadequate computers, incompatible hardware and software, and these lead to little chance for instructors to integrate ICT tools into teaching students (Karagiorgi, 2005; Boni, 2018).

Other studies have reported that school authorities can hamper the successful integration of ICT into teaching and learning (Boni, 2018). Fox and Henri (2005) have emphasized this assertion in their study carried out in Hong Kong and reported that teachers in the area felt their head teachers in second cycle schools did not have knowledge in ICT and its significance to the country's transference to learner-centered activities. Somekh (2008) also observed that a school timetable that is rigid could hinder the adoption of ICT by teachers and students. With a sample of about four hundred instructors who were recruited from schools in the US, Somekh (2008) assessed factors impeding their pedagogical use of ICT and found that the period for a subject was not even up to an hour, which suggested that they had rigid timetable that did not support successful integration of ICT in class.

In the study undertaken by Mereku et al. (2009), they observed that in Ghana, the adoption of ICT in schools is hindered by various challenges. They reported that there are some second cycle schools in Ghana that have computer laboratories, however, due to lack of stable power, obsolete computers, virus attacks and inoperative air-conditioners, those laboratories are not effectively used for teaching and learning,. This story is not fully different in the ECE centres in Ayawaso central. The findings from the study indicated also that none of the computer laboratories in the ten schools surveyed was connected to a server. It was however observed that only four computers out of twenty in one of the schools surveyed had internet connectivity. Internet

connectivity is very important in the use of ICT in teaching reading, this is because there are many materials online that can facilitate teaching of reading in the ECE centres but could not be accessed due to absence of the internet in the centres.

In a qualitative study conducted in Ghana by Soma et al. (2021), they investigated some of the factors that hinder the integration of (ICT) in schools in the country using secondary data, the researchers carried out a review of one hundred and twelve (112) journal articles and books published online. The findings from the study indicated that the use of ICT/computers in education could considerably enhance the educational system in Ghana. It was observed however, that lack of ICT infrastructure, bad internet connectivity, interruption in electricity, the higher prices of computers and other technologies, and insufficient knowledge of teachers or technical skills in using ICT tools in teaching are the challenges facing the integration of ICT in the educational system in Ghana. The findings suggest that addressing these challenges will aid in the smooth implementation of ICT in the educational system in the country.

According to Buclkry & Kanyi, 2019, despite the benefits of ICT tools in teaching reading, there are also several challenges that need to be considered. One of the main challenges is the lack of ICT infrastructure and resources in schools, particularly in rural areas. This limits the integration of ICT tools in teaching reading and affects the quality of instruction. Another challenge is the need for teachers to develop digital reading skills and integrate ICT tools effectively into their teaching practices (Agyei & Voogt, 2018). Teachers need to receive training and support to use ICT tools in a way that promotes reading development and addresses the specific needs of their students.

To overcome the challenges of using ICT tools in teaching reading, several best practices have been identified. These include the need for a balanced approach to

reading instruction that combines the use of ICT tools with other instructional strategies (Agyei & Voogt, 2018). Teachers should also select ICT tools that are developmentally appropriate, aligned with the curriculum, and promote active learning. Additionally, teachers need to consider the socio-cultural context and the individual needs of their students when selecting and using ICT tools in their teaching practices.

Several factors influence the successful implementation of ICT in early childhood education. Firstly, there is a need for a clear policy framework that supports the integration of ICT in teaching and learning. Secondly, adequate resources, including funding, ICT infrastructure, and technical support, are essential for the effective use of ICT tools in teaching. Thirdly, teacher training and professional development in the use of ICT tools are crucial to ensure effective implementation in the classroom. Fourthly, stakeholder engagement and collaboration, including parents, teachers, school administrators, and policymakers, are vital for the successful implementation of ICT in early childhood education.

Davis (1985) originally discussed the Technology Acceptance Model (TAM). The TAM suggests that a possibility of an adoption of innovation is dependent on a person's anticipations and attitude toward the innovation (Davis, 1985). Two concepts have been discussed in the model that are said to be the focal point of the TAM. The first is the way potential adopters of the innovation view the innovation in terms of its simplicity when implementing it. The second is its potential usefulness of the innovation in terms of the level to which it will enhance the adopter's job-related or personal performance (Straub, 2009). In the view Davis (1985), with these concepts, perceived usefulness is directly influenced by ease of use, in that there is higher possibility that users will adopt an innovation and realise higher productivity when they view it to be simple to use and beneficial (Davis, 1985).

Ajzen (1985) also argues that, when it comes to the TAM, behavioural intention should be taken into consideration. According to the author, what is meant by behavioural intention is the level of people's preference and their level of willingness prior to adopting technology behaviours. Nevertheless, researchers like Marangunić and Granić (2015); and Liu et al. (2019) have asserted that the most substantial variables predicating behavioural intention in a direct or indirect way are the anticipated convenience (perceived usefulness) of innovation and anticipated comfort (perceived ease) of use of a particular innovation. Davis (1989) explains that perceived usefulness is assumed to be how much innovation adopters are convinced that applying technology will enhance the results of their work. In relation to this, it could be argued that if early childhood or preschool instructors perceive the benefits and serviceability when using ICT in teaching and learning (namely, perceived usefulness), their intention toward these innovative tools and systems will be stronger (Hong et al., 2021). Some studies that have applied the TAM include Valdehita et al. (2019); and Rafique et al. (2020). These researchers investigated the substantial influence of perceived usefulness and perceived ease of use on adopters' using intention toward technology. In educational surroundings particularly, studies have reported that educators' perceived usefulness and perceived ease of use are certainly associated with their adoption intention of ICT in teaching activities (Pynoo et al., 2012; Scherer et al., 2019). This theory is thus relevant to this study on the use of ICT tools in teacher reading in early childhood education in Ghana. The TAM will be applied to explain the extent to which ECE teachers use ICT in teaching reading in kindergarten in Ayawso Central Municipality, the types of ICT tools used in teaching, teachers' knowledge level in the use of ICT in kindergarten, and the challenges ECE teachers encounter in the use of ICT reading tools in teaching in the kindergarten at the study area.

2.8 Summary of Literature Review

The Technology Acceptance Model (TAM) developed by Davis (1985) provides a theoretical foundation for understanding teachers' use of Information and Communication Technology (ICT) tools in teaching reading in kindergarten. The model explains that the adoption of technology is influenced by perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which an individual believes that technology will improve job performance, while perceived ease of use refers to the extent to which an individual believes that the technology is simple and easy to implement (Straub, 2009). These factors influence teachers' attitudes and behavioral intentions toward ICT adoption.

The application of TAM in ICT use for reading teaching highlights the significance of perceived usefulness in early childhood education. Teachers' perceived usefulness of ICT tools refers to their belief that these tools enhance children's reading skills and learning outcomes (Hong et al., 2021). Research indicates that educators view ICT as valuable for differentiated learning and improving engagement and motivation in young learners (Ally, 2004; Wachira & Keengwe, 2011). Interactive tools such as digital libraries, multimedia resources, and educational applications have been recognized as effective in developing reading, writing, and comprehension skills (Graham & Perin, 2007).

The perceived ease of use of ICT tools also plays a critical role in teachers' willingness to integrate technology into their teaching practices (Teo, 2009). Teachers with higher technological proficiency and confidence are more likely to use ICT in reading instruction, whereas those who perceive technology as complex or difficult to use may resist its adoption (Schrum & Levin, 2009). Providing teachers with training, technical

support, and professional development opportunities has been found to enhance their perceived ease of use and promote effective ICT integration (Chai, Koh, & Tsai, 2010).

Teachers' attitudes toward ICT in teaching reading also influence their likelihood of adoption. Educators with positive attitudes toward technology demonstrate a greater willingness to integrate ICT into their teaching methods (Mumtaz, 2000). Creating a supportive organizational culture, encouraging peer collaboration, and exposing teachers to successful technology use cases contribute to fostering positive attitudes (Ottenbreit-Leftwich et al., 2010). Conversely, negative attitudes toward technology may hinder ICT adoption and limit its effectiveness in reading instruction (Mouza, 2008).

Behavioral intentions to use ICT tools are shaped by perceived usefulness, perceived ease of use, and overall attitude toward technology (Teo, 2011). Educators who consider ICT tools beneficial, user-friendly, and aligned with their instructional goals are more likely to integrate them into their reading teaching (Rogers, 2003). Interventions aimed at improving teachers' perceptions of ICT usefulness, ease of use, and attitudes are therefore essential for promoting ICT adoption in early childhood reading instruction (Venkatesh et al., 2003).

In the case of Ayawaso Central Municipality, TAM can be applied to assess the extent to which kindergarten teachers use ICT tools for reading instruction. The model can also be used to examine the types of ICT tools employed, teachers' proficiency levels in ICT, and the challenges encountered in ICT adoption. Addressing these factors through targeted training, infrastructure development, and policy support can significantly enhance ICT integration in kindergarten reading education.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter of the research is devoted to the methodology employed to undertake this study. The researcher discusses the philosophical underpinnings of the research approach, research design adopted for this study, population, and sample and sampling techniques, research instrument data gathering methods, and the instrument used to obtain data. Additionally, the researcher discusses how data is analyzed and discuss ethical consideration as well.

3.1 Philosophical Underpinning of the Study

The study was nested into the interpretivism paradigm. Interpretivism relates to constructivist epistemology (Junjie & Yingxin, 2022; Slutskiy, 2021). This viewpoint is based on the premise that individuals do not have access to the real world, inferring that their knowledge of the perceived world is meaningful in its terms and can be realised through the cautious use of interpretivism procedures. According to interpretivists, precise, systematic, and theoretical responses to complex human problems do not exist because cultural and historical situations vary and are unique and thus, involve an analysis of the exceptionally defined, particular contexts in which it is rooted (Al-Ababneh, 2020; McChesney & Aldridge, 2019).

Unlike positivists, interpretivists have different perspectives on the social world. It is argued that individuals are not physical objects. Positive thinkers believe that people simply respond to environmental stimuli. Rather, it is a more sophisticated issue that must be explored by grasping social reality and considering all relevant aspects (Hasan, 2016; Kelly, 2021). Interpretivists believe that the same social reality or behaviour can be understood or analysed in various ways by different persons, each with their valid reasons for doing so. As a result, they claim that understanding human acts necessitates looking at them through the eyes of the people who are doing them (Thompson, 2015; Weber, 2004).

As a result, the interpretivism method is far more qualitative, relying on procedures like interviews and observation. In that vein, the researcher believes that reality, about the awareness and motivations, surrounding the use of ICT tools in teaching reading at the Early childhood centres in the Ayawaso Central Municipality for research visibility had no existence before the activity of the investigation; and that reality ceases to exist when we no longer focus or consider the uses to which lecturers put social media platforms.

In the views of Khan (2014) and Willis, (2007) opined that interpretivists focus on process and meaning through observations and interpretations. Thus, to observe is to collect information about events, situations, and conditions. To interpret is to make meaning of that information by drawing inferences or judging the match between the information and some abstract pattern (Fancourt, 2009).

Kumatongo and Muzata (2021) noted that the “interpretivism” paradigm stresses the need to ensure that analyses are interpreted in a given context. In this study, the researcher was concerned with understanding the world as it is from the subjective experiences of the lecturers relative to social media utilisation and research visibility.

Interpretive research does not predefine dependent and independent variables but rather, it focuses on the full complexity of human sense-making as it arises in the circumstance (Elbardan et al., 2017).

The primary purpose of the interpretive paradigm is to understand the subjective motivations and meanings that drive social behaviour (Harrison et al., 2017; Krauss, 2005). The goal of interpretivists is not to create new theories but to examine, evaluate, and modify existing ones. For this study, the researcher intended to examine, evaluate and by extension, modify lecturers' opinions about the potential of utilising social media platforms to make their research visible. Consequently, it must be noted several authors have asserted that interpretivism focuses on individuals' subjective experiences and how they 'construct' the social world by sharing meanings and interacting with or relating to each other (McChesney & Aldridge, 2019; Hiller, 2016).

3.2 Research Approach

Based on the case study design adopted, the researcher utilised qualitative approach to help in data gathering and analysis. This approach was applied because as indicated by Monette et al. (2008), this approach is applied when you seek to have a profound comprehension of the life and behaviour of individuals. With this approach, a researcher is able to gather enough information (data) and conduct an in-depth analysis of the data (Monette et al., 2008). This research approach according to Cohen and Crabtree (2006), classically arises from the 'interpretivist' paradigm. One of the earliest scholars who discussed research paradigm is Chalmers (1982). In his view, the term covers the broad or universal theoretical conventions and laws, and belief system through which some individuals who belong to a particular scientific community recognise a situation under exploration. There are quite a number of research paradigms, however, rationalism, interpretivism, empiricism, positivism, and

normativism paradigms are among the leading research paradigms that strengthen studies mentioned by researchers (Shah & Al-Bargi, 2013).

3.3 Research Design

A research design is a basic plan that guides the data collection and analysis (Churchill & Iacobucci, 2005). The plan should systematically answer the research questions. An interpretive case study takes a phenomenon, or our perception of a phenomenon, as starting point (Coe, 2012). It aims to represent, describe and understand particular views of the educational world. In this study, the aim was to understand how teachers are using information and communication tools in teaching reading in kindergarten classroom specifically in Ayawaso Central Educational Municipality.

The study used qualitative study embedded in an interpretive case study. Qualitative research that is interpretative, is guided by a set of beliefs and feelings about the world and how it should be understood and studied (Denzin & Lincoln, 2000:26). The methodological framework that was used in this study was interpretative. The framework helped to establish how teachers use information and communication technology tools to teach reading in the Kindergarten classroom within Ayawaso central municipality.

This is critical as it indicates how the researcher chose the participants who provided data, the study area and how data were obtained by a researcher which aided in addressing the objectives (Kirshenblatt-Gimblett, 2006). In other words, the design assists the researcher to conduct the study to make it look balanced (Kirshenblatt-Gimblett, 2006). According to Burns and Grove (2001), designing a research or study is significant because it helps the researcher to plan and carry out the work in a way that will help them attain the projected results, therefore, improving the likelihood of attaining information that could be associated with the actual circumstance or situation.

In this research, the researcher resolved to adopt the case study research design. This research design was used in this study because as argued by Bryman (2012), it allows a researcher to conduct an investigation in its natural setting. With this design, scholars argue that one can use it to investigate a person, group of persons, a case, a particular place or town as well as a community (Borkan, 2004; Bryman, 2012). Bryman (2012) has further indicated that with the case study research design, a researcher can embark on detailed and extensive inquiry of multiple cases or a single case. Consequently, in this study, the researcher found the case study research design applicable to investigate the use of information and communication technology tools in teaching reading in early childhood education in the Ayawaso Central Municipality.

3.4 Study Area

One of the newly formed assemblies created out of the Accra Metropolitan Assembly is the Ayawaso Central. Until February 19, 2019 the Municipality was a sub metro of the Accra Metropolitan Assembly. The Municipality has since been among the 260 MMDAs in Ghana. It has also been part of the 29 MMDAS in the Greater Accra Region of Ghana (Ayawaso Central, 2020). The researcher chose this study area to explore to establish whether early childhood schools in the Municipality adopt ICT tools in teaching reading. It was also because at the time of carrying out this study, the Municipality had not been used as a study area for a study like this one.

3.5 Population of the Study

The total number of individuals or cases from which a sample is derived to form the subjects/participants of a study is referred to as the population (Saunders et al., 2007). In other words, the population suggests all the individuals in a particular study area and every one of them is a potential participant of a study. Accordingly, the population for this study included all kindergarten teachers in the Ayawaso Central Municipality.

According to the Ayawaso Central Education Directorate, there are 64 kindergarten teachers. Among the scientific community, there seems to be a lack of consensus about determining the sample size for a qualitative study.

3.7 Sampling and Sampling Technique

A sample in research refers to a subset of a population selected for observation and analysis. It is chosen to represent the larger population from which it is drawn, allowing researchers to make inferences about the population as a whole without studying every individual within it (Levy, & Lemeshow, 2013). The use of samples is critical in research for practical reasons, as studying an entire population is often impractical or impossible due to constraints of time, resources, and accessibility. The sample size for this study was twelve (12) kindergarten teacher. A study aimed at exploring a phenomenon is best accomplished with a sample size of 5-20 participants (Tahadoost, 2016). The purposive sampling technique was used to select the sample for this study. The researcher purposively selected twelve (12) teachers who have over ten years of teaching experience in kindergarten classrooms and also had undergone through the ICT training in 2015 are believed to have the necessary information that is needed for the study. Purposive sampling, also known as judgmental, selective, or subjective sampling, is a non-probability sampling technique in which researchers select participants based on specific characteristics or qualities that are deemed essential to the study. This method is employed when researchers aim to gain in-depth understanding of a particular phenomenon rather than generalize findings to a broader population (Saunders et al., 2007).

Participants are chosen based on the researcher's knowledge and judgment about who will provide the most relevant and valuable information for the study (Etikan, Musa, & Alkassim, 2016). Purposive Sampling ensures that data collected is relevant and

specific to the research question. It also facilitates the collection of in-depth and detailed information from knowledgeable participants (Patton, 2015, Palinkas et al., 2015).

3.8 Research Instruments

Semi-structured interviews and observations were employed for the data collection in this particular study. O'Leary (2005) argued that; semi-structured interviews are neither fully fixed nor fully free and are perhaps best flexible. This instrument allows the interviewer to ask initial questions, followed by probes meant to seek clarification of issues raised using the semi-structured interview schedule offered the participants the opportunity to construct their own world. The researcher's use of the semi-structured interview allowed her respondents to express themselves at length, but offered enough shape to prevent aimless rambling. It also offered the researcher an opportunity to clarify or probe and expand the interviewees' responses to ascertain their feelings. This is what structured interview fail to achieve but the flexibility of the instrument makes it difficult for the researchers 'bias to be dealt with (Opie & Sikes, 2004). As much as possible the researcher is independent and neutral to responses of respondents.

3.8.1 Semi-structured Interview Guide

A face-to-face interview was conducted to elicit responses from the participants. According to Creswell (2012), face-to-face interview occurs when the researcher decides to ask questions and to record answers from only one participant in the study at a time. Notwithstanding the costly approach to conducting individual interviews, they give much privacy to the respondent to freely express him or herself as may not be so with the focus group interviews. Again interviews allow the researcher to prepare the questions ahead of time which enable the researcher to appear prepared and competent during the interview; it also provide reliable and comparable qualitative data (Subbey,2019). Interviews were audio-taped using a voice recorder after getting the

approval from the interviewees. Also, notes were written down whenever necessary and the interview records were transcribed verbatim.

3.8.2 Observation

Observation is one of the major instruments that helped great educationists like Ivan Pavlov, Carl Warden in their time to arrive at successful results. Kothari (2004) stated that, the main advantage of this method is that subjective bias is eliminated, if observation is done accurately. He added that, the information obtained under this method relates to what is currently happening; it is not complicated by either the past behaviour, future intentions or attitudes. He further stated that, this method is independent of respondents' willingness to respond and as such is relatively less demanding of active cooperation on the part of respondents as happens to be the case in the interviews. Observation enables the researcher to have a better understanding of why a person would act in a particular way and also it enable the researcher to note and identify other important issues which might have been overlooked. However, it is quite difficult trying to take note and observing at the same time (Kankam & Weiler, 2010). The researcher used a participant observation because he wanted to avoid ethical issues that goes with non-participant observation. The researcher used a week to familiarize herself with the school environment and the pupils then made the observation the second week. This will enable the teacher to feel relaxed and learners will not see him as a stranger so they can act freely. An observational guide was used to guide the observation process

3.9 Validation of the Instrument

The interview guide was peer reviewed by three colleagues who are knowledgeable in research work. The reviewers suggested that the statements should be open ended rather

than closed ended. They also suggested that the number of questions in the guide should be reduced. The suggestions from the peer reviewers were incorporated into the instrument and later presented to the supervisor for his expert comments. A final interview guide was then produced, which was needed and used to collect the data.

3.10 Piloting the Instrument

The instrument was pre-tested among five Kindergarten teachers who were not part of the 10 participants who participated in the study. The pilot exercise was intended to check the clarity of the questions; the extent to which the information provided could be kept confidential; and the measures that could be taken to maintain anonymity during the study (Opie, 2004). The researcher gave them an opportunity to comment on the appropriateness of the schedule in generating the expected qualitative data for the study. Most of the participants made a comment that indicated their preference for semi-structured interview, since the researcher would not have a thorough idea of all questions pertaining to the phenomenon under study. This comment drew the researcher's attention to the time demand placed on the interview schedule. With this, the researcher used semi structured interview because they are neither fully fixed nor fully free and are perhaps best flexible in the main research work.

3.11 Trustworthiness

Trustworthiness according to Guba (1992) used criteria 'to judge the quality of a study located in an interpretivist constructivist paradigm. The elements of the criteria include credibility, transferability, confirmability, and dependability. These elements were employed alongside other strategies, to ensure the quality of this particular study. The first element adapted to ensure trustworthiness was transferability of findings. Transferability refers to the degree to which the results of qualitative research can be generalized or transferred to other contexts or settings (Merriam & Grenier 2019). As

the research is a Case Study approach, which is an example of qualitative research, the findings are very difficult to generalise since it mostly focuses on one instance (Verma & Mallick 1999). For example, the case to be studied might be similar to other districts in Ghana. The aim of conducting this study is not to generalise the findings, but to find teachers use of ICT in teaching reading in Kindergarten classroom within the Ayawaso Central municipality as compared to other study areas. But, if readers find similarities between their contexts and the context of the study, then they can transfer the findings to their individual contexts. The credibility of qualitative research relates to the validity of quantitative study. This is dependent on the researcher's ability and effort. The quality of the research is related to the trustworthiness and integrity of the research study. Validation also depends on the quality of the researcher's work during the investigation. According to Denzin and Lincoln (2000), fairness is an important factor, and is described as the 78 deliberate attempt to prevent marginalisation, and act affirmatively with respect to inclusion so that all participants' voice are heard and their stories treated with fairness and balance. By way of ensuring credibility the researcher followed this procedure: 1. The participant 's names were concealed and represented with codes (KGT 1- 15).

The interview took place after school hours to avoid distractions. 3. Participation of the participants in the interviews were strictly voluntary and their privacy and confidentiality were strongly maintained at all time. Dependability is important to trustworthiness because it establishes the research study's findings as consistent and repeatable. Researchers aim to verify that their findings are consistent with the raw data they collected. They want to make sure that if some other researchers were to look over the data, they would arrive at similar findings, interpretations, and conclusions about the data. This is important to make sure that there was not anything missed in the

research study, or that the researcher was not sloppy or misguided in his or her final report (Leavy, 2020). According to Leavy (2020), researchers attain confirmability when they allow an outside researcher to conduct an inquiry audit on the research study. That is, the outside researcher examines the processes of data collection, data analysis, and the results of the research study. This was done to confirm the accuracy of the findings and to ensure the findings are supported by the data collected.

Credibility

The credibility of qualitative research relates to the validity of quantitative study. This is dependent on the researcher's ability and effort. The quality of the research is related to the trustworthiness and integrity of the research study. Validation also depends on the quality of the researcher's work during the investigation. According to Denzin and Lincoln (2000), fairness is an important factor, and is described as the deliberate attempt to prevent marginalisation, and act affirmatively with respect to inclusion so that all participants' voice are heard and their stories treated with fairness and balance. By way of ensuring credibility the researcher followed this procedure:

1. The participant's names were concealed and represented with codes (Response 1-12).
2. The interview took place after school hours to avoid of distractions.
3. Participation of the participants in the interviews were strictly voluntary and their privacy and confidentiality were strongly maintained at all time.

Dependability

Dependability is important to trustworthiness because it establishes the research study's findings as consistent and repeatable. Researchers aim to verify that their findings are consistent with the raw data they collected. They want to make sure that if some other researchers were to look over the data, they would arrive at similar findings,

interpretations, and conclusions about the data. This is important to make sure that there was not anything missed in the research study, or that the researcher was not sloppy or misguided in his or her final report (Leavy, 2020). According to Leavy (2020), researchers attain confirmability when they allow an outside researcher to conduct an inquiry audit on the research study. That is, the outside researcher examines the processes of data collection, data analysis, and the results of the research study. This was done to confirm the accuracy of the findings and to ensure the findings are supported by the data collected.

Confirmability

"In qualitative research, confirmability is a crucial criterion for establishing the trustworthiness of the study. It refers to the degree to which the researcher's biases are minimized and the findings accurately reflect the participants' perspectives and experiences (Lincoln & Guba, 1985). Techniques such as member checking and maintaining an audit trail are commonly used to enhance confirmability (Creswell, 2013)." The researcher guaranteed confirmability by preventing his knowledge, values and conclusions from impacting the study's findings. Each phase of the data analysis was included in the study, including the conclusions that were derived as suggested by Charmaz in Kusi (2012)

Transferability

Transferability refers to the degree to which the results of qualitative research can be generalized or transferred to other contexts or settings (Merriam & Grenier 2019). As the research is a Case Study approach, which is an example of qualitative research, the findings are very difficult to generalise since it mostly focuses on one instance (Verma & Mallick 1999). For example, the case to be studied might be similar to other districts in Ghana. The aim of conducting this study is not to generalise the findings, but to find teachers use of information and communication technology tools in the teaching

reading in Kindergarten classroom within the Ayawaso Central municipality as compared to other study areas. But, if readers find similarities between their contexts and the context of the study, then they can transfer the findings to their individual contexts.

3.12 Data Collection Procedure

3.12.1 Sources of Data

According to Mesly (2015), research data are thought of as statistics or facts from which researchers might draw inferences. They are also any material used in the course of a research that become the source of information for the researcher (Mesly, 2015). This study included both primary and secondary data sources. In order to collect primary information from the subjects interviewed, the researcher used an interview guide. Secondary information was gathered by reviewing literature from a variety of sources, including but not limited to reports, magazines, internet sources, books, dissertations, and journals.

Due to the approach adopted, the researcher had to embark on interview sessions to be able to obtain data. Hence, the respondents had to be informed about the study and the interview for data collection. After, a formal consent was sought from the study sites (schools in the Ayawaso Central Municipality), the preschool teachers were approached and informed about the data collection activity. There were some respondents who could not be convinced to partake in this study because of their personal issues. However, the researcher was able to successfully sample ten (10) teachers and scheduled interview sessions with them. There were some of them who preferred telephone interviewing. Accordingly, their phone numbers were obtained by the researcher. The researcher had to schedule different interview dates with the teachers based on their leisure. The researcher was able to interview the first six respondents as

scheduled. Reaching the sixth respondent proved futile because phone calls were not going through. Later on, the researcher was able to interview four (4) other respondents. In all, nine (10) teachers were successfully interviewed. The data collection exercise traversed for three consecutive weeks.

3.13 Data Processing and Presentation

The accuracy of all the information gathered through interviews with respondents was checked before commencing analysis. The data were then manually coded by the researcher for thematic analysis. Only suitable themes were used for analysis. Consequently, the respondents were given pseudonyms or imaginative names for the purposes of secrecy and anonymity. They were known as Subjects 1 through 7. The respondents' comments were played back and written down. The responses were edited by the researcher for greater clarity. The presentation of the results, which were provided in text style, also included appropriate quote.

Position of the Researcher and the Research Participants

Another interesting experience was the researcher's position as a researcher and the research participants. As a former teacher from the research area, although my former school was not part of the selected schools for the research, positioning myself as a researcher interviewing individuals from the same circuit was a challenge to me. However, at the start of the data collection, it was considered very important to observe what Gray (2004) describes as striking a balance between insider and outsider status, because as former member of the district, my position would have influenced the respondent's behaviours and the responses they provided for the study. Therefore, a better understanding of my position as researcher and a former member of the same community at the same time enabled me to position myself to avoid any form of influences or biases on the part of the respondents which could affect the credibility of

the data. Although being a former member of the research area would have made the data gathering difficult, however it helped to increase my understanding of the people better, and also helped in the selection of the right people that could provide information for the study.

3.14 Ethical Consideration

Ethical considerations are the procedures that are followed to protect the right of the institution where a study is being conducted and the participants to ensure scientific integrity. Bhabdari (2021) noted that ethical considerations in research are a set of principles that guide a research participant, enhancing research validity, and maintaining scientific integrity. Some ethical consideration that were ensured in this research include voluntary participation, informed consent, anonymity and confidentiality. These considerations are in line with the thought of Bhandari (2021)

After deciding on the setting of the study, the next important decision relates to how to obtain permission to access the place for the research. With this, the researcher first the consent of the educational authorities of Ayawaso Central Municipality. The purpose of the study was stated to them, the procedure for the data collection and the type of research participants needed were also stated to them. In research, it is unethical to enter into an institution or study settings to collect data without permission from the authorities. The researcher obtained permission from the school authorities starting with the Municipal Education Directorate the Head teachers of the schools used and the individual Teachers involved in the study.

Informed Consent

After the researcher has sought permission from the authorities, it was important for the researcher to gain informed consent of the 10 participants of the study. Informed

consent is an agreement of the relevant individual and organizations on the basis of appropriate information. It involves giving information about the study, how the study was carried out, the nature of their participation, the time requirement, the kind of data to be collected, and how it will be used and reported.

Voluntary Participation

To this end any participant is free to decide to participate in the study or not. Any subject can withdraw from, or leave, the study at any point in time without feeling an obligation to continue. The researcher made it clear to participants that there are no negative consequences or repercussions to their refusal to participate in the study or respond to any question or statement posed from the interview guide. People make decision to participate in the study depending on the quality of information they receive from the researcher.

Anonymity and Confidentiality

Anonymity and confidentiality of all participants were strictly ensured. Participants were encouraged to participate voluntarily, and participants were informed that they could withdraw from the study at any time, if they wish to do so. The researcher promised the anonymity of the research participants by ensuring that the names and addresses of the participants were not indicated in the study. These were replaced with codes. They were ensured that recorded information, instrument for the data collection, and dissemination of research finding did not contain the names of the research participants. The research information gathered from the participants were not passed on to the department. All audio-recorded information was protectively stored in a personal recorder and later transferred to a personal password-protected laptop. The researcher transcribed all the interviews and for each participant, created a file which was identified using assigned pseudonym.

3.15 Data Analysis

Biographical data of research participants was analyzed through descriptive statistics, in terms of percentages and frequencies, while thematic analysis was utilized with interviews. The qualitative and open-ended interview questions were analyzed thematically, in that, the researcher transcribed the information collected into written texts by combining the notes taken from the audio recorder. These were then organized using various thematic categories in the data, distinct from each other. Observations made during the data collection were also factored into the data analysis. To ensure the focus of the interview reflected the research objectives in the data analysis, the interviews were structured according to the main areas that reflect the research objectives. Microsoft Excel (Office 365 version) was used to summarize qualitative data by generating frequency tables and percentages

3.15 Chapter Summary

This chapter has discussed a number of methods that aided the researcher to conduct this study. Accordingly, the case study research design and the qualitative approach have been discussed. The Ayawaso Central Municipality which is the study area has been described as well as the population which included preschool teachers has been discussed in this chapter. Moreover, sampling technique adopted and sample size have been discussed. The sources for data and the various methods adopted to collect primary data and analysed the data have also been presented in this chapter. Besides all these, the ethical considerations have been discussed.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSION

4.0 Introduction

In this chapter, I presented the results of my comprehensive investigation into teachers' utilization of Information and Communication Technology (ICT) tools in kindergarten class rooms for reading instruction within the Ayawaso Central Municipality. The preceding chapters outlined the research questions, methodology, and theoretical framework that guided our inquiry. As I delved into the results, I aimed to provide a detailed portrayal of the current state of ICT integration, the types of tools employed, teachers' knowledge and proficiency, as well as the challenges faced by ECE teachers in harnessing technology for enhancing early reading.

The research questions posed were carefully designed to address key facets of the use of ICT in ECE, aligning with global trends in education and technology adoption. Through the collection and analysis of data, I have sought to illuminate the existing practices, unveil the prevalent challenges, and highlight areas of potential growth in the Ayawaso Central Municipality's ECE sector. My findings serve as a crucial step toward enhancing the quality of early reading education, ensuring that the youngest learners are well-prepared for the dynamic digital world they will encounter as they progress through their educational journey.

In the pages that follow, I present a structured exploration of my research findings, supported by relevant data and analysis. The chapter uncover the current landscape of ICT integration in early childhood education in Ayawaso Central Municipality and consider the implications for future enhancements and advancements in the field.

4.1 Socio -demographic Characteristics

Data on the socio demographic characteristics of the participants were collected to help have a fair understanding of the background of the participants in the study. The characteristics examined included sex, age, level of education and number of years they taught at the KG.

Total population sampling technique was used to purposively sample 7 participant for the study as shown in table 4.1. All 7 respondents were females. The socio - demographic characteristics indicate that all of them had completed tertiary institution. Two of the respondents had completed their master's programme. One holds an MPhil in early childhood education and the other education admin. Another two respondents had diploma and degree in early childhood education respectively. The rest of the three respondents, two had degree in social studies and the others had diploma in education. All the above respondents have been teaching at the KG for more than five years.

Table 4.1 Characteristics of Respondents

| Demographic Variable | Categories | frequency |
|---------------------------------------|-------------------|------------------|
| Gender | Female | 12 |
| Level of Education | Diploma | 4 |
| | Degree | 6 |
| | Masters | 2 |
| Teachers Level of Competencies in ICT | Beginners | 8 |
| | Intermediate | 3 |
| | Proficiency | 0 |
| Number of years at the KG | 5yr - 10yrs | 6 |
| | 10yrs – 15yrs | 4 |
| | 15yrs - 20yrs | 2 |

The information above shows the characteristics of the respondents. It tells us that all the respondents are females twelve (12) in number. Level of Education, there were four (4) respondents who hold diplomas in basic education and in early childhood

For degree certificates, six (6) respondents were recorded to hold such certificates in the sampled schools. Finally, there were two (2) respondents who hold M.Phil. in early childhood education and masters in educational Innovation and leadership Science.

Teacher's level of knowledge in ICT was also recorded. Most of the respondent totalling eight (8) were labelled to have been at the beginner level and two were at the intermediate level.

For number of years taught, between 5 to 10 years, the data recorded six (6) respondents to have taught for the number of years. Between 10 – 15years the data brought to the fore four (4) respondents. Finally between 15 – 20years, two respondents were also recorded.

4.2 Research Question One: What is the extent to which ECE teachers use ICT in teaching reading in kindergarten in Ayawaso Central Municipality?

In the rapidly evolving landscape of education, the integration of Information and Communication Technology (ICT) in early childhood education has gained increasing attention. This research question seeks to comprehensively assess the current landscape of ICT usage among Early Childhood Education (ECE) teachers in public kindergarten within the Ayawaso Central Municipality. As the foundation of reading development is laid in these early years, it is crucial to understand the extent to which ICT tools are integrated into reading instruction. This inquiry delved into the extent to which technology is employed as a pedagogical tool, examining the prevalence of digital resources, educational software, and interactive platforms used by teachers in their daily practice. By understanding the degree of technology integration in these crucial

formative years, I can gain valuable insights into the evolving nature of early childhood education in the Ayawaso Central Municipality.

Theme 1: Current ICT Usage in ECE for Reading

This theme focuses on the current level of ICT usage in ECE classrooms and how it relates to reading instruction. Understanding the extent to which ICT tools are currently integrated into reading teaching is crucial for assessing the baseline situation. The following were gathered from the respondents.

Response KGT1:

“We have a computer in our classroom, but we rarely use it for reading. It’s mostly for occasional activities, like watching educational videos. We mainly stick to traditional methods.”

Response 1 highlights a common situation where ICT tools are underutilized, often reserved for supplementary or non-core activities rather than being integrated into everyday reading instruction.

Response KGT 2:

“We don’t have interactive whiteboards in our school, i do not even know how to use it. I have not seen some before.”

Response 2 emphasizes that while schools may have ICT infrastructure, their utilization for specific reading skill development is lacking, indicating a need for more targeted integration.

Theme 2: Barriers to ICT Integration

This theme explores the challenges that teachers face in integrating ICT tools into their reading teaching. Identifying these barriers is essential for finding solutions to improve ICT integration. The following excerpts were accrued from the respondents.

Response KGT 3:

“Limited access to computers and tablets is a big challenge. There are not enough devices for all students to use simultaneously. So, we can’t rely on them for everyday teaching.”

Response 3 highlights a resource-based barrier, demonstrating that limited access to ICT devices hinders their effective use in reading teaching.

Response KGT 4:

“Many teachers lack the necessary training to use ICT effectively in teaching reading. We feel ill-equipped to make the most of these tools.”

Response 4 underscores the importance of professional development, as it reveals that teachers feel they lack the skills and knowledge needed to effectively incorporate ICT into reading instruction.

Theme 3: Teacher Training and Support

This theme addresses the need for teacher training and support to enhance the use of ICT in reading instruction. Teachers often require specific skills and guidance to maximize the potential of ICT. The following excerpts were accrued from the respondents.

Response KGT 5:

“I think if we had more training on how to integrate ICT into our reading lessons, we could use it more effectively. We want professional development in this area.”

Response 5 underscores the demand for ongoing professional development, suggesting that with the right training, teachers can be more effective in utilizing ICT for reading instruction.

Response KGT 6:

“There’s a lack of technical support in our school. When something goes wrong with the computers or software, we often can’t get it fixed quickly. That’s frustrating.”

Response 6 highlights the importance of technical support in maintaining and troubleshooting ICT resources, as issues can disrupt the learning process and deter teachers from using them.

Theme 4: Effective ICT Strategies

This theme explores successful strategies and practices for using ICT in teaching reading, offering insights into what works best for young learners. The following excerpts were ensued from the respondents

Response 7: “Some teachers have successfully integrated educational apps into their reading lessons. It keeps the kids engaged and motivated to learn.”

Response 7 identifies the success of using educational apps as an engaging tool for reading instruction, indicating that such strategies can be effective for young children.

Response KGT 8:

“We’ve found that using multimedia content, like animated stories and videos, are very effective in making reading more engaging for young children.”

Response 8 suggests that multimedia content, including animated stories and videos, can enhance engagement and the overall learning experience for young children.

Theme 5: Desired Resources and Policy Support

This theme discusses the resources and policy support teachers feel are necessary to improve ICT integration in ECE reading teaching. Addressing these needs is crucial for

creating an enabling environment. The following extracts were accumulated from the respondents

Response KGT 9:

“We need more funding to acquire updated ICT tools and resources. This will ensure that every child gets a chance to use them.”

Response 9 highlights the need for increased financial support to ensure that schools have access to up-to-date ICT resources, promoting equity in access.

Response KGT 10:

“Government policies should also encourage and support the use of ICT in ECE. This can include incentives for schools to invest in technology.”

Response 10 emphasizes the role of government policies in incentivizing schools to invest in ICT technology, suggesting that supportive policies can foster broader adoption.

These responses offer a deeper understanding of the challenges and opportunities related to the use of ICT in teaching reading in Ayawaso Central Municipality’s kindergarten. These insights can guide the development of strategies and policies to improve the integration of technology into early childhood education.

Observational Analysis

The use of ICT tools such as computers and tablets during reading lessons is widespread among ECE teachers. This integration enhances the interactive nature of lessons, making learning more engaging for young children. It reflects a shift towards modern teaching methods and a recognition of the potential of digital tools in early education. However, it also highlights the need for ongoing teacher training to maximize the benefits of these technologies.

It was also observed that educational apps and software are a common feature in the reading instruction provided by ECE teachers. These tools support interactive and personalized learning experiences, allowing children to learn at their own pace. The frequent use of such apps indicates a positive trend toward embracing digital reading in early childhood education. This trend necessitates careful selection of high-quality educational software to ensure educational effectiveness and alignment with curriculum goals.

ECE teachers regularly incorporate multimedia resources, such as videos and digital stories, into their reading lessons. These resources cater to various learning styles and make abstract concepts more tangible and understandable. The use of multimedia aids in capturing the children's attention and improving retention of reading skills. This approach also underscores the importance of multimedia reading, preparing children for a media-rich world.

ICT tools are widely used to facilitate interactive reading activities in kindergarten centres. These activities promote active learning and improve learners' engagement and comprehension. Interactive elements like digital games and story-telling apps encourage participation and can be tailored to meet individual learning needs. This practice highlights the importance of incorporating interactive methods in early reading instruction to foster a love for learning and enhance skill acquisition.

While some ECE teachers use ICT to keep learners engaged during reading lessons, there is variability in this practice. This suggests that while ICT has potential, its adoption for engagement purposes is not yet universal. This variability was due to differences in access to technology, teacher familiarity with ICT tools, or pedagogical preferences. Greater emphasis on training and resources could help increase the consistent use of ICT to sustain learner engagement.

ICT is used by ECE teachers to promote collaborative reading activities among learners. This practice encourages teamwork, communication, and social interaction skills. Collaborative ICT activities, such as group projects using digital tools, help children learn to work together and share ideas. The use of ICT for collaboration reflects a shift towards more interactive and participatory learning environments in early education, which can be further strengthened with more widespread and consistent application.

Again, it was observed that ICT-based assessments are utilized by ECE teachers to measure reading skills. These digital assessments provide immediate feedback, helping teachers to identify learning gaps and tailor instruction to meet individual student needs. The use of technology in assessments indicates a move towards more efficient and data-driven approaches in early childhood education. It highlights the need for reliable and valid assessment tools to ensure accurate measurement of reading skills and support the development of effective teaching strategies.

4.3 Research Question Two: What are the types of ICT tools used in teaching reading in kindergarten in Ayawaso Central Municipality?

In today's digital age, the landscape of education is rapidly evolving, particularly in early childhood education. This research question delves into the heart of this transformation by seeking to uncover and categorize the types of ICT tools that are commonly employed by ECE teachers for teaching reading in preschool classrooms within the Ayawaso Central Municipality. The utilization of ICT tools in reading instruction is a dynamic and crucial aspect of modern teaching. This inquiry seeks to provide a comprehensive picture of the technological resources at the disposal of educators. It identified and classified the digital tools, platforms, and technologies that have become instrumental in shaping the reading learning experiences of young children. Understanding the prevailing technologies and innovations in this context is

essential for tailoring effective educational strategies and interventions to support early reading development.

Theme 1: Commonly Used ICT Tools

This theme focuses on the ICT tools that are commonly used by ECE teachers for teaching reading, providing insights into the prevailing technologies.

Response KGT 1:

“We often use educational software and apps on our phones. These are interactive and engage the kids in learning to develop their vocabulary, read and write.”

Response 1 indicates that educational software and apps on our phones are frequently used for reading instruction, emphasizing their interactivity and engagement for young learners.

Response KGT 2:

“desktop computer workstation are quite available in few schools. They allow us to display and interact with various reading materials, making lessons more visual and engaging.”

Response 2 highlights the widespread use of interactive whiteboards, which enhance visual and interactive learning experiences but are not available in my school.

Theme 2: Emerging or Innovative ICT Tools

This theme explores any emerging or innovative ICT tools that teachers have started using to teach reading, indicating potential advancements in the field.

Response KGT 3:

“We’ve recently started using e-books on dedicated e-readers. It’s an exciting way to introduce children to digital reading.”

Response 3 introduces the innovative use of e-books on e-readers, suggesting a shift towards digital reading in early childhood education.

Response KGT 4:

“We’re experimenting with virtual reality (VR) and augmented reality (AR) applications. It’s a new way to immerse children in reading activities and stories.”

Response 4 points to the adoption of VR and AR applications, signalling the exploration of immersive technologies to enhance reading experiences for young learners.

Theme 3: Challenges with ICT Tool Usage

This theme focuses on the challenges that teachers face while using ICT tools for teaching reading, shedding light on potential obstacles.

Response KGT 5:

“Not all schools have access to reliable internet connections, which hampers our ability to use online resources and interactive tools effectively.”

Response 5 highlights the challenge of unreliable internet access, which can impede the use of online resources and interactive tools.

Response KGT 6:

“The cost of maintaining and repairing ICT equipment can be burdensome for some schools, especially those with limited budgets.”

Response 6 points out the financial challenge of maintaining and repairing ICT equipment, indicating a need for sustainable solutions.

Theme 4: Recommendations for ICT Tool Integration

This theme presents the teachers’ suggestions and recommendations for improving the integration of ICT tools into reading instruction.

Response KGT 7:

“Schools should consider investing in more tablets and e-readers for students, ensuring access to digital reading resources.”

Response 7 recommends expanding the availability of tablets, projectors and e-readers to provide students with access to digital reading resources.

Response KGT 8:

“Professional development and training for teachers are essential. We need support to understand how to use these tools effectively in our lessons.”

Response 8 emphasizes the importance of professional development and training to empower teachers with the skills needed for effective ICT tool integration.

These interview responses provide insights into the types of ICT tools commonly used, emerging technologies, challenges, and recommendations for enhancing the integration of ICT tools into preschool reading instruction in Ayawaso Central Municipality. Understanding these aspects is essential for improving early childhood education and reading development.

Observational Analysis

4.4 Research Question Three: What is teachers’ level of knowledge in the use of ICT tools in teaching reading in preschool classrooms in Ayawaso Central Municipality?

In the 21st century, the effective integration of Information and Communication Technology (ICT) into education has become a cornerstone of modern teaching practices. This research question is dedicated to evaluating the knowledge and competence of Early Childhood Education (ECE) teachers in Ayawaso Central Municipality concerning the use of ICT tools in teaching reading. The efficacy of

technology-enhanced learning is heavily dependent on the expertise and comfort of teachers with these tools. This inquiry aims to provide a detailed snapshot of the current proficiency of ECE teachers in utilizing ICT tools for reading instruction. By exploring the extent of their ICT knowledge and capabilities, I can gain valuable insights into the areas where further training and support may be needed to ensure that teachers are equipped to effectively harness the potential of technology for early reading education.

Theme 1: Current Knowledge and Competency

This theme focuses on the teachers' current knowledge and competency in using ICT tools for reading instruction, providing insights into their existing skillset.

Response KGT 1:

“I have some basic knowledge of using computers and projectors, but I wouldn't say I'm highly proficient. I can manage basic reading software, but I'd like to learn more.”

Response 1 reflects a moderate level of competency in using ICT tools for reading but expresses a desire to enhance their skills.

Response KGT 2:

“I'm quite comfortable using educational apps on tablets. I've been using them for a few years and have seen positive outcomes in my students' reading skills.”

Response 2 indicates a higher level of proficiency with specific ICT tools (educational apps on tablets) and a positive impact on students' reading development.

Theme 2: Training and Professional Development Needs

This theme explores teachers' opinions on their training and professional development needs to improve their ICT knowledge and skills.

Response KGT 3:

“We need more training. The initial training we received on ICT was limited, and it didn’t cover the latest tools and techniques. I believe ongoing training is essential.”

Response 3 highlights the need for more comprehensive and continuous training to keep teachers updated on the latest ICT tools and methods.

Response KGT 4:

“I think there should be workshops and courses specifically focused on using ICT for reading instruction in ECE. It would be very beneficial for all teachers.”

Response 4 suggests the value of specialized workshops and courses designed to enhance teachers’ knowledge and skills in using ICT tools for reading in early childhood education.

Theme 3: Challenges in Gaining ICT Knowledge

This theme addresses the challenges that teachers face in acquiring ICT knowledge and skills for reading instruction.

Response KGT 5:

“One of the main challenges is a lack of access to training opportunities. There aren’t many resources or programs available to teachers in our region.”

Response 5 emphasizes the scarcity of training resources as a significant challenge in gaining ICT knowledge.

Response KGT 6:

“Teachers often have heavy workloads, making it difficult to find time for additional training. We need support to balance our teaching responsibilities with professional development.”

Response 6 points out that heavy workloads and time constraints hinder teachers from dedicating time to gaining ICT knowledge, highlighting the need for support in managing their responsibilities.

Theme 4: Recommendations for Enhancing Teachers' ICT Knowledge

This theme presents the recommendations and suggestions provided by teachers for improving their ICT knowledge and competency.

Response KGT 7:

“Regular in-school training sessions and peer collaboration would be beneficial. It’s more convenient and can be tailored to our specific needs.”

Response 7 suggests the effectiveness of in-school training and peer collaboration, which can be more accessible and customized to individual needs.

Response KGT 8:

“We need mentorship programs where experienced teachers can guide the less experienced in using ICT for reading. This would provide valuable hands-on learning.”

Response 8 recommends mentorship programs, emphasizing the practicality of learning through experienced teachers' guidance.

These interview responses provide insights into the current knowledge levels, training needs, challenges, and recommendations for enhancing teachers' ICT knowledge in preschool classrooms in Ayawaso Central Municipality. Understanding these aspects is crucial for the professional development and continuous improvement of teachers in the context of ICT integration in early childhood reading education.

Observational Analysis

Based on the provided data from the observation on the proficiency of kindergarten teachers in using various ICT tools for reading instruction in the Ayawaso Municipality:

Teachers demonstrate proficiency in operating desktop computers for reading instruction. This skill is crucial for effectively utilizing a wide range of digital resources, software, and tools that enhance reading learning. It reflects a strong foundation in basic ICT skills among teachers, which is essential for integrating technology into the classroom.

Teachers are proficient in operating interactive whiteboards for teaching reading concepts. This ability suggests that teachers can enhance visual learning and interactive engagement, making reading lessons more dynamic and interactive. The effective use of interactive whiteboards can significantly improve the teaching and learning experience.

Again, teachers efficiently use projectors to display reading-related content. This proficiency indicates that teachers can present information clearly to the entire class, facilitating better understanding and engagement. Projectors can be used to display multimedia content, making lessons more visually appealing and informative.

It was also observed that teachers can navigate and utilize educational apps on smartphones for reading purposes. This skill highlights the flexibility and adaptability of teachers in using mobile technology to support learning. Educational apps can provide personalized learning experiences and interactive content that enhance reading skills.

Teachers are proficient in accessing and using e-books or digital storybooks for reading lessons. This capability allows teachers to offer diverse and engaging reading materials,

catering to different learning preferences and promoting a love for reading among students.

Teachers demonstrate the ability to use audio recordings or digital audiobooks in reading instruction. This proficiency is important for developing listening skills and comprehension, offering an alternative mode of learning that can benefit auditory learners.

Teachers are knowledgeable about using reading-related games on computers or tablets. This skill is beneficial for creating an engaging and interactive learning environment, where students can develop reading skills through play and interactive activities. The use of educational games can enhance motivation and reinforce learning outcomes.

However, there was a lack of proficiency in integrating online educational platforms into reading teaching. This gap suggests a need for further training and support to help teachers utilize these platforms effectively. Online platforms can provide access to a wealth of resources, interactive content, and collaborative opportunities that enhance reading education.

Teachers do not competently create and use multimedia presentations like PowerPoint to support reading lessons. This deficiency indicates a potential area for professional development, as multimedia presentations can be a powerful tool for visual learning and structured content delivery.

4.5 Research Question Four: What are the challenges ECE teachers encounter in the use of ICT tools in teaching in the preschool classrooms in Ayawaso Central Municipality?

The incorporation of Information and Communication Technology (ICT) tools in early childhood education presents a promising avenue for enhancing teaching and learning experiences. However, it is not without its challenges. This research question is dedicated to understanding the obstacles and barriers faced by ECE teachers in Ayawaso Central Municipality when using ICT tools for teaching in preschool classrooms. It recognizes that the adoption and integration of technology into education come with a unique set of challenges. This inquiry seeks to identify and categorize these challenges, which can range from resource limitations to technical issues, and even resistance to change. By thoroughly examining these challenges, I can develop strategies and policies to address and mitigate these barriers, ultimately ensuring that the potential of ICT tools can be fully harnessed in the early childhood education context.

Theme 1: Limited Access to ICT Resources

This theme focuses on the challenges related to the availability and access to ICT resources in preschool classrooms.

Response KGT 1:

“Many of our schools lack sufficient ICT devices like computers or tablets. This limits our ability to use these tools effectively for teaching.”

Response 1 highlights the common challenge of limited access to ICT devices, which hampers effective use of technology for teaching.

Response KGT 2:

“Even when we have some devices, they are often outdated or in disrepair. It’s frustrating because we can’t rely on them.”

Response 2 underscores the issue of outdated or malfunctioning devices, indicating that even when available, ICT resources may not be reliable.

Theme 2: Lack of Teacher Training

This theme explores the challenges arising from the inadequate training and preparation of ECE teachers in using ICT tools effectively.

Response KGT 3:

“Many teachers haven’t received proper training in using ICT for teaching. We often feel lost, especially when it comes to choosing the right software or apps.”

Response 3 emphasizes the lack of training in ICT use, leading to challenges in selecting appropriate tools and applications for teaching.

Response KGT 4:

“We need ongoing professional development to keep up with the rapidly changing technology. Without it, we can’t harness the full potential of ICT.”

Response 4 underscores the importance of continuous professional development to stay updated with evolving ICT technologies for effective teaching.

Theme 3: Technical Issues and Maintenance

This theme addresses the challenges related to technical issues, maintenance, and support for ICT resources in preschool classrooms.

Response KGT 5:

“When something goes wrong with our computers or software, it can take a long time to get it fixed. This disrupts our teaching and causes frustration.”

Response 5 highlights the issue of technical support and maintenance delays, which can negatively impact teaching and teacher morale.

Response KGT 6:

“Our schools lack proper IT support staff. We often have to troubleshoot issues ourselves, which can be time-consuming and distracting.”

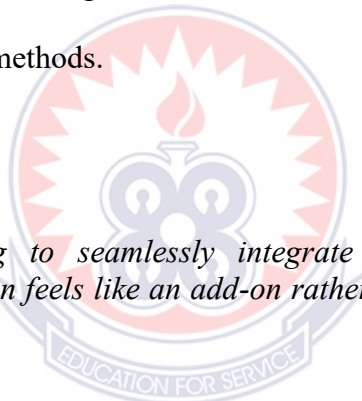
Response 6 points out the absence of dedicated IT support in schools, leading to teachers having to handle technical problems themselves.

Theme 4: Integration Challenges

This theme focuses on challenges related to the integration of ICT tools into the curriculum and teaching methods.

Response KGT 7:

“It’s challenging to seamlessly integrate ICT tools into our curriculum. It often feels like an add-on rather than an integral part of our teaching.”



Response 7 suggests that the integration of ICT tools can be challenging, leading to a disconnect between technology and curriculum.

Response KGT 8:

“We face resistance from traditionalists who believe that ICT tools are replacing traditional teaching methods. This affects our confidence in using technology.”

Response 8 points out the challenge of resistance from traditionalist perspectives, which can undermine teachers’ confidence in using ICT tools.

These interview responses provide insights into the challenges that ECE teachers encounter in using ICT tools for teaching in preschool classrooms in Ayawaso Central

Municipality. Understanding these challenges is crucial for developing strategies and policies to overcome obstacles and effectively integrate technology into early childhood education.

Observational Analysis

The observational data shows that teachers face significant technical issues with ICT equipment, such as malfunctioning hardware or software. These problems can disrupt lessons and reduce the effectiveness of ICT integration. Addressing these technical challenges requires regular maintenance, updates, and technical support to ensure smooth operation and minimal disruption.

Also, lack of reliable internet access poses a major challenge for ICT-based teaching activities. Without stable internet, accessing online resources, educational platforms, and interactive content becomes difficult, limiting the potential of ICT tools in enhancing reading instruction. Improving internet infrastructure is crucial for maximizing the benefits of digital learning.

Some teachers also experience difficulties in integrating ICT tools into the existing curriculum. This challenge suggests a need for better alignment between technology and curriculum goals. Professional development and curriculum redesign may be necessary to seamlessly incorporate ICT tools into reading instruction, ensuring they complement and enhance learning objectives.

Insufficient training or professional development in using ICT for teaching is a significant barrier. Teachers need ongoing support and training to build their confidence and competence in using digital tools effectively. Investing in professional development programs can help teachers stay updated with the latest technologies and teaching strategies.

Also, lack of adequate ICT resources, such as an insufficient number of devices, is a major issue. Limited access to necessary tools restricts the ability of teachers to implement ICT-based activities widely. Ensuring that schools are well-equipped with sufficient and up-to-date ICT resources is essential for successful integration.

Again, maintaining student engagement when using ICT tools for teaching is not reported as a significant challenge. This indicates that when ICT tools are available and functional, they are effective in keeping students interested and involved in reading activities.

Teachers face difficulties in managing classroom behavior when ICT tools are in use. The interactive and often individualized nature of digital tools can lead to distractions and behavioral issues. Effective classroom management strategies tailored to the use of ICT are necessary to maintain a conducive learning environment.

Moreover, ensuring equitable access to ICT tools for all learners is a challenge. Disparities in access can create inequalities in learning opportunities, disadvantaging some students. Addressing this issue involves providing sufficient resources and support to ensure all students can benefit from ICT-enhanced instruction.

However, there is no evidence of lack of administrative support for the use of ICT in teaching reading. This suggests that administrative bodies are generally supportive of integrating ICT into reading instruction, providing a favorable environment for technological adoption. However, continuous support and investment are needed to address the other identified challenges effectively.

4.7 Discussion

The extent to which ECE teachers use ICT in teaching reading in kindergarten

My research reveals that in Ayawaso Central Municipality, the extent to which ECE teachers use ICT in teaching reading varies across different schools. While some schools have integrated ICT tools, such as the use of computer workstations, phones, tablets and educational softwares, into their reading instruction, others still rely primarily on traditional teaching methods. This discrepancy is often attributed to differences in resource allocation and teacher training.

The integration of Information and Communication Technology (ICT) in early childhood education has gained attention globally. Studies such as the one conducted by Chakroun and Zayd (2019) highlight the positive impact of ICT use in the early years. Their research indicates that ICT can enhance young learners' engagement, promote interactive and self-directed learning, and support teachers in personalizing instruction. However, the extent of ICT usage in specific districts, like Ayawaso Central Municipality, can vary. Local studies, such as that conducted by Ayittey et al. (2020), reveal that while ICT tools are present, their utilization in teaching reading may not be optimal. This could be attributed to resource constraints and the need for more targeted teacher training. The extent to which ECE teachers use ICT tools is a crucial factor in shaping early reading experiences and warrants further investigation to guide the development of strategies for effective integration.

The disparities in ICT usage among ECE teachers in Ayawaso Central Municipality mirror global trends. Local studies in regions with limited access to resources and training, such as Ayawaso Central Municipality, indicate that not all schools can equally embrace ICT integration (Ackon et al., 2019). To address this, there is a need

for targeted support and resource allocation to ensure equitable access to technology in early childhood education.

The types of ICT tools used in teaching reading in kindergarten

In Ayawaso Central Municipality, the types of ICT tools most commonly used for teaching reading in kindergarten include educational software and apps on tablets, phones, sound boxes and, to a lesser extent, e-readers. Emerging technologies such as interactive white boards, projectors, virtual reality (VR) and augmented reality (AR) applications are also gaining traction, albeit at a slower pace.

In the context of early childhood education, identifying the types of ICT tools used is pivotal in understanding the evolving landscape of teaching. International studies like the one by Parette, Scherer, and Huer (2004) emphasize the importance of identifying and classifying the specific technologies employed in early reading instruction. It is noteworthy that commonly used tools like tablets with educational apps, interactive whiteboards, and e-readers are prevalent globally. However, emerging technologies such as virtual reality (VR) and augmented reality (AR) applications are starting to find their way into ECE classrooms (UNESCO, 2020). Understanding the types of ICT tools utilized in Ayawaso Central Municipality allows for targeted support and resource allocation in line with local educational needs and trends.

The prevalence of commonly used ICT tools aligns with global practices in early childhood education (Parette et al., 2004). However, the adoption of emerging technologies like VR and AR applications suggests a willingness to explore innovative methods of reading instruction. To effectively support these technologies, it is essential to provide educators with relevant training and resources.

Teachers' level of knowledge in the use of ICT tools in teaching reading in preschool classrooms

The research indicates that teachers in Ayawaso Central Municipality possess varying levels of knowledge in the use of ICT tools for teaching reading. Some teachers report having basic knowledge and proficiency, while others express a higher level of comfort and experience with specific ICT tools, such as educational apps on tablets.

Teachers' knowledge and competence in using ICT tools for teaching reading are critical determinants of successful integration. Research conducted by Yelland (2011) suggests that teachers' preparedness and training significantly influence the effectiveness of ICT integration in early childhood education. It is widely acknowledged that ongoing professional development is crucial for teachers to adapt to the ever-evolving technological landscape (Mouza, 2008).

In the context of Ayawaso Central Municipality, local studies like the one by Ackon et al. (2019) emphasize the need for comprehensive teacher training programs to enhance their ICT proficiency. Understanding the current level of teachers' knowledge is a foundation for developing tailored training initiatives that empower educators with the skills and confidence to leverage ICT effectively in reading teaching.

These findings echo international trends where the level of ICT knowledge among educators can be diverse (Yelland, 2011). Tailored professional development programs are vital to bridge knowledge gaps and enhance teachers' confidence and competence in using ICT for reading instruction.

Challenges ECE teachers encounter in the use of ICT tools in teaching in the preschool classrooms

The challenges encountered by ECE teachers in Ayawaso Central Municipality include limited access to ICT resources, outdated or malfunctioning devices, a lack of teacher training, and issues related to technical support and maintenance. These challenges are significantly impeding the effective integration of ICT tools in early childhood education.

The challenges faced by ECE teachers in the use of ICT tools for teaching in Ayawaso Central Municipality are reflective of broader global trends. Studies conducted by Al-Shammari and Koc (2019) and Voogt et al. (2017) highlight common challenges such as limited access to resources, technical issues, and resistance to change. However, the unique context of Ayawaso Central Municipality can introduce local challenges that require targeted solutions. Research by Addo (2021) suggests that resource limitations, specifically the availability of up-to-date devices, can be a substantial hurdle in the local context. Similarly, insufficient technical support and maintenance can disrupt teaching, as noted in the study by Boadi et al. (2020). Understanding these challenges is paramount for policymakers and educational institutions to develop effective strategies that address the specific barriers to ICT integration in the early childhood education sector.

These challenges are not unique to Ayawaso Central Municipality but resonate with global issues in ICT integration (Al-Shammari & Koc, 2019; Voogt et al., 2017). To address these challenges, a comprehensive approach is needed, encompassing resource allocation, ongoing training, and technical support to ensure that ICT tools effectively

enhance the quality of early childhood education. This localized understanding of challenges is essential for the development of context specific solutions.



CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Overview

In this concluding chapter, I distil the key insights garnered from my research into the integration of Information and Communication Technology (ICT) tools in early childhood education for reading instruction within the Ayawaso Central Municipality. Building upon the results presented in Chapter 4, I offer a comprehensive summary of my findings, followed by a conclusive reflection on the implications of the research and the recommendations derived from it.

My journey through this research has been a meticulous exploration of the status quo, the types of tools commonly employed, teachers' readiness, and the challenges faced in embracing ICT in the early years of education. In this chapter, I presented a condensed synthesis of my findings, which collectively unveil a picture of the current state of ECE in Ayawaso Central Municipality.

With these findings as my foundation, I drew insightful conclusions that underscore the significance of ICT integration in early childhood education. The implications of the research extend beyond Ayawaso Central Municipality, resonating with the broader discourse on ICT in education. These conclusions pave the way for a set of strategic recommendations directed at local educational authorities and institutions to guide future action.

5.1 Summary of the Study

The main purpose of the study was to explore the use of information and communication technology (ICT) tools in teaching reading in early childhood education in Ghana using kindergartens in the Ayawaso Central Municipality. To achieve this purpose, the following research objectives were formulated to guide the study:

1. Ascertain the kindergarten teachers' attitudes of the use of ICT tools in teaching reading in the Ayawaso Municipality.
2. Explore the ICT tools kindergarten teachers' perceived usefulness in the Ayawaso municipality in teaching reading.
3. Determine the frequency of ICT tool usage in kindergarten reading lessons in the Ayawaso Central Municipality
4. Identify the challenges kindergarten teachers encounter when integrating ICT tools into reading instruction

To achieve this purpose, the case study design was employed. A convenient sampling procedure was adopted to include twelve (12) respondents in the study. The questionnaire was used to gather data. Data gathered were analysed using a thematic approach. The following are the key findings from the study;

5.2 Key Findings

Research Question 1: What are the attitudes of kindergarten teachers toward the use of ICT tools in teaching reading in the Ayawaso Municipality?

The findings from the study revealed that the extent of ICT usage among ECE teachers in the Ayawaso Central Municipality varies across different schools. Some schools have integrated ICT tools, such as desktop computer workstation, phones, sound boxes, tablets, and educational softwares into their reading instruction, while others primarily

rely on traditional teaching methods. The disparities in ICT usage can be attributed to differences in resource allocation and teacher training.

Research Question 2: Which ICT tools do kindergarten teachers perceive as useful for teaching reading in the Ayawaso Municipality?

The study findings further revealed that commonly used ICT tools for teaching reading in Ayawaso Central Municipality include educational software and apps on tablets, desktop computer workstation, phones and sound boxes. Emerging technologies such as virtual reality (VR) and augmented reality (AR), interactive white boards, projectors and e-books applications are gaining traction, albeit at a slower pace. The prevailing technologies reflect global practices in early childhood education, with a willingness to explore innovative methods of reading instruction.

Research Question 3: How frequently do kindergarten teachers use ICT tools in reading lessons in the Ayawaso Central Municipality?

ECE teachers in Ayawaso Central Municipality possess varying levels of knowledge in the use of ICT tools for teaching reading. Some teachers have basic knowledge and proficiency, while others express a higher level of comfort and experience with specific ICT tools, such as educational apps on tablets. These findings emphasize the need for tailored professional development programs to bridge knowledge gaps and enhance teachers' confidence and competence in using ICT for reading instruction.

Research Question 4: Identify the challenges kindergarten teachers encounter when integrating ICT tools into reading instruction

ECE teachers in Ayawaso Central Municipality face several challenges in the use of ICT tools for teaching. Common challenges include limited access to ICT resources,

outdated or malfunctioning devices, a lack of teacher training, and issues related to technical support and maintenance.

These challenges are significantly impeding the effective integration of ICT tools in early kindergarten education, necessitating a comprehensive approach to address them.

5.3 Conclusion

Based on the findings of the research questions, the following are recommended.

1. The study concludes that the integration of ICT tools in teaching reading at the kindergarten level in public schools in the Ayawaso Central Municipality is uneven and influenced by several key factors. While some schools have made notable progress by incorporating digital tools such as desktop computers, tablets, phones, sound boxes, and educational software into their reading instruction, many others continue to depend heavily on traditional teaching methods. This variation highlights a significant disparity in the use of ICT across early kindergarten classrooms within the municipality.
2. The study concludes that kindergarten teachers in the Ayawaso Central Municipality are gradually incorporating ICT tools into reading instruction, reflecting a growing alignment with global educational practices. Widely used technologies such as educational apps on tablets, desktop computers, mobile phones, and sound boxes are playing a key role in reading development at the kindergarten level. Although advanced tools like virtual reality (VR), augmented reality (AR), interactive whiteboards, projectors, read aloud and e-book applications are beginning to emerge, their usage remains limited, indicating an early but promising stage of adoption.

3. The study further reveals that ECE teachers in the municipality possess varying levels of ICT competence. While some demonstrate basic operational knowledge, others show greater proficiency and confidence in using specific tools, particularly those that are more user-friendly or familiar. This variation suggests a pressing need for ongoing and differentiated professional development tailored to teachers' specific ICT skill levels. Such training initiatives would not only bridge knowledge gaps but also boost confidence and motivation among educators to fully integrate technology into reading instruction.
4. Despite the enthusiasm among some teachers to embrace ICT in their classrooms, several barriers hinder effective integration. These include limited availability and accessibility of modern ICT tools, outdated or non-functional devices, insufficient training opportunities, and a lack of reliable technical support. Addressing these challenges is crucial to ensuring equitable and effective use of ICT in reading instruction across all kindergartens in the municipality.

5.4 Recommendations

1. The Ayawaso Central Educational Directorate should collaborate with ICT specialists to organize regular training workshops tailored to the needs of kindergarten teachers. These workshops should focus on practical ways of integrating ICT tools such as educational apps, tablets, and sound boxes into reading lessons. Emphasis should be placed on hands-on sessions that build teachers' confidence and proficiency in using both basic and emerging technologies for reading instruction.

2. The Ayawaso Central Educational Directorate should conduct a resource audit to assess which schools lack ICT tools. Based on the audit, efforts should be made to provide under-resourced schools with essential devices such as tablets, computers, and projectors. Additionally, the Directorate should advocate for public-private partnerships and government support to ensure all kindergartens have access to standard ICT resources for effective reading instruction.
3. The Directorate should establish an ICT support team at the municipal level. This team will be responsible for the regular maintenance of devices, troubleshooting technical problems, and offering on-site assistance to teachers. Having readily available technical support will reduce downtime and encourage consistent use of ICT tools in teaching reading.
4. The Ayawaso Central Educational Directorate should develop a structured plan that outlines how digital tools can be systematically integrated into ECE kindergarten instruction. This plan should include clear goals, timelines, and indicators for success. It should also promote the gradual adoption of innovative technologies such as e-books, interactive whiteboards, and augmented reality (AR) in classrooms, aligned with global best practices in early childhood education.

5.5 Suggestions for Further Studies

The following areas are suggested for further studies

1. Future studies can assess the Impact of ICT Integration on Early reading Outcomes: A longitudinal study could be conducted to assess the long-term impact of ICT integration in kindergarten reading outcomes. This study could track the progress of students who have been exposed to ICT tools from kindergarten through their primary years and compare their reading skills,

comprehension, and overall academic performance with those who had limited exposure to technology.

2. Future studies can go into Teacher Training Efficacy: This study can
3. Investigate the effectiveness of different teacher training programs in improving ECE teachers' ICT knowledge and confidence in using technology for reading instruction. Comparative studies could assess the outcomes of various training approaches, including online courses, in-person workshops, and blended learning, to determine the most effective methods for preparing ECE teachers to integrate ICT effectively.
4. Future studies can explore the Parental Involvement in ICT-Based Early Reading: This study can examine the role of parental involvement in supporting ICT-based early reading activities at home. Research could explore how parents can be engaged to extend learning beyond the classroom through educational apps, digital books, and interactive online resources. Understanding the dynamics of parental involvement in the digital reading journey of their children is crucial in today's technology-driven world.

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APPENDIXES

APPENDIX A

UNIVERSITY OF EDUCATION, WINNEBA

DEPARTMENT OF EARLY CHILDHOOD EDUCATION

INTERVIEW GUIDE FOR PARTICIPANTS

Dear participant,

I am conducting a study to the use of information and communication technology tools in teaching reading in early childhood education in Ayawaso Central Municipality. The purpose of this interview guide is to investigate use of information and communication technology tools in teaching reading in early childhood education. By gathering insights and perspectives from participants like yourself, I aim to gain a deeper understanding of use of information and communication technology tools in teaching reading in early childhood education.

This interview guide has been developed to guide our conversation and ensure consistency across interviews conducted with different participants. I encourage you to share your experiences, perspectives, and any suggestions or recommendations you may have. Please be assured that your participation in this study is entirely voluntary, and all information shared was treated confidentially. The data collected will be used solely for research purposes and will be reported in aggregate form to maintain anonymity. Your cooperation and openness during the interview process are greatly appreciated. Thank you for your willingness to participate in this study and for sharing your valuable insights.

Interview Questions

Research Question One: What are the attitudes of kindergarten teachers toward the use of ICT tools in teaching reading in the Ayawaso Municipality?

1. How frequently do you integrate ICT tools into your reading instruction in the preschool classroom?
2. Can you provide examples of specific ICT tools or platforms you use for teaching reading, if any?
3. In what ways do you currently use technology as a pedagogical tool for reading development?
4. What factors contribute to the limited integration, and how do you perceive its impact on teaching and learning?
5. How does the limited access to computers and tablets affect your ability to incorporate ICT into daily teaching activities?
6. How do you think additional training could positively impact your use of ICT tools in reading instruction?
7. In what ways do you believe increased training on integrating ICT into reading lessons would enhance your teaching effectiveness?
8. How has the lack of technical support affected your confidence and willingness to use ICT tools for reading instruction?
9. Can you share examples of successful strategies you or your colleagues have used to integrate ICT into reading lessons effectively?
10. How do you think the use of educational apps or multimedia content contributes to engaging young children in reading learning?
11. How do you envision supportive policies positively influencing ICT integration in ECE reading teaching?

Research Question Two: Which ICT tools do kindergarten teachers perceive as useful for teaching reading in the Ayawaso Municipality?

1. Could you describe the types of ICT tools commonly used in your reading instruction?
2. How have you or your colleagues integrated emerging ICT tools such as e-books on e-readers or into reading lessons?
3. Regarding challenges like unreliable internet access and the cost of maintaining ICT equipment, how have these issues impacted your ability to use online resources or advanced technologies in your teaching?

Research Question Three: How frequently do kindergarten teachers use ICT tools in reading lessons in the Ayawaso Central Municipality?

1. Can you elaborate on your current knowledge and competency in using ICT tools for reading instruction?
2. How do you perceive the impact of your existing ICT knowledge on the reading skills development of your students?
3. In what specific areas do you feel the need for more training and professional development in using ICT for reading instruction?
4. How do you think specialized workshops or courses focused on using ICT for reading instruction in ECE, would benefit you and your colleagues?
5. How has the lack of access to training opportunities affected your ability to acquire ICT knowledge?
6. Regarding the suggestion of in-school training sessions and peer collaboration how do you think these methods would contribute to improving your ICT knowledge and skills?

7. Considering the recommendation for mentorship programs, how do you see experienced teachers guiding less experienced teachers in enhancing their ICT knowledge?

Research Question Four: What challenges do kindergarten teachers face in integrating ICT tools into reading instruction?

1. In what ways does the limited access to ICT devices affect your teaching in preschool classrooms?
2. How do outdated or malfunctioning ICT devices impact your ability to integrate technology into your teaching methods?
3. Can you provide examples of how the lack of proper training in using ICT for teaching has posed challenges in your classroom?
4. How has the absence of ongoing professional development affected your ability to keep up with evolving ICT technologies?
5. In what ways do technical issues disrupt your teaching and learning environment?
6. How has the lack of dedicated IT support staff impacted your ability to address and resolve technical challenges?
7. How do you currently integrate ICT tools into your curriculum, and what challenges do you face in making it an integral part of your teaching?
8. How do you navigate this resistance and maintain confidence in using ICT tools for teaching?

APPENDIX B

