PLAY WAY METHOD OF LEARNING IN DEVELOPING DIGITAL LITERACY AMONG PUPILS IN PRIMARY SCHOOLS IN NANDI COUNTY, KENYA

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DECLARATION

Declaration by the Candidate

I declare that this thesis is my original work and has not been presented for a degree in the department of curriculum instruction and educational media or any other department or University. No part of this thesis may be reproduced without the prior written permission of the author and/or Moi University.

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DEDICATION

I dedicate this thesis to God almighty, without whom, all the strength, knowledge, wisdom and care, my personal interest would be in vain. Secondly, I dedicate this thesis to my late mother Elizabeth Jeptoo Marus, who brought us up single handedly. Mum, you had high hopes in me, but only heavens knows why you did not live to see this day. You believed in me Mamma. Let your spirit light my path. Despite the many struggles you had, you ensured that schooling was a priority. You are a living testimony of a mother's unconditional true love that has always made me resilient, forging ahead-a real inspiration in my life '*Ru netala'.* Thirdly, I dedicate this thesis to you my dearest husband, Wycliffe Kipchirchir Kemboi, for all the support you accorded during this journey. Our children were young and needed more of my presence but you stood in and filled that gap. Where could I get such a valuable friend as you? A big thank you for the support. Fourthly, to my son and daughters Kiprotich, Jepkoech and Jelimo. I dedicate this thesis to you my children. You saw how I was struggling and some other time I did not have time for you. Learn from my experience dear children so that you may understand that life requires some sacrifices. Struggle dear ones so that you may achieve the best in life.

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ABSTRACT

Digital literacy is the ability to have knowledge and skills which are necessary to effectively use a wide range of digital content and devices for learning. Learning in early years emphasizes play as an effective teaching method. Play using digital devises can help learners develop digital skills. The purpose of this study was to investigate play method of learning in developing digital literacy among pupils in primary schools in Nandi County, Kenya. The objectives of the study were: To explore teachers' perceptions of play way strategies of learning in developing digital literacy among pupils in primary school, examine primary school pupils' digital literacy competencies demonstrated through play way method of learning, assess the challenges primary school pupils and teachers face in developing digital literacy through play method and design a model on the association between play way strategies of learning and development of digital literacy competencies among pupils in primary schools. The study was underpinned by Constructivism Learning Theory, utilized qualitative research method, case study research design and adopted interpretivism research paradigm. The target population comprised 30 primary schools with a total of 13,500 pupils and 450 teachers. The selected sample size constituted twelve public primary schools in Chesumei Sub County in Nandi County, 12 head teachers, 12 grade one teacher, 480 learners and one education officer obtained through purposive sampling technique. The research instruments used for data collection included teacher reflective journals, interview and observation schedules. The data was analyzed thematically. The study findings established teachers perceived play way method of learning as being effective for digital skill acquisition with the advantage of being a child centered approach and a method that favorably changed the role of the teacher to that of a facilitator. Competencies developed in pupils included the manipulation of the tablet menu, access to digital content and reading on screens, booting up, use of icons and search engine. Challenges experienced included digital devises hanging; inadequate time to learn digital literacy, lack of confidence and a few tablets allocated to schools. The findings the study designed a digital play model that can be used to teach digital literacy effectively as an innovative method of teaching. The study concludes that play way method of learning is an enabler to the development of digital literacy skills because of its child centred nature and hands on approach that enhances the development of digital literacy competencies. The main challenge was not only the inadequate supply of digital devices, but also the seeming absence of an overall integration of digital content for learning. From the study results, the recommendations made included that teachers adopt the learners' digital play model designed in this study to enhance the acquisition of digital literacy competencies. The Ministry of Education apart from consistently supplying digital devices to schools needs to increase digital content that may compel teachers to enhance use of computers for learner digital literacy. The findings are beneficial to: Primary school teachers, pupils, school Managers, Kenya Institute of Curriculum Development (KICD), Teachers Service Commission (TSC), Educational Directorates in Kenya, Teacher Training Institutions/Universities and Policy Makers.

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ACOT	Apple Classrooms of Tomorrow
CBC	Competency Based Curriculum
CEMASTEA	Center for Mathematics, Science, and Technology Education in Africa
CoE	Condition of Education
CPD	Continuous Professional Development
CSO's	Curriculum Support Officers
EGMA	Early Grade Mathematics Assessment
GoK	Government of Kenya
HOTS	Higher-order Cognitive Skills
ICILS	International Computer and Information Literacy Study
ICT	Information Communication Technology
iNACOL	International Association for K–12 Online Learning
IRA	International Reading Association
ISTE	International Society for Technology in Education
ITE	Initial Teacher Education
ITU	International Telecommunication Union
KICD	Kenya Institute of Curriculum Development
MoEST	Ministry of Education, Science and Technology
NAEYC	National Association for the Education of Young Children
NESP	National Education Sector Plan

PRIEDE	The Primary Education Development
RoK	Republic of Kenya
SSA	Sub-Saharan Africa
TUSOME	A Swahili word denoting “Let's Read”
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations International Children’s Emergency Fund
US	United States

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Introduction

The ministry of education developed the competency-based curriculum (CBC) in 2017 under the 2-6-3-3 system of education in Kenya. One of the competencies in the new curriculum is digital literacy which needs to be taught from early years of learning and one of the ways which learners can develop digital skills is through play. Play is directly related to children's development (Whitbread, et al., 2017) as it promotes the learning of pre-academic skills for early learning and academic achievement. Its connection to early reading and numeracy acquisition, as well as later academic achievement has gained a lot of recognition (Pirrone, Nicolosi, Passanisi, & Nuovo, 2015). While there is substantial evidence on learning through play, there has been less evidence on teaching through digital play. This study explores the use of play using laptops and tablets provided by the government of Kenya as a teaching strategy towards digital literacy (Kenya Government, 2007 cited in Kerkhoff & Makubuya, 2021). The government's expectation was that digital literacy be integrated to teaching and learning from grade one.

The Kenya Institute of Curriculum Development (KICD, 2017) explains that the government recognizes digital literacy as an important avenue of improving learning and teaching to begin at a young age. Learners start developing digital abilities at a very young age, which they utilize more and more to explore and take advantage of the world of information and turn it into knowledge (GOK, 2017). Relatively little is known about the development of digital literacy skills in primary schools (Kennedy et al. 2012; Kerkhoff & Makubuya, 2021).

Digital literacy enhances the effectiveness of instruction and learning, as well as learning outcomes, self-efficacy and pupil capabilities (Aslan, 2021; Erwin & Mohammed, 2022). As a result, digital literacy is essential for learning and teaching today. However, there is a lack of knowledge about how Kenyan teachers and institutions are expected to actively incorporate and employ digital literacy. With this in mind, it is clear that for learners to prosper in the contemporary world, institutions and systems of education need to integrate digital literacy tools and resources into their teaching. In conjunction with that, Kenya envisions facilitating digital literacy as a general method of instruction and training and to accomplish that, Ntorukiri, Chun and Boudouaia (2022) in their study aver that every learning institution, teacher, and learner should be furnished with necessary digital skills and the relevant infrastructure. However, there is a significant challenge in the introduction and integration of digital literacy into the curriculum in Kenyan schools, and only a tiny portion of pupils are exposed to digital skills.

Even though, infrastructure, tablets and laptops have been availed, it should be noted that other factors such as the teacher have roles to play (Otieno, 2020) for successful digital implementation. Yet they are ill-equipped to integrate digital literacy in teaching and learning. Teachers are primarily involved in all matters of education and they thus play a vital role in the process of integrating digital skills in teaching and learning (Barasa, 2021). As such their attitude towards technology, their level of expertise and training, and their efficiency in utilizing technology for education have a direct impact on the level of success in integrating digital skills in teaching and learning. This study explores the use of a particular approach to digital literacy integration as a means to develop the digital literacy implementation process in Nandi County by using digital play activities. The focus is on the perceptions and experiences when using the play approach, the skills that

are developed through play and the challenges the teachers and learners may face when implementing the play activities.

1.2 Background of the Study

There are learning strategies in promoting skill development in digital literacy. These learning strategies are the overall ways in which the process of instruction is organized and executed (Mudra, 2020). It is a means of organizing and facilitating learning experiences. This definitions presents teaching strategies as deliberate planning and organization of experiences and situations with a view to achieving specific instructional objectives (Rajagopalan, 2019). It is a means through which the teacher organizes and facilitates learning experiences. The overall plan or design in which the process of instruction is organized and implemented and the role of the teacher as the facilitator and organizer (Senthamarai, 2018). The teaching strategies are the expository and the heuristic strategies.

The expository strategy also referred to as transmission strategy. Involves direct instruction where the teacher transfers or transmits basic information, values, skills and attitudes where learners are expected to memorize, copy, imitate or reproduce (Heryadi & Sundari, 2020). The teacher imparts knowledge or exposes knowledge to the learners and presents declarative information. The teacher is believed to be the only custodian of knowledge while the learner is a passive recipient (Nasution, 2020). Teaching methods which fall under this category of strategies include lecture, teacher demonstration, narration, text-reading and audio-visual presentation

The heuristic strategy also referred to as discovery or facilitation Involves indirect instruction where the teacher facilitated the learning by posing questions, guiding and sharing ideas, problems and solutions (Davis & Arend, 2023). The teacher takes the role

of a facilitator while the learner is an active participant in the learning process. The learner finds out information by themselves, while the teacher assumes a non-directive role (Mwaka et al., 2014). Teaching methods which fall under this strategy include; simulations, question and answer, programmed instruction, discussion, field trip, problem-solving, projects, learner demonstration and play way method. This study is anchored towards play way method of learning in development of digital literacy skills.

Early learning and subsequent academic achievement are based on play (Ansari et al., 2019). Play and early learning have attained and will continue to achieve global awareness (Verdine et al., 2014; Ansari et al., 2019). A report by UNICEF acknowledged that play is a significant part of a child's learning process and therefore play enables learners perform day to day activities paving way for learning (UNICEF, 2018). According to Donald, Lazarus, and Lolwana (2010, p. 53) "development does not just happen to pupils. It is also based on their active engagement with and exploration of their physical and social world." Thus, through play pupils learn to engage analytically with each other's ideas (Ansari et al., 2019; Lipsey et al., 2018). Play also paves the way to the development of the cognitive, intellectual, linguistic, physical, socio-emotional, creative domains and visual perception (Jemutai & Webb, 2019; Smith & Pellegrini, 2013).

Play is crucial to the development of children and has long piqued the curiosity of learning psychologists, educators and researchers as well as child development experts (NAEYC, 2020; Hassinger-Das et al., 2017). Play encourages the acquisition of knowledge and abilities such as verbalization, vocabulary, Digital skills, language comprehension, attention span, creativity, focus, impulse management, skepticism, problem-solving techniques, collaboration, compassion, and mutual cooperation (Kimbell-Lopez et al,

2016; Nath & Szücs, 2014). Thus, this study sought to explore play way as a strategy of learning to develop digital literacy of pupils in selected Kenyan primary schools.

Gilster (1997 p.1) used the phrase "digital literacy" in the late 1990s to refer to the capacity to comprehend and apply information delivered via computers in a variety of formats and sources. Several of the articles under examination refer to this definition as the "know-how" (Goodfellow, 2011). The concepts of digital literacy emphasize mental abilities and skills (Saleem et al., 2022). In Beetham's definition, which emphasizes the cognitive perspective of digital literacy as the operational access, methods and techniques required to become a self-assured, flexible implementer of a range of technologies for personal, academic, and professional use," Bennett (2014) and Traxler and Lally (2016) draw attention to the fact that the individual is in focus rather than the social dimensions of learning (Beetham & Sharpe, 2011, p. 1). Digital literacy is described by Chan et al. (2017) as "the ability to interpret and utilize information in diverse formats with emphasis on cognitive reasoning instead of information and communication technology abilities." They also make reference to cognitive skills. The ability to generate meanings and communicate successfully with others by use of digital technologies with the capability to explore, appraise, and synthesize from digital resources, is what is meant by being digitally literate. In a similar vein, Martin's definition of digital literacy is the consciousness, perception and capacity of people to adequately utilize digital platforms and tools to recognize, access, handle, incorporate, assess, and interpret digital resources, develop new knowledge, and create media expressions, while Falloon, (2020) define it as a social practice, Digital literacy is defined by Stewart (2013, p. 232) as "the ability to utilize the linkages and interactive abilities of digital technologies, in their power to develop, modify, reuse, and exchange new knowledge as well as merely convey old information."

Digital literacy and computer use by young children has been used in United States and United Kingdom. Technology use has been embraced in the developed world such that Children as young as pre-schoolers can use technology (Marsh et al, 2016). According to research conducted in the US and the UK, small children use a variety of technologies, such as cell phones, video games consoles, audio players, digital toys, laptops, computers, TV's , to develop a variety of knowledge and skills. Compared to past generations, today's children have access to a broader variety of gadgets, including tablets and smartphones.

According to Rideout (2013), children in the US aged 0 to 8 only use screens for a little under two hours a day. There is proof, for instance, that pupils play games on other platforms more frequently. Additionally, more pupils are using home computers to access the internet and are increasingly likely to watch television on demand (Ofcom, 2015). Recent years have seen a rise in the use of YouTube and other online media by young children (Chaudron et al., 2015; Marsh et al., 2015). Despite the lack of research on children under the age of eight, studies show that more children in industrialized countries are now accessing internet content for learning and teaching at younger ages than in the past. This is especially true since the invention of tablets, which gained popularity after the 2010 release of the iPad. Young children can interact with games, applications, and webpages reasonably easily.

Digital Literacy in the Kenyan context was designed in a manner that teachers are required to enhance, expand, and deepen learning using technology. Digital literacy competence needed to enable the learners to acquire information and knowledge, master it, and disseminate it in a global economy. The elements of digital literacy are identified as use of technology to reinforce learning, extending and deepening learning, discovery, mastery and communicating knowledge and information. The attributes presented to the

educators include computer literacy which includes: knowledge, ideas, methods, and mindsets. Digital usage is the use of digital skills in a particular setting, like a classroom, creative and innovative approaches in digital transformation. The digital literacy in the Kenyan context aimed at understanding, articulating and simplifying the electronic information through information gathering, retrieval techniques, information interpretation and representation including summarizing, comparing, and contrasting. Information is produced through applying, adapting, constructing, developing, or producing information, and drawing conclusions about its value, relevance, utility, or efficiency. Finally, the information is distributed in an efficient digital format that is specific to a certain audience (British Council, 2016).

The curriculum development process is a combined effort of the school leaders and the teachers (Syomwene et al., 2017). The school leaders take a lead in facilitating and supporting the curriculum development process. The support facilitates the teachers in planning their schemes of work, the lesson plans and delivering the lessons through use of digital literacy leading to abilities on the part of the learners.

Digital literacy competence has been proposed in the primary school syllabus in a manner that the teacher takes the lead in the use of technology and only uses technology to emphasize certain concepts during teaching. The syllabus further provides websites which the teacher needs to click to get an explanation or a clip on a topic of study. The anomaly that seems to appear in the syllabus is that it only gives the teacher the chance to use technology as the learners only observe. Learners are yet to be taught how to handle and use the digital devices. In grade one for instance, where digital literacy is supposed to begin according to KICD (2017), there are programs that were installed in the digital devices in different subject areas including: Mathematics, English, Kiswahili, Science

and Social studies for both grade one and two as well as games. These games are in line with the curriculum. While these learning areas contain interesting topics which learners need to be taught electronically, schools are yet to achieve this. If well implemented however, this would help the learners develop different skills like solving problems, working in teams, being creative, and exercising critical thought. Literacy exercises, activities on the English language, activities on creativity and movement, activities on religion, activities on nutrition and hygiene, activities on environment, activities on mathematics, activities on Kiswahili language and pastoral instruction activities are among the subject areas covered by the CBC program and instruction. These areas are timetabled from morning to noon. In the afternoon, for schools that retain the learners, remedial and homework is done.

The competency based curriculum requires that every learner is taught digital literacy as one of the competences starting from grade 1 (KICD, 2017). The syllabus in the competency based curriculum explains the role of the teacher in the use of digital technology. What the teacher needs to do during lesson delivery is to use a video to emphasize a lesson by clicking on websites written on the course books. It is for this reason that the current study was conducted to enable the learners get hands on experience on the use of technology through play. The learners were exposed to the digital tools available in the schools, then shown how to use them using play, this was done so as to enable them develop different skills and digital literacy competences.

The employment of digital literacy in classrooms has numerous advantages for the pupil. It promotes learning that is centred on individuals allowing learners to choose, arrange, and evaluate information and data (Mudra, 2020) and provides simple access to electronic information and concept comprehension. Moreover, digital literacy enhances the

effectiveness of instruction and learning as well as learning results and learner competences. Digital literacy is therefore very crucial for teaching and learning today. Therefore, the study used play in the development of digital literacy skill which is more learner centered and interactive with an aim to meet the expectations of the competency based curriculum.

1.3 Statement of the Problem

The policy in the Ministry of Education in Kenya stipulates that teaching and learning needs to be transformed by incorporating new pedagogies that are appropriate for the attainment of 21st Century skills (KICD, 2017). One of the pedagogies is digital literacy which needs to be developed from early years of learning. The ability of a person to effectively use digital technology in a variety of circumstances is known as digital literacy, which is defined as the combined cognitive, practical, emotional and social aptitude of an individual. The strategies for the attainment of digital literacy skills are still a question. Play enables children develop new competencies, important for optimal child development (Taylor & Boyer, 2020). Moreover, "play fosters the best learning environment, one in which children can naturally develop and operate" (Buehl, 2023; Ferrara et al., 2011).

Play can be used for pedagogical purposes (Marklund & Dunkels 2016). In this system, the instructor serves more as a catalyst for learning than as a knowledge-provider (KICD, 2017). Digital literacy as one of the competence needs to be taught from grade one. These digital tools can equip learners become confident and agile adopters of a range of technologies. The early education of children must prioritize assistance and digital skills.

The Kenyan government in year 2016 initialized the development of digital literacy to all primary school children by distributing tablets to public primary schools. If learners are

taught through the use of digital literacy the policy and the aspirations of the Kenyan government will be realized. However, there was no mechanism and methods to teach and develop digital literacy skills in primary school going children (Murithi & Yoo, 2021; Maureen, Meij & de Jong, 2020). The specifics of how young children interact with electronic tools are still up for dispute (Otieno, 2020; Neumann and Neumann 2017). The methods which appear to have the potential to teach digital literacy include play way method with tablets. Edwards and Bird (2017) make the case for the use of learner-centered educational frameworks, like play, which encourage children to explore, solve problems, and develop new skills. This study set out to explore the use of play way method of learning in developing digital literacy among pupils in primary schools. In addition, the study sought to find out whether teachers use play way method to teach digital literacy and if play way method is considered effective compared to other methods of teaching.

1.4 Purpose of the Study

The purpose of this study was to explore play way method of learning in developing digital literacy among pupils in primary schools in Nandi County, Kenya.

1.5 Objectives of the Study

The specific objectives of the study sought to:

1. Explore teachers' perceptions on play way strategies of learning in developing digital literacy among pupils in primary school.
2. Examine primary school pupils' digital literacy competencies demonstrated through play way method of learning.
3. Assess the challenges the primary school pupils and teachers face in developing digital literacy through play method.

4. Design a model on the association between play way strategies of learning and development of digital literacy competencies among pupils in primary schools.

1.6 Research Questions

1. What are the teachers' perceptions of play way strategies of learning in developing digital literacy among pupils in primary school?
2. Which digital competencies are demonstrated by pupils when taught using play way methods?
3. What challenges do primary school pupils and teachers face in developing digital literacy through play method?
4. Which model can be designed on the association between play way strategies of learning and development of digital literacy competencies among pupils in primary schools?

1.7 Justification of the Study

Kenya's education system is implementing the competence based curriculum (CBC) and one of the seven competence areas is digital literacy. The study sought to find out developed competencies by grade one learners in the curriculum through guided play using laptops and tablets. According to the words of Hinson et al. (2016), Modern Governments need to have an education system that can equip citizens to compete in the global arena and continue to argue that a system of education that is highly focused on generating citizens who are at ease and effective in a hi-tech world is required for tech-driven competitiveness. This is one of the major principles underlying digital literacy competence in the new curriculum. Falloon (2020) emphasize that digital integration in education means that Information and Communication Technologies (ICTs) should be continuously utilized to efficiently and effectively manage education at all levels, support

and promote the achievement of curriculum objectives, and improve the necessary competences, comprising abilities, understanding, dispositions, and values.

A good illustration of how our conception of literacy and literacy development needs to shift in tandem with alterations in society's demands for literacy is the adoption of terminology like "digital literacy" in academic discourse (Saleem et al., 2022). This study gave many perspectives on the topic of digital play as a means of fostering pupils' digital literacy. The changing literacy development strategies and integrating ICT into the learning setting are not simple tasks. While achievement of digital literacy was supported by the Kenyan government that provided tablets to schools, the same tablets were kept under key and lock yet pupils were expected to develop digital literacy competencies. This then provides justification for further research on the topic of digital literacy on the part of pupils, teachers, head teachers and schools.

1.8 Significance of the Study

The study aimed at exploring play way method of learning in developing digital literacy competencies among pupils in primary schools in Nandi County. Therefore, by exploring play as a strategy towards attainment of digital literacy, the ministry of education in Kenya can use the study findings as a model to enhance the development of digital literacy competences among pupils in primary schools. The study therefore, made recommendations on guided digital play as a strategy on the acquisition of digital literacy skills basing on research findings. In addition, play way method of learning was perceived as a method that aided the acquisition of digital literacy skills and learners developed digital literacy competencies through play, even though studies on the acquisition of digital literacy skills using play have not been clearly documented. This study aimed at the use of play way method to achieve digital literacy skills. The study findings made informed decisions on how digital literacy can be included in the timetable and design a

model on the association between play way strategies of learning and development of digital literacy competencies among pupils in primary schools. In that connection, research based programs on play have had major impact in improving education in many countries. To this extent, the findings of the research may form part of educational policies that are developed as a result of research of such an endeavor. The knowledge gained from the study also stimulated among education planners, policy makers, administrators, researchers, school managers, head teachers, teachers and parents the need for further research on digital literacy since very little has been done on the use of digital play as a strategy in primary school education in Kenya. The study findings has contributed to the existing literature and recommendations for further areas of study within digital literacy and guided play strategies.

1.9 Scope and Limitation of the Study

The study's scope describes how deeply the research topic will be examined and the investigations that will operate under and its viability. The feasibility must not be a very wide or narrow area. Other factors included in the scope are: topic being studied; geographical location covered, population and sample including the duration of the study.

Study limitations are those aspects of the design or technique that have an impact or influence on how the study's conclusions are applied or interpreted (Leedy & Ormrod, 2015). These constraints cannot be controlled by the researcher (Dimitrios & Antigoni, 2019) and therefore have adverse effect on the trustworthiness of the study which in turn affects the study’s results and conclusions. Limitations can be categorized into two thus; technical constraints and the researcher's constraints (Simon & Goes, 2018). Methodological limitations comprise of limitations that relate to; sample size, data collection instruments and inadequate prior studies in the research area. While, limitations

of the researcher encompass; researcher personal biasness, time constraints and limited access to data (Simon & Goes, 2018).

1.10 Scope of the Study

This study mainly focused on the use of play way method to teach digital literacy among grade one pupils in public primary schools. The study was conducted in Chesumei Sub County in Nandi County between August and October, 2021. The respondents of the study were grade one teachers because they were the key informants of the study and grade one pupils in public primary schools who were the targeted population by the government of Kenya in development of digital literacy skills. More so, digital literacy skills need to begin in the early years of schooling (KICD, 2017). The study therefore sought to explore teachers' perceptions of play way strategies of learning in developing digital literacy among pupils in primary school; examine primary school pupils' digital literacy competencies demonstrated through play way method of learning; assess the challenges primary school pupils face in developing digital literacy through play method and finally design a model on the association between play way strategies of learning and development of digital literacy competencies among pupils in primary schools. The study was confined to the use of digital tools. A total of 12 schools participated in the study. The theoretical framework that was employed was Constructivism learning theory. The researcher gathered the views of the participants on the acquisition of digital literacy therefore interpretive paradigm was employed. The study also employed purposive sampling techniques. Case study research design was used to inform the study using qualitative research methods to collect data with the following research instruments; interviews, observations and teacher reflective journals. The data was analyzed thematically through coding, codes were created from the qualitative data generated, and the codes formed the themes.

1.11 The Limitations of the Study

The researcher used semi structured interview schedule, observation schedule and teacher reflective journals to collect data. The semi structured interviews have the disadvantage of data being influenced by the biases of the interviewer. Triangulation was utilized to overcome this. Triangulation is the process of gathering data using two or more approaches. Considering the evidence from the many sources enabled the development of a convincing defence of the study giving a strengthening mechanism. The observation schedule on the other hand had the possibility of observer bias thus undermining validity and reliability of data collected. Same applies to the teacher reflective journals. All the biases mentioned were overcome by triangulation. Therefore, the quality of the study was entirely dependent on the quality of the data collected from the respondents and the findings collected. The research process was carried out not only to generalize the findings but also to develop a thorough understanding of the phenomenon being studied. The study findings are useful to other parts of the county.

1.12 Assumptions of the Study

The investigation was started on the premise that:

In Kenya, the use of ICT in the classroom was ongoing and that there exists digital tools in public primary schools and the teachers are aware about them. It is further assumed that digital literacy has not been effective and other measures should be developed and practiced in schools. In addition, digital literacy strategies varied from school to school leading to varied responses that were useful in developing the findings of the study. It was also assumed that the respondents were cooperative in answering the questions and availing research data. Finally, it was assumed that gender did not affect the integration of digital literacy in public primary schools in Chesumei Sub County.

1.13 Theoretical Framework

1.13.1 Constructivism Theory

The constructivist theory was used in this investigation. The constructivist method is founded on the idea that pupils can build knowledge from their environment and prior experiences (Kalpana, 2014; KICD, 2017; Waweru, 2018). Lev Vygotsky (1978) and Jean Piaget (1962), the authors of this theory, change the emphasis from the teacher—who was previously seen to be the source of knowledge—to an instructor (Waweru, 2018). Group learning was the main focus of the constructivist theory's methodology. As developed by Jean Piaget, constructivism was approached in a method that targets both individual and group learners (Kalpana, 2014) According to the principle, when a learner assimilates new information, it expands their body of knowledge. Therefore, it is crucial for teachers incorporating digital literacy to comprehend that learning can be focused on person's knowledge extraction and comprehension. This insight would enable the instructor to place more emphasis on the pupils' active involvement and participation in order to foster their creativity and create 21st-century-ready persons (Mudra, 2020). Hence, constructivism refers to individuals actively creating knowledge through social processes in environments where they are present rather than passively consuming it (Zajda, 2021). As a result, comprehension, application, thinking, and analysis are more important than simply gathering, remembering, and repeating knowledge.

The teacher became a facilitator or guide of the learning process. In constructivist learning environments, cooperative learning activities were prioritized (Fosnot, 2013, where learning is prioritized over teaching or instruction. Within this study, constructivism implied that: Knowledge is not merely acquired through the senses or through conversation; instead, it is actively acquired by the person. Collaboration was emphasized as opposed to individual learning (Waweru, 2018). In this study learners engaged in group

work activities on their tablets. This theory's proponents contend that when students work in inclusive settings where they may exchange experiences and develop a shared knowledge, they are more likely to understand concepts. In such a case, the instructor must provide a cooperative, democratic and shared-content learning environment that gives the pupils a sense of ownership over their information. This theoretical knowledge was important for this study because it allowed the teachers to promote cooperative learning by sharing devices in low resource environments where digital capabilities might not be adequate for every learner. The use of digital tools by the pupils was considered as involving them actively in the learning process. The importance of past information and input from other people was also important. Learning requires interaction with and input from others, including peers and anybody else who has relevant experience (Otieno, 2020). In this study learning took place through social interaction amongst the learners with the use of digital tools. Collaboration took centre stage and learning through peers who are more knowledgeable was encouraged. The four principles that form the basis of Vygotskian's sociocultural theory: Children build their own understanding, social environments are important for growth, learning promotes advancement, and language and thinking skills are intertwined. In this study learners were engaging one another to create meaning as they interacted together and with the digital tools. They shared their experiences and sharpened their communication skills.

Given his scientific training, Jean Piaget is one of the key proponents of cognitive constructivism. According to Piaget, a person develops through four different, overlapping phases that are tied to age. These are the phases:

i.) The sensory-motor (0-2 years)

ii.) Pre-operational (2-7 years),

iii.) Concrete operational (7-11 years)

iv.) Formal operations (11+ years).

New skills and methods of processing information have evolved as a result of each of the aforementioned phases or stages. The learners in this study are in the pre-operational stage; a stage that is characterized by playing alongside other children and getting absorbed in their own world through play and learning. Learners at this stage become deeply engaged in their activities and learn through those activities. Relating their play with the tablets used this study, play using tablets as cognitive tools to learn with seemed to contribute a lot. According to Algoufi (2016), despite the many excellent anecdotes of adopting use of tablets and computers in education, they cannot provide "excellent" learning, even though pupils can improve their performance using them. In this study learners had to perform play activities on their tablets so as to learn skills. According to the constructivist concepts, (1) viewing children as thinkers and (2) viewing children as knowledgeable can be linked to the cognitive domain (Piaget, 1962). The approaches of constructivist theory in this study targeted teachers' perceptions of play in the development of digital literacy. The proponents of the theory emphasized knowledge creation through peers or a more knowledgeable other which led to the development of digital literacy skills through play and how challenges faced in the class set up was resolved through peer learning.

1.14 Conceptual Framework

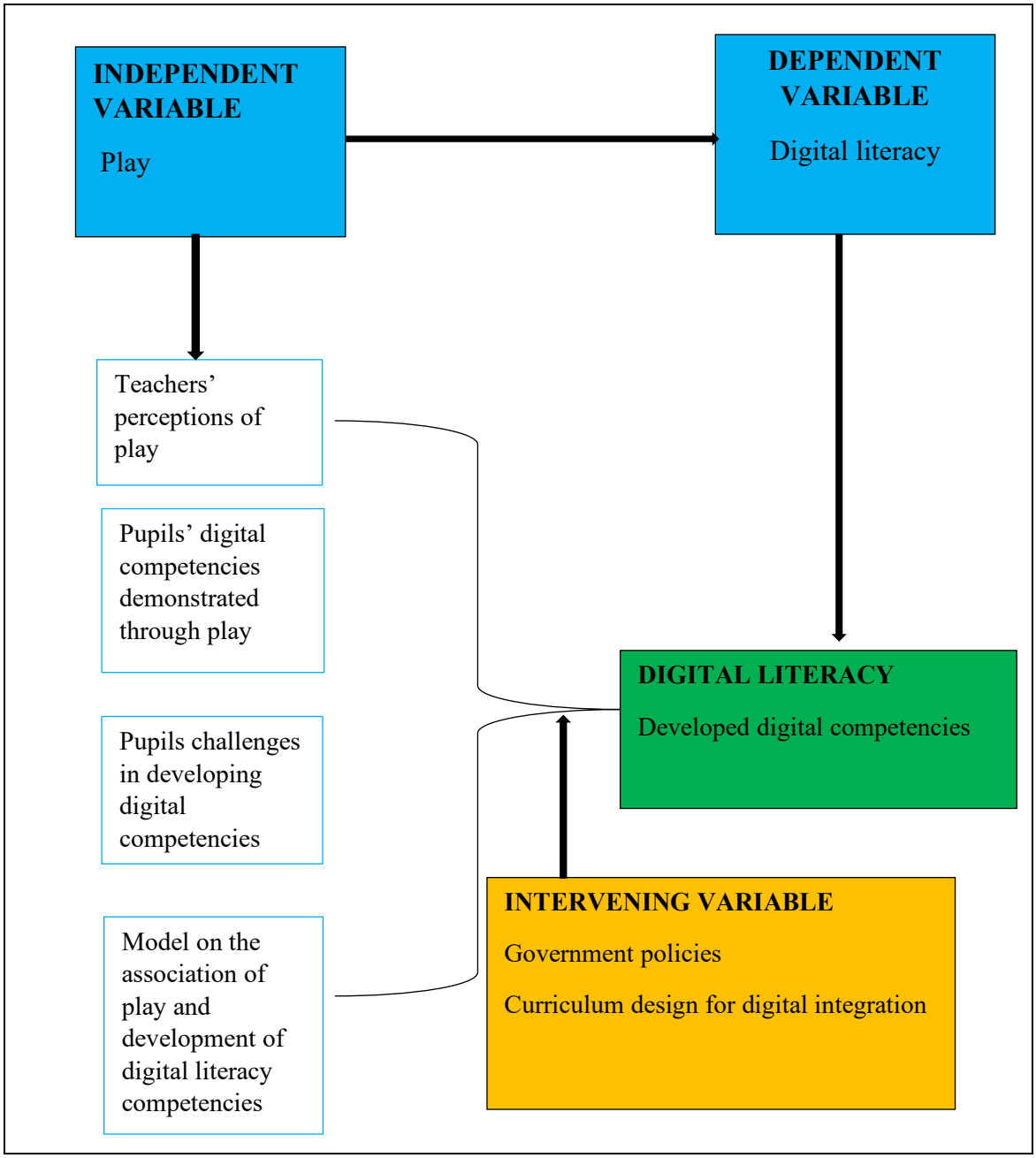


Figure 1.1: Conceptual Framework

The conceptual framework outlined the interrelationship between play as the independent variable and digital literacy as the dependent variable. The interrelationship of the two leads to the development of the concept digital literacy as an established model for teaching digital literacy. The constructs explored for the development of digital literacy include teachers' perceptions of play, pupils digital competences demonstrated through

play, challenges pupils and teachers may face in the development of digital competence and finally Design a model on the association of play and development of digital literacy.

1.15 Operation and Definition of Key Terms

a.) Teacher Perception: Teachers have beliefs about their work and their pupils that are influenced by their prior experiences and life lessons, and which guide their professional behaviour. These are the thoughts, feelings and experiences of a teacher about play way method of learning.

b.) Play way strategies: Play-way strategies are the steps and method of learning that enables overall development of a learner in terms of feelings, intellect and skills. It not only focuses on subjective and emotional development of the child but includes play activities that engage the learners in developing competence, knowledge and attitude in the digital space.

c.) Digital literacy competencies: Digital literacy competencies are skills and knowledge that help one to employ information and communication technology to search, assess, analyze, develop, and transmit concepts and information in a digital world. This involves skilled, emotional, and intellectual capabilities.

d.) Digital tools: Digital tools are electronic gadgets having software, programs, applications, platforms, and (online or offline) resources that can be used to acquire skills. These tools

include; computers, laptops, tablets and other digital devices, for children eye learning

e.) Digital play way method: Digital play method is a pleasurable and flexible activity through use of tablets or any other digital devise and that can make significant contribution to children's learning and acquisition of skills; the ability to create powerful learning opportunities and experiences across all domains of learning for holistic development of a child through playful interaction with objects and people, an activity that is cherished in childhood. The play interaction constituted the use of digital tablet during the lesson under minimum control by the teacher.

f.) Digital Literacy The capacity to comprehend and make use of information for learning when it is presented via computers and tablet in order to create meaning and effectively communicate with people using digital tools, as well as locate, evaluate, and synthesize information from digital sources.

g.) Digital integration: Information and communication technologies (ICTs) are being continuously incorporated to support and improve the achievement of curriculum goals.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The purpose of this chapter was to review literature on the concept of theories and models. In this respect, literature on constructivist theory, models or frameworks on digital play and development of digital literacy integration is reviewed. The chapter looks at the global perspective of digital play in development of digital literacy in schools and digital literacy competence in sub Saharan Africa. In addition, attention is given to the Kenyan perspective of nurturing digital literacy in the curriculum where policies and frameworks have been reviewed. Relevant literature on play as one of the methods of developing digital literacy is explained, these encompassed play and child development, importance of play, pedagogical value of play and the types of play. Teacher training and digital media are also elaborated. Importance of utilizing digital media in the classroom is discussed and finally supporting learner-created digital products is also reviewed.

2.2 The Concept of Theories and Models

The models and frameworks are discussed in the sections that follow.

2.2.1 Constructivist Theory

Constructivism is a theory about 'knowing' and a philosophy about how an individual gets to know' by constructionism" from an epistemological perspective. Constructivism is not a theory of teaching but rather one about learning and knowledge (Fosnot, 2013). Constructionism respects the constructivism's tenets but adds that creating or working with an artefact is the greatest approach to learn or create knowledge (Zajda, 2021). Constructionism suggests that whenever appropriate, electronic information are being utilized. This suggests, in relation to computers, laptops, and tablets, that the computer

does not serve as a tutor or instructor, but that the computer instead becomes a tool that the learners can use to learn (Johnson et al., 2016). Therefore, if the teachers lack the knowledge and skill to operate the computerized teaching tools, its implementation may not be feasible. Hence, generating or constructing knowledge through something rather than educating or teaching is the focus. As a result, it is clear that there are two different sorts of construction: building in the physical world and building knowledge within (Kalpana, 2014). In the classroom setting, both the process and the product are significant. The Zone of Proximal Development is where learning occurs, according to Vygotskian theory (ZPD). The ZPD is defined as "the difference between higher levels of prospective growth as determined by problem solving under the guidance of an adult or in partnership with more experienced colleagues and the true developmental stage as measured by independent issue solving" (Vygotsky, 1978, p. 86). The ZPD describes a person's actual and probable level of development. A person needs assistance or scaffolding to go from the current level to the potential level (Nordlof, 2014) which can be provided through digital media (Fadeev, 2019). Vygotsky did not clearly outline the types of social support needed to advance an individual through the ZPD. Tools for Computer Supported Collaborative Learning (CSCL) assist pupils in moving through their Zone of Proximal Development by providing assistance in the form of the teacher and peers (Wald & Harland, 2022).

The advancement of digital technologies may make it easier for educators to evaluate and revise their methods. Communal constructivism can be described as an educational strategy in which pupils actively participate in creating information for their learning community in addition to creating their own knowledge (constructivism) as an outcome of interacting with their surroundings (social constructivism) (Rannikmäe et al., 2020). Learners are seen to be active knowledge creators within their groups. In many cases, the

instructor will act as a scaffolder at school, but this does not always have to be the case. Peers and other competent individuals can also act as scaffolds. The chances for solitary and silent work are still there in the social interactive learning that supports social constructivism (Wald & Harland, 2022). The idea of "meaningfulness" is expanded by social constructivism to encompass education as a situated activity immersed in real-world situations. The justification for real assignments is that they increase motivation and engagement (Alexander & Schoute, 2022). Focus should be placed on making a connection between what pupils currently know and what they are supposed to learn, leading to the utilization of artefacts that reflect pupils' thinking (Rannikmäe et al., 2020).

These utilization that is attributed to facts means facts on their own have no meaning unless they are understood and summed up into a complete idea. Learning must go beyond the concentration on purely factual information (Basse, 2023). Reflection could help make learning more meaningful since it is important to reflect before, during, and after learning. The cognitive constructivist view of reality is that our unique interpretation of what we observe is the only reality that matters. The learner attempts to organize his or her own experiences into already existing cognitive structure or schemes, and as a result, the change within a person occurs in the brain (Zajda, 2021). This suggests that the mind cannot be perceived as being empty.

Constructivist theory sees knowledge as transient, developing, subjective, internally produced, and mediated by social and cultural factors resulting to the development of cognitive structures. Piaget (1962) came up with a child’s stages of cognitive development. Piaget's work emerged from his biological scientific training and was affected by the fields of psychiatry and epistemology as well as the idea of evolution. His research heavily relied on observation, and he tried to elicit comprehension in three ways:

(1) by focusing on what a child does when solving problems and (2) by conducting experiments to understand how children perceive the world and (3) by speaking with children to get a clear understanding of their perception of reality. Piaget sees the child as an organism that is active and a lone scientist, which paints an image of a pupil who explores and draws conclusions about his or her explorations on their own or in solo mode (Oogarah-Pratap, 2020). According to Piaget, children learn not because of adult authority but in spite of it. Teachers should treat pupils equally and not as superiors, encouraging discussion and inquiry rather than moral agreement and restraint.

Piaget's perspective should not be interpreted incorrectly. When a grownup and child interact, cooperation and respect for one another are crucial. Furthermore, the Piagetian "lone scientist" idea has frequently been misinterpreted as if the social setting had no bearing on learning. She makes the case that it is important to distinguish between Piaget's psychological and epistemological claims. She claims that the former explains how thoughts and knowledge evolve, and the latter explains how a child develops, including with regard to social circumstances. Social engagement and exchanges between children are favoured in the Piagetian setting for cognitive development instead of exchanges between adults and children. According to cognitive constructivism, learning is a process of absorption, adaptation, dissonance, stability, and adaptability. Both children and adults act and think in accordance with the plans they have created (Ondog, & Kilag, 2023).

Disequilibrium happens when a child or adult is presented with a new encounter or opportunities of learning, and the learner must make sense of the fresh encounter using his or her current schemes (assimilations). The pupil won't be able to internalize new experiences if they are difficult for them to understand. As a result, the learner must adapt his or her current strategies to take into account the novel experience (accommodation).

Restoration of equilibrium is the effect of accommodation. One may say that the individual modifies his or her existing plans as a consequence of the new learning encounters (Ondog, & Kilag, 2023). Or, to put it another way, the individual or learner modifies existing structures to accommodate the newly acquired information. Teachers take on a variety of roles in constructivist environments, including team coordinators, collaborators, instructional planners, and advisors who oversee evaluation. Additionally, it can be argued that if one considers the Vygotskian socio-cultural theory, the educator also assumes the roles of mediator, ZPD guide, and scaffolder with the responsibility of creating authentic learning contexts and problems that their pupils can solve cooperatively by utilizing the available tools, including language. The role of the learners also shifts in this cooperative social environment, and they become self- learners, team member and knowledge managers.

Sugrue, (2020) provide a brief summary of the justification for utilizing cognitive tools: When utilized inside constructivist learning contexts, cognitive tools will be most effective, Instead of acquiring preconceived notions from others, cognitive tools enable learners to demonstrate their own knowledge representations, "Deep introspective thinking can be supported by cognitive tools, which is important for meaningful learning", It has been said that "cognitive tools have two kinds of significant cognitive effects: those that are with the technology in terms of intellectual partnerships, and those that are of the technology in terms of the cognitive remnant that is left after the tools are utilized", In contrast to the effortless learning that other instructional technologies promise but rarely deliver, cognitive tools allow for deliberate, difficult learning, Learners should be the source of the tasks or issues to which cognitive tools are applied, with guidance from teachers and other learning resources and "Tasks or problems for the use of cognitive

tools should be situated in realistic circumstances with outcomes that are personally relevant for learners," the statement reads.

In planning the educational experience, teachers should emphasize the importance of community (Basse, 2023). When developing learning experiences, teachers must also consider the objectives or outcomes mandated by the curriculum and confer with their pupils to determine what they want to learn. The teacher's position will also change from instructor to facilitator. Additionally, the instructor must see learning as a process that is not just focused on finding the correct response but also recognizes that incorrect responses might present opportunities to learn that could reframe incorrect preconceptions. Learners will be given the opportunity to use digital tools to more personally investigate and direct their learning in a cognitive constructivist learning environment. The teacher must be aware that it is very important that they address any misunderstandings or issue areas that they may notice or that the pupils may flag as troublesome. Using electronic channels as a generative cognitive tool assumes that knowledge is in the head and that it can be matched to the outside world by exploiting depictions inside the head. It also views the teacher from a pedagogical perspective as a facilitator of "cognitive conflict," a listener, and a questioner (Ondog, & Kilag, 2023).

The role of constructivist theory within this study is that, the teacher tailors the lesson preparation to the requirements of each of the pupils by taking the learners' existing knowledge into consideration when creating the learning encounters. The teacher guides in the learning process. Teacher’s perception in the constructivist classroom helps in the understanding of concepts of technology. The learners become active creators of knowledge who are seen to be involved in thought provoking activities that helps them learn and develop skills and competencies in technology use. Teachers can reflect on and

re-evaluate their approaches merits the advancement of digital technologies as method of instruction whereby pupils actively participate in the knowledge production process as well as create their own knowledge through interaction (Boonmoh, et al., 2021). The teacher or any other knowledgeable learner provides the scaffolding.

2.2.2 Models on Digital Play and Development of Digital Literacy

Both information skills and information literacy are covered by a variety of frameworks and models digital integration. Many of these frameworks or models include:

2.2.2.1 Beetham and Sharpe's Framework (2010)

Beetham and Sharpe's framework (2010) emphasizes on digital literacy as a developmental process. The framework outlines the progression of digital literacy from basic access and practical skills to top level abilities and identification. Yet, this can vary based on the setting; therefore it also illustrates how people can be inspired to learn new techniques and talents in many situations.

The growth of digital technologies that offer new potential to improve teaching and learning depends on digital literacy. Developing pupils' digital skills has several personal advantages, including: delivering high-quality instruction in creative and flexible ways, satisfying the demands and requirements of a variety of pupils through improved learning experience, raising skills and boosting employability in a digital economy, increasing pupil enrollment in the global education market, Procedure, systemic, and organizational capacity improvement and Maximizing the return on investment from investments in learning technologies, content, and services. The model explored institutional approaches to digital literacy across a variety of stakeholder groups, including top managers, teaching personnel, instructors, researchers, librarians, officials, and technical employees. It explores the "top down" strategic issues related to creating digital literacies throughout an organization as well as an "on the ground" perspective of what this entails in real life.

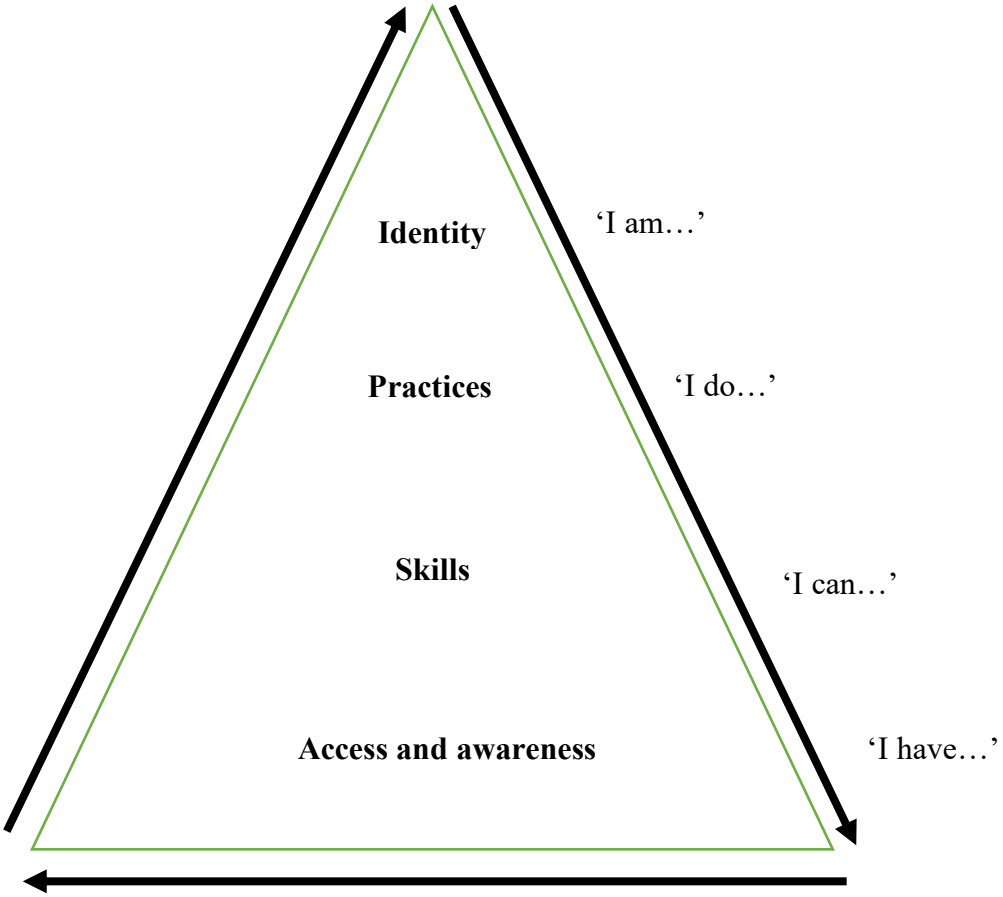


Figure 2.1: Beetham and Sharpe 'Pyramid Model' of Digital Literacy Development Model

Source: Beetham and Sharpe (2010)

The discrepancy in this model is that it emphasizes the 'top down' and the role of stakeholders in the development of digital literacy. This can be technology from the teacher who has knowledge in the field of technology to the learners. In this model the teacher share knowledge on technology and the learners work collaboratively in order to develop further skills on technology use. This study emphasizes the development of technology from 'bottom top'. The development of technology by children as they advance to higher levels of learning.

These and other models are helpful resources for promoting knowledge and including stakeholders in talks about digital literacies in order to establish common objectives. They can also be used practically to map out how these might be created, supported, and assessed. Considering digital literacy in this manner is vital because literacy is about development; language is acquired, increases in skill through time, and eventually reaches a level of fluency. Digital literacy is described as a development phase from access and competence to higher level capacities and identity in Beetham and Sharpe's (2010) paradigm. Yet, this will vary depending on the context, thus it also illustrates how people can be inspired to learn new techniques and talents in various circumstances.

2.2.2.2 The PLUS Model

The premise of the plus model is that in order for students to structure their learning and generate high-quality assignments, they need direction (Herring & Tarter, 2004). Four interconnected steps are defined by Herring and Tarter (2004) as follows: (1) Purpose, (2) Place, (3) Usage, and (4) Self-evaluation. These steps may be cyclic, repeating, or not at all sequential (Herring & Tarter, 2004). The components of the plus model, as well as the accompanying abilities and ways of thinking, include (Herring & Tarter, 2004):

Purpose: Identification of the subject, application of prior knowledge, brainstorming, and possible print or electronic sources are the objectives. *Location:* Locate information through visiting libraries, bookstores, CD-ROMs, and the World Wide Web; selecting relevant and high-quality information; using ICT to find or seek resources. *Use:* reading comprehension, the ability to skim and scan electronic content for pertinent information, comprehension of what is read, viewed, or listened to, and the capacity to connect new information to prior knowledge. Choose useful or pertinent data: Reject irrelevant material, assess its appropriateness, authority, and dependability, take notes or record it,

synthesize it in a logical framework, and use your writing and representational talents logically *Self-evaluation* Consider the procedure and pinpoint areas that require improvement.

In this study, a process relating to the four steps was used by the teachers to develop digital literacy skills among the learners. Although the four steps may not be necessary to the pupils who are to develop digital literacy competencies.

2.2.2.3 Information Literacy Planning Overview (ILPO) Model

The Information Literacy Planning Overview (ILPO) paradigm was created by Ryan and Capra (2001, p. 3), and it has been adopted widely. The following steps make up the ILPO model: Describing, identifying, choosing, analyzing, organizing, synthesizing, creating, and evaluating are the first two steps (Ryan & Capra, 2001). The ILPO model's steps for abilities and related cognition are as follows:

Defining: Create inquiries; examine and make clear the conditions of a task or issue. *Locating:* Locate and use a variety of resources, or use diverse forms, to find and access prospective sources of knowledge. *Selecting/analysing* Analyze, choose, and discard data pertaining to the issue, subject, or project. *Organising/synthesising* Organize obtained data; synthesize data with existing knowledge; and create innovative solutions. *Creating/presenting* Develop communication abilities; use them in a variety of mediums and contexts. Teachers give students the chance to gain these abilities. *Evaluation* critically assesses how well a leaner performs tasks or solves issues, and via reflection, determines what needs to be learned in the future.

According to Ryan and Capra (2001, pp. 3–4), this methodology can help students strengthen their cognitive, imaginative, and innovative thinking skills so they can come

up with answers to issues. According to Herring and Tarter (2004), the PLUS and ILPO models both share material as well as the steps to be taken and time for reflection.

2.2.2.4 Big Six Model

A model created by Eisenberg and Berkowitz (2004) includes the phases of task description, information searching, identification and access, using the information, fusion, and assessment. According to Eisenberg & Berkowitz (2004), the components of the big six paradigm and the accompanying abilities and ways of thinking are as follows:

Task definition: Describe the information issue and the necessary information. *Information seeking:* Find all potential sources and choose the best ones. Place and accessibility locate sources (both physically and cognitively); discover information in sources. *Use of information*: Interact (by reading, hearing, seeing, or touching), and glean pertinent information. *Synthesis*: assemble data from several sources and present it. *Evaluation:* Examine the method as well as the product effectiveness or efficiency.

The above mentioned models outline their use on stakeholder's engagement on digital literacy to create a common understanding of objectives. These models deal with institutional approaches to digital literacy for the development of critical and creative original thinking which guides learners develop skills on digital literacy. Little has been designed on models that can be used to develop digital literacy competencies and more specifically to young learners in their early years of learning. The above mentioned models give a guideline on the steps that can be followed towards the development of digital skills. This study explored the use of a particular approach; that is play, for the development of digital literacy.

2.2.2.5 Technology Acceptance Model

The basis of the technology acceptance model (TAM) is the user's perception of the utility and perceived simplicity of the technology (Sharples & Modules, 2014). Researchers that study the use of technology in education have frequently modified and criticized the theory (Bagozzi, 2007). The belief among users, such as educators, that a technology will facilitate their work or the work of their students will result in improved job performance (Muinde & Mbataru, 2019).

This model explains that if teachers use a method that is going to help learners acquire skills then, they will embrace it. This suggests that instructors would likely use computers if they believed that doing so would improve the organization and accuracy of their daily tasks, such as creating lesson plans, lesson materials, and analysis of student test results. The perceived ease of use of new or current technology would imply that people believe that learning to utilize it doesn't take a lot of work (Venkatesh et al., 2003). This implies that teachers might accept technology that they believe is simple to learn and use without the need for extensive expert input. This model emphasizes more on the teachers' use of technology because they have perceived it to be useful.

This study looks at the learner in a constructivist classroom who takes the centre stage in developing skills in technology. In a survey that led to the development of the Unified Theory of Acceptance and Use of Technology, Venkatesh et al. (2003) expanded the TAM to incorporate additional models (UTAUT). The study identified three factors: effort expectancy (user satisfaction), effort expectancy (usefulness and ease of use), and social influence. These factors were assumed to have a direct impact on behavioral intention in the use of technology. Gender, age, experience, and voluntariness, according to Venkatesh et al. (2003), could be categorized as moderator variables in studies on the intention to utilize technology. They contend that men will prefer to adopt a particular

technology based on socialization if they believe it will help them complete a task. According to the argument, the moderating influence of age may be due to younger people's propensity to be inspired by external variables like rewards. In this study this was not the case as the teachers were not the focus but the learners. Learners were to use what interested them the most that is, ‘play’ to develop skills in technology. This was predicated on the alleged impact of the new curriculum's mandatory usage of digital literacy in primary school (KICD, 2017).

2.3 Digital Play in Development of Digital Literacy in Schools – A Global Perspective

One definition of the word "digital literacy" is "the capability to operate digital technologies or software, to be competent of utilizing and generating digital information, to be proficient to actively engage in digital communities" (Alexander et al., 2016; McGee & Welsch, 2020). The skills necessary for a person to live, learn, and work in a digital society are known as digital literacies (Jisc, 2014). For both adults and children, digital literacy is crucial in today's communities. In a world where 50% of people are online, including 70% of the younger generation, it is crucial for citizens to acquire the skills necessary to take advantage of digital opportunities (World Bank, 2018; OECD, 2018).

Young learners especially need to be aware of this, since they tend to spend a lot of time online compared to adults (Ofcom, 2019), exposing them to both the benefits and dangers of connectivity. Digital literacy is necessary for first-time users as the second half of the world becomes online and the internet permeates new spaces. Also, investing in young pupils' digital literacy results in the development of future citizens who are more accountable, professional, and compassionate (Abu Zahra, 2020; Raheem et al., 2021). More efforts will be required to make sure that students become the content creators and involved actors that many people want for Fluck, if learners are to participate fully in the

digital age (2019). Although unwittingly, attempts to protect children from risks do not also work to constrain their options (Byrne et al., 2016 et al., p. 82). While the significance of young learners being digitally literate is acknowledged on a global scale (UNICEF 2017), there are few international data on the digital literacy of these young learners in primary schools. Statistics from the ITU, a significant source of information about worldwide ICT, only begins at age 15. In the lack of statistics, national or regional studies offer a partial indicator of digital literacy.

Despite their apparent skill with digital technologies, young learners are not necessarily digitally savvy (Pazilah et al., 2019). For instance, young learners in Bulgaria use the internet earlier and more frequently, yet they still require assistance and direction to improve their collaborative and critical thinking skills (Kanchev et al, 2016). These learner skill gaps are just as wide as those between adults, refuting the notion that they are "digital natives." Despite the lack of information outside of Europe, "the facts that are now available show that digital inequalities are not an issue of the generation and will endure into the future" (ITU, 2018; Sabiri, 2020). Despite all of these factors and the large variety of digital literacy tests available globally, there is no uniform norm. Focus, purpose: admittance, licensing, training needs analysis, and employability, target audience, adoption, development of items, validity and reliability manner of dissemination, pricing, sustainability, and accountable authority are among the diverse ways that differ. Whatever method becomes the accepted global standard, it must be a feasible and, consequently, scalable technique to gauge digital literacy in low- as well as middle-income nations. This still remains difficult to accomplish. There are ways that appear to be useful and can be used to teach digital literacy. One of the ways is through play (Plowman et al., 2014).

In terms of the resources available for play and the methods in which those resources are used in various types of play, it is becoming evident that play in the digital era is changing (Marsh et al., 2020; Reddy et al., 2020). Secondly, children today use technology differently from those who grew up in earlier generations (Milanovi, & Cvekovi, 2021). Little to no statistics shed light on pre-schoolers' access to technology. Compared to past generations, young learners today have access to a greater selection of gadgets, including smartphones and tablets (Kopcha et al., 2021). It appears, though, that this young age group continues to spend the same amount of time on screens. Notwithstanding the lack of research on pupils under the age of eight (Verenikina et al., 2016), our findings suggest that more young pupils are now accessing internet information sooner than in the past. Primary learners can interact with games, applications, and webpages reasonably easily due to the availability of touch screen technology, however this claim needs to be qualified given that not all children find touch screens straightforward to operate and some programs are not simple (Fluck et al., 2020).

The interaction of online and physical locations is another feature of modern play. The manner that toys and other artefacts are digitally mediated has undergone a number of developments (Burke & Marsh, 2013; Manches et al., 2015). As a result, play and conversation that transcend physical boundaries and combine material practices emerge (Burnett et al. 2014; Marsh et al. 2017). There has been a variety of concerns raised about how the development of technology has somehow lessened play. For instance, Vygotsky's (1978) beliefs on play as a key activity in intellectual and inventive development are cited by (Drew, 2019). Modern digital cultures offer several chances to encourage play that is grounded in young learners' daily lives. This type of play is beneficial for the development of creativity and coexists with more conventional play activities.

Edwards (2017) argues that it is necessary to re-evaluate the relationship between conventional play (construction play, pretend play), and "converged play". This is in respect to post-industrial times in a study of young learners' usage of digital technology in ten homes in Australia. She refers to play that is connected to children's well-known cultural artifacts and texts, including digital media, as convergent play. As convergent play can also result in imaginative play, Edwards contends that it is no longer fair to regard traditional play as the highest quality form. Instead, she views the two types of play as being connected rather than antagonistic. This relates to Hutt's (1971) approach, which made a contrast between games with rules and exploratory and imaginative play. This category of play is interesting because it gives consideration to both play that is improvised and play that is constrained by rules, which can both be used to young learners' digital play.

A large variety of everyday communications and literacy activities using digital media are observed and practiced by very young learners from birth to three years of age, according to pan-European study (Chaudron et al., 2018; Gillen et al., 2018). Most children are using tablets or laptops by the time they are two, according to the study, and among children under five who have exposure to tablets at home, almost a third of them possess their own tablet (Marsh et al., 2015). According to national figures from the UK, young children are using digital media at an increasing rate. Children between the ages of three and seven spend an average of one hour per day online, up to 45 minutes playing games, and two hours watching television (on a television set) (Forutanian, 2021; Ofcom, 2017). According to this viewpoint, childhood is a time when people actively participate in cultural practices and tools. In modern countries, this includes allowing children to interact with information via digital media and mobile devices (Rahman & Yunus, 2020). This shows that now is a very exciting time for school-age pupils to build an awareness

of digital literacy practices (Tan, 2019). Empirical research on young children's digital literacy practices has rapidly increased over the past several years in a range of fields (Chaudron et al., 2015; Hussain et al., 2016; Aliagas & Margallo, 2017; Marsh et al., 2017).

Technology is frequently employed in classrooms as an "add-on," with an emphasis on computer literacy and the use of computers as teaching tools (Salomon, 2002). According to Chin et al. (2020), when American educators were polled regarding their usage of computers, the results showed that they rated computer abilities as more crucial and necessary than understanding academic subjects like history and science. However, Jonassen and Carr (2020) highlight that because pupils are increasingly subjected to technology and related technologies in modern culture and can do so without much help, digital literacy does not appear to be as much of a problem as it was in the past (Fluck et al., 2020).

Concentrating on computer literacy or learning how to present material that is not connected to the curriculum would appear to position technology as the emphasis or centre of attention rather than how one may use technology to increase their knowledge and help them with problem-solving (Jonassen & Carr, 2020). This technocratic viewpoint, which advocates using computers merely for the sake of using them, has little impact on the curriculum (Otieno, 2020). According to the technocratic viewpoint, technology is a strong, independent, and revolutionary force that is independent of human control and is capable of bringing about change on its own (Valtonen et al., 2022). On the other end of the spectrum, it means that technology is a tool, not an independent force, but rather a force under human control, which may be utilized for good or bad, and that it expands slowly and gradually over the course of evolution. Hence, the change process

is led by those who utilize computers or computer-related technologies, making it "people-based" or "people-oriented" (Valtonen et al., 2022). Therefore, global technology use for young learners' pedagogical purposes is an area that needs to be researched on.

2.4 Digital Literacy Competence in Sub-Saharan Africa

There is substantial evidence that, in specific contexts, digital literacy which includes ICT can be a useful tool for enhancing instruction and learning. Many Sub-Saharan African nations' decision-makers see digital learning as a catalyst to improve educational outcomes (Piper et al., 2015). The Kenyan Ministry of Education, Science, and Technology (MoEST) is committed to raising standards and using digital literacy to enhance educational outcomes (MoEST, 2014). The National Education Sector Plan (NESP) (MoEST, 2014), which prominently emphasizes digital literacy, and the incorporation of digital learning that incorporates technologies in both the Education Act of 2013 (RoK, 2013) and the Sessional Paper No. 14 of 2012 (RoK, 2012), which serves as the sector's guiding policy document, all reflect this intent in the Kenyan policy environment. However, it is well known that its introduction of digital literacy innovation entering schools does not, by itself, increase achievement or enhance the standard of instruction (Fullan, 2007). Hopefully, the teacher's pedagogical and technical proficiency is crucial in this situation.

Agyei (2021) claims that governments in sub-Saharan Africa (SSA), like governments elsewhere, place a strong emphasis on teacher development as the key to successfully implementing policies and curricula, utilizing digital skills to improve teaching and learning, and boosting standards of education (Kipchumba, 2021). Lack of skilled instructors is a major barrier to education in many African countries digital literacy (Plessis & Subramanien, 2021). This problem is further worsened by the exponential growth in the pupil population during the past 20 years, which paradoxically corresponds

to the noble Millennium Development Goals of free universal primary education. The most enduring and formidable difficulty facing the African educational system in general, and the incorporation of digital literacy in particular, is addressing the dire need for more certified, competent instructors (Marín, & Castaneda, 2023).

East Africa has been sluggish to adopt digital literacy (Nascimbeni, & Vosloo, 2019). Despite the lack of technology, pupils are excited about utilizing computers for learning, and schools are increasingly providing laptops and tablets for administrative, teaching, and learning needs. Moreover, connection is improving. Some nations are creating digital content for use in all subjects. Information Communication Technology usage and access are still, however, somewhat sporadic, much like the energy supply. For the first time, there is the assurance of widespread access to broadband connectivity that uses the undersea cables that are currently being laid to circle the entire SSA and are already in place along the Eastern coast (Cariolle, 2021). It will take time, though, for money to link schools to one another.

Together with helpful local policies, school leadership, and curriculum, further critical needs for ICT use include the formulation and execution of national policies, as described for the East African setting by Wamakote, Ang'ondi, and Onguko (2010). They report that although there are certain gaps in implementation tactics, policies are finally being put into practice. The inclination of national policies and educational curricula in the majority of SSA nations to regard digital literacy and ICT as a separate subject in the shape of information technology and computer science when evaluated by the national examination boards presents a significant barrier. While research shows that incorporating digital education into subject learning is much more successful for learners, there is a nearly global focus on teaching basic software usage information collecting

abilities. The paucity of classroom technology and the related focus on purpose-built computer laboratories support the skills emphasis (Fyksen, 2011).

Countries like the UK, who have a high ICT adoption rate in schools, are now abandoning this paradigm, especially as the use of mobile and classroom-based technologies like portable devices and interactive whiteboards rises in popularity. Further difficulties come from the curriculum's optional status for digital literacy and authorities' disapproval of the internet and computers (Castek, & Gwinn, 2020). Another issue that has to be addressed is the lack of contextually suitable course material for both teachers and pupils (Hennessy & Onguko, 2010). Overall, despite recent advancements and the hope that many more pupils can benefit from access to digital literacy, low-income nations lack the infrastructures required for the deployment of technical resources. Also, a lot of teachers operate in environments that don't encourage the usage of digital literacy (Kipchumba, 2021). It becomes clear that there are other, significant teacher-related elements that affect classroom utilization. They are primarily teacher confidence in digital literacy and subject teachers' education to help them incorporate digital literacy into areas of learning (Dexter & Richardson, 2020).

There are numerous difficulties in generalizing digital literacies into the educational process across SSA and most emerging nations. The use of digital literacy by teachers is influenced by a variety of physical and cultural factors, some of which have been identified by Hennessy and Onguko (2010). These include factors such as unreliable access to electricity, limited technology infrastructure, such as internet access, bandwidth, hardware, and software availability, language of instruction, and software that is readily available; geographical factors such as country size, terrain, and communications; and demographic factors such as population size (Abu Zahra, 2020). Extreme poverty, an

increase in HIV/AIDS prevalence, and a lack of political will to improve the situation through effective planning all make access problems even worse (Dexter, & Richardson, 2020). Moreover, educational criteria such as teachers' levels of education, literacy rates, and access to professional development all have a significant effect in education (Kipchumba, 2020). Moreover, numerous studies show that the main obstacles impeding teachers' preparedness and confidence in applying digital literacy assistance are their attitudes, expertise, lack of autonomy, ignorance of the usage and role of digital literacy in teaching, or technophobia in instructors. Also, there is a general lack of learning tools, course curricula, and other educational materials that include the usage of digital literacy.

The idea that having access to technology encourages teachers to use it in their instruction is a widespread one. Teachers' own planning schedules and the absence of a national policy on computer use in schools were cited as the major obstacles to the utilization of computers and other digital devices (Agyei, 2021). Additional obstacles were infrastructure, such as operating computers, a lack of electricity, or internet connectivity, albeit these differed by nation especially in nations like Mauritania, Ghana, and Zimbabwe, there is a severe scarcity of computer hardware, software, and stable internet connectivity. In general, not having access to technology is unavoidably a significant obstacle, but accessibility does not imply utilization. The main problems impeding teachers' preparation and confidence in using digital resources for teaching are a lack of technical assistance in the schools and instructors' lack of knowledge in using digital learning.

Teachers frequently exhibit a constructivist approach and are eagerly involved in collaborative initiatives (zajda, 2021). To employ technology in the classroom successfully, school administrators provide very little institutional support and little

incentives. In developing nations, the curriculum is far too frequently restrictive and packed with requirements, leaving little opportunity for creative teaching methods (Langthaler & bazafkan, 2020). By coordinating curricula, tests, and rewards with the desired educational outcomes, national policies need to show a stronger commitment to assisting teachers in successfully integrating internet and digital learning technology into the classroom. In the end, computers are merely instruments for teaching and learning and add relatively little to the process of learning on their own.

The ICT competency criteria for teachers, outline three strategies: technology literacy, knowledge amplification, and knowledge production. These methods are thought of as existing along a continuum of development, and each method has different implications for the reform and enhancement of education, as well as for alterations to the various elements of the educational system, including teaching methods, instructor professional and practical growth, assessment and school administration and organization. With new innovations demanding new teacher roles, pedagogies, and areas of teacher education, digital literacy plays a special but complementary function.

The ability of teachers to set up their learning environments in unconventional ways and combine innovative pedagogies with technology is essential for the successful implementation of digital literacy in the classroom (Fullan, 2007). This calls for the development of a totally distinct set of classroom management abilities, as well as creative uses of technology to boost learning and promote technological literacy, knowledge amplification, and knowledge production. At the knowledge creation conclusion of the continuum, the curriculum goes beyond a concentration on topic knowledge to explicitly integrate 21st century skills — the capacity to cooperate, communicate, create, innovate, and think critically — necessary to establish new

knowledge and take part in lifelong learning. Here, teacher development is considered to be a key element. It optimally integrates the superior professional abilities of instructors with the pervasive usage of technology. This in turn helps learners who are active in creating and overseeing their own educational objectives in a classroom that is always improving and who are producing knowledge products. By their own continual professional development—both individually and in collaboration—teaching professionals act as role models for learners by modeling the learning process. There are two standard distinctions in the literature. Learners might discover a scenario in which digital tools are essentially used as coaches to improve learners' foundational abilities and knowledge. In a more active learning process, they can also learn using computers, where technology is applied to a range of goals and seen as a tool to foster higher-order thinking, creativity, and research abilities (Langthaler & Bazafkan, 2020).

When pupils are given opportunities to reflect and challenge their own knowledge, academic achievement improves the most. There is no doubt that teachers who implement digital learning in the classroom must exhibit high levels of vigor, diligence, and persistence, frequently in the face of significant obstacles (Emre, 2019). If they are early adopters, they will need to use creativity and perseverance to get through several obstacles. The planning process for computer-based education can be time-consuming and resource-intensive. As a result, educators employing digital tools in the classroom shouldn't operate independently of one another. Pupils require access to materials that will give them inspiration and materials for a variety of uses in the classroom, including colleagues who are also creating their own pedagogies and resources (Mudra, 2020).

Computers have immense potential for teaching, but they also confront teachers with new challenges. Nevertheless, in many poor nations, the majority of teachers possess little to

no digital literacy, and are unable to help pupils acquire it. Effective Initial Teacher Education (ITE) and Continuous Professional Development (CPD) are two of the most crucial supports for integrating digital literacy into teaching and learning (CPD).

Teachers' views and practices are most affected by both, but professional development time in particular is frequently not provided for (Emre, 2019).). Moreover, studies on teacher education in situations in the northern hemisphere indicate that conventional methods tend to be ineffective in fostering lasting practice change. Their top-down approach and lack of focus on teacher involvement, attempts to introduce digital literacy into academic institutions in SSA have also frequently fallen short of their goals. A prolonged professional development program that taps into teachers' local professional networks, promotes ongoing peer learning between educators of comparable subject matters and age ranges, and encourages responsive classroom practice is a more promising course of action (Marín, & Castaneda, 2023).

A significant challenge for practitioners and teacher educators is transforming traditional classrooms in SSA from static settings with a one-way information flow from teacher to learner to dynamic, learner-centered settings where pupils interact with peers in teams and teachers play a more facilitative role (Agyei, 2021). The use of technology intimidates many teachers, who feel more at ease using their tried-and-true teaching methods, known as traditional methods of teaching. Making explicit the potential pedagogical and educational benefits of using technology is necessary to bring about change. Teachers require assistance, role models for new behavior, leadership from their school officials, and the time they need for their own professional development and experimentation with novel strategies. Although pupils, who are typically more savvy with technology, can get material fast and dispute the teacher's position as the major source of knowledge, many

at first feel frightened by the perceived loss of power in the classroom. Yet, teachers who participate in appropriate professional development learn how to better manage their classrooms and use technology to create an environment that is more exciting for learning (Boonmoh et al., 2021).

Using computers to promote teacher development in schools at a lower cost could be of help. These initiatives, which are currently in place in Kenya, Uganda, and Tanzania, let instructors study independently and at their own pace. As a result, leveraging technology in distance and open learning methodologies for Initial Teacher Education (ITE) and Continued Professional Development (CPD), more teachers may be hired in SSA (Agyei, 2021). By working to modernize SSA education in this way, educators and decision-makers will be better able to use digital literacy to advance the educational and economic advancement of their nations. The expansion of digital literacy in the educational community, according is a crucial part of the worldwide agenda for educational reform. The isolation of digital literacy from broader policy reform, however, is all too common. ICT is a subject taught in several nations. Several academics contend that this use of ICT in education runs counter to patterns in society outside of schools, where technology is a commonplace economic, social, and cultural instrument rather than a discrete component of life (Cariolle, 2021).

Isolating ICT as a subject only has a small impact on pupils' learning outcomes, according to Burden and Shea (2013). On how to best incorporate digital literacy in education for greatest impact on learning outcomes as well as equity, educators, policy makers and researchers disagree. According to Rubagiza et al. (2011), simply implementing ICT gear and software in schools won't enable pupils to reach their full potential in terms of digital literacy. Mukuna (2014) asserted that without a change in how ICT is taught and learned

in educational facilities, many young people are unlikely to learn how to take advantage of the opportunities ICT offers. In other words, ICTs could worsen disparities for specific communities in the absence of clear governmental direction. Information Communication Technologies were initially viewed as instruments to streamline administrative tasks, the school's formal processes, so that records, enrolment information, and employee information could be efficiently managed (Hennessy et al., 2010).

In keeping with this, Ngololo et al. (2012) report that most sub-Saharan African schools have only recently begun to implement ICT particularly in rural areas. When it is utilized at all, it is usually for management. Decision-makers need to understand the value of technology in schools, particularly in the context of the learning and teaching environments. According to this idea, high level policies must be redesigned to address how ICT is used as a pedagogical instrument in an educational setting. Schools in SSA face a variety of obstacles when attempting to employ ICT to enhance learning.

In order to identify obstacles to ICT development, ICT education programs in South America and sub-Saharan Africa. The study looked into how Technology changed conventional pedagogy. Few schools in Kenya possessed suitable ICT equipment, making it difficult to integrate ICT into the process of learning and teaching. However, although ICT facilities were there, they were not effectively utilized, in part due to personnel shortages and in part because pupils appeared to use tablets more for fun than for academic purposes. Most academic institutions with computers lacked Internet connection and accompanying educational programs in terms of infrastructure. Therefore, there is still paucity of data in SSA on how young learners are supposed to develop digital literacy skills. Little to none has been researched on primary school learners of age 6

digital literacy competencies demonstrated in their teaching and learning with digital tools.

2.5 Kenyan Perspective on Nurturing Digital Literacy in the Curriculum

Kenya has made notable strides toward expanding access through online instruction. Hence, since (2017), focus has shifted to enhancing quality as well by launching a comprehensive overhaul of the curriculum and organizational structure of the educational system from primary to postsecondary levels. A significant curriculum reform was started in 2017 within this broader framework of educational change. The curriculum reform is a response to the rising perception that Kenya's current educational system (8.4.4) and curriculum are insufficient to achieve the nation's objectives as outlined in Kenya's Vision 2030. Kenya Vision 2030's main objective is to make Kenya a globally competitive nation by 2030, according to the MoE's (2014) statistical report. "Within the social pillar, the education sector plays a critical role in facilitating the process of inculcating knowledge, attitudes, and skills necessary to propel Kenya into an internationally competent nation and gaining new knowledge in a methodical manner with an in order to enhance products and processes" (MoEST, 2014).

A Competency-Based Curriculum (CBC) is being implemented nationwide with the aim of preparing students with the knowledge and skills necessary to assist the accomplishment of this goal, learners with twenty-first-century skills and competencies which main competency is digital literacy. Digital literacy aims at enabling them to take part in the contemporary global economy. These goals mirror those that have been generally embraced by educational institutions around the world. The function of curriculum in guiding the educational process toward a predefined group of objectives (competencies) was incorporated with the introduction of the CBC. In terms of digital literacy as one of the competence, the new curriculum demands a fundamental

transformation from conventional didactic teaching strategies to personalised learner-centred instruction, in which teachers serve as mentors and facilitators of the pupils' learning (Mwaka et al., 2014). In order to make learning more personalized and learner-centred, the new curriculum also asks for a change from a concentration on rare, high-stakes summative exams to the integration of more continuing formative assessments. In realigning everyday practices and norms regarding evaluation in classrooms, this shift broadly aims to redefine the role of pupil assessments in curriculum development in guiding and assisting the learning experience (Syomwene et al., 2017). Teachers need to provide more individualized learner attention.

From the literature reviewed, it shows that there is no evidence on strategies laid on how young learners of ages 6 and below are supposed to develop digital literacy competence that can equip them with 21st century skills. Little to none has been documented in the Kenyan context. Less is understood about how modern technology can enhance outcomes of learning within nations that are developing (Falloon, 2020). Digital literacy has only been partially adopted in Kenyan schools, despite playing a critical role in the efficacy, productivity, and delivery of services within education. The view among individuals that digital literacy was complex, the fact that many potential users lacked appropriate technological literacy, the lack of technical and psychological preparation, and the lack of adequate policy guidelines all hindered the adoption of digital literacy (Nikou et al., 2022; Nyaga, 2018). They said that the employment of technology in schools has been limited by a lack of proper technical and psychological preparation, which prevented attitudinal and behavioral improvements.

According to Otieno (2020), they asserted that instructors' preparation in terms of psychological and technical skills depended on training and greater investment in digital

infrastructure. New educational methods that emphasize digital literacy should be investigated and used in the teaching process (Buehl, 2023). In other words, programs that integrate digital literacy to bettering teaching and learning must take precedence over those that are output-based on digital technology. Future residents would benefit from this transformation since it would prepare them for lifelong learning. Although there is evidence that digital learning can support active learning, there is limited agreement on the best pedagogical models to use. Moreover, the accompanying gear has similar problems: While some instructors have called for stationary tools like desktop and laptop computers, others have argued for more adaptable mobile gadgets (Hennessy et al., 2010). Several obstacles have made it difficult to integrate ICT with instructional reform. The personnel that ICT advancement would impact present a challenge. Although classroom teachers are the primary carriers of innovation and the spread of knowledge and concepts at the school level, the importance of head teachers in the implementation of digital learning programs cannot be understated (Kerkhoff & Makubuya, 2022).

According to Ngololo et al. (2012), teachers have unfavourable views about digital learning and that there is a need to concentrate on pedagogical applications of digital literacy. The few schools who made heavy use of digital tools for pedagogy displayed creative leadership. Also, the introduction of digital learning in rural schools is advocated. In addition, Maina and Rosemary, (2019) noted that despite significant investments in digital literacy facilities, tools, and professional growth to enhance education in Kenya and other nations, acceptance and integration of digital skills in teaching and learning have lagged. Lack of teacher digital literacy skills, absence of teacher confidence, absence of didactical teacher education, lack of appropriate educational software, limited access to digital devices, rigid traditional educational standards, and restrictive curricula that restricts the time for digital learning in the school timetable are some of the obstacles

identified to the impactful utilisation digital literacy for quality education. Making judgments about how to solve these issues might benefit from more research into the extent to which these variables obstruct the successful use of digital literacy for education. Digital literacy is becoming more and more ingrained in Kenya's educational policy texts. The National Education Sector Strategy for Kenya from 2013 to 2018 places a lot of emphasis on using digital tools, including integrating tablets into lesson changes (MoEST, 2014). Despite this, there is no data on how digital literacy affects learning in Kenya, and the NESP paper mostly relates to on-going or planned efforts (such as the anticipated national laptop program, the digitization of the curriculum and instructional materials used in schools, and the ICT training provided by the Center for Mathematics, Science, and Technology Education in Africa [CEMASTEA].

Kenya published a national ICT policy in 2006 that applies to all industries in order to increase the accessibility of effective, dependable, and reasonably priced ICT services. The use of ICT in schools, colleges, universities, and other educational institutions across the nation was encouraged as one of the policy's primary measures for enhancing learning and teaching (MoEST & Ministry of Information and Communication, 2006). The strategy also seeks to enhance individuals' quality of life by providing dependable, easily accessible, and reasonably priced digital literacy services. In order to enhance the quality of teaching and learning, the government is also promoting the use of digital learning at all institutions of higher learning. A long-term research horizon is the integration of digital literacy into learning and teaching. In terms of methodology, few studies have been done to determine the causal effect of ICT and computer literacy initiatives. The discourse also suffers from a lack of data to back up the priority school policies place on ICT and computer literacy instruction. Integration of ICT in education was emphasized in the Kenyan National ICT Policy of January 2006. The NESP, the Jubilee platform, and Vision

2030 of the Republic of Kenya. The Kenyan government support ICT integration in education as a long-term approach for quality enhancement.

Curriculum and professional development are prioritized by ICT policy in education, and ICT learning outcomes are significantly emphasized by Investment Program No. 25 in the National Education Sector Strategy (MoEST, 2014). Nonetheless, there is a greater understanding that simply supplying hardware would not result in the needed educational improvements. Since the key to successfully integrating ICT to support the process of learning process and ultimately improve educational quality, the government is currently concentrating on enhancing teacher skills and pedagogy. The usage of digital technology in the classroom in Kenya is still restricted despite recent policy reforms, especially in basic education. Kenya and other nations like it must conduct extra study to comprehend what circumstances are essential for effective digital literacy implementation so as to deliver value for money. Even industrialized nations with strong ICT adoption rates in educational facilities are now shifting away from the approach of predominantly utilizing ICT in off-site computer laboratories. In Kenya and the East African environment, in particular with large classrooms, that are not easily or quickly transferred, the location of equipment in a closed, gatekeeper-controlled lab some distance from the school setting, particularly the early primary school, is a disincentive to its use. Furthermore, when computers are reserved for usage only on rare occasions, they are not seen as the enabling tools that they may be but rather as mysterious things. When integrated within a larger model of instructional change, ICT use can have a minor effect on learning. To the extent that it is integrated with an already successful instructional support program, digital literacy can have a significant, beneficial impact on learning outcomes in literacy. ICT integration is not a magic bullet for solving educational problems, so it must be planned in a way that can help pedagogical development initiatives succeed. Instead of integrating

the use of digital literacy into broader reform processes, the current ICT de facto policy causes information technology or computer science to be taught as a discrete subject in teacher training institutions and secondary schools, as was discussed in the review of literature above.

Numerous national ICT initiatives, including the Pan African Research Agenda, Intel World Ahead, School NET, One Laptop per Child, and the New Partnership for Africa's Development, span numerous African nations but have not yet completely integrated ICT and digital technologies with educational programs. It will be challenging for such sizable ICT projects to produce significant effects on learning if they are not created with a focus on successful educational changes (Otieno, 2020). To the fullest extent possible, Kenyan policy must take into account the use of digital literacy as a teaching and learning tool. To ensure that digital literacy education policy promotes and is backed by appropriate education policies, current educational methodologies must be changed and rationalized. The development and execution of top-notch professional development programs is crucial to this transformation in order to make sure that educators can fully utilize technology to enhance their classroom pedagogy.

2.5.1 Digital literacy Policies and Frameworks in Schools

Digital literacy frameworks, which can be found in policy papers, school curricula, certification programs, and scholarly publications, are conceptualizations aimed at creating a set of interrelated competences that aim to improve the capacities of a particular target group. The All Aboard research, which found more than 100 models to map the digital capabilities that would be required in a current economy and society, demonstrates the abundance of these frameworks in the digital domain. In order to promote the use of technology for learning in colleges and universities, another category of the digital

literacy competence framework was created. These structures, which are a part of formal education curriculum, typically concentrate on students' and teachers' digital competences (Barasa, 2021). The International Computer and Information Literacy Study (ICILS) and the International Society for Technology in Education (ISTE) standard are two examples of this type of digital literacy framework (Livingstone et al., 2019; Mascheroni et al., 2016). The National Standards for Quality Online Teaching, the International Association for K–12 Online Learning (iNACOL), and the UNESCO ICT Competence Framework for Teachers (Ministry of Education, 2011; Nascimbeni, 2018). Integration of information and communication tools in academic environments cannot be viewed as a straightforward classroom issue; rather, school systems and school cultures are deeply concerned. This has become increasingly clear over time. Localized, constrained solutions that depended on good will and pioneering work have been found to be insufficient or ineffective. The introduction of computers in the classroom, Internet connectivity for schools, the provision of course materials and access to digital resources, and teacher training as sporadic initiatives have not resulted in the "new teaching-learning techniques and functions matching the capabilities of ICT" (Nascimbeni, 2018; Byrne et al., 2016).

The majority of educators will concur that culture must change before the use of digital technology can be transformed, but that is not what they have been seeing (Kristiawan, & Muhaimin, 2019). As a result, frameworks have been created to reform education. These Frameworks are typically organizational tools that teachers are unfamiliar with (Petko et al., 2018). Here, frameworks for dealing with digital literacy in education are taken into consideration. The lack of digital literacy tools in the majority of frameworks should be noted. The frameworks created to deal with the utilization of digital technology barely mention this study, which focused on more basic ways to information research.

Digital literacy frameworks have been developed, in the goal that they will enable teachers to revolutionize teaching and learning by empowering them to not only master but also integrate technology. However, history has proven that utilizing ICT alone is insufficient to effect meaningful change. It is frequently believed that if educators are outfitted and linked, using the instruments will also come with the necessary knowledge to use them. The ICT or digital literacy paradigms that have been implemented in education follow extensive efforts that have typically started with the purchase of hardware, software, and equipment, followed by the provision of educational resources for teachers, and lastly teacher training. Unfortunately, the realization that training should be the first step occurs at the very end, when it is much more difficult to make the appropriate judgments because the tools and resources are already available. Majority of the frameworks, which implement a worldwide strategy for educational change, ought to have changed the pedagogical landscape, but either this hasn't been happening at all, or it's been very minor. In order to determine if more recent frameworks have a greater chance of achieving this, it is now vital to attempt and understand why these frameworks have not led to a generalized integration of digital culture within school settings. Schools are being forced to critically evaluate their practices for using educational technology as a result of the integration of digital technologies.

According to research based on the Global Kids Online surveys, policy actions addressing children's rights and well-being in the digital era should take the following holistic approach: When creating policy interventions, it is important to keep in mind all of the factors that affect learners' rights and general well-being in the digital age, including access, skills, dangers, and opportunities .

The DigiLitEY project makes the connection between literacy and digital literacy, arguing that three elements—operational, cultural, and critical—are involved in children's digital literacy. Operational elements include the abilities needed to read and write in a variety of media; cultural aspects include an understanding of literacy as a cultural practice; These critical components highlight the necessity of critical engagement and the need to query issues of power, representation, and authenticity (Sefton-Green et al., 2016).

In the literature on policy and research, there are both protectionist and empowering viewpoints (Carretero et al., 2017). The first viewpoint sees media, ICTs, and the internet negatively and calls for digital literacy as a way to protect learners from digital risks, while the second perspective sees those as positive developments: in this view, digital literacy becomes a way to give learners access to information as well as freedom of participation and expression. While studies have demonstrated that opportunities affordable to all ages in the digital world outweigh the threats (Buckingham, 2010), evidence supports the necessity to balance the two perspectives when it comes to learners (Byrne et al., 2016).

Digital literacy was acknowledged by the ministry of education in 2016 as one of the seven important competences that every Kenyan citizen should possess and as one of the fundamental abilities for learning (Ministry of Education, 2017). Projects that seek to ensure that everyone is digitally literate, such as those that include digital skills into school curricula or create computer labs and community learning centers. As an illustration, the Kenyan Ministry of Education has changed the national core curriculum (from preschool to grade six) since 2016, and put more emphasis on broader cross-cutting competencies rather than subject-based learning objectives. Digital literacy is integrated into all competence areas in the core curriculum, with a separate space devoted to it

(Ministry of Education, 2017). This strategy provides more opportunities for development of learner digital literacies through local curriculum and the engagement of individual teachers.

2.5.2 Digital Literacy in Kenyan Context

Although it is asserted that today's children are digital natives who need to use technology and ICT-related instruments for learning and teaching, it is still necessary to teach comprehension and reading skills. Additionally, it is asserted that several learning theories encourage the use of digital tools in teaching and learning. The current state of affairs in Kenya is out of step with the world as a whole. There are a lot of distinctions amongst Kenyan schools. This is demonstrated by Table 2.1 (Department of Education, 2019).

Table 2.1

Distribution of Schools with Computers in 2016

County	Schools installed	Schools pending	Total schools	Percentage installed
Elgeyo marakwet	369	0	369	100%
Nandi	709	0	709	100%
Taita Taveta	194	0	194	100%
Makueni	887	0	887	100%
Uasin-Gishu	456	0	456	100%
Transnzoia	351	1	352	99.72%
Kitui	1232	6	1238	99.72%
Kisii	697	1	698	99.86%
Murang'a	482	0	482	100%
Nyeri	389	3	392	99.23%
Kericho	502	1	503	99.01%
Vihiga	378	0	378	98.94%

Schools installed 21, 638; Devices 1,169000

21,638 public primary schools received tablets from the government, which also purchased them. This amounts to 99.6% of all primary schools in the nation, and 1,168,798 tablets have been provided for use by pupils in grades one through three. Due to financial restrictions, 1,902 new schools overall have not acquired the equipment. ICT

integration training has been provided to 331,000 teachers. Among them, 93,009 teachers have received training on using Computers and devices, while 218,253 teachers have received training on the Competence Based Curriculum (CBC). “Further training for 121,000 educators in public and private schools was provided in December 2019,” Yet the teachers do not implement the use of the devices. This shows a huge digital divide, in comparison with the developed world like United States of America.

According to (NETP, 2004), "During the past decade, 99 percent of our academic institutions have been linked to the Web with a computer to learner ratio of 1:5." the Internet connection within US schools is almost 100% (NETP, 2004, p. 10). Additionally, the United States of America in 2004 (NETP, 2004) states unequivocally that access to computers and the Internet must be increased, as well as that the pupil-to-computer usage ratio must be reduced even further.

Given that Table 2.1 makes it very evident that the situation in Kenya is severe, this poses a significant problem for Kenyan pupils and their connectedness. In that, it is only the distribution of the devises which is seen. The use of the devices remains unclear. The Department of Education (2016) asserted that more schools are using digital devices for both teaching and learning. However, some of the schools are still without laptops and tablets (Department of Education, 2016). So, it is evident that there is a significant digital gap. The Department of Education has not yet fulfilled its promises of delivering more digital devices to schools. To bring Kenya up to pace with European and Westernized nations, a lot of effort still needs to be done, according to an analysis by Myovella et al., (2020). A total of 22,927 schools have electricity connections, 19,042 of which belong to the main grid and the rest 3,885 are in distant places and are supplied by solar energy, according to the Kenya power formally Kenya Power and lighting Company (KPLC).

Efforts to connect and develop uninterrupted power supply to all schools to support digital learning has been on going. The connection has also benefited the nearby villages. Moi University and Jomo Kenyatta University of Technology would assemble 1.2 million new gadgets on a local assembly line. Phase two of production is now underway with a focus on pupils in Grades 4-6 and for general sale. Digital devices with approved material for pupils in grades 1 through 4 are available (KICD, 2017). Teachers regularly update the Kenya Education cloud's content (Elimika portal) or at the institute for upgrading.

Digital literacy is of great concern to the Kenyan government after the funding of the tablet project. The Kenyan government highlights in its curriculum statements that technology is essential and important because it might help the country transition to a new model of teacher development and teaching, learning, and assessment via digital literacy, it is hoped that technology will spur the creation of fresh approaches to teaching that emphasize teamwork, creativity, and problem-solving. This is because the widespread use of tablets in classrooms should make curriculum implementation easier (Department of Education, 2016). It seems that tablets as tools used to learn with could help define the function of instructors in the learning and teaching process (Department of Education, 2016).

Musyoki, (2021) first put up the notion that laptops and tablets could serve as engines for advancement and change. The computer might be a potent tool for achieving a dramatic shift in education philosophy and teaching. The government has emphasized the importance of technology integration in educational practices as a component of curriculum change. The Department of Education claims, digital literacy as one of the competence, should be used to change the way that learning and teaching is done in education. By 2030, technology should be used to give pupils the abilities they need to

fully engage in the knowledge society (Department of Education, 2016). Yet, little has been shown to occur in Chesumei constituency especially in Mutwot Zone on how learners are supposed to use their digital literacy skills for learning. The Apple Classrooms of Tomorrow (ACOT) demonstrates how technology may be a key component of teaching and learning change. This shows that using technology could help the Kenyan Department of Education realize its new vision for teaching and learning. By the use of digital tools, pupils should be able to search for, use, apply, and author information through collaborative learning. They should also be able to access, analyze, evaluate, integrate, present, and convey information (Department of Education, 2016).

It appears that the idea of knowledge as the gathering of knowledge and the emphasis on rote learning might indeed be surpassed to become knowledge production and meaning making with the application and integration of ICT. Understanding is created by learners by connecting new information to previously acquired knowledge, a process known as knowledge construction or meaning making. Given the significance of the aforementioned, it is crucial to note that the inclusion and incorporation of ICT into schools won't always result in the immediate development of all the aforementioned thinking abilities. Also, it is important to keep in mind that digital literacy is not a magic fix for all of our educational problems (Mudra, 2020). Information Communication Technology, on the other hand, might help in the process of developing these skills. The development of teachers, their exposure to digital learning opportunities, and their availability to on-going digital literacy support are some of the factors that have led to this realization (Sabiri, 2020).

Kenya Institute of Curriculum Development (KICD) explains that in order to execute the new curriculum, teachers must develop unique and innovative ways and competencies.

The new curriculum's defining characteristics are active learners (as opposed to passive users) who can think critically and apply knowledge skilfully (Department of Education, 2016). A high emphasis should be placed on skill development rather than rote learning, and pupils should be taught to be critical of their learning and the environment in a good way (Department of Education, 2016). Collaboration is also emphasized. Integration of information and its connection to real-life circumstances are of utmost importance. The educators must change their ways of thinking in order to help pupils become creators of knowledge rather than only knowledge disseminators.

In order to reinforce pupils' value, activities in the classrooms should become learner-centered with constant feedback as a cornerstone regarding the development of their learning (Department of Education, 2016). The fundamental and core competences that will be cultivated in the competency-based curriculum, which represent the following, are equally vital: (1) Interaction and cooperation; (2) analysis and problem-solving; (3) imagination and creativity; (4) Citizenship; (5) Digital literacy; (6) Learning to learn and (7) self-efficacy, round out the list. The CBC curriculum should include the competences as a core component. When one considers what is meant by the use of technology in teaching, one may see the value of critical thinking, self-management, information gathering and analysis, effective technology use, and learning methodologies. Digital skill literacy requires not just the ability to acquire pertinent, authentic, and current information on the web, but also the ability to critically evaluate the information obtained and use it to address the issue(s) at hand (Blum-Ross & Kumpulainen, 2019). According to Barton and Dexter (2020), having technological know-how does not automatically translate into the ability to use information effectively. For this reason, these abilities should be considered as part of the technology integration process whenever computers are being used. It becomes apparent that the new learning and teaching strategy being

considered is one that is built around meaningful learning. Meaningful learning is simply defined as learning that takes place "when learners are actively making meaning" or when learners are wilfully engaged in a meaningful task. Pupils go on to define meaningful learning as learning that exhibits the following five characteristics: (1) active, manipulative, observant; (2) constructive, articulative, reflective; (3) intentional, reflective, regulatory; (4) authentic, complex, contextual; and (5) supportive, participatory, interactive.

The development of 21st-century learning and thinking skills through the use of digital literacy is a crucial, globally encouraged topic (Brun-Mercer, 2019). All people need to have "digital competence" in order to be able to function in the present and the future. The aim of digital literacy ought to be higher-order cognitive skills (HOTS) in a framework where people comprehend what it means to live in a digital and networked society; these writers make it abundantly obvious that digital usage must surpass digital literacy. When individuals are able to find and acquire knowledge in a community that has become more and more linked, mastering digital literacy could help to empower and emancipate them (Mujan et al., 2019). The use of tablets and laptops in school, citing four justifications: the social, the vocational, the pedagogical, and the catalytic (Hawkridge, 2022). By utilizing digital literacy learning methodologies including project-based learning, problem-based learning, inquiry-based learning, and the proposed digital play approach used in this study, it may be able to realize the type of learning that the Kenyan Department of Education has suggested. The four rationales would be satisfied by these integrative approaches because, as pupils use tablets as tools, they will be learning more about them and, presumably, become less anxious about them as they grasp the social rationale (Hawkridge, 2022).

Additionally, the linked learning abilities indicated could give pupils useful abilities that could help them when they become adults and must work for either themselves or someone else, realizing the value of a career. These integrative approaches could possibly support realizing the didactic rationalization of learning and teaching differently because they call for a different style of instruction, different teacher responsibilities from the conventional models, and distinct classroom management techniques from the conventional transmitting approach strategies. Hence, employing digital holistic techniques that vary from conventional learning and teaching and conventional digital literacy inclusive ways could serve to launch a transformative change process within education and equip schools for transformation.

Digital literacy may become one of the primary accelerators and a stimulant for the development of futuristic learning environments where learning is much more social, which will require instructors to take on new roles in order to achieve the prospective learning and teaching that is envisioned. Despite the altered setting, instructors will continue to play a crucial role. This implies the need for change (Escudeiro et al., 2018) Children will have to wait for pedagogical and technological advancements in education (Kopcha et al., 2021). That change and rethinking of education and its related essentials is an urgent situation (Craig, 2018), and repackaging existing solutions is a hallmark of reforms, and as a result, the status quo actually persists.

Notwithstanding the fact that schools need reform, that transformation is only likely to be successful if "schools embrace and implement the changes in education sector" (Lee et al., 2022), by shifting the prevailing notion that educators should instruct and exert control in favor of pupils who learn (Fosnot, 2013) digital play could be the catalyst for this reform (Zajda, 2021). This might therefore make it easier to switch from the conventional

learning and teaching style to a constructivist one. Addressing the distinctions between the conventional and constructivist classrooms, Table 2.2 compares the conventional classroom to the classroom of the future as envisioned by Brooks and Brooks (1993, 1999), including complementary characteristics.

Table 2.2

Comparison between Conventional and Constructivist Classroom

Traditional Classroom	Constructivist Classroom
Learners are merely passive receivers of information.	Learners build knowledge with the aid of others.
Learners wait for the teacher to direct learning	Active learners
Learner mostly works alone	Learners mostly work in groups
The teacher sees the pupils as "blank slates" to be filled with information.	Learners are viewed as thinkers with emerging theories about the world. (Cognitive novices)
The majority of educational activities use tactile resources and information from textbooks, workbooks, and other sources.	Primary sources are frequently used in educational activities
Instructors typically act didactically, passing along information to learners. Instructor talks, learner takes in	Instructors often operate in a way that engages learners and mediates the learning environment. Less instructor speaking, more active learning
To validate learner teachings, teachers look for the right responses.	In order to comprehend learner learning and employ it in subsequent ideas, educators desire the learner's view of information.
Testing is the primary method used to evaluate learner learning, which is seen as distinct from instruction.	Evaluation of learner learning is embedded into instruction and takes place through portfolios, exhibitions, and instructor observation of learners at work.
Knowledge is from one source	Knowledge is situated in living systems and is dynamic.
Programmatic memorization	Learning that is meaningful builds on prior knowledge and is useful and kept
The teacher plays an authoritative, directed position.	The function of the teacher is that of a coach, mediator, and strategist.
Programmatic repeating exercises promote learning.	Learning that is meaningful builds the known to the unknown.
The curriculum is taught piece by piece, with a focus on fundamental abilities.	The curriculum is delivered whole to portion, focusing on the main idea

Source: Du Plessis (2004, Brooks and Brooks (1993, 1999), Prawat (1992), Bodner (1986) and McMahon (1997)

Today's pupils pay attention, but adults literally bore them to death with conventional ideas about learning and teaching yet today's pupils are digital natives who crave interaction (Sailin, & Mahmor, 2018). Integrating digital literacy could help teachers better comprehend today's digital natives (learners) and undoubtedly play a significant part in inspiring pupils to develop a more positive attitude toward the educational environment.

Employing technology can help learners improve their literacy abilities (McGee and Welsch, 2020). They contend that in the digital information age, pupils must develop comprehension techniques like reading, asking and answering questions, observing and making prediction, combining new concepts with prior knowledge, and creating visual displays to demonstrate understanding, selective reading, summarising and synthesising, navigating text and finally interpreting and evaluating information. McGee and Welsch (2020) state that, teachers have to come up with innovative developing the aforementioned strategies through exercises. They do caution teachers that these abilities do not emerge overnight. Mifsud (2021) suggests a five-step process for developing each of the aforementioned comprehension reading methods, including (1) educating pupils about the strategy, including its benefits and its application, (2) modeling the strategy with pupils and teachers, and (3) execution through collaboration and the provision of scaffolding when necessary, (4) guiding learners toward independence. Finally, learners can independently use the technique by designing their own solo or group assignments that allow them to demonstrate their expertise in the tasks at hand.

2.5.3 Digital Literacy Competence

The capacity to locate, assess and create understandable information using writing and other media is known as digital literacy competence on any given platform (Beetham & Sharpe, 2011, p. 1). In addition, digital literacies refer to those abilities that enable a

person to live, learn, and work in a digital society. The intellectual, cognitive, emotional, social and physical, linguistic, and artistic domains are among these developmental domains. Rational reflection and learner participation are essential for building digital literacy abilities that will help pupils transition from the classroom to the workplace. Social media should be used in the classroom for both learning and collaboration. Teaching in the digital age is more about pupils discovering and producing information for themselves than it is about giving it to them. Learners must develop skills in handling digital gadgets (Miller et al., 2017; Chang et al., 2018).

Digital literacy competence therefore can be defined as possessing the information and abilities required to use a variety of digital devices and material efficiently and safely. Cell devices, smart phones, tablets, laptops, and desktop computers are a few examples of these gadgets. These are all examples of network-enabled gadgets. Computer literacy abilities should not be mistaken with digital literacy, which focuses primarily on network-enabled devices (Mifsud, 2021). The growth of literacy must go beyond the confines of conventional text-based reading and writing. The growth of digital literacy should also encompass reading and writing on digital devices. Traditional types of literacy and computer literacy, however, help people acquire digital literacy abilities more quickly.

If someone has a wide variety of digital knowledge and skills and has a fundamental awareness of the possible applications of computing equipment, they are considered to be digitally literate. The ability to use desktop communication networks, participate in online social networks, understand and follow ethical behavior guidelines and search, evaluate, and use information sourced from digital platforms are all examples of digital literacy skills. Additionally, the digitally literate person should be able to use technology in a

secure and safe manner while also being able to evaluate the type of information that is gathered so as to promote and improve the environment (British Council, 2015).

Digital literacy as a competency includes knowledge and abilities relating to the proper use of a range of hardware components including such computers, tablets, and mobile devices, as well as their software, such as but not restricted to internet search or web application software. Due to the rapidly evolving field of information and communication technology and the continual development of technical gadgets and the software that goes with them, digital literacy is a dynamic competency. Since the industry works to meet the rising demand for effective and efficient communication technology on a global scale, this is a field that is always innovating and developing. Nowadays, one of the primary basic competencies for education and daily living in the 21st century is regarded to be digital literacy. It pushes the boundaries of conventional wisdom and practice while encouraging more original, imaginative, and frequently transformative learning. Everyday usage of voice, video, text, and screen-based resources is ingrained in learners' lives from birth, and even very young children are exposed to the 21st-century paradigm of digital communication, entertainment, and gaming.

Technology transformation will unavoidably have an impact on young children's early literacy development as well as how parents and expert educators can prepare today's youth for a connected world in the future (Säljö 2010). The phrase "digital literacies" has been used to describe the variety of learners' literacy activities and abilities across digital tools, platforms, and media. According to Steiner and Mendelovitch (2016), educators consider digital literacy as valuable in their classrooms, particularly when it comes to encouraging pupils' focus and active learning. Since these digital devices may be altered in accordance with the pace, skill level and demands of the learners; digital literacy meets

the needs of all learners at once. Studying on a tablet saves time and is more dependable (Steiner & Mendelovitch, 2016).

Users of digital literacy competence face a myriad of challenges which include; lack of technological expertise, apprehension about making mistakes, and scarcity of time and time required to learn digital literacy (Sabiri, 2020).Teachers' seniority and age were viewed by Steiner and Mendelovitch (2016) as major impediments. Steiner and Mendelovitch (2016) noted that teachers' reactions to the integration of digital literacy could occasionally be fearful. Lack of support from the administration can hinder digital literacy use (Falloon, 2020) yet technology is shaping education in innovative ways such as in improving all linguistic abilities. Various software and applications including play have greatly improved both learning and teaching.

Technology provides a plethora of information and knowledge for both instructors and pupils. It makes it easier for teachers and pupils to use digital content and match it to their academic needs. Technology makes it easier for teachers and pupils to combine fundamental abilities and apply them to particular topics. To educate reading and writing, for instance, images and text can be combined (Kopcha, et al., 2020). Technology integration increases teachers' enthusiasm in lessons and raises student involvement, according to Mertala (2019). Unlike textbooks, which force teachers to adhere to the printed subject material, technology enables teachers to employ a variety of contents (Sabiri, 2020). Also, technology has aided teachers in tailoring their lessons to the needs of their learners. Learners have the chance to learn from one another through digital learning. Technology has made it feasible for teachers to provide each learner with individualized feedback and direction. Teaching and learning have both benefited greatly from digital learning in a variety of ways such as learning language and communication

skills (Otieno, 2020). Technology facilitates the pupils to go over any lessons again until they understand them. By removing location and time constraints, digital literacy enhances teaching and learning techniques (Buehl, 2023).

Using technology in the classroom allows pupils communicate their learning challenges and helps them learn language (Sabiri, 2020). Technology transforms pedagogical setting, which has enabled the actuality of collaborative learning. Technology, improves communication between pupils and teachers as well as between pupils and other pupils. By enabling instantaneous learning and quick sharing, technology has eliminated the old restrictions on material access and poor sharing. The use of technology in the classroom has improved pupil motivation and involvement, leading to greater comprehension and Vygotsky (1978) provided compelling evidence that playfulness can result in positive learning and development results.

As a result, digital literacy has frequently been developed as part of larger frameworks of 21st-century skills. The importance of young learners using a variety of technologies as a foundation for the future acquisition of competencies and skills for functioning and growing up in a digital culture, as well as for higher educational pathways, employment, and citizenship, has not, however, been adequately studied. Children begin to acquire knowledge, skills, and attitudes that are crucial to their future development as individuals and as community members at a young age. Digital literacy and 21st-century competencies highlight fundamental elements of growing up in modern societies and receiving assistance from families, communities, and educational institutions in fostering a culture of lifelong learning. First, in the lives of school-age children, digital technologies are a fairly new and rapidly evolving phenomenon. However, too often, the eulogy for education reform by way of digital technologies is provided without recognizing the

relationship to confirmed pedagogical strategies, without engaging with the public mission of education, or without addressing accessibility/equity issues. Digital technologies do, and will keep playing, a role in instructional reform and innovation (Reich & Ito, 2017). To develop, a lot of work needs to be done to school going children in order to develop digital literacy competence.

2.5.4 Methods of Developing Digital Literacy

Beyond basic Computer abilities, digital literacy refers to a broader range of digital behaviors, routines, and identities. Digital literacies are fundamentally a collection of professional and academic contextual practices enabled by various and evolving technology since what it implies to be technologically literate evolves over time and between settings. Recognizing digital literacy in this sense is crucial because literacy is about development; over time, we learn language, get better at it, and eventually reach fluency. Digital literacy the progression from access and practical knowledge to higher level abilities and personality (Falloon, 2020).Yet, this will vary depending on the context, thus it also illustrates how people can be inspired to learn new techniques and talents in various circumstances.

Building leadership and strategic thinking skills around digital literacy at every levels is crucial for institutional change since a digitally literate school is better suited to handle a variety of difficulties. Institutions must offer opportunities and support services that help learners and employees improve their digital literacy. Enabling a helpful IT architecture that promotes flexibility and a variety of digital behaviors, encouraging a climate of innovation and change where a variety of engagement options are encouraged and staff and students are involved in strategic discussions about digital literacies at all levels (Kopcha et al., 2021). Assessing current policies, procedures, and procedures will help prioritize improvement areas and gain a better understanding of how digital literacy is

supported. Ensuring that systems are in place to properly evaluate and advance the digital talents of learners and staff, and acknowledging the need for support services workers to improve their own digital literacy. Staff and learners rewards and recognition are important drivers of participation in learning activities.

The strategic growth of digital literacy depends in large part on the conventional financing in the career development of its workforce. An important message for schools is that procedures and policies need to spur growth across various academic and support jobs in a variety of ways. This is explored in the section on fostering staff digital literacies, which also covers approaches and tools. One of the approaches of digital literacy skill acquisition is through play (Hutt et al., 2022).

2.6 Play

Play has been used as one of the ways through which learners learn in a more engaging manner. It is though play that children can show their potential and helps the child develop cognitively (Piaget 1952; Vigotsky, 1978). Teachers can use play to develop digital skills (Taylor & Boyer, 2020). Play is a universal phenomenon and to date children have continued to play. Childs play is recognized by the United Nations High Commission (Human Rights 1989) as a right of children. International Play Association, (2016) recognizes play as recreational and that which can be recognized in children's activities. Play has been of great interest to educators, scholars of child development and education, theorists, psychologists and therapists (Jessen et al., 2019). Play takes place in a serious thought-provoking, full of aspects of knowledge, growth, and advancement (Taylor & Boyer, 2020).

Play is an interaction between both the environment and the person that is self - determined, internally managed, and devoid of many of the restrictions of objective

reality, (Buehl, 2023). Children engage with the environment around them through play, and as a consequence, play enables them to acquire new skills and competencies that boost their resilience and confidence and prepare them for future obstacles they may face on a daily basis (Jemutai & Webb, 2019). Moreover, play encourages an ideal learning atmosphere through which they can perform and grow naturally. Play is a random, voluntary, enjoyable engagement that entails a mix of body, object, symbol use, and interactions. There is a lot of intrinsic motivation that is developed in children through play as children play they engage deeply (Buehl, 2023).

Play is a valuable encounter that children find it to be incredibly fulfilling as well, eagerly seeking it out and finding it to be endlessly engaging. Play is a simple joy that is a treasured aspect of childhood. During play children share joyous moments together and can be seen laughing and smiling as they play. Play is therefore about creating plausible, alternative worlds that help players perform at their peak levels; being intellectual, imaginative, unique, and inventive. Play supports children in educational, social-emotional, language, self-regulation and builds exclusive functions.

Play may be messy, imaginative, and hands-on, which is crucial for academic success. By interacting with the children through play, teachers can concentrate on the children's interests, skills, and educational, sociological, and emotional growth (Taylor & Boyer, 2019). This type of play is typically preferred by children since the teacher demonstrates for them (Edwards, 2017). Play has developmental benefits and can promote learning in a variety of ways (Keung & Cheung, 2019). According to literature, educators must take part in the play experiences offered to children in order to facilitate subject learning. Together with play, guided play is when a teacher incorporates scaffold learning goals while keeping the focus on the child (Thunder et al., 2023).

Guided play promotes academic development because it fosters a learning atmosphere where children are encouraged to play and study. A powerful technique for young children is guided play. Preschoolers benefit from an organized curriculum that offers plenty of cognitive stimulation. Children's learning, engagement, and curiosity are emphasized in the guided play, which is advantageous for pupil education. Play supported by educators develops in young children by having longer talks and asking open-ended questions that encourage more talking while playing; this improves their language abilities (Hadley & Dickinson, 2019). The children show excellent growth in vocabulary. Child-led conversation about words rather than adult-led conversation supports word learning. They demonstrate that language can be fostered in reading and guided play environments. With all the positive value of play, little has been documented on how teachers can use play for classroom instruction. A lot has been documented on the value of outdoor play yet guided play which is an area that aids the development of pedagogical purposes requires further research (Taylor & Boyer, 2019).

2.6.1 Play and Child Development

More focus is being given to young children learning via play and discovery in early childhood programs. Also, a key component of young children's learning experiences should be digital literacy. Due to the implementation of such programs, digital play and literacy must now be incorporated into the early childhood curriculum. A description of digital literacy that goes beyond the desktop computer is necessary for a variety of contexts in which play and digital literacy seem to coexist, such as touch technology or the role of technological toys in socio-dramatic play. Desktop computers are still the main source of digital literacy instruction in early learning environments, and this trend is expected to continue for some time. Use of computers and play are both considered crucial for childhood development within curricula efforts, but prior research has

demonstrated that in early year's classrooms, are frequently secondary to the main task of learning (Verenikina et al., 2016).

Learning' is interwoven into the idea of digital play, as play is a crucial component of how educators teach children to build both conventional print literacy and more multimodal literacy features associated with the idea of digital literacy (Hutt et al., 2022). Moreover, Marklund (2022) notes that the informal professional development activities using online social network groups to debate how to use tablets in education show that instructors are building their own perspective on how to confront digital learning and technology use in primary schools.

Former U.S. Secretary of Education Arne Duncan spoke about how teachers must use technology to transform both how they educate as well as how individuals learn. Teachers are currently living through a technological revolution. He underlined that teachers must collaborate with their peers to remove any barriers standing in the way of a deeper grasp of the digital resources at their disposal. Digital technology provides learners with powerful new surroundings that encompass models, animations, scaffolds and guided practice sets, and experts who may be located far away, similar to how the printing press enabled individuals to educate from books as well as teachers. Using technology to enable tailored learning or interactions which are more interactive and relevant is one way to enhance and improve learning (U.S. Department of Education, 2016).

The NMC Horizon Report 2011 K-12 Edition, a similar piece by Johnson, Adams, and Haywood (2011), stressed that digital media literacy continues to gain relevance as a crucial ability in every discipline and vocation. The insufficient training that is frequently supplied within teacher education makes this, a significant difficulty for education. The research also highlighted how instructors are starting to understand how their failure to

support learners in developing and using digital media literacy skills throughout the curricula and their lack of acceptance of digital media literacy as the norm limits their ability to learn.

Today's pupils are among the most technologically adept generation ever to come through our academic institutions reading instruction (Thunder, et al., 2023). This generation has thoroughly normalized the use of digital technology and it is now fully incorporated into their daily life. This is a new skill that is yet to be developed in Kenyan primary schools due to challenges of access and meager competencies on the learners. Teachers in this context need to embrace the value of play, as play can help learners acquire skills.

2.6.2 Importance of Play

Play has a lot of benefits. These benefits include; creativity, sentiments of confidence and competence, collaboration and negotiation with others, Adaptability in communication, personality, and tolerance for uncertainty, ability to take risks, a sense of a measure of environmental control, adaptability, Sensorimotor processes and problem-solving (Boyer, 2020). With all the literature that has been documented on the importance of play in children in early years of learning, children never get enough time to play (Staempfli, 2009). Children's play has not been given a lot of attention and that "play has been undervalued, and their opportunities for uninterrupted free play are under threat." The main reason is that priority is being given to acquiring academic skills as early as possible (Taylor and Boyer, 2020) and children given a lot of pressure to accelerate in their academic skills. Play has been pushed to the periphery of the curriculum due to high demands for teacher accountability and outcomes that are measurable (Thunder et al., 2023). Though, Jensen et al., (2019) say that play enhances learning when children are encouraged to engage in it. Play is the "medium of learning at all ages since many aspects of play improve the process of learning," and Centre for Science and Policy concurs.

According to teachers, occupational therapists, educational psychologists and pediatricians, play is important for children's development (Thunder et al., 2023). Yet, play has become increasingly structured unlike earlier years when play gave joyous moments to children (Taylor and Boyer, 2020).

2.6.3 Pedagogical Value of Play

Play is an integrative undertaking that is essential for a child's whole growth. Play is, in reality, the most effective, potent, and fruitful way for young children to acquire the information they need, according to Kinkead-Clark, (2019).Piaget clarified that during play, children get various opportunities to learn about their surroundings these opportunities helps them accept and integrate new knowledge. Therefore, play gives the basis for education. It lays the foundation for literacy development necessary for acquisition of academic skills (Smith, 2013). Playing is a learning component, and when done together comprise a process of gaining knowledge (Marklund, 2022). They all belong to the same epistemology. There is a connection between play and developmental domains. The linguistic, intellectual, cognitive, emotional, social, physical and artistic domains are among these developmental domains. Jean Piaget, Vygotsky, and Bruner were among the first theorists who associate learning and cognitive development (Donald et al., 2010). Play and cognitive development were originally connected by Piaget and Vygotsky in 1962 and 1978, respectively. Research shows that integrating play into development is crucial. According to Shonkoff and Phillips (2000) explain that research has shown that play is crucial for the healthy development of the brain and has yielded great effects on brain development. Play enables all essential brain functions to naturally integrate.

2.6.4 Types of Play

Hutt et al., (2022) explain that there are many forms of play which include; sensory motor play, exploratory play, socio dramatic play, object play, play with rules and digital play. These forms of play develop adaptation, innovation, flexibility and enhanced problem-solving. This study focused on digital play towards the development of digital literacy.

2.6.5 Digital Play

Digital play plays a role in pedagogical interactions and literacy development (Buehl, 2023). The availability of tablet technology in the learning environment for primary school pupils has changed playtime and the chances that subsequently arise for literacy acquisition. Technology brings language and literacy development to children. Technology builds strong minds, places and futures. Technology has enormous contribution towards literacy and the ways that pupils interact with their environment through play. Vygotsky scripted, ‘The child primarily develops through play activity, according to the author, who also stated that "in play the child is always acting beyond his age and above his regular everyday behavior; in play he/she is, in a sense, a head above himself" (Vygotsky, 1978, p. 74). Even though there isn't a single definition of play, it is understood to be a significant developmental effect on pupils with the potential to progress their intellectual, socio-emotional, linguistic, and literacy development (Verenikina et al., 2016; Edwards, 2017).

The designation of play as a "right of the child" acknowledges the advantages of play (article 3 in the United Nations Conventions of the Rights of the Child, (UNICEF, 2018). Children take charge of their activities when they play, making them meaningful within the frame of their play. Examining what actually happens for young learners in play environments is necessary. Play is recognised as a renowned sense for a child to obtain collaboration and communication skills (Siraj-Blatchford, 2009), but it is this idea of the

context for play that gives us a way to examine the various ways that young children interact with language and literacy for different purposes.

The engagement through play develops other mental or social abilities (Edwards, 2017). According to Vygotsky (1978), children learn through socially relevant interactions, and language is both a social construct and a crucial learning aid. Children can express their comprehension of experiences and surroundings effectively through play. Unfortunately, little research has been done on young children, or those in the first few years of primary school, on the use of digital play for learning. Digital play, according to (Mudra, 2020 p.6), is "the first fundamentally distinct type of learning that has been offered in at least some hundred years," and "it demands an especially comprehensive consideration of its function in children's lives".

Due to young children's increased access to digital tablet technologies, there is an urgent need to concentrate on children's digital play. Many instructors currently prioritize integrating digital technologies into reading, writing, and communicating lessons (Hutchison & Reinking, 2011; Saine, 2012). Tablet technologies are practical, portable, and more cost-effective than other types of technology. Young children spend considerable time playing with computers or smart phones (James et al., 2009).

The effect of digital media on young children's play is controversial. According to research, 70% of 4- to 6-year-olds in the US spend an average of more than an hour every day on a computer. On the one hand, some criticize how pupils are drawn to these new digital play formats and express concern that technology may hasten the demise of unstructured, conventional forms of play (Kinkead-Clark, 2019). Others enjoy these technology advancements and the new play opportunities they bring. For instance, Marklund, (2022) suggests that computers might encourage project-based learning in

schools whereas Falloon, (2020) show that playing computer games can significantly enhance children's capacity for imagination. Digital media are here to stay and will be extensively used by young children, despite any potential drawbacks, such as an increased risk for visual strain, obesity, and other side effects of sedentary behavior (Taylor and Boyer, 2020).

The crucial question is how to utilize the benefits of these new media so that they enhance rather than detract from children's playtime. According to Mudra, (2020), the utilization of computing resources is typically used to supplement conventional teaching approaches with software that supports literacy and numeracy. In addition, a study by Otieno, (2020) revealed that teachers felt underprepared to integrate digital learning into the curriculum. Children who have fun, pleasant computer experiences during their formative years are more likely to develop a favorable attitude toward digital literacy that will benefit them well as they advance into their formal education (Buehl, 2023). It is well acknowledged that play fosters children's development across domains and that play has positive effects on early learning. It has proven difficult to pinpoint what makes play such a useful tool for learning and growth. It is important to note that thorough study has shown the great developmental potential of addressing an activity as if it were play rather than not play. Learners identify play activities as those that take place without adult supervision, are self-selected, and can happen on the floor instead of at a table (Marklund, 2022). Even though these traits appear to be fairly superficial, subsequent in-depth research into problem solving after practice in settings that children define as either play or not play has repeatedly shown that children's interpretation of an occurrence has a substantial impact on their accomplishment and behavior.

People are considered to be digitally savvy if they have a wide range of digital abilities and a fundamental awareness of how computing equipment could be used Verenikina et al., 2016). Due to the growing demand for effective and efficient communication technology, this is a field that experiences ongoing innovation and improvement. Digital literacy is currently regarded as one of the primary basic competences for education and daily living in the twenty-first century. It promotes imaginative, creative, and frequently transformative learning while testing stimulating thinking and practice (British Council, 2015). This study intends to investigate various perspectives on the topic of digital play as a way to increase learners' digital literacy.

Additionally, during the past few decades, the world has seen a significant transformation in information and communication technology (KICD, 2017). This has altered the transmission and reception of information. Today, information on any subject is widely accessible and is constantly being created, shared, and distributed through extremely effective digital channels. It is true that a lot of knowledge is produced online. This has made it necessary to transform how teaching and learning are thought, created, and provided in the educational sector. Teaching in the digital era is more about learning and knowledge creation than it is about imparting information to the pupil. The implementation of suitable pedagogy that promotes 21st Century competencies like blended learning, solving problems, creative and critical thinking, and creativeness will be impacted by this paradigm change. Digital learning has enormous potential to enhance educational outcomes KICD (2017), claims and enhance equity in education. The republic of Kenya is implementing the Competency based Curriculum and one of the competencies is digital literacy that entail the 21st century skills.

A complicated collection of component abilities are required for digital literacy, including the capacity to recognize, comprehend, analyze, produce, and transmit textual, printed, and digital texts. Emerging digital literacy acknowledges the abilities and attitudes that are the developmental forerunners of digital literacy (Neumann et al., 2017). "The integrated cognitive, technical, and social-emotional competence of an individual to properly use digital technology across the diverse settings of life. The learner gains various advantages from the usage of digital technology in the classroom. They include simple access to digital information and concept comprehension and encouraging learner-centered, self-directed learning in which pupils can decide how to arrange and understand knowledge. With all the benefits of digital play little has been documented on play with the digital devises and the acquisition of digital competencies. This is an area of research that this study needs to fill on the role of digital play and the acquisition of digital literacy skills.

2.6.6 Stages of Digital Play

The phases of a learner's digital play were described by Haugland and Wright (1997). When a pupil uses computer software for the first time, he or she plays about with some of the program's functions and investigates specific aspects of it. The pupil uses the application initially reluctantly and with adult assistance, and as their confidence builds, they become more independent. Finally, the pupil can operate the computer program on his or her own. This concurs with Hutt's (1971) observation that when pupils come upon what seem unusual, they first investigate it to see "what does this object do?" When comfortable with the item, they play with it and explore its potential uses. Before engaging in actual play, children must have time to become accustomed to the hardware of computers and tablets as well as certain games (Taylor and Boyer 2020).

In contrast to the worry that computers can isolate children from one another, they add, playing with a computer can give children opportunity for rich social relationships. Children frequently watch other children play, remark on what they're doing, and offer assistance to one another when using a tablet (UNICEF, 2018). Instead of asking the teacher, children are more inclined to ask their classmates who are sitting next to them. Yet, because there aren't enough computers, disputes about turn-taking and usage frequently occur. All too often children can clear up this dispute on their own, but other times teachers must step in to help (Emre, 2019). Software designed for pupils must focus on resolving disputes and be open-ended (Sabiri, 2020). They continue by saying that software should offer "micro-worlds" where pupils can choose what to investigate and have chances to satisfy their curiosities. As these closed-ended programs restrict learners' initiative and decision-making, drill and practice are not necessary. Open ended programs do not require pupils to determine a single correct response. Instead, they encourage pupils to expand their thinking and engage in exploration (Buehl, 2023).

Playful learning software encourages originality, innovation, initiative, and exploration. Learners can have conversations and engage in creative play with open-ended software. Also, it has been discovered that open ended software encourages learners to behave more cooperatively than drill-and-practice systems (Falloon, 2020). Events playing out on the computer monitor can inspire anything from straightforward acts of pretend play to more complex types of socio-dramatic play. Play is facilitated by on-screen activities because participants are attentive to what is being shown and can utilize computer content for off-screen play activities (Sailin & Mahmor, 2018). Playful learning software encourages originality, innovation, initiative, and exploration. Learners can have conversations and engage in creative play with open-ended software. Also, it has been discovered that open ended software encourages learners to behave more cooperatively than drill-and-practice

systems (Mudra, 2020). Events playing out on the computer monitor can inspire anything from straightforward acts of pretend play to more complex types of socio-dramatic play. Play is facilitated by on-screen activities because participants are attentive to what is being shown and can utilize computer content for off-screen play activities (Taylor & Boyer, 2020).

There are many positive, pro-social, and educational video games available for learners. These video games encourage innovative and creative play. Such computer games can be used by learners to encourage learning, enjoyable play, and growth. It's also possible that success or winning in video games is considerably more significant. When they play, for instance, they do better and are more motivated and engaged with the activity. They also use more deliberate problem-solving techniques and have higher levels of metacognition and self-regulation (Buehl, 2023). Learners are likewise inspired by situations that provide control and choice and foster good impact, according to studies that unintentionally generated pupil judgments of digital competence. The greatest way to include digital literacy into early childhood curriculum may be for educators to supervise pupils' learning opportunities through suitable dialogical engagement (Otieno, 2020).

Technology-assisted learning has gained widespread attention (Lee, 2021), and there are particular traits that can be encouraged with its use. These qualities include supporting the discovery of passions, collaboration, independence, motivation, sincere praise, independence, patience, and respect, as well as giving choices and fostering decision-making. When used properly, technology gives pupils a new avenue for research and discovery. Teachers should take advantage of pupils' intense interest in computers and tablets, which has the potential to assist learning, and provide it with the appropriate actions and materials.

Using computers in small groups of pupils fosters collaboration and teamwork, which helps pupils build healthy peer connections (Rahman & Yunus, 2020). Pupils feel as though they are emulating grownups when using tablets, especially those who are important to them. They are pleased of themselves when they can show off their successes and receive praise and congratulations for accomplishing something that the adults can do (Reddy et al, 2020). Tablets also "surrender" to pupils by providing them the authority and duty to carry out the duties they decide on. Pupils believe they have the power to run the device because they know that it will never scold them if they fail, or point out their errors. Tablets will commend their effort, will respect their pace of learning, and will give them plenty of time to consider and answer questions (Nascimbeni, 2018). In this approach, learners' autonomy and independence are increased, and they also get the possibility to practically immediately "inspect" their accomplishments and receive concrete consequences (Mudra, 2020). Teachers need to be conversant with digital media for them to guide the learners.

2.7 Teacher Training and Digital Media

Mifsud (2021) explains that while examining digital behaviors in elementary schools, it is necessary to move beyond the notion of culturally defined knowledge building. The three components she names—individual know-how or knowledge, language, and materiality—which make up a potential analytic space. These three factors are components that influence how educators create, sculpt, and develop their digital practices. According to Misfud, the shortage of suitable educators in the pedagogical use of digital technology makes it necessary for these teachers to have a certain level of specialized expertise before engaging in digital activities. Discussion, materialism, and individual knowledge make up the three dimensions, elements of success when using digital media in schools (Lafton, 2012).

2.7.1 Discourse

McGee & Welsch (2020) argues that it is significant to recognize that educators must situate themselves and their work in respect to societal discourse patterns. This interpretation can be influenced by the idea of media panics. An emotional, as opposed to logical, response to the arrival of new media is called a media panic. Before schools can completely incorporate digital play in their learning activities, these reactions have resulted in a number of obstacles that must be solved. According to Emre (2019), the majority of justifications for using ICT in schools have to do with the pupils' long-term welfare. Future and future society discussion functions as a discursive pattern. Teachers, who are in a position to make these dreams a reality in the classroom, have strong beliefs about the role that IT will play in our society. Teachers claim the need to develop techniques to construct open-ended learning activities and improve their capacity to notice and react to learners' initiatives in order to become more flexible about the level of control in learning activities. The authors Howard et al., (2012); Lai et al (2018) concur with these claims.

Open-ended inquiries foster an enjoyable learning environment for children. According to Hawkridge (2022), closed apps place learners in the role of knowledge consumers while open apps place learners in the role of information producers. They make the point that using more open apps enables the creation of learning scenarios that are more similar to how technology is used more naturally outside of the traditional educational setting. Furthermore, Sandvik et al. (2012) stress the value of exploratory discussions when using digital literacy in educational contexts.

According to Karila and Rantavuori (2014), instructors must work together to develop new procedures that ease pupils' transitions from preschool to school. According to them, educators have a greater input in how these lessons are created. In this partnership, the

teachers' knowledge is somewhat ignored. Their expertise in the use of play for educational objectives is frequently disregarded or excluded from the talks, demonstrating how school education predominates in comparison to formative days learning and care norms (Taylor & Boyer, 2020). This study aimed at using play, as pupils discuss and share ideas in their groups, in a collaborative manner so as to acquire digital literacy skills.

2.7.2 Materiality

As Fluck et al (2020) note, it might be difficult to tell materiality from discourse. They talk about the fact that institutionally responsibilities, systems, and procedures of schooling appear to work against incorporating technologies in the classroom and that digital literacy has a longstanding experience of being discussed as a facilitator of change and innovation, an idea that has also been endorsed by governmental conversation for decades. According to Lynch and Redpath, this is mostly due to the emergence of digital literacy, which is altering the roles and relationships used in institutionalized methods of learning and teaching. According to Sandvik et al. (2012), interactions between pupils and tablets in the classroom might be viewed as literacy-demanding circumstances or occurrences. They contend further that standard print literacy is no longer sufficient to comprehend social discourse and significance. In their opinion, since textual content, pictures, music, and numbers are all intertwined in a culture that is becoming more and more reliant on the capacity to read screens, communication should be viewed as multimodal.

Edwards (2017) advocates digital play as an essential topic of debate in early years' education as a means of bridging the gap between analogue and digital. Edward claims that we may today understand the context of learners' lives as a digital consumer environment. In this new setting, pupils are seen as consumers, which appear to have an

impact on the environments in which they can play. Their play takes place in a digital consumerist context, which is defined by the potentials made possible by the integration between different products, digital media, and digital technologies along a continuum of digital to non-digital experiences, as opposed to play in which adult life is interpreted. This viewpoint suggests that shifting social trends could be to blame for altered play behaviors in children. Early childhood educators can mistake a possible reduction in learners' play quality for new playing styles that are in line with modern culture than with how we now think about learning and play.

Nevertheless, it is yet unclear how these altered play patterns affect pupils' development. What aspects of apps are most crucial for supporting young learners' learning is a less discursive issue. Falloon (2020) asserts that objectives of the lesson should be communicated in ways that pupils can access and fully comprehend; smooth or distraction-free pathways should be provided to help users reach their goals; clear instructions and teaching materials should be included; and formative corrective feedback should be used; combine the right amount of game, practice and learning elements; offer engagement criteria that are matched to the target learner group's learning preferences.

Falloon contends that app designers must create tools that help learners improve their literacy. Nevertheless, the fundamental concern of this study, is the dearth of well-designed educational apps. Therefore this study aims at using the available resources – the digital devises, use the play programs to develop the digital literacy skills. A key component of academic achievement is the effective use of resources that are child centered that develops exploration among the learners (Gee, 2012); unlike when a book is used as a guide for mentoring. Books and digital media both run the risk of becoming

passive, when utilization is not put in place. The study aims at utilizing the play programs available in the tablets for the acquisition of skills and competencies.

2.7.3 Individual Knowhow

The study by Neumann et al. (2017) explains what instructors think about teacher efficacy and the curricula. They identify three aspects of teacher competence as knowledge of what and why, technical expertise and interactivity, rationality, and operational competence. Also, they claim that although instructors already possess a wide range of interdisciplinary approaches, there were still some areas where it was necessary to improve, such as when assisting learning in the subjects of science, mathematics and digital literacy. Research on digital competence and learning in general frequently addresses the positions of teachers. According to Nikou et al., (2022), people can achieve two different levels of proficiency in both conventional and digital literacy. It is highlighted as being crucial for the individual to learn a level of academic language in regards to conventional literacy, reading, or writing or a language in the context of digital media or digital technologies in order to be capable of succeeding in the contemporary age using these literacies. According to Sheridan et al., the definition of teacher competency is also continually being recreated in light of societal changes and altering ideals in preschool regulations and syllabi.

According to Ntorukiri, et al. (2022), adult mediation of pupil technology use in school tends to have a favorable impact on the play encounters of children. They go on to say that when pupils are using tablets for learning and play, educators need to moderate their interactions with them in a way that both supports the process of learning and gives the pupils the right level of independence, flexibility, and responsibility (Buehl, 2023). They contend that adults can help learners think more clearly. According to Bennett (2014), the extent to which our cultural traditions have been computerized will have an impact on

how society views us in the future. Therefore, they contend that the outcomes of technological advancements ought to be central to classroom activities. They also stress the need of teachers ensuring that the relevant technology is presented and utilized in a way that will help learners improve their capacity for critical reflection and that what they learn will help them in their duties as citizens. According to Rahman & Yunus (2020), educators and researchers must collaborate to develop digital literacy learning support systems that provide an equilibrium between child-initiated and adult-led activities. They contend that the teacher's communication style and how the software is incorporated into daily tasks have an impact on the learning outcomes.

2.8 Importance of Utilizing Digital Media in the Classroom

The Web as well as other information and communication technologies (ICTs) are reinventing the essence of communication, writing and reading, according to The New Literacies and contemporary Technological advances, a stance statement from the International Reading Association (IRA; now known as International Literacy Association) (IRA). The survey confirmed that literacy teachers must incorporate these new competences into the curriculum as a way to get pupils ready for effective civic engagement in a global setting. The position statement listed a number of crucial topics that pupils should have access to: Teachers who efficiently use digital technologies for teaching and learning, Peers who properly utilize digital literacy and freely share efficient techniques used in a variety of literacy contexts and objectives, and a literacy program that provides possibilities for group reading, sharing, and content creation. So there still exists paucity of play on digital devises in the development of digital literacy.

Learners switch between varieties of these user types as they mix them in new ways, which serves to show life as it is experienced through the lens of digital technology. Schools must provide learning opportunities that are interesting in the present but useful

in the future. Critically, this would allow schools to re-engage with what today's youth is doing and promote their development of future-ready abilities, such as cooperation, inventiveness, personality, and media literacy (Green & Hannon, 2007). In its Top Ten ISTE's Education Technology Priorities for 2010, the International Society for Technology in Education (ISTE) took a similar viewpoint. Technology in education must pervade all aspect of the process of learning, according to one of the objectives (ISTE, 2011).

Although digital literacy has the power to affect change (Falloon, 2020), the system of education around the globe has preserved itself in a way that makes technology an add-on to match conventional methods of learning and teaching. Teachers appear to be among the system's defenders of traditional methods of instruction and learning (Tondeur, 2020). These are agents who are unwilling to alter. As a result, when it comes to utilizing technology, teachers adopt it by: integrating it into their current practices, avoiding change, and adding technology to an existing practice; using technology to improve the effectiveness and efficiency of current learning and teaching, extending and deepening existing practice (Ma'rifah et al., 2021). The outcome is that tablet becomes a tool to learn from which acts as a transmitter of knowledge in the classroom (Jonassen & Carr, 2020), utilizing tablets and laptops in conventional ways. The distribution and teaching, where educators are the disseminators and pupils are the recipients, informs the educational premise in the use of digital tools. This is referred to as employing computers to accomplish conventional aims or using technology to speed up, simplify, or improve learners' access to traditional learning methods. The teacher continues to be the only knowledge source for pupils in this conventional setting. This study aimed at using a strategy that focused on the learners' use of technology as the teacher facilitates the learning process at school.

2.8.1 Digital Integration at School Level

According to the Apple Classrooms of Tomorrow (ACOT) project, instructors go through three phases when confronted with advancement: survivability, mastering, and influence (Raheem et al., 2021). They are given the digital devices; leave them to gather dust in offices without use. Educators struggle in the survival phase because they are being exposed to so many new situations, issues, and technological advancements. The teachers ask themselves questions like: "Will I get it?" (Raheem et al., 2021) They lack sufficient comprehension of tablets and computers, which makes it difficult for them to foresee potential issues with technology and the new classroom environment. As a result, they frequently respond to issues with ambiguity. In the mastery level, teachers get more comfortable using technology and start to improve their problem-solving and preparation skills. This leads to a sense of assurance or mastery, that is; "I can do the work." The emphasis of the influence stage is on how their use of digital devices in education has affected learner understanding and perceptions. The ACOT project viewed change as an ecological method that proceeds through five phases: entrance, implementation, adaptability, expropriation, and innovation. The teacher serves as a leader, rejecter, re-affirmer, co-learner and adopter (Lawrence & Tar, 2018).

According to the UNESCO report, there are four stages to the application of digital literacy: (1) emanating, (2) implementing, (3) integrating, and (4) reshaping. Schools begin to acquire computers and software in the developing stage, and they begin to explore the potential of using digital tools. Just as what the Kenyan Government did by providing the tablets to schools. The use of digital tools is primarily intended for the educators' individual utilization. This level is still largely characterized by conventional teacher-centered practice: educators talk, pupils listen and writes what the teacher says. Subjects have set at a particular period in the school schedule. Access to technology for

pupils is provided by teaching staff. Administrators and teachers and administrators use digital technologies for duties that are already completed in school administration and curriculum during the applying stage.

For the Kenyan case, this is stage where the curriculum support officers CSO's use technology to train school managers and teachers on how to use technology. The classroom environment is still primarily controlled by the educator at this point. Schools work to modify the curriculum so that more subjects can use digital devices. Teachers are beginning to employ digital technologies for training and professional growth. Since the utilization of computer generated materials increases, certain improvements in their methodology are being influenced by digital literacy. Learner access is through the computer room or taking the devices to the lecture hall. At institutions that use a variety of computer-based technology in computer labs, classrooms, and office buildings, the infusing step entails integrating digital literacy across the curriculum. Combining topics and time periods allows for more flexibility on how schools are organized. The World Wide Web and community content are just two of the many sources used. Instructors start collaborating with other educators to resolve issues and share pedagogical encounters, become more innovative in their planning, and taking into account various styles of learning.

The transformative stage marks the start of a fresh way of thinking about how to re-new and re-imagine school organization in original ways. Using technology becomes routine for them. Instructors experiment with new teaching and learning methods and employ a variety of strategies. A clear transition from a teacher-centered approach to a learner-centered approach occur. The emphasis shifts to practical applications, and access to technology is no longer limited. This would seem to show that integrating technology is

by no means simple, as people and institutions go through different stages of development, some more quickly than others. Therefore, it would be essential to create a relevant strategy, model, and/or framework for educator participation and preparation. This would help with the adoption and integration process. Using the digital devices as tools to learn with to achieve goals of constructivism. This study aimed at designing a model on the association between play and the development of digital literacy skills.

When the digital devise is used as a tools to learning with, the phrase "learning with context" describes the environment in which pupils build their knowledge. With careful and demanding instruction placed in relevant and meaningful situations, the pupils construct their own interpretations of information. Deep thought, including creativity and reflection, is key to this process (Jonassen, & Carr, 2020). This is referred to as the creative utilisation of digital technologies whereby pupils construct knowledge. This situation is described as technological applications that go beyond conventional learning methods to enable new and improved forms of learning. Although, according to Krumsvik et al. (2018), the deployment of digital literacy has a minimal impact on learning in technologically advanced nations like Norway. Incorporating components of cooperation into lessons can help teachers and pupils develop their capacity for extreme and unconventional thinking on a deeper level. Digital devises can be utilized as tools in three various tool modes: (1) as cognitive tools, (2) as mediational tools, and (3) as transformational tools. Also, the aforementioned tool modes recommend several educational uses (Erbas et al., 2021). These opinions represent constructivism's execution of its (Valtonen et al., 2022). The use of digital play with the tablets can provide skills for technology implementation and integration to achieve the goals of constructivism.

2.8.2 Supporting Learner-Created Digital Products

Porter (2010) issued a warning about the need to give learners' digital tools more rigor so as to work and engage them with digital media. Teachers should consider if their pupils' digital products show what they know and truly comprehend beyond what is already known, or whether they only show how they are experimenting with and developing their technological skills. Teachers should first figure out the kind of communication that is required, then choose the method that is appropriate for the objective or the pupils, and finally determine the instrument that needs to be utilized. Porter emphasized that including pupils in the process aids in boosting their sense of ownership, affinities, and independent learning abilities. Considine et al. (2009) emphasized the necessity for teachers to handle the complicated, high-tech media settings that are a part of pupils' daily lives in order to educate our pupils for the 21st century. They emphasized that this includes teaching pupils both what technology and media "do" and what they "do with" it. It is not sufficient for teachers to merely incorporate media, technology, or media use into their lesson plans. Therefore, it's crucial to give pupils explicit education in media that makes it simple for them to understand and grasp the content of written materials as well as texts that include images, sounds, or other types of multimedia (p. 474). Pupils must be prepared with knowledge skills and competencies that make them agile adopters of technology. Play seems to offer much and through play with the tablets, learners can develop the skills and competencies necessary for 21st century.

2.9 Chapter Summary

Literature reviewed in this chapter focused on the theories and models, the global perspective of digital play in development of digital literacy in schools, digital literacy competence in sub Saharan Africa, Kenyan perspective of nurturing digital literacy in the curriculum, Play as one of the methods that can be used for the acquisition of digital skills,

teacher training and digital media. The importance of utilizing digital media in the classroom and finally supporting learner-created digital products was reviewed. From the literature review, it became evident that there is lack of global data on young learner's digital literacy and more specifically for pedagogical purposes. Digital literacy in SSA is still at infancy stage. Technology use by the children is an area that requires further research. Literature reviewed in this chapter on the importance of play together with Vygotsky's constructivism theory of 1978 was used as analytical lens for findings of this study. The next chapter is about research design and methodology. The chapter provides details of the methods of inquiry that inform the design, data collection and analysis of this qualitative research study.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The purpose of this descriptive study was address the following objectives: To explore teachers' perception of play way strategies of learning in developing digital literacy among pupils in primary school; Examine primary school pupils' digital literacy competences demonstrated through play way method of learning; Assess the challenges primary school pupils face in developing digital literacy through play method; and Design a model on the association between play way strategies of learning and development of digital literacy competencies among pupils in primary schools. This chapter therefore highlights information on the research design and methodology used in conducting the study. The chapter further presents the theoretical foundations of the study, the data gathering and analysis procedures, and the philosophical grounds that formed the foundation for this study. The tools used to generate the data are listed, and the methods used to gather and analyze the data are described. Lastly, ethical issues and factors for validity and dependability are outlined.

3.2 Research Paradigms

3.2.1 Interpretivism Paradigm

The qualitative data in this research located the investigation into a specific area of the 'Interpretivism paradigm (Creswell & Creswell, 2018). The researcher adopted the interpretive paradigm because the objectives and the research questions were answered using the qualitative research tools. These tools included observation, semi structured interviews and open-ended teacher reflective journals. Interpretivism allows the researchers to gather different views and ideas from the participants who share their ideas in their own words. Through Interpretivism paradigm, the researcher is able to make

meaning of (interpret) what others have about the world. The researcher explored teachers' perception of play way strategies of learning in developing digital literacy among pupils.

According to Creswell and Creswell (2018), interpretivists believe that people want to comprehend the environments where they work and live. Unraveling the essence of particular human experience is important; therefore understanding the phenomenon is important to the researcher (Yin, 2014). As a research methodology a case study research strategy enables a rigorous and systematic investigation of the phenomena (Creswell & Creswell, 2018) thus was relevant for this study in order to uncover the digital competencies demonstrated through play. The teachers generated individualized interpretations of their experiences, interpretations directed at certain things or things which for the case of this study was the use of digital tools (Creswell and Creswell, 2018).

3.3 Study Design

A case study research design was used in this investigation. Any empirical work and case study research uses multiple methods for data collection and analysis (Cohen et al, 2018). The research objectives outlined by the researcher in this study employed; interviews, observations and teacher reflective journals to collect data. Each objective employed a different method for data collection.Case study research designs describes, interprets events, situations and/or conditions (Yin, 2018). Cohen et al. (2018, p. 376) state that "Instead of just providing readers with abstract theories or principles, case study design offers a singular instance of actual individuals in actual instances, allowing them to comprehend concepts more easily" allowing the researches to "to enter into situations in unconventional ways predisposed to numerical analysis" (Cohen et al., 2018, p. 376). The researcher in this case penetrated into the classrooms to observe how the classroom was organized in terms of the promotion of digital literacy.

Shared with the teachers their experiences on digital literacy using the play way method in order to examine, analyze, clarify, and describe in depth the occurrences, actions, learners and institutional strategies (Thomas, 2011; Yin, 2014), as is happening, giving an opportunity to thoroughly analyze particular events (Yin, 2018). It is the ‘thorough analysis of a tiny sample’ which according to this study was a zone and a thorough examination from several angles of a particular, absolute 'project, strategy, organization, programme, or system' to capture its 'complexity and originality' (Rashid et al., 2019). A case study thus adds uniqueness to a research study (Cohen et al., 2018). In addition case studies guide one to “see the situation of the participants” by giving them a chance to express it in their own words. The researcher in this case study listened to the teachers and saw the activities learners engaged in during the play sessions with computers. These computers and laptops were availed to public primary schools in the area which the study was carried out. The hermeneutic tradition of research, which involves viewing a situation through the participants' perspective, is widely followed in case studies (Cohen et al. 2018 p.380). This resulted to the choice of interpretive paradigm. Interpretive paradigm permits the researcher gather different views from the participants. The objectives of this study aimed at looking at the classroom in promotion of digital skills, observing the teachers as they undertook the digital play sessions in order to gather their experiences on the use of digital devices and how they expressed their views on digital play as they filled the reflective journals.

The researcher explored how they perceived the play sessions and whether they felt that learning took place by participating in it. The advantage of a case study is that it offers originality and enables the researcher to show how a range of elements influence a phenomenon being researched (Hyett et al., 2014) and explored detailed insights on the encounters of the those taking part (Aggarwal et al., 2019). Even though case studies have

many benefits, they are frequently criticized because of their reliance on a particular case. Singularity, limits a generalizing conclusion (Hyett et al 2014; Cohen et al., 2018). However according to Kozma and Anderson (2002, p. 390), when it comes to technology-based cases "the emphasis is not on the distinctiveness of these instances, but on what can be learnt from them concerning how technology can be utilized in educational transformation." This became an important factor in this study as the goal was to gain an in-depth understanding from the situation under study in order to make improvements on methods of teaching and teacher training. Generalization is problematic within case studies but this does not indicate that case study results are unimportant. The outcomes are pertinent for specific case and in other contexts. This study used participants from various schools (multiple cases). It could help in a research study with the verification of specific elements or the identification of inconsistencies or discrepancies between the cases connected to specific aspects (Yin, 2018). The investigator could learn from several situations if the theoretical hypotheses are true or whether other explanations are pertinent

The case undertaken in this study was a single case study in which the researcher explored, explained, identified and described experiences (Yin, 2014) of the participants and ascertained whether there was change towards digital literacy. Due to the potential for investigator subjectivity, case studies as a research method have drawn criticism for having problems with validity (Cohen et al, 2018; Denzin & Lincoln, 2011). Investigative partiality can be overcome, according to Yin (2014) by using multiple sources of evidence.

3.4 Research Methodology

The research approach that was undertaken is the qualitative approach because the researcher used qualitative methods to collect data. These methods were interviews, filling of journal reflection sheets and observation. The researcher also gathered views

from the participating teachers in order to explore their perceptions of play way strategies of learning in developing digital literacies, examined the competencies demonstrated through play way and the challenges the learners and teachers faced in the development of digital literacy. This guided the researcher on the choice of the interpretive paradigm (Lincoln et al., 2011; Mertens 2010). According to Cohen et al. (2018) interviews warrant the investigator to gather information that cannot be obtained from observations and enables one to go further into respondents to learn more about their encounters, sentiments, and perspectives, concerns and interests. Open-ended questions during interview process to best enable the individual to express their views and experiences unimpeded by any viewpoints of the researcher (Creswell & Creswell, 2018). According to de Vos et al. (2011) the most common data gathering method in qualitative research is the interview, which is regarded as one of the most effective methods for both participants and researchers to comprehend others (de Vos et al., 2011)..

3.5 Study Location

The research was done in public primary schools in Mutwot zone, Chesumei constituency, Nandi County-Kenya. Nandi County has a population of 885,711 (KNBS, 2019). The county has two institutions of higher learning and two teacher training colleges. The public primary schools within Mutwot zone are 30 schools. Most of the public primary schools are connected with electricity and most of them received the government laptops. The 12 public schools that were selected by the researcher are the schools that were within almost similar geographical area and close to one another for ease of movement by the researcher.

According to Sutton and Austin (2015), an ideal study environment should be reachable by the researcher and allow for quick interaction with the participants. In Mutwot zone, few schools implement the use of digital literacy in teaching and learning. For significant

qualitative research that offers in-depth details about the primary concept or phenomenon being studied, a small sample size can be used (Creswell & Creswell, 2018). Several regions of Nandi County are still important despite the selection of the Mutwot zone. The necessity to make the best use of the most likely time and human resource allocations informed the selection of the study area. In addition studies of this nature have not been carried out in Nandi County. Integration of digital literacy in the classroom boosts the teachers and learners in the utilization of resource material donated by the Kenyan government. Additionally, the schools selected were those with functional tablets, laptops and had a reasonable chance of attaining the aims of the study. For the purposes of anonymity the selected schools were designated pseudo names and the names of the teachers were not mentioned. All the children in grade one class were considered for the study.

3.6 Target Population

According to Cohen et al. (2018), a target population is defined as the group to whom the investigator would preferably wish to generalize their research findings. It is regarded as any group of people that share one or more traits and are relevant to the researcher is referred to as the target population (Cohen et al., 2018). The selected sample in the study area that the researcher plans to analyze is the target population. The overall population of study participants or the entire environment that will be examined. Mutwot zone has a population of 30 public primary schools with 13500 pupils and with 450 teachers. This is the overall population of learners and teachers. Grade one class was considered for the study. The class had a minimum of 40 learners with two teachers per grade in some schools. For the 12 schools selected purposively, 24 teachers and 480 learners were considered to take part in the study.

3.7 Sample Size and Sampling Procedures

A sample is a portion of the population from which the researcher wishes to generalize his or her findings (Cohen et al, 2018). The sample size is a subset of cases selected from a larger population and generalized to the study population (Neuman, 2014) in order to make conclusions about the complete set. Yin (2014) observes that determining the sample size entails the procedure of picking a subset of instances to be incorporated in a study. This study sampled 12 public primary schools in Nandi County, one officer in charge of quality assurance from the sub-county, head teachers of the schools, 24 grade one teachers and 480 learners. The teachers were sampled purposively engaging existing grade 1 classes in the county. Campbell et al. (2020) argue that the ideal method for obtaining a representative sample is through purposive sampling, which involves deliberately focusing on a population that is thought to be dependable for the study.

Purposive sampling method, according to Creswell and Creswell (2018), is a way of choosing sample cases that include the data needed to support the study's aims. Its goal is to choose topics that have been carefully selected because they are instructive or exhibit the necessary qualities. The schools were selected purposively based on the criteria that they were public primary schools in Mutwot zone with functional computer laboratories. The qualitative idea is not to generalize findings but to develop a thorough understanding of the concept being studied. Grade one teachers guided their pupils in the guided play as part of the research process used in this study using the tablets available in schools. The researcher and grade one teachers created time out of the scheduled timetable. For schools that retained the pupils for the afternoon remedial, the afternoon sessions were used for digital play while other schools used one lesson per week for the English activity lesson. Play programs available in the school tablets were used during the play sessions. Grade 1 teachers were also selected purposively. In Mutwot zone teachers who teach grade one,

two and three are specific teachers for those classes. Therefore, those specific teachers teaching grade 1 were selected for the study. The play activities done on the digital devices were age appropriate and related to the subject areas taught in the competency bases curriculum. The plays involved drawing, painting and colouring, matching objects of similar types and colours, grouping and stacking objects, counting and naming, numbering, filling in blank spaces in weather symbols and spelling game.

The teachers guided the pupils carry on with the play activities on the tablets as they filled in the reflective journals. When the learners were capable of performing the activities fully in their groups without further challenges, then the development of digital literacy skill had happened.

3.8 Instruments of Data Collection

The data collection instruments were generated using reflective journals sheets, observation, and interviews.

3.8.1 Observations

Classroom observations were used in the study objective two and three which sought to; Examine primary school pupils' digital competences demonstrated through play way method of learning, and Assess the challenges the primary school pupils face in developing digital competencies through play method. Observation is more than just looking Appendix B. It entails looking (often methodically) and taking systematic notes of individuals, occasions, behaviors, surroundings, artifacts, and practices (Marshall & Rossman, 2016).

A less structured style of observational research was used in the study (Denscombe, 2014). The researcher observed the classroom if it had the requirements for the promotion of digital literacy like; availability of electricity, charging systems for the laptops and

tablets, seating arrangement that can allow the learners handle the digital devises, the number of digital devices against the number of learners, the availability of enough space and how engaging the play sessions were in terms of digital competence development. Classroom observations were conducted by the researcher to find out how the teachers and the learners carried out the play programs with the tablets. Observations were carried out in the school once a week for the three months that the study was conducted. This method of data collection was chosen because the researcher aimed at collecting qualitative data by observing learners during play whether they are capable of following instructions given, complete tasks ahead of them, seek for clarity whether in difficulty and share ideas freely with their classmates.

In contrast to, for instance, reported data and second-hand stories, observation as a research process gives the researcher the chance to collect first-hand, "live" data from naturally produced social settings (Wellington, 2015, p. 247). The potential for more genuine or authentic data than is normally the situation with inferential and mediated approaches exists when observation is used as the primary mode of research (Creswell, 2014). Observation enhances understanding of the described situation (Cohen et al, 2018). There exists a lot of value attached towards observation method of data collection because “With observation, it is possible to document behavior as it occurs.” The observations in this study were carried out in a manner that the participants could not ascertain that they were being observed. The researcher observed them from a distance and also took part in guiding the children when any challenges arose. This was done in order to handle observation biases also known as hawthorne effect. These observations were done from general to particular by focusing on the competencies which they displayed on their groups. Refer to the attached observation tool, appendix B.

3.8.2 Teacher Interviews

Semi structured interviews were used by the researcher for objective one, objective two and objective three which state: To explore teachers' perception of play way strategies of learning in developing digital literacy among pupils in primary school; Examine primary school pupils' digital literacy demonstrated through play way method of learning; Assess the challenges primary school pupils face in developing digital literacy through play method.

According to Cohen et al. (2018) interviews warrant the investigator to gather information that cannot be obtained from observations and enables one to go further into respondents to learn more about their encounters, sentiments, and perspectives, concerns and interests. Open-ended questions during interview process to best enable the individual to express their views and experiences unimpeded by any viewpoints of the researcher (Creswell & Creswell, 2018). According to de Vos et al. (2011) the most common data gathering method in qualitative research is the interview, which is regarded as one of the most effective methods for both participants and researchers to comprehend others (de Vos et al., 2011). In addition, the study presented by DeJonckheere and Vaughn (2019) explain that with use of interviews, people focus on one another throughout so as to obtain understanding of the encounters, worries, aspirations, attitudes, ethics, knowledge, and perspectives as well as the modes of just seeing, perceiving, and behaving with others. According to Pessoa et al., (2019), the interviewer should utilize questioning and probing since these techniques enable the interviewer to carry on the conversation with the interviewee (see Appendix A). These interviews were carried out individually after classroom observations. Interviews provide possibilities for discourse and the exchange of various opinions or viewpoints between the interviewer and respondent (DeJonckheere & Vaughn, 2019).

3.8.3 Teacher Journal Reflection Writing

Teacher journal reflection was used in addressing all the study objectives. which stated: To explore teachers' perception of play way strategies of learning in developing digital literacy among pupils in primary school; Examine primary school pupils' digital literacy demonstrated through play way method of learning; Assess the challenges the primary school pupils face in developing digital literacy through play method.

The study used teacher journal reflection writing in order to gain an understanding of one's own thinking (Ainley, 2015). In this study teachers were given an opportunity to write journals to portray their feelings, attitudes, experiences and challenges in computer use. The researcher prepared the journals and the teachers filled in during every digital play session and at the end of the research process. The teacher filled in the journal before the play lesson began then completed the same journal at the end of the lesson for the entire play sessions of data collection. Then a final reflective journal was filled after all the plays has been conducted. In this process observations were also carried out (Appendix C and D).

3.9 Validity of the Study Instruments

If we are assessing what we should be measuring is a matter of validity. According to Creswell and Creswell (2018), qualitative reliability denotes that the researcher's technique is uniform across various researchers and projects, whereas qualitative validity refers to the researcher checking the precision of the results by using specific processes (Creswell & Creswell, 2018). Validity is achieved if conclusions that are appropriate and significant for the particular study may be drawn from the data collecting methods (Mertens, 2010). In qualitative research, validity serves to shed light on a particular occurrence rather than to draw broad conclusions . Although, its subjectivity has been a point of contention (Cohen et al., 2018). This can be avoided by utilizing a variety of data

sources generation like those used in this study; interviews, journal reflection prompts and observation. Dependability functions as the criteria for determining credibility (Butler-Kisber, 2010). The evaluation of dependability is driven by reliance and trustworthiness (Jwan & Ong'ondo, 2011). Credibility, is the degree to which researchers accurately and truthfully evaluate and describe data obtained from respondents.

Dependability in this study was ascertained by capturing all the interviews in a recorder then transcribed them verbatim. The reflective journals that were filled by the teachers and reproduced accurately were done in order to eradicate any threats to reliability. Qualitative validity as checking for accuracy. The researcher rechecked the transcripts and all the qualitative data generated then compared the data with existing literature (Creswell & Creswell, 2018). Triangulation helps verify the reliability as well as the correctness of the data (Basit, 2010). The qualitative data from teacher interviews, teacher reflective journals, and observations provided appropriate descriptions of the situations under study. More than one classroom observations were conducted in order to develop an in-depth understanding of the phenomenon under study and to enhance the believability of the issues that were identified. Observing the participants in their natural setting enabled the researcher gather valid qualitative findings. The **c**oncurrent data analysis and generation was done by the researcher in that the initial teacher reflective journals were analyzed as classroom observations and interviews were going on (Creswell & Creswell, 2018). Triangulation was realized by corroborating all the qualitative data.

The Triangulation that was carried out by the researcher was from various data sources by looking at the evidence from the domains and utilizing it to create a cogent defense for themes. The credibility of the study might be argued to be increased if themes are

developed by combining various data sources or respondent viewpoints. Among the benefits of qualitative research is validity, which is the assessment of whether the conclusions are true from the perspective of the researcher, the respondent, or the audience of an account (Creswell & Creswell, 2018). Finally, take the final report or particular characteristics or concepts back to respondents and figure out if these respondents feel that they are accurate to assess if confirmability is also used to determine the validity of the qualitative findings. This does not entail returning the original transcripts to verify their authenticity; rather, the researcher returns some elements of the final or almost final result, such as the key conclusions, key themes, or analysis. A follow-up interview with study participants may be conducted as part of this approach, and they may be given the chance to comment on the results.

The researcher also provided a detailed, in-depth description of the findings. Results are more realistic and richer when qualitative researchers give in-depth descriptions of the setting or offer a variety of viewpoints on an issue. This process strengthens the reliability of the results. Also, the researcher addressed the prejudice through introspection. Readers responded favorably to the open and honest narrative that was the result. A crucial element of qualitative research is reflexivity. The researcher put forward how interpretations of the findings were shaped by the teachers and learners. In addition, provide information that is contradictory to the concepts or is negative or erroneous. Discussing contradictory information increases the credibility of a story because real reality is made up of several perspectives that don't always coincide. The researcher achieved this by outlining supporting data for a theme. The majority of the evidence supported the concept. This contradicting information makes the story more credible and believable (Creswell & Creswell, 2018). Prior to the commencement of data collection process. The researcher piloted the tools for data collection in Uasin-Gishu County a

neighboring county to Nandi County. This was done in public primary schools that received the donated laptops and tablets. The researcher and the teachers went through what was installed by KICD in the tablets on the activities meant for class one including all the plays with class one teachers and conducted the plays with them. Then the researcher requested them to fill in the journal reflection sheets and then the researcher interviewed them before the researcher used the tools for the actual research that was undertaken in Nandi County.

3.10 Data Collection Procedure

During the research process, the researcher visited the schools in Mutwot zone that took part in the study. Mutwot zone received the government donated laptops and tablets. The zone is fully connected with electricity. During the data collection procedure the researcher met the heads of these schools, delivered letters of introduction to them and informed them about the study (see Appendix E and F). Met grade one teachers in their respective schools and introduced to them the play activities via the tablets and requested that they think about taking part in the study. The schools that took part in the play process were schools that had functional computer laboratories, government (public) primary schools because these were the schools that received free laptops from the government. The researcher informed the participating teachers and one ICT champion teacher who had been trained by the ministry of education MOE about the aims of the study and how the plays were supposed to be carried out. Together with the grade one teachers. The researcher and the teachers conducted a pre-trial lesson with the devices that were to be used in the study. This was done to ascertain the content upon which the plays were anchored and for successful completion of tasks by the learners. The researcher further used various qualitative data assembling resources to obtain information about the same occurrence. Then mentioned the methods used to collect the data. Moreover, triangulation

was used by using a variety of data sources. Using these multiple sources gave a ‘strengthening mechanism’ that assisted with validity (Cohen et al., 2018). The researcher employed data collection and data analysis to ensure that the data collected had reached exhaustion level. This too contributed to the validity of the qualitative research. The participating teachers were required to fill in their reflective journal every time they undertook the play activities. The researcher filled in the observation schedule during every visit and maintained open ended field notes on the observation schedule during the visits. Finally, the teachers were interviewed using the semi structured interview guide on how the play sessions were carried on.

3.11 Data Analysis

According to Creswell and Creswell (2018); Babbie and Mouton (2010) data analyses is the process of splitting up the data into digestible concepts, structures, patterns, and correlations. The manageable themes assist in creating the researcher’s awareness of the fundamental components of the data, which allows them to see potential trends. Data analysis necessitates the asking of questions to find meaning. These meanings transform the data into findings. According to Cohen et al (2018) data analysis “reduces the amount of raw data and communicates the essentials of what the data show.” Triangulation arises in order to verify the efficacy of the study methodology (Cohen et al., 2007). The definition of triangulation is "the employment of two or more data gathering methods in the investigation of an element of human behavior” (Cohen et al. 2007, p. 141). When different methods of data collection are used it provides a ‘strengthening mechanism’ (Denscombe, 2014) leading to greater validity. The data from all the tools were typed. Interviews were captured on tape and written down. These were further coded and the codes were categorized into themes. The codes came using the respondents' or the

scientist's precise words who compose phrases (Creswell, 2011). Teacher reflective journals were also analyzed and themes developed from them.

Table 3.1

Summary of Data Analysis

Research Objective	Methods	Analysis Techniques
1. To explore teachers' perception of play way strategies of learning in developing digital literacy among pupils in primary school,	• Interviews • Teacher Reflective Journal	• Thematic Analysis
2. Examine primary school pupils' digital literacy competencies demonstrated through play way method of learning,	• Teacher reflective journals • Interviews • Observation	• Thematic analysis
3. Assess the challenges the primary school pupils face in developing digital literacy through play method. 4. Design a model on the association between play way strategies of learning and development of digital literacy competencies among pupils in primary schools.	Interviews Observation schedule Teacher Reflective Journals	• Thematic Analysis

Source: Researcher, 2020

3.12 Thematic Analysis

Data collection and writing up of outcomes went hand in hand with data analysis in this qualitative study. For instance, while conducting interviews, the researcher was analyzing teacher reflective journal collected earlier, and organizing the structure of the final report (Creswell & Creswell, 2018). Watts (2014) assert that the researcher selected this methodology for its versatility, capacity to capture the complexity and depth from the data, and the way it allowed the respondents' voices and perceptions to shine through. In a qualitative study, data gathering and analysis often occur concurrently (Braun & Clarke, 2006). Each presentation was captured on audio or video, then transcribed. The approach of thematic analysis helped the researcher organize the huge amount of data in a

systematic manner, enabling the discovery and examination of recurring patterns or themes in order to produce meaningful, in-depth analyses and discoveries. The versatility of thematic analysis in handling large, intricate, and varied amounts of data was a factor in the researcher's decision, along with its emphasis on comprehending the data in the context of describing and analysing the common understanding and thoroughness that had been established by the respondents," (Watts, 2014, p. 4).

The practice of analyzing qualitative data involves numerous layers of analysis and progressive phases from the particular to the general:

Step 1. *Preparing the data to be examined by organizing it.* This involved typing up field notes, electronically digitizing documents, and interview transcriptions. Depending on the sources of information's, the data was then sorted and organized into various types.

Step 2. *Read or examine all the information.* This first step gives you a broad understanding of the data and a chance to consider its overall significance. What are respondents saying generally? What kind of tone do the thoughts have? What perception do you have of the information's general depth, reliability, and application? At this point, the researcher began by documenting general opinions regarding the data or making notes in the margins of transcripts or observational field notes.

Step 3. *Begin coding all of the information.* Coding is the process of arranging the data by enclosing sections of text or other content in brackets and inserting a word that denotes a category in the margins (Rossman & Rallis, 2012). It entails gathering text data obtained during collection of data, categorizing sentences (or passages), and assigning each category with a term, frequently based on the recipient's actual language (called an *in vivo* term). The researcher coded the data as required.

Step 4. *Create themes and a description.* Create themes or categories for assessment and a description of the scene or the characters using the coding procedure. A description entailed a thorough rendering of details about educators, institutions, or activities in a space (the strategy of digital play). For this description, the researcher in this study created the codes. This analysis can be used to create in-depth themes for case study descriptions. These topics were selected as headings in the findings sections of this qualitative investigation since they emerged as key findings. At this step, the researcher made sure that the themes were identified clearly, that the names of the themes captured each theme's core, and that the names of the themes were closely related to the participants' meaning-making. In order to find words, quotes, or headers that the used by respondents that could be utilized as the names of the concepts, the researcher went back to the recordings.

These concepts presented various points of view from different people, and they were backed up by various quotes and concrete examples. Beyond identifying the themes during the coding process, the researcher built additional layers for complex analysis. For example, themes were assessed for each unique case and in comparison to other cases.

Step 5. *Representing the description and themes.* It was necessary to consider in advance the qualitative narrative's representation of the statement and concepts. The analysis' results were presented in a narrative passage by the researcher. This made reference to a timeline of events, a deep discourse of numerous concepts (complete with sub categories, particular examples, multiple points of view from participants, and quotations), or narratives with themes that are related to one another. Tables were utilized by the researcher to supplement the conversations or to present illustrative data about each participant. Braun and Clarke (2006) contend that choosing the most pertinent and

convincing extracts to serve as examples to illustrate the concepts put out represents the final chance for analysis. As a result, the researcher offered excerpts both written and visual that she believed captured the key ideas.

Tesch (1990) cited in Creswell and Creswell, (2018) provided eight specific coding procedures commonly used to create codes that focus on the kinds of codes to create when examining a text transcript. These steps are: 1. Reading all transcripts carefully to see the big picture of the data, made a note of thoughts as they occur. 2. Wrote thoughts on the underlying meaning after reading the transcripts on the margins. 3. Made a list of all the topics and clustered together similar topics. Formed these topics into columns, arrayed as important, distinctive and leftover subjects. 4. Returned to the data after taking the list. 5. Coded the themes and place the codes next to the relevant text segments to observe whether additional categories and codes appeared. 6. Identified the words that best described the research topic and classified them. By combining topics that are related to one another, the overall number of categories was decreased. Therefore, made connections between the categories by drawing lines between them. Chose a final acronym for each group and arranged these codes in alphabetical order. 7. Gathered the information from each category in one location and did a preliminary analysis. 8. Reorganized the data.

3.13 Ethical Issues

According to Leavy (2017) Integrity, ethics, impartiality, and honesty are all components of ethics. Integrity is the ability to act in accordance with one's awareness of right and wrong. Social research prioritizes ethics because of the social realities of human beings. An ethical practice that includes morality or behavioural guidelines in research (Struwig & Stead 2004). Basit (2010) underlines how crucial ethical considerations are because the majority of educational research involves human subjects. It is the responsibility of

researchers to follow the code of research conduct. According to Babbie and Mouton (2010), researchers have an obligation to follow the rules of conduct that apply to most professions. In general, views about what is good or evil, right or wrong, appropriate or inappropriate (McMillan & Schumacher, 2006). By performing social research, researchers delve into the personal lives of the subjects (Leavy, 2017). Privacy of the participants must be ensured at all times (Struwig & Stead, 2004) the participants views from journals and interviews were used in this study. Their names were not revealed. Creswell (2011) maintains that Dignity, impartiality, sincerity, ethics, privacy, secrecy, confidentiality, and voluntary participation are all part of professional ethics.

The researcher requested approval from the heads of schools for the research, keeping in mind all of the aforementioned and the acknowledged professional ethics of studies carried out. Organize workshops with the teachers who carried out the play activities with computers, outlined and discussed with the participants the objectives of the study, the research design, and methodology to school heads and teachers of the participating class (grade1) prior to any data collection. The heads of schools and teachers were requested to sign indemnity consent forms appendix F. The forms gave an explanation about the role of the learners during the research process.

Parents of the participating pupils were made aware of what the learners were doing on the digital devises, appendix G. This is due to the fact that in research they are regarded vulnerable because their knowledge and expressive capacities are limited. The participants (heads of schools, teachers, and learners) were made aware that their responses were used for purposes of this research and nothing else. The school names and the teachers' names were not mentioned in the study. Pseudo names used so as to safeguard their confidentiality and anonymity. The participants were treated with respect

in that their views were respected. Fairness was upheld at all times just in case the participants felt they wanted to withdraw from the study, they were free to. In case the stakeholders required the results of the study, then they were also guaranteed. Ethics approval was sought at the National Commission for Science Technology and Innovation (NACOSTI) appendix H before data generation process began.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter reports the analyses of data pertaining to digital play strategy of learning to develop digital literacy of pupils in selected Kenyan primary schools in Nandi County. The structure for providing the findings was consistent; the section began with a description of the research objectives, followed by the applicable data, then the thematic analyses are presented. The thematic analysis, presentation, interpretation and discussion are based on the respective objectives. The interpretations were derived from the outcomes attained. The demographic profile of the study participants is given in the chapter's opening paragraph and then the research questions are addressed.

4.2 Demographic Description of the Respondents

The sample of the study comprised 12 head teachers 12 teachers and 450 grade one pupils. The participants were selected from Chesumei Sub-county in Nandi County. For both teachers, a purposive sampling method was used to choose the sample, head teachers from the targeted schools. The sample was drawn from a total of 30 schools from the zone. The 30 schools consisted of public and private. For the purposes of this study, 12 schools were selected because these were the schools that got the government tablets. The other schools were private schools and public schools which did not received the tablets. The government supplied tablets to public primary schools only. All the participants took part in the study. All handed in their journal reflection sheets apart from one who never filled the final reflection sheet. All the participants were interviewed and audio recorded giving a return rate of 99%. The 99% return rate mean that all the participants were able to hand

in their reflective journals and they were all interviewed after taking part in the play process.

4.3 Teachers' Perception of Play Way Strategies of Learning in Developing Digital Literacy among Pupils in Primary School

This study's initial goal was to determine the teachers' perception of play way strategies of learning in developing digital literacy among pupils in Chesumei sub-county primary schools. To do this, the following inquiry was put forth; *what are the teachers' perceptions of play way strategies of learning in developing digital literacy among pupils in primary schools in Mutwot Zone?* To answer this question, open ended interviews and journal reflection sheets were given to the 12 participants. The participants had to state their perceptions of digital play way method of learning in developing digital literacy. Since the schools were selected purposively, this meant that only schools that had electricity and had received the government tablets were to be used for this study. Table 4.1 shows an excerpt summary of the teachers' perceptions of play per tool of data collection vis a vis the emerging themes that were followed by presentation and interpretation. Table 4.1 was drawn by the researcher from the analysis of the transcribed interview data, participants' reflective journals and the observations that were carried out in the play classrooms.

Table 4.1

Analysis of Teachers' Perception of Play Way Strategies of Learning in Developing Digital Literacy among Pupils in Primary School

Tool for data collection	Summary Excerpts of Teachers perception of play way strategies of learning	Categorized themes	Theme
Interviews	Digital play was perceived as; Acquisition of skills through play Enjoyment in learning. Creative learning New approach to learning. Collaborating in learning and owning the learning process. Play as searching. Involving learners in the teaching. Visual stimulation. Play as advancement and development in technology. Digital play way seen as new opportunities and alternative perspectives. Learners owning the learning process.	Enjoyable learning	Skill acquisition
	A way of Incorporating slow learners in group work activities. Collaborative learning	Use of digital devises	
	Play as motivational learning Play as development of communication skills. Thorough preparation for lessons. Independence and discovery of knowledge.	Motivational learning Knowledge creation	
Journal reflection sheets	Advanced method of teaching using technology New approaches to learning Learners directing the learning process Development of interest in learning process	Reverse of traditional approach Innovative learning	Child centred approach

	Digital play as development of computer skills.		
	Belief in the viability of using tablets as a learning and teaching tool.	Motivational learning	
Journal sheets	Digital play as the reverse of "*traditional talk and chalk"*		
	Easy management of big classes. Learners become active participants.	Changed role of the teacher	Changed role of the teacher
	Communication skills are enhanced.		
	Teacher becomes facilitators of learning process		
	Learners change from traditional passive listeners to active and hands-on learners. Technology enhanced learning.	Facilitator of learning	
	Using the tablets to teach.	Changed educational beliefs	
	Interacting learners.		
	Creativity in the digital play. Introduction of tablets and using it to learn.		
	Knowing the usefulness of the tablet.		
	A very good approach of teaching digital literacy.		

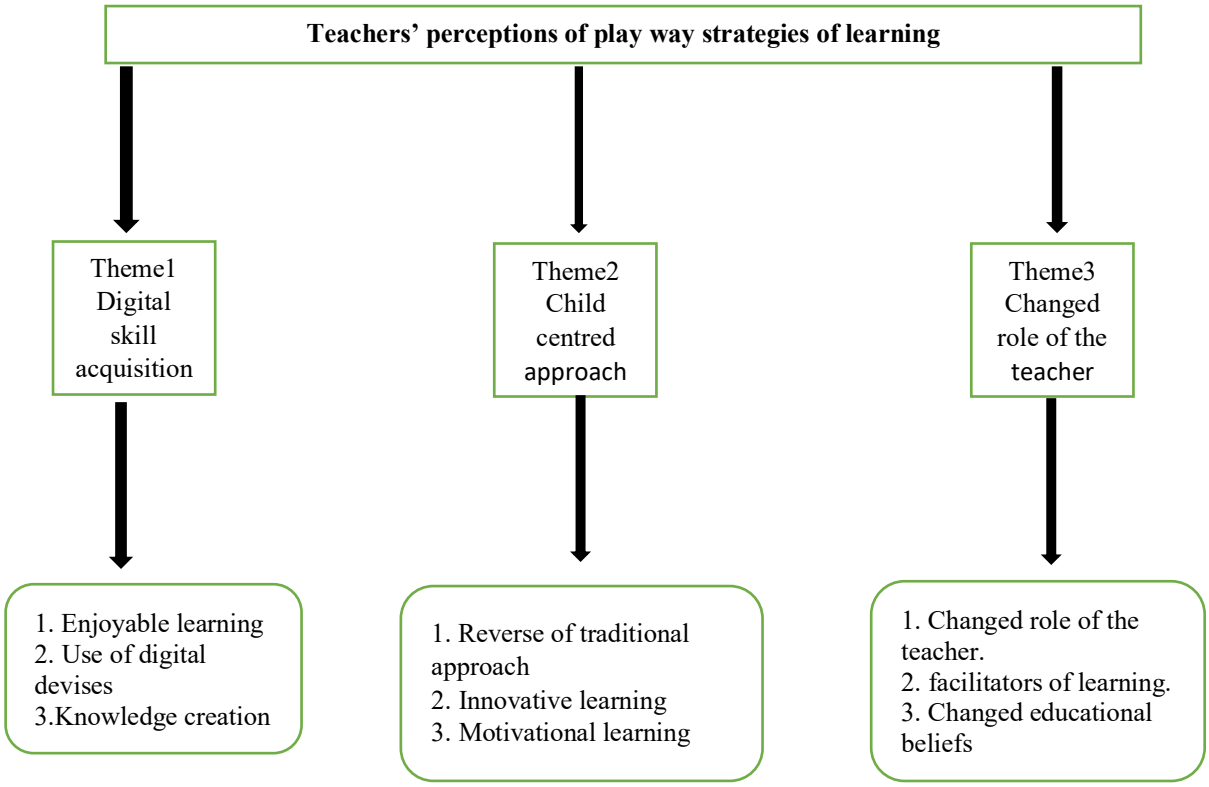


Figure 4.1: Teachers Perception of Play Way Strategies of Learning in Developing Digital Literacy

The findings above highlight three themes in response to teachers' perception of play way strategies of learning in developing digital literacy are discussed in this section. These are i). Digital skill acquisition, ii). Child centred approach and iii). Changed role of the teacher.

4.3.1 Theme 1: Digital Skill Acquisition

Participants in this study perceived play way method of learning as digital skill acquisition, whereby learners acquire digital skills through playing with the digital devises. The participants highlighted that the digital skill acquisition involved three processes, namely, (i) Enjoyable learning, (ii) Using digital devices to teach, and (iii) Knowledge creation.

4.3.1.1 Enjoyable Learning

Enjoyable learning is imparting knowledge that captures the interest of the learners. It is an essential aspect of promoting meaningful, active learning. Rather than standing in front of a classroom simply speaking about a subject. Teachers in the play strategy had the opportunity of livening up their teaching with play activities in the tablets. Teachers stated that they understood play way method of learning where learners acquire skills in an enjoyable manner. In an interview with participant 1, she perceived play method in her own words

> *..as a method where children play as they learn using the games in the gadgets which they use to acquire skills for example using the finger to drag objects and discover so many things*.

Participant 2 perceived play way method as *teaching through play* and was echoed by participant 5 who explained play way *as a process of learning through play*. Participant 6 narrated that *it is learning in a more enjoyable manner*, *having fun as skills are being imparted and it can be played by any age group*. Learners cooperate together, ask questions and enjoy the play.

The participant continued to note that digital play encompassed the entire process that aids the learners to learn aspects of technology in a playful manner which is enjoyable to them and their ability to select through the various plays by creating spaces on the screen for them play. The learners were overjoyed whenever the tablets were taken to their classrooms and they had big concentration for them. They did not want to stop playing and felt miserable when the tablets hanged or discharged. Through group work activities that were formed, it developed in the learners the spirit of collaboration. Participant 4 noted,

> *"This is the first time that I have taken tablets to class to explain concepts though play and learning which is not the usual play that learners go to field and play"*

Participant 6 confirmed this:

> *This is a different form of play where the children use the tablets to play. They share ideas together and play together in turns in a collaborative manner. It was unusual since I had to demonstrate it to pupils how to search and scroll. What pleased me the most is the fact that learners enjoyed the play sessions so much and they were very cooperative and enthusiastic every time I entered the classroom! This method led to collaborative learning and enjoyment on the side of the learners.*

The above explanations and quotations by the teachers explained their perception of play way method of learning. According to (Csikszentmihalyi, 2020), play interest children that nothing else seems to matter. Play with digital devices became an interesting approach to the learners. The ability of the learners to interact freely and share skills learnt together. Learners developed skills on tablet use in a way that was interesting and enjoyable to them. The children were able to open the tablets, search and play.

4.3.1.2 Using Digital Devices to Teach

The participants were eager in the use of new approach to teaching where they used tablets as a new approach to classroom instruction. The use of the tablets in the classroom made them perceive play way method as a method of learning using technology. Participant 8 perceived it as a way of teaching. She clearly narrated that;

> *"Mmmmm I think first of all play way method of learning is a way of interacting learners as they learn by themselves on how to play different types of games which they find in their tablets"*

Participant 4 added by saying play way refers to;

> *Managing to open the tablets and identifying some games, sorting and matching of different objects with same colour and texture, playing with colours and painting pictures on the tablet, drawing different types of objects and opening and shutting down the tablets*. These words were echoed by participant 7.

Participant 6 reiterated by saying succinctly that play way method of learning is;

> *The ability of a learner to demonstrate creativity in the digital play while using the tablets*. *The capability of the learners to identify buttons in their tablets that are used to direct the plays like the curser. Identification of the tools for drawing and painting on the tablet and learners ability to arrange objects correctly*.

Participant 1 wrote that: Play way method is the opening of the tablet, identifying the games without difficulties. Not forgetting the development of interest towards digital devices. Participant 8 added by saying play way method of learning is cooperative learning through the use of digital tools. Participant 6 referred it as development of digital skills through play. Participant 10 explained it as

> *The introduction of the tablets to the learners since they are from pre-primary so that they can know how to start using it for learning and learn how to shut down*

Responses to the interviews confirmed this view.

Participant 1 expressed herself eloquently when she said, I have mastered a variety of abilities that will guide me in my teaching. The statements were a clear demonstration of information empowering and she continued to say, It has developed a chance for technology advancement. In the journal reflection sheets Participant 9 explained play way method of learning as a very good approach of teaching digital literacy. She said, I enjoyed the entire process the skills that the learners demonstrated and how enthusiastic they were every time I entered class. Learners could switch the tablet, start the game and play. They also learned how to search for other games. Some also learned how to save by themselves. Playing games on the tablets at the start of the project as children watched gave them some insights on how to tackle the play activities and guide learners through the rules and goals of every game. Digital play enabled the learners have interest in technology hence the interest of learning and using the tablet was portrayed.

Participant 1 illustrated that learners got the interest in identifying where games are because play interests children. This enhanced curiosity in learners and helped to improve their creativity and critical thinking. In the teachers journal entry sheets most of the respondents said that in their institution's teachers were very supportive on using play way strategy for teaching and learning on the tablets. The responding educators were optimistic toward utilizing tablets as a teaching devise. Teachers said that they found the use of play way on tablets as practical to their learners and indicated in their journals that they thought that the tablets are crucial components of classroom learning. Learners developed confidence as they progressed with the play sessions. Despite the respondents' initial lack of confidence, play method helped them get comfortable using digital tools. The information gathered by this journal sheet showed that participants were conscious that digital play would demand a different strategy than the conventional "chalk and talk" strategy since the pupils would need to swiftly and freely gather knowledge (Participant

12), the learners searched for information and begin the plays by themselves. This developed knowledge on tablet use.

4.3.1.3 Knowledge Creation

Play was seen to have led to the advancement of knowledge and expertise on how to handle digital devises. Learners were able to deepen one's comprehension of the duties ahead of them. They developed high concentration during the play sessions that nothing else seemed to matter.

Participant 11 noted in her journal that, play way is playing in a collaborative manner and being able to take instructions easily, develop knowledge on problems solving and critical analysis. The ability to incorporate slow learners in an activity and letting all the children get access to a tablet through group work activities. In addition, being able to carry out various play sessions. The strategy needed an individual to have organized him/herself intellectually, physically, emotionally, and also in terms of conducive environment so as to enable one to reach his/her goals. Participant 5 voiced her perception of play way method as playing the game with minimal disturbance that makes work easier for the teacher as she/he takes the role of guiding the teaching and learning process.

Participant 8 stated that play way method of learning is a process of developing the skills that the learners will attain at the end of the digital play sessions, the capability of the learners being able to select from a list of games and their ability to use the curser. In an interview with Participant 4 she clearly stated, that play way refers to

> *"Having the basic skills - opening, searching for games and search for subject areas for the learners." "Basically I see tablets as tools that makes it simple for teachers to combine the learning areas into manageable units so that pupils can participate in the teaching and learning."*

In the teachers open ended interviews, most teachers noted that the use of tablets was their first exposure to teaching through play. Digital play gave a sense of empowerment to the learners. Participant 9 clearly wrote in her journal that digital play has developed in the learners how to work with others collaboratively and how to discover information by themselves. Participant 9 further added that I have gained a lot of knowledge about many things and searched and prepared more for the lesson. While participant 4 said that this type of learning has empowered and assisted the learners in their learning.

Digital play way method of learning became an enabler towards the acquisition of digital skills. Grade 1 learners however young they were, enjoyed the learning process and developed high concentration during the play activities. Learners developed skills on how to handle the tablets as they cooperated and collaborated in their learning. Through play learners developed knowledge and skills on problem solving. Whenever they got stuck they sought for assistance from their peers and further assistance from the teacher. They developed a sense of independence during the digital play sessions. An investigation of the list's summary in more detail in the, journal reflection sheets and interviews demonstrates that almost all of the respondents said they had fun in the digital play way method as a method of instruction and learning where they share the different plays to the children, search for related information and guide the learners follow the rules of the play.

Determinants of motivation found by instructors and enjoyment during the project were that they (learners) felt empowered to have had the chance to explore the digital devices, had realised a goal that even to them they were able to learn the soft skills through collaboration, had achieved a dream of the capability of navigating the tablets, had learned new skills more specifically opening the tablet playing and finally shutting down, had seen digital play as a new way of teaching and learning where learners practice digital

skills (linking theory with practice), had experienced competence, becoming experts in digital use, had found out that digital play way opened new possibilities and different ways of thinking, had continuously collaborated together resulting in peer learning, had developed creativity through playing on the screen, had found interesting information that was both audio and video-this aroused their interest and finally had felt they had some control over what they wanted to do. The aspects of digital play made learning process so empowering. Some elements that were noted are consistent with the collaborative theory (Lawlor et al., 2018; Blum-Ross & Kumpulainen, 2019) and motivational theory (Sun, & Gao, 2020; Malone & Lepper, 2021) which emphasize issues that teachers who were implementers digital play strategy had to bear in mind.

The above-mentioned aspects can be articulated in a manner that teachers and learners created knowledge through mutual understanding, a method that was seen as empowering to the pupils. Pupils that are digitally literate grow up to be more conscientious and compassionate adults (Abu Zahra, 2020; Raheem et al., 2021). The learners were seen to be content creators and engaged actors that many hope for (Fluck, 2019). Vygotsky's (1978) theories of play are seen as a leading activity in cognitive and imaginative development (Drew, 2019) where children get to interact with content (Rahman, & Yunus, 2020).

Hence, one can conclude that digital play has been experienced as a way that learners can create knowledge that is empowering to them. This enhanced the enthusiasm and interest of pupils taking part in the play activities. All of the aforementioned factors emphasize the critical function of empowerment as a motivating factor in knowledge generation. According to Keller (1987) and Bandura's key work, teachers must feel competent and

confident in order to feel empowered. As a result, confidence and competence became crucial motivating factors towards knowledge creation in this study.

4.3.2 Theme 2: Child Centred Approach

A child-centered method involves putting the child at the conceptual heart of the educational process, where they actively participate. Giving children tasks to perform as the teacher acts as the facilitator of the learning process. Digital play was perceived to be a child centered approach. Learners owned the learning process and discovered information on the tablets on their own. They developed skills on how to handle the tablets during the play process and after the play process. They took turns to play developing in them a sense of responsibility. Teachers perceived digital play way method of learning as child centered approach which encompassed the following; (i) Reverse of traditional approach, (ii) Innovative learning, (iii) Motivational learning.

4.3.2.1 Reverse of Traditional Approach

In this study the perception of play way method of learning was the “reverse of the traditional approach” which can be used with big classes. Learners can be grouped in big classes and the children can work independently on their own. The current state of public primary schools is that the number of learners increased as a result of free primary education. Digital play made this numbers manageable. Data from the journal reflection sheets on how teachers perceived digital play way strategy gave a response that learners were able to converse with each other and were engaged participants. In terms of teaching and learning, the teachers believed that the digital play approach would entail that: The pupils' role in using digital gadgets would be work on their own, while the teacher would facilitate and watch over them. The teacher provided instruction to the pupils, and they work as a team towards searching and starting the plays. The instructor assisted pupils in doing information searches and direct learners on their plays. Learners were seen as

having a distinct function from the conventional passive listening function to active and hands-on learners. Participants' comments that learners in the digital play strategy became: Knowledge discoverers and finders, Skills practitioners, Readers, Active and hands-on participants, reporters and judges.

Majority of the participants specified that their learners enjoyed working on their own during digital play sessions, as learners are fond of tablets. As they searched, they realized that there are other sources of information besides books. Statements confirming the aforementioned claims from the journal entries were: Learners do like to use tablets and all the time when a computer was placed before them, they become interested (Participant 9), Handling the tablet by itself is fascinating, but it becomes more fascinating when one knows how to use it (Participant 3), Learners work with tablets finding information without waiting for the teacher to give information (Participant 1) , The availability of games and plays including other information to be read, reading was encouraging (Participant 10). In an interview with participant 11, she stated clearly that;

> *Pupils enjoy learning via play, and this method of learning will be quite different from the ordinary.*

According to these findings, educators need to ensure that: The topic choice is pertinent by considering the proficiency of the learners. The plays added visual interest to the pupils which encouraged exploration and showed confidence in them.

Participant 7 stated that play way method of learning,

> *...helps children become independent since they learn things on their own without you, the teacher, telling them*.

It makes them understand better and information leant is retained. On the other hand Participant 5, added that digital play learning is practical and different from normal class where we use books and pencils since you simply receive instructions in a regular class, but in play using the tablets you go to the tablet and search and do the day's task.

Participant 8 added by saying; It is different and it is informative learners are hands on throughout the lesson. Participant 4 agreed that apart from the tedious classroom atmosphere where pupils are forced to listen to you and slumber off in the middle of your teaching out of boredom. Nevertheless, when they use tablets, everything is very different, and they find it to be quite thrilling. The digital play way method is a method that is beneficial in general terms, as explained by participant 2 who said: when I started the digital play I had no idea how to start looking for the different plays installed but as I went on filling the challenge section on my reflective journal for the researcher to read and kept asking other teachers who had skills I really learned how do it (Participant 2). Participant 4 added "this programme (digital play strategy) facilitated our computer literacy. Participants 7 and 5 agreed that pupils are tech-savvy and love using technology, and participant 5 added, "They prefer to figure a way out. So this play way method of learning clearly suits their style."

The above theme clearly highlights that learners become hands on throughout the instruction process. This enables the teacher to incorporate all the learners together in group work activities enabling them to learn collaboratively. These technological skills get to be imparted in an enjoyable manner- making learners develop big interest in technology. The teachers' role is to guide the teaching and learning process. The tablets become a necessary part of classroom instruction that enables the learners develop communication skills as the digital play makes them active participants. Teachers

perception of digital play strategy enabled them realize that information can not only be found in books but also in digital devices where knowledge can be imparted in an enjoyable manner. This aspect became a stance that is supported by Rahman and Yunus, (2020) who stress that that the implementers of an activity are the beneficiaries when the activity is performed. Grade one pupils became the beneficiaries of technology by playing on their tablets.

Learners also had access to different sources of information. Participants said that their pupils will love digital play since they like to play on tablets, as was already mentioned. The participants agreed that it is crucial for pupils to understand that there are other informational resources besides books. Berger et al. (2018), and Ferguson and Braten (2018) have severely opposed to this idea of the text book as the sole source of information, regarding it as the only so-called authentic source of knowledge. Because of this, it may inspire pupils to study a greater variety of sources instead of simply paper-based printed books if they can learn from a young age that knowledge is not only restricted to textbooks but also that other sources, including digital sources, offer various types of knowledge. Knowing that there are knowledge sources other than the conventional paper books may operate as a "push factor" to organize, seek, and organize information in new ways. Learners and teachers as implementers of digital play experienced digital literacy as play. Participant 8 suggested that learners would enjoy play as a method of learning the learner centred approach has a component of enjoyment. Youngsters enjoy learning via play, and this will be a completely different method of learning than usual, as she described it. According to Triberti's et al. (2021) notion of "Optimal Flow," the aspect of "playfulness" is another critical ingredient that might boost motivation and enthusiasm for computer-related tasks (Csikszentmihalyi (1990, p. 4) as cited in Liu and Csikszentmihalyi (2020). Optimal flow is "the condition wherein

individuals are so absorbed in an endeavour that none appears to matter; the sensation is so pleasurable that individuals will engage in it even at significant expense, for the sole purpose of engaging in it." In certain sessions, the researcher had to inform the participants that the play strategy had to come to an end. The play sessions had reached exhaustion, which made it evident that some needed more time to continue, some suggested that we could collaborate with other schools and play and read on the tablets. Furthermore, some participants continued on their own for quite a while after the researcher had informed them that the sessions had ended, observation which support Csikszentmihalyi's (1990, 2020) notion of play which pupils show a lot of concentration on the activity. Picture 4.1 below shows pupils concentrating on the play activity that was a child centred approach. The next sub theme is play became an innovative way of learning.

Picture 4.1: A Photograph Depicting Learners' Concentration on the Play

4.3.2.2 Innovative Learning

Innovative learning is the process of creating a learning environment where learners learn about new things regularly. Teachers perceived play way method of learning as innovative way of learning. Innovation as a factor was emphasized by participant 9. She said:

> *Tablets made my pupils eager to learn new information. They made sacrifices to attend afternoon classes and also when it was raining when the teachers could not attend the class and talk because of the noise, they requested for the tablets to explore by themselves because to them it was so wonderful to be just in front of a tablet.*

Participant 6, said that she is "chased" by the pupils to utilize the tablets. Participant 3 believed that when the teacher is not "in control" but the learners are given the opportunity to explore, became a driving force. While in class, pupils pay attention to what you are directing them to do, but during digital play, they participate actively in their learning through digital information.

An interesting response was noted to the statement in the journal reflection sheets that that use digital devices like the ones used in this study (tablets) are not similar to other projects in class,' A possible explanation could be that participants had seen that the tablets were being used for digital play, the tablet based project gave positive attributes as the medium to the study was the tablet. The medium has a significant impact on innovative way of teaching and learning. The positive impact of the tablet as medium to innovation is also highlighted by the response of participants at the end of the digital play, that participants liked and enjoyed working through the aid of a tablet.

This information revealed how the initiative had positive impact on the participants - teachers and pupils - in such a way that they had a positive impression of the effectiveness of the digital play approach. The fact that the activity helped pupils to be autonomous as they find out things by themselves - not being taught by a teacher and information learnt stays better in their brains when they uncover it on their own, was effectively summarized by a participant during her interview. The participant's response appears to be in agreement with Milanovi and Cvekovi (2021), who contend that teachers are likely to attempt to apply a new strategy at their schools if they can personally experience or observe the technique's efficacy. According to this, it is clear that the digital play method has a relative advantage because it is relatively simple to prepare and put into practice. Pupils were able to watch as the teacher in charge of the class explained how to put the

digital play approach into practice. Participants' perception of this strategy as powerful has therefore been influenced by their participation in the project and development of the digital play. This supports Rogers' (2003) claim that the aforementioned factors must be present for a practice to change or for a technological invention to be adopted. Additionally, the findings showed that the teacher training procedure at the start of the study when they knew very little about playing on the tablets had influenced the participants to become positive, motivated and innovative in the sense that the learners were always seen to be cooperative, imaginative and creative.

The participants stated that the digital play approach is in line with the Competency Based Curriculum requirements and the participants also indicated that the digital play approach was not difficult to implement as long as the tablets were fully charged. They were exposed to innovation, gained practice-based knowledge, made observations, and had positive experiences with digital play, all of which had a positive and motivating effect. The data from the open-ended interviews about the advantages the digital play project had on the participants supported the aforementioned findings, as participants expressed a value for digital play and noted that the digital play way approach gave them opportunity to enhance their teaching, digital play way method introduced them to new approaches, digital play was inspiring though having information at learners fingertips, digital play way prepared them for change through the acquisition of 21st Centuary skills, digital play way enabled them to become facilitators who could teach others how to play on their own tablets , digital play created interest making learners own the learning process, digital play enabled them to explore new horizons through examining their methodologies and provided them with computer skills.

These findings are in agreement with Roger's (2003) ideas that innovations are available to be explored or to be tried out such as the innovation on digital play. Furthermore, the play way approach on the tablets approach guided the learners become more engaged in and in charge of their own education. According to participant 12, interview data confirmed that the digital play approach differs from the conventional "chalk and talk" technique. In regular classrooms, pupils must pay attention to what you are teaching them to do, but during the play-way approach, every pupil actively participates in the learning process. Digital play could help shift teaching and learning away from the traditional method but towards a more active, constructivist method.

Overall, the data suggest that digital play way method was an innovative approach to learning that empowered learners with the acquisition of digital literacy skills. The data from this study demonstrate that the digital play teaching technique has had a good impact on instructors' methods of instruction and pupils' capacity for learning, despite the idea that teachers teach in the same manner in which they were trained (Tondeur, 2020). This implies that the teachers found the process of digital play to be important because it opened a new method of teaching for the participants. The learner's role transformed in the context of digital play, a method that involved independence, creativity, curiosity, activity, and collaboration. The context in which learners search for games click on them and begin to play also contributed to learner motivation, interest and yearn to acquire digital skills, as the digital play approach lend itself to guiding learners experience play as learning (Csikszentmihalyi, 2020; Triberti et al., 2021). The ability of the digital play technique to arouse learners' interest by allowing them to see first-hand that information was not limited to books is also crucial. Hence, the approach on play could be contributing towards digital literacy. The idea of ownership, creating screens for play grouping objects and regrouping was also thought to be something that may advance digital literacy. Lastly,

teachers experienced the digital play approach which provided them with more confidence while playing on the tablets and added that the approach will change how they perceive teaching. Therefore, it is indicated that the digital play approach could have a big impact as a motivator and an educational tool which is an innovative source towards the development of competencies; especially within public primary schools in Kenya. Hence, the digital play technique could help tip the resource scale and simultaneously promote the digital literacy skills of learners. The tablet as a resource created an aspect of innovativeness on the learners and teachers who developed the skills of technology.

Technology has shaped education in innovative ways such as in improving all linguistic and reading abilities (Houcine, 2011). Learning and teaching have become much more enjoyable due to a variety of soft tools and applications, including play. Technology, according to Isisag (2012), provides a wealth of knowledge and information for both instructors and pupils. It makes it easier for participants to use digital content and match it to their academic needs. Digital learning made it easier for teachers and pupils to combine fundamental abilities and apply them to particular lessons. To teach reading and writing, for instance, image and text were combined. Houcine (2011) noted that via innovation, digital learning increases pupils' engagement and increases teachers' enthusiasm in their classes. Unlike books, whereby one is required to adhere to the written relevant content, digital play that was employed in this study allowed teachers to use a variety of digital play contents (Sabiri, 2020).

In addition, technology has aided teachers in tailoring their subjects to the requirements of their pupils. According to Malone and Lepper (2021), not all pupils have the same learning preferences. As a result, wherever possible, one should endeavor to adapt all learning preferences or rotate the forms of learning strategies to serve all pupils. In light

of the aforementioned information, Mifsud (2021), and Abu Zahra, (2020), debated whether media influence learning once more. The tablet as a medium of learning became a motivating factor in the sense that newness of the method potentially lead to the "fingertip effect," which is the idea that "When we put information at learners' fingertips, they take the opportunities" (Perkins & Salomon, 2018 p. 145). Perkins and Salomon (2018) warn that, on the other hand, grasping fresh possibilities could not always occur. It was anticipated that the pupils would be enthusiastic about discovering and utilizing the new options they were exposed to during this digital play. In this project, it had already happened. The participants in this experiment claimed that this cutting-edge method of instruction had opened up a new universe to them, indicating that the fingertip effect of Perkins and Salomon (2018) had taken place. Yet one should note the warning from Kapoor (2020) that one should be cautious about novelty since "interest may occasionally be increased at the price of cognitive engagement." Because of this, technology cannot be the lone motivator - the so-called "silver bullet" - or the only solution to the challenging issue of learning motivation. Banoğlu and Gümüş (2022) assert that as the computer is merely one of the instruments for learning and may not even be the greatest tool in some circumstances; it is the learners' "eagerness or aptitude to learn that is crucial." The outcomes of this research indicate that, in addition to the play method's unique nature, other factors that may have contributed to the participants' learning were their willingness to enhance their learning and strong encouragement. Picture 4.2 shows how the pupils were so involved in their innovative way of learning. The next sub theme is on how play became a motivational way of learning.

Picture 4.2: A Photograph Depicting Learners' Innovative Learning

4.3.2.3 Motivational Learning

Motivational learning is essential for learning and success in both formal and informal learning situations. Motivation initiates and sustains behavior toward a goal. Motivated pupils are those who are more driven to learn persevere longer, put up stronger effort, study more thoroughly, and achieve better in class. Digital play way method was also perceived as motivational. Motivational learning is a great learning experience that adds value to the learner. The use of digital play helped learners understand digital skills which

learners could not do before. Teachers imparted skills that were well-crafted. A valuable process because of the experiences that were purposeful and put the needs of the learners first. Digital play added value to the learners learning and developed great interest for them to learn. The teachers also explained that every time they entered the classroom, the learners were so eager to get hold of the tablets, open and play. The activities that were introduced to them were those that the learners could tackle.

Participant 9 in her interview said that;

> *In my school, I started with my class with the activities of painting, regrouping those of different colours and shapes with the children then inserted a picture and they painted. Then I asked the children to look for information on that learning area. Once the learner completed a task correctly the tablet could reward the child and awarded marks attained and congratulated the child with a remark, excellent! This motivated the learner a lot and they wanted to do more activities.*

When the tablets were introduced to the classroom, according to interview data, the pupils were motivated. They even made sacrifices to have afternoon classes. Participant 9 stated, "Learners like digital play sessions, in that when you delay a little they reminded that is was time to play. They took pleasure in learning by doing. As a result, Perkins and Salomon (2018); Forutanian, (2021) opines that when a method is new the approach provides motivation for learning which adds value to the learning process. The data from the open ended interviews advise that in order to maintain pupils' motivation and interest during the lesson, the instructor needed to make sure that the digital play approach; (1) demonstrated the abilities of the pupils, and (2) give them the freedom to decide the plays and to move to a group in which they needed assistance in case of challenges. These requirements are corroborated by motivation theory (Sun & Gao, 2020; Malone &

Lepper, 2021; Forutanian, 2021) the ‘situated perspective’ on learning and notions of self-efficacy (Bandura, 1997; Gerbino, 2020; Schunk & DiBenedetto, 2021).

Participants also pointed out that digital play did assist learners to remember more about a topic, learning new information, which concurs with the findings of Lajoie & Sharon, (2013) and Lawrence, (2018) since they feel that learners' usage of artifacts, particularly auditory visual content, helps in this respect. It has been previously demonstrated that artifacts with audio visual could lead to seeing knowledge as something that is not just based on paper, but also that the practice and utilization of digital devices could also build new critical cognitive abilities such as organisation skills, as well as reflection skills.

Rogers (2003) and Lee (2021) argue that when a resource that is perceived to be new is used for classroom instruction its usefulness becomes worthwhile. These worthwhile resources are powerful motivators (Mumtaz, 2000; Milanović & Cveković, 2021). The participants acknowledged their appreciation for the digital play way strategy. Teachers had personally seen how the learners responded to the digital play when their responses were interrogated in their open ended interviews. Interview data suggested that the digital play strategy was very interesting and the learners were always eager to learn (participant 11). When asked if the project was intriguing or challenging after the conclusion of the digital play strategy, the following response was given: Oh! Indeed, it was fascinating and enjoyable. Participant 3 continued, "Yeah, it's really interesting and fascinating. It would be lot more engaging if we could put what we learned into practice.*”* Secondly, the participants continued to say that as the play continued they became more confident and skilled in the use of tablets.

The digital play strategy has significantly improved the respondents' approach toward instruction and learning. Something became clear through the responses on the journals

that the learners were looking forward to the play sessions as it showed great enjoyment for teaching and learning. We need practical and long-lasting confidence in education. It is possible that the usage of digital play and technology could help to promote confidence in schools in Chesumei constituency. Picture 4.3 below clearly shows how the children are concentrating on the day's task, depicting how motivated they are to learn. The following section discusses on the third theme on how digital play changed the role of the teacher.

Picture 4.3: A Photograph Portraying Learners' Concentration towards the Day's Task

4.3.3 Theme 3: Changed Role of the Teacher

Digital play way method changed the role of the teacher. According to the contributing instructors, this position of the teacher can be seen from a conventional standpoint to a constructivist design perspective enhanced motivation and interest. The teachers seized to be a sage on stage to a guide on the side**.** Teachers perception of play changed role of the teacher and accentuated the following i) facilitator of the learning process, ii) changed educational beliefs.

4.3.3.1 Facilitators of Learning

A teacher who doesn't follow the conventional model of instruction is called a facilitator of learning, and their role is to support and encourage pupils while they study on their own. Learners are involved in the teaching and learning process through self-exploration and dialogue. The teacher in this study played an important role as an educator who must be very alert and go around and see to it that there is no learner who is lost. Teachers perceived play way method of learning as changed role of the teacher who guides the learning process (Davis & Arend, 2023) The use of digital play could give pupils the chance to work autonomously. "It is speedier and learners may search for various plays by themselves and work autonomously," participant 11 observed. Participant 12 corroborated this and added that the digital play technique "invokes in the pupils a sense of autonomy, curiosity, and collaborating with each other," which could also improve the learners' experience. Participant 3 said that pupils liked using technology while the teacher guided the learning process. This was narrated succinctly by the words of Participant 1 that,

> *"Through the teacher's guidance learners were capable of using a tablet and independently locating information and share learned information to each other."*

Participant 5 stated that pupils are inquisitive and appreciate learning new things your role as the teacher is that of a facilitator. Moreover, learners were viewed as: inventors and practitioners of skills, readers, active and hands-on pupils, discoverers and finders of knowledge, Reporters, and Assessors. The above are in line with the critical outcomes of the Competency Based Curriculum Ministry of Education (2016) and constructivist principles. The interview data indicated that the digital play sessions were something totally new and an approach that enabled learners voice their learning experiences. This was seen as a new methodology According to Participant 3, the conventional "chalk and speak" method is regarded differently. In a typical class, the pupils must pay attention to what you are asking them to accomplish, but during the digital play sessions, every pupil is actively engaged in their education. Hence, there is a distinction between "normal" *traditional classrooms and the play way method of learning.* Participant 11 agreed and elaborated when he stated:

> *Yes, yes there exists a difference since tablets are not used in regular classes. In a typical lesson, you would probably just be instructed what to do, but in the digital play, you would just use the tablet to search. It differs significantly from a typical lesson. My work as the instructor in the digital play classroom is to guide the learning process, assist and support where it is needed.""*

Participant 9 added: Your role as the teacher is to be there when they get stuck - if learners call you, you walk to their tables click a button in an area they feel they got stuck and a problem is solved. The learners on the other hand are very curious wanting to know more and by the time they seek for help, they will have tried to solve a problem by themselves. Data from the interviews showed that the participants thought the instructor's position would need to alter from being a sage lecturing on stage to a mentor by the side

monitoring learners progress (Blum-Ross & Kumpulainen, 2019). Digital learning provided learners with the opportunities for peer learning as the teacher facilitated the process. Korkut (2012) agrees with Sabiri (2020) that digital learning made it feasible for teachers to provide learners with individualized comments and direction and it greatly improved both teaching and learning in other ways such as learning language and communication skills (McLuhan, 2012). Digital learning enabled the learners to repeat the activities on the tablets until they got mastery (Bean & Melzer, 2021). Digital literacy lowered barriers for better learning and teaching of traditional ways of teaching (McLuhan, 2012).

4.3.3.2 Changed Educational Beliefs

Understandings or convictions regarding elements of education, such as teaching and learning, are referred to as educational beliefs. These convictions are developed early in life, are ingrained, and are more difficult to alter. According to Rubach and Lazarides (2021), educators' educational ideas influence their professional decisions. So, one can contend that a particular set of educational beliefs is deeply ingrained in educators' planning, pedagogical choices, and teaching methods. Rubach and Lazarides (2021) contend that educators frequently instruct pupils in the same manner in which they were instructed. So, it is believable that educators' educational attitudes and classroom practices are significantly influenced by the way they were taught in school and throughout their post-secondary to professional studies. Similar arguments are made by Banoğlu and Gümüş, (2022), Boorman, (2019), and Cuban (2001), who claim that teachers are resistant to change and that this is the reason why digital learning is not widely used in schools. According to Hoareau et al. (2021) and Gamache (2002, p. 286), practice is either overtly or covertly embedded in a certain theoretical framework. This means that since people's views are deeply ingrained, transformation is a challenging

process (Fullan, 2003). Participants stated that because the digital play strategy is novel and engaging, it has the ability to alter the conventional method of instruction. This answer is in line with Milanovi et al. (2021); Li et al. (2018) argument that adopting something new and witnessing its success may have an impact on adoption, which in turn affects the process of change.

The participants also expressed their belief that their pupils would like the digital play way approach. Thus, one may say that the integrated digital play way approach might be good for introducing computers to young learners. As Participant 11 simply put it, "The activity taught me that long gone are the days of providing pupils all the knowledge," the results clearly indicate that this project has had an effect on the contributing educators' educational ideas. They need to explore as well. This reaction demonstrates the need for additional instruction rather than "teacher’s talk in front of the class" when using the digital play technique. This kind of change is referred to as being a mentor on the side rather than a sage on the stage (Blum-Ross & Kumpulainen, 2019; Borah, 2021).

During the digital play classroom, the instructor takes on the roles of facilitator, guide, feedback-giver, and motivator. It is clear from the results that the vast majority of participants believed that the teacher's role differed in the digital play technique. At the same time, it's important to note one teacher who claimed it wasn't different. She suggested that digital play learning shouldn't be any different as facilitators and guides should also be present in regular classes. Her contradicting ideas resonate with those of Creswell and Creswell (2018) who claim that technology is not the only silver bullet to all educational woes. The participants indicated in the journals and interviews that the teacher's responsibility when utilizing the digital play learning and teaching technique includes facilitation, skill development, supervision, guidance, feedback provision,

mentoring, mediation, assistance with problem solving, and even motivation. It seems reasonable to describe all the roles as suggested by the participants, even though some phrases, like the term facilitator, might include all of the aforementioned responsibilities. These articulated roles showed that the study has also had an influence on broadening the concept of facilitator. Picture 4.4 below clearly shows how learners engaged collaboratively in the learning process that gave them the skills to participate on their own as the teacher facilitates the learning process.

Picture 4.4: A Photograph Portraying Learners Engaging Collaboratively

Synthesis of Teachers' Perception of Play Way Method of Learning

Collectively, the three themes (with their categories) in response to the question *"What are the teachers' perceptions of play way method of learning in developing digital literacy?* Point to how they perceived play as; Digital skill acquisition, child centred approach and Changed role of the teacher (See also, 4.3). In the next section I discuss the findings of the second research question/ objective.

4.4. Primary School Pupils' Digital Literacy Competencies Demonstrated through Play Way Method of Learning

The second objective of the study was to examine primary school pupils' digital literacy competencies demonstrated through play way method of learning. The following research question was derived from the objective; what are primary school pupils' digital literacy competencies demonstrated through play way method of learning? To answer this question teachers had to fill in their reflective journals before any play activity was to take place, then indicate whether they met their stated goals after every play activity. Interviews were conducted after all the plays had been conducted and classroom observations were also done by the researcher during the digital play process. The plays that the learners engaged in were age appropriate and in line with the content for class one. This plays included; sorting and matching objects of similar types or colours, grouping objects according to sizes, arranging objects from the smallest to the largest and counting them, drawing painting and colouring, naming objects, grouping and numbering in groups of ten and plays involving filling in by typing in blank spaces. Teacher's analysis is presented in Table 4.2.

Table 4.2

Analysis of Primary School Pupils' Digital Literacy Competencies Demonstrated through Play Way Method of Learning

Tool for data collection	Summary excerpts of digital literacy competencies demonstrated through play way method of learning	Categorized themes	Emerging themes
Interviews Observation	Using the arrow to search. Digital Navigation through plays. Starting with simpler plays. Recharging the tablets. Switching off after the play time.	Manipulating the tablet menu	Navigation skills
Journal and observation Interview	Reading skills on the tablet Searching for information. Restarting and locating information. Going through the tablets menu. Development of literacy skills. Analyse and sequence information Collaboration and problem solving	Finding digital information Problem solving	Search skills and reading attitude
Interviews Journals	Learnt basic computer skills. Switch the tablet on. Developed patience for the tablet to boot up. Proper use of the track pad. Typing skills. Proper use of flashing vertical line on the screen. Frequent use of Icons. Shut down the computer following the right procedure	Booting up	Opening and shutting the tablet Typing

Observation			
observation	Competence in computer language and use. Collaboration by the learners. Team work and group work. Sharing tablets and skills learnt. Able to click on the game and play directly. Could identify the number of games available. Learnt how to count	Computer language Learner to learner collaboration. Critical thinking skills	Computer language and skills
Interviews journals Observation	Focused learning. High levels of concentration. Learner's ability to think and not the tablet. Learning became active constructive process. Digital play as hard work Tablets opened new possibilities to teaching and learning Provided several points of view It made collaboration possible. The students improved their creativity, Learners owning the learning process		

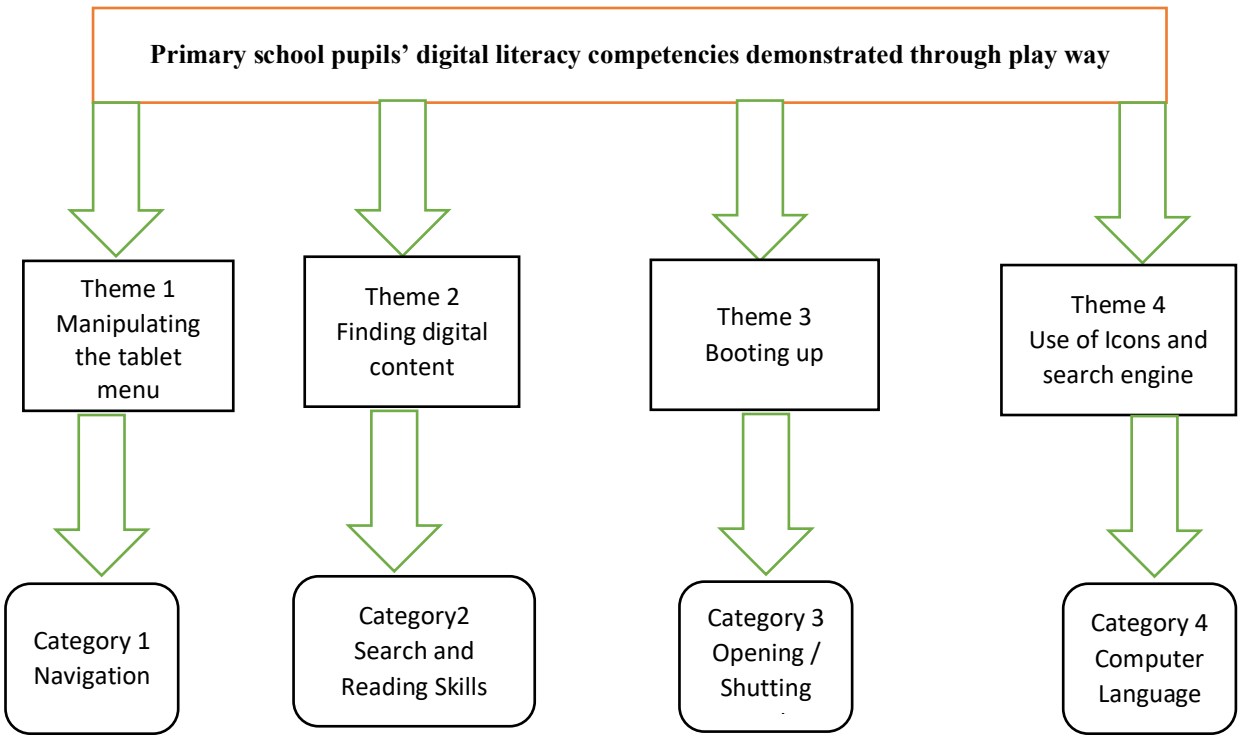


Figure 4.2: Digital Literacy Competencies Demonstrated through Play Way Method

A competence is the capacity to carry out a task successfully or effectively through the skills learnt. A skill is an ability to use ones knowledge of a learned physical task effectively and readily in a performance. It is the ability to do an activity competently. Learners during play way method of learning developed some expertize in handling and using the digital devises. These digital literacy skills were analysed from the journal reflection sheets, open ended interview and observation. Primary school pupils' digital literacy competencies demonstrated through play way method of learning are: i), Manipulating the tablet menu, ii), finding digital information, iii), Booting up and iii), Use of Icons and search engine

4.4.1 Theme 1: Manipulating the Tablet Menu

The participants in the study were seen to be going through a set of options presented on their tablet applications. Manipulation helped learners execute play programs on their

tablets. According to the participants manipulation involved the development of navigation skills.

4.4.1.1 Navigation Skills

Navigation is the act of opening and moving through computer menus like the start menu, viewing files and to move the cursor around the screen to access Icons and other features on the computer or tablet. Navigation as a skill was seen to have developed in the learners. They were able to explore the digital tablet by using the arrow to search. Teachers explained that the plays that were installed were of different types. Teachers and learners navigated through all the plays "Finally we resorted to the easy ones and this made the children enjoy the games very much" commented participant 5. In the classroom, the children too navigated through the plays and when they were through with a game for a particular day, they requested whether they could move to the next game, she added. Learners took good care of the tablets they could also wait for instructions to be given to them. So the play sessions taught them patience they were able to charge when the battery went low. Throughout the play sessions, they were also very cooperative. Teachers and learners skill on navigation was attributed to the newness of the digital play way strategy, the digital literacy context, the newness of using the tablets, and computer language. Personal experience and observation related to skills on the digital play way strategy of teachers and learners indicated that teachers and learners struggle immensely with play especially those that deal with technology (Perkins, & Salomon, 2018). Navigation as a skill which is embedded in the play way approach, assisted learners and teachers develop skills on location of the plays. Learners were more and more exposed to computers and learn quite easily how to use computers and related technology with a great deal of assistance from peers and their teachers who were facilitators (Fluck et al, 2020). Teachers created a more stimulating learning environment (Davis, & Arend, 2023).). Digital

literacy skill supports teaching and learning and improves educational outcomes (Piper et al., 2015).

The next theme that emerged from the competencies that were demonstrated through play way method of learning is finding of digital content.

4.4.2 Theme 2: Finding Digital Content

Finding digital content that is meaningful involved employing various search strategies that helped to source information on the plays. The experiences that were playful in nature created some form of interactivity within the learners and allowed room for exploration. Digital content was retrieved due to the acquisition of search skills.

4.4.2.1 Search Skills and Reading Attitude

Search which is sometimes referred to as seek is a process of finding letters, words, files, or games. It is a feature that is found on the digital devices used to locate data. The responses to the journal sheets indicated the continuous plays became more interesting after the learners had practiced more and gotten used to the search skills. Digital play sessions by learners helped them develop reading skills. This was clearly stated by a participant during an interview that;

> *You realize these children have an issue with reading, as they search they must read the different files on the tablet screen to be able to locate the plays and that means that we are supporting their reading ability when they are associated with digital play technology. So it is a good thing to do. Digital play provides a variety of information* added participant 8.

Nevertheless participant 1 suggested that the digital play sessions had a positive impact on searching for information, restarting and locating information. The learners were able

to go through the tablets menu through searching after switching the tablet on. They were able to locate where the plays that were on the tablet menu.

The participants inevitably had to read a lot while looking for information. They had to read the steps to follow and observe the buttons to press. Follow the instructions on the tablets for example grouping of objects. This seems to indicate that looking for information on their tablets did enhanced the understanding of what the learners read on the tablets. Through following the instructions on their digital devices, learners gained literacy skills, she narrated;

> *"When children are busy playing they get more insight and improvement in their reading skill as they will be required to do a lot of reading and also listening because some instructions were given in audio. They get the ability to sequence and analyze the information found* (Participant 7).

This notion is followed by those of Brun-Mercer (2019); Mujan et al. (2019); McGee & Welsch (2020) who contend that digital literacy can help cultivate certain literacy abilities while utilizing technology.

Abu Zahra (2020); Brun-Mercer (2019) and McGee and Welsch (2020) all note that the use of digital devices such as those used in this project (tablets) provides the potential to help with the growth of reading abilities, and as a consequence, digital literacy could evolve into a useful tool to help instructors manage reading challenges. These writers also assert that by providing explicit instructions as games advance, digital literacy could help to enhance reading-related skills. Mifsud (2021) agrees that it's critical to improve digital reading comprehension abilities because digital media are continually evolving. As a result, screen reading needs to be developed because it seems like the number of digital media is growing every day (Abu Zahra, 2020). The skill emphasis was reinforced by the

use technology in classrooms and the availability of computer hardware and software (Fyksen, 2011). Learners' skills resulted in the application of a range of objectives in a more active learning environment and seen as a tool to foster higher order thinking, creativity, and search skills (Langthaler & Bazafkan, 2020). Digital learning helped learners share difficulties in learning and helped them learn language (Sabiri, 2020). Search skills transformed collaborative learning that was made possible by the instructional environment (Kumar & Tammelin, 2008). Sabiri (2020) emphasizes that digital learning increases mutual interactions between learners as well as learners and the teacher.

The next competence that was developed as a result of digital play way method of learning was, booting of the tablet

4.4.3 Theme 2: Booting the Tablet

The participants were seen to have developed the skills on booting their tablets. Booting is a process of starting the tablet using the power button on the tablets. Booting up encompasses opening and shutting the tablets using the right procedure. Participants were also seen to have developed skills on general computer skills. This gave rise to the opening and shutting the computer using the right procedure.

4.4.3.1 Opening and Shutting the tablet using the Right Procedure

Learners were seen to have gained knowledge on basic computer skills wrote Participant 1 in her journal. They were able to switch it on added Participant 7. Once turned on, learners waited as the tablet takes time before it is ready to use. They could also show their friends the few different displays that flash on the screen, when the tablet is booting up. They clearly understood that once the tablet has booted up, it is ready to use, explained Participant 9. Learners guided their plays using the track pad on their tablets, added

participant 3 they could either press or tap the track pad to click. The keyboard also appeared on their tablet screen, this allowed learners to type letters, numbers, and words into the tablet. Whenever learners saw flashing vertical line on the screen called the cursor they started typing on that vertical line. They learnt to type the name of the game and the game popped on the screen, narrated participant 8.

Learners were seen to have developed the skills on typing. Participant 2 stated;

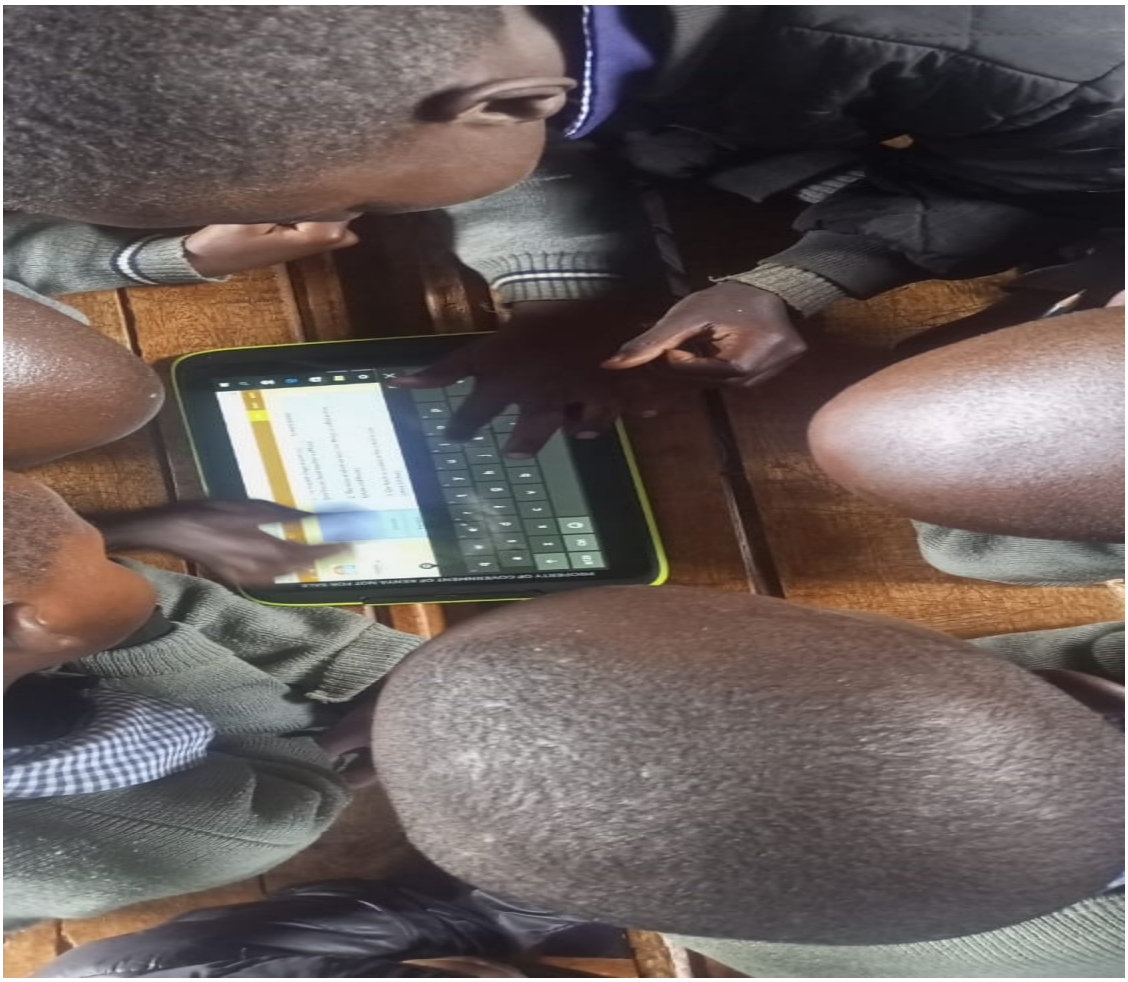
> *Some other time when the learners could not go through the tablets menu, they could type the name of the game for example spider and spider game popped out on the screen.*

This skill helped the learners save on time. After developing the skills on search, they also searched on their screens where to type on the search bar. Participant 7 wrote on her journal that I had shown my learners how to type because some games like those of grouping and sorting objects required some sections typed. The typing was on simple three letter word. If the word was long then the learner was required to type a vowel sound on the word.

Learners were seen to use their fingers to control the pointer on the screen and be able to click on the games and play. Whenever they moved their finger across the tablet, the pointer moved in a similar manner. They simply dragged their finger across the track pad to move the pointer on the screen. Learners were able to identify the Icons and their use, wrote participant 5. She continued to say, they frequently used Icons that represented different plays on their tablets. The icons in their tablets were small images that gave them an idea at a glance. Participant 3 added that, one of the Icons had all the games in it. Double-clicking the icon on the tablet will open that application or file. Learners progressively were seen to have understood how to shut down the computer following

the right procedure. Shutting down was done by the learners when they were done with the day's play activity. Participant 11 wrote that; I was able to observe my class shut down their tablets by clicking the start button, then selected from the menu by searching and locating the power symbol. Then clicked on it and the tablet could shut down. Picture 4.5 shows how learners were demonstrating their typing skills.

The next sub theme is the use of icons and the search engine.



Picture 4.5: A Photograph Portraying Learners Developing their Typing Skills

4.4.3.2 Use of Icons and Search Engine

Participants were seen to have gained knowledge and skills on performing fundamental tasks on the tablets like the use of Icons and search engine. The journal data also indicated that participants felt that they became more competent as they progressed with the play

activities. By the end of the digital play, statements from the journals like the ones written below provided examples of how this was apparent:

> *Learners are becoming competent now. After the tablet has booted up they begin their plays without much struggles (participant 6). Nothing hard so far the pupils can practice the skills acquired I am slowly getting there (participant 2). Not at all at least everything was fine with the play we undertook today. I did not struggle that much as before (Participant 10)*

Participant 9 had the following to say about how learners developed computer skills development in her journal "In fact when we started the play sessions it was somehow difficult because I had never used this method before but as time went by the learners and myself became more competent.It was observed that the participating teachers and learners collaborated with what needed to be done. When learners had difficulties, teachers offered assistance to those who were stuck. They accepted their mistakes when they went wrong and took corrections positively. This was seen in all the schools. Participant 3 clearly explained that learners developed the skill of working together as a team. Majority were able to assist each other they worked in groups, they shared the tablets and could even teach themselves, the learners colored and painted in turns. Some were fast and had to show the slow learners what needed to be done. They finished their tasks on time apart from a few learners at the beginning of the project who had not clearly understood and were given enough time to finish their task.

Through observation, it was clear that the children were able to click on the game and play directly, identify the number of games available and that was the reason why some of the learners wanted to play several games available. Nonetheless, children focused on the game that was meant for a particular day, depending on their capability to switch on

the games and play. They were able to list the games they had already played and those they had not. Participant 11 added by saying that learners showed total co-operation were so cheerful and wish they could continue again and again they were eager to learn more about the games and were happy with the play. Participant 7 said;

> *Pupils worked together in a collaborative manner were trying to show their groupmates what they have done, they were working in groups hence, there was collaboration. I had grouped them in groups of five and they were able to assist one another as they play. Other groups were faster*.

The learners were excited when the lesson started and eager to learn and to use the tablet every day. They asked if they had a lesson on tablet because everyone wanted to carry the tablet and open for the group, they were telling their friends how the play was, this enhanced their communication skills. Participant 6 highlighted that the fast learners were able to assist the slow learners and also shared the tablets. They never wanted to stop the lesson they really wanted to continue.

Participant 10 said every learner was jovial throughout the lesson, they were so eager to learn. She added by saying learners were united in action, they really enjoyed working in harmony. They were very keen and attentive on whatever instructions they were told in manipulating the digital device. Participant 5 stated that whenever they played correctly they cheered up and clapped their hands. They had marked the tablets they were using and you could hear, “hiyo ni yetu (this tablet belongs to us). Participant 8 stated that out of enthusiasm they wanted to show everyone what they had achieved. Learners developed the skills on computer language like: scroll, minimize, maximize, search, increasing brightness and darkness on the screen, increasing and reducing volume, click, open and shut.

During the digital play, data revealed that at the beginning of each session, the respondents were required to list their goals in their journal entries. At the conclusion of each session, they were required to assess which goals they had achieved and which ones they had not. Every time the participants had to set goals for every digital play activity that was to take place and the duration for every activity was planned. Personal observations, nevertheless, failed to uncover any type of drawn timeframes. Nonetheless, the respondents were mindful of the fact that they had a deadline for finishing their digital play activities, so they pace themselves on those specific dates and time including the durations they were to undertake. Participants clearly indicated that when they were involved in group work, they discussed what each learner should do. So they planned their activities collaboratively.

Journal data suggest that participants thought that the following could assist the learners acquire skills to finish on time that: Working at extra times especially for the slow learners, so after the classroom play the slow learners were given further attention, the available time was also used effectively. Punctuality by starting the sessions on time when all the tablets were fully charged prior to the lesson. The learners were given the opportunity to practice more. Learners were also encouraged to work cooperatively and this enabled them learn from each other. The learners too were free to ask for assistance in case of any difficulty and were encouraged to keep practicing the search skills. In their activities learners Collaborated more, learned from mistakes, asked for assistance, revised previously done work, focused more and copied on their exercise books what was summarised on the chalkboard on the newly acquired skills. Participant 3 remarked “I think it sets us on the proper route in that you understand what you intend to accomplish at the end of the day," they were stating that the entries on the journals were useful for planning. Participant 2 stated: From my perspective, the entries were beneficial since I

was able to reflect on what I did in order for my observer (researcher) to understand where I struggle so that she can assist me in the next session and be able to complete the day's task on time. Participant 6 when asked if she had any reservations about finishing the journal and whether it was time consuming and that she was not, she stated: *"No, no, no I have no problem in finishing the journal.* Participant 4 said the journals were useful because the investigator could employ them to ascertain which topics the participants had trouble with or which areas needed more time. Learners could complete tasks within a stipulated time and some were fast and needed to do more plays.

It was regularly observed that children were able to share ideas with classmates others were able to narrate their experiences on play. There was a lot of excitement during the play sessions in that they could show each other what needed to be done and complete tasks within the stipulated time was also observed in all the schools. It was noted that as the project proceeded, the participants continued to note down their goals because they needed to plan for their lessons before the real play was to be performed in class.

Forutanian (2021) outlines how establishing personal goals can serve as motivation, especially when those goals are attained. They strived to achieve those goals at the end of every play session. Furthermore, developing computer skills created focus on every aspect that helped one who is implementing an approach that is believed to be new not to be distracted. The results of this study demonstrate that the development of the teachers' computer and planning skills was a result of their regular use of journal writing for reflection, which is widely regarded as an essential component of the learning process (Pazilah et al. 2019). Goal-setting techniques were used to help the researcher identify the participants' areas of computer skill weakness, and as a result, the researcher was able to help the participants by reading their goals at the conclusion of each session researcher

check on how planning of future sessions were carried out that led to improvement on computer skills. Although they felt the entries had great value in that they helped them accomplish their goals, many participants first admitted that they did not enjoy writing in them. The fact that participants initially did not enjoy writing in their reflective journals could be due to the fact that they found it difficult and unpleasant at times given what the entries revealed that you do not always attain your goals. Although in their final interviews participants found journal writing and goal setting beneficial, as they noted down how computer skills developed gradually. A number of participants indicated at the end of the digital play that their planning for activities on classroom instruction was ‘very good’. Their journals were examined, and it was discovered that a variety of goals had been set. Participants' abilities to help their pupils in the digital play classroom also increased during this trial, and this tendency was similar. After the digital play, the participants said they felt much more equipped to run the computer classroom.

The participants shared their views and felt that they had the basic computer knowledge required to manage teaching and learning, after they had been guided on how to carry on with the play sessions.The filling of the entries on the journals on a daily basis helped in the development of the aforementioned sub-theme –use of icons and the search engine- as improvements were observed. Through play way method of learning learners were able to share skills learnt. They were able to demonstrate as they worked on their groups how the play activities begin and how to end. They did not want to stop they shared their activities continuously. Shared their achievements in terms of what went well and what did not go well. With the games that had scores they were able to share their scores in celebration especially when they scored highly, they could click on an icon that congratulated them with some sound, ‘excellent’!

Personal observations provided data that some participants had prepared sheets with columns that were used for learners assessment about how the children completed their play activities with the use of the icons and the search engine, the duration taken and whether there was any challenges faced. Participant 2 stated, during her journal that The assessment sheets showed how they use their tablets especially for the development of basic digital skills. As the learners created knowledge through mutual understanding they became competent in their communication skills. They shared ideas and information all the time. They were able to ask each other questions and answer them. Influenced each other and shared lessons learnt from the play activity. Clear learner to learner interaction was seen; and also teacher to learner interaction. Children were seen to be seriously concentrating on the tasks ahead on them. They were patient with one another playing in turns and always followed rules. Any form of play that was played they shared the rules as they discussed with each other. This helped the learners own the learning process; they developed independence, inquisitiveness and working together.

It was also highlighted that the play process needed participants to maintain concentration and think through concepts that served as their guides while playing. Also, it was intriguing to observe how engrossed and focused how pupils were while watching the play. This seems to indicate that playing needed a lot of attention, which breeds confidence. The research also showed that while using a tablet as a tool, it is the pupil who must do the thinking rather than the tablet. This supports the claim made by Tan (2019) that a computer can serve as a mind-extension cognitive tool. Hence, rather than the tablet, it is the learner who contributes intelligence (Erbas et al., 2021). When a learner participates actively in an activity, for instance, use of icons, then learning is happening. Learning also evolves into a process of active construction (Sailin, & Mahmor, 2018). The participants seemed to like the digital play despite the fact that it seemed to require a

lot of concentration and mental effort, which is possibly why there was a drop in the perception of digital play as hard labour.

The experiences that were developed as a result of digital play way strategy had a positive impact on learners and teachers attitude towards teaching and learning. This became evident in the comments section of the observation which indicated that the teachers became more positive about their teaching and learning. Throughout the digital play sessions teachers clearly said that: They felt empowered, They felt that they have a sensation of proficiency in using a tablet, It enabled collaboration, it provided new opportunities and new ways of thinking, The pupils improved their creativity, They were able to search, use the icons and locate their plays through the menu or typing the name of the game. They felt they had some control over what they wanted to do.

The participants felt that the role of the teacher was different. Participant 2 wrote, the project taught me that gone are the days of banking information on the learners. The participants frequently made reference to the need to consider their learners' abilities, especially in language proficiency. At some other time Kiswahili language was used to give instructions. Furthermore, digital play process required a substantial amount of reasoning and concentration, as the tablet has evolved into a cognitive instrument that demands that the pupils create the thinking rather than the tablet. In all the schools they cooperated with each other as they played and exhibited high levels of collaboration and team work that led to the development of competencies. Prior to the play process the tablets were tested on the play content for the day charged to ensure that the battery never runs down during the lesson and then the teachers guided the learners step by step through the lesson. The learners were grouped into groups of five and six per tablet. Picture 4.6 shows learners use of icons.

Picture 4.6: A Photograph Portraying Learners' Use of Icons

Synthesis of Digital Literacy Competencies Developed through Play Way Method

Collectively the three themes in response to the question *what are the digital literacy competencies demonstrated through play way method of learning?* Revealed how the participants developed skills on digital literacy competencies as manipulating the tablet menu, finding digital content and booting the tablet then typing. These skills were mentioned and observed by the teachers to have developed in their learners who enjoyed doing activities on the screens of their tablets. In the next section challenges faced in developing digital literacy through play are discussed.

4.5 Challenges Faced in Developing Digital Literacy through Play Method

The third objective of the study was to assess challenges primary school pupils face in developing digital literacy through play method. The following research question was derived from the objective, *what are the challenges primary school pupils face in*

developing digital literacy through play method? To answer this question the participants had to indicate in their journals the challenges they faced during play way strategy of learning, and then voice their challenges too in their open ended interviews as shown in Table 4.3.

Table 4.3

Analysis of Challenges Faced in Developing Digital Literacy through Play Method

Tool for data collection	Summary excerpts of the challenges faced in developing digital literacy through play method	Emerging sub themes	Categorized themes
Interviews	Some tablets went off Lack of electricity at some other time Hanging tablets. Poor identification of icons Some learners were slow in terms of computer language and medium of instruction to grade 1 Some plays were very challenging. Use of digital devices still in initial stages of development. Teachers struggle to teach using technology.	Tablets not working Lack of skills to handle digital devices	Hanging tablets
Journals	Lack of ICT support from CSO's. Ignorance on use of the digital devices. Lack of administrative support. Trainings offered not practical oriented.	Inadequate support from the ministry. Theoretical trainings	Lack of administrative support and ministry
Journals	Lack of confidence to handle tablets. Inadequate skills in technology use. Poor search skills. Struggle in directing the plays using the arrow	Lack of skills to handle digital devices	Fear of Technology
Journals	High enrolments. Constrained contact opportunities. Less tablets in schools. No allocation for computer studies in the time table. Lack of space. Faulty tablets. Repairs and replacements only done by specific people	Lack of clear guidance on digital literacy. Scarce infrastructure	Time tabling and time related issues

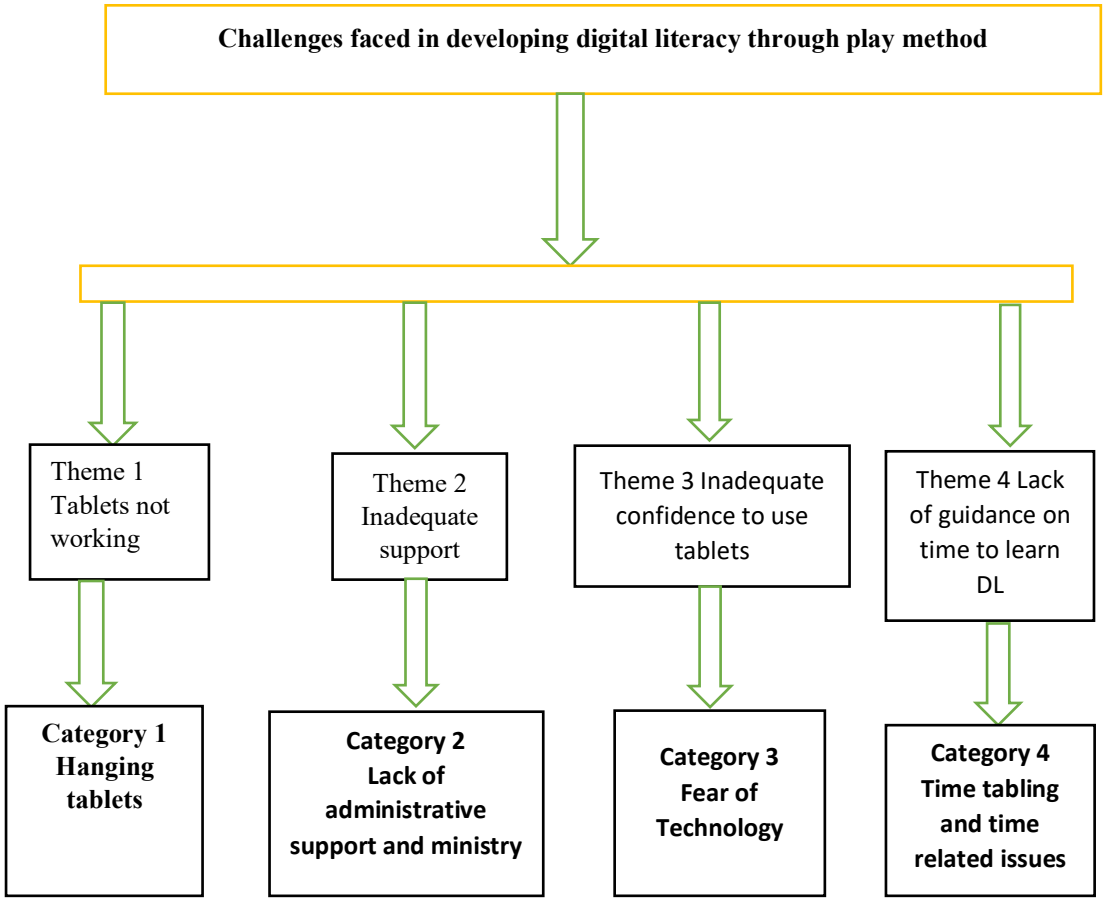


Figure 4.3: Challenges Faced in Developing Digital Literacy through Play Method

4.5.1 Theme1: Tablets not Working

Play way method of learning though an interesting method never missed some challenges. A tablet being an electronic devise, depending on the information fed into it, could sometimes stop processing the information leading to frustrations on the side of the participants. When the tablet was given a lot of commands at the same time, it created confusion on the tablet causing hanging. Some of the challenges reported during the play project included; the tablets sometimes stopping to work, inadequate support, and inadequate confidence by participants to use the tablets and lack of time to learn digital literacy. The first sub theme was the tablets hanging. When the tablets stopped to work, the lesson never stopped. There were always extra tablets left on charge that were on standby. Then after the lesson the ICT champion teacher trained by the MoE could refresh them in readiness for the next Lesson. Grade on learners had never been exposed to the

tablets since they were from pre-school. A report that was said by the participating teachers before the commencement of the digital play lessons.

4.5.1.1 Hanging Tablets

The participants in the play faced this challenge while using the tablets. Initially learners could not follow instructions so easily and so they kept clicking on different plays at the same time. Several play programs could run at once causing the tablets to hang since the tablet processed the plays very slowly. Participant 6 had the following to say;

> *Some learners were just tapping the tablet not knowing exactly what to do causing the gadgets to hang some learners could not identify where the colors, paint and brush are and where to click so as to progress with the activity. This confused the tablets. At the early stages of the digital play, learners were wondering how they can draw on the tablet. At some other time learners were not able to match the cards accordingly in addition, some learners were unable to regroup objects of shape and size together.*

Participant 9 also explained her challenge by saying that some of the learners did not understand English language had to use Kiswahili to explain some concepts on computer language to grade one was difficult to them and I resorted to using Kiswahili language which is also a medium of instruction. In the Competency based curriculum the promotion of indigenous language is also encouraged.

Participant 7 lamented that some tablets could occasionally stop working, some other time, every learner wanted to be the one controlling the tablet and because of curiosity they wanted to click the tablet at the same time. I encouraged them to hold it in turns which in turn promoted the spirit of patience and sharing. Some plays were very

challenging to the pupils. At the beginning I needed to teach the leaners how to open, search and show them how to play added participant 3 that this took time. Participant 1 said that; letting learners to click on the tablet was quite challenging, few learners had fear of handling the tablet. Giving instructions now and then as some learners wanted to be followed. Sometimes some learners were absent. What was encouraging was that this became a struggle at the beginning of the play process but as we continued learners had got some skills on how to use the tablets. Some were able to switch it on but could not access the play menu. Through observation at the initial stages of the play strategy few learners were failing to get instructions but solved through restarting tablets and assisting them in their groups.

Some learners did not understand the difference between to group and re-group., a few problems especially on expanding the diagrams on the tablet screen was also observed. Through handling of small groups the learners were assisted and they were able to play. The fast learners could also show and demonstrate to their friends in the group. Participant 5 stated that the slow learners were also assisted step by step most were able to work by themselves but slow learners were assisted. Participant 2 complained that, at the beginning I needed to teach the leaners how to open, search and show them how to play. This took time. Participant 1 was pleased to say that;

> *Learners were able to start and shut down the tablet using correct procedure though not all few could learn from their peers as I supervised them. I also added them more time so that they could finish their tasks.*

They asked themselves questions as they played together in areas they did not understand, this promoted communication skills I had quick learners who helped one another to do the play even though some learners complained of the tablets hanging and could restore

the tablet. At some other days some of the quick learners were absent. I had to attend individually to slow learners hence consuming more time. This gave me a lot of satisfaction because at the end of the day all the learners were equipped with skills on digital play. Every time I experienced any challenges I had to guide the learners overcome the challenges. Sometimes the tablets could not work required an expertise regarding maintenance, which wasn't typical for the project. Only two teachers gave a positive response when questioned if the participants had someone to help them technically. Participant 5 explained that a technician is sent by the ministry of education to visit schools and do the repairs. This posed a great challenge because during delivery of tablets and laptops contacts were left so that in case of any challenge information is passed. The greatest problem was that since it was a government project it took a lot of time for the experts in maintenance to be sent to schools for repairs as long as three months lamented participant 3.

Participant 11 narrated that every school had an ICT champion, those teachers who were trained as ICT specialists. Although their expertise was questionable in that they could not repair any tablets in case they could stop working.

Most of the indications on the journal data indicated that the technology plans on use of digital devices, were still in initial stages of development and needed refinement especially on the use of the digital devices in line with what is provided in the Kenyan Curriculum designs. Interview data and observation reports supported this interpretation. These technological advancements are to be taught to the learners. The sections in the curriculum designs and the textbooks outlined websites that can be used after every topic for learners to use technology in their learning although the teachers still struggle to teach using technology. The goal setting was on enabling learners to get more hands on and on

teaching pupils how to use computers effectively. The adoption of digital play was intended to help pupils meet the constructivist-based objectives of the Kenyan Competency-Based Curriculum (Davis, & Arend, 2023). These results concur with the current trends cited by the Ministry of Education (2016, 2017). It's crucial to note, nevertheless, that many of the participating schools had the donated government laptops and tablets yet the teachers struggled to implement and embrace the use of technology in their teaching and learning due to their educational believes (Rubach & Lazarides, 2021). Participants indicated also that they felt free to seek for assistance whenever they went wrong or whenever they were stuck especially when the tablets could stop working. The next theme is that there was a challenge on the support of the teachers.

4.5.2 Theme 2: Inadequate Support

Kenya Institute of Curriculum Development (KICD) emphasizes that digital literacy should begin from early grades of learning. Facilities; tablets and laptops were availed in schools yet clear guidelines were not put in place on their use. Teachers needed support from the ministry and the school administration

4.5.2.1 Lack of Administrative Support and Ministry

Participants agreed that they could not rely on the government's assistance for ICT zonal termly training organized by curriculum support officers (CSO's). In their journal entries, the participants noted that the CSOs grouped teachers per school for training but the practical sessions were not there. So it became very difficult to implement the strategy on the use of laptops and tablets for teaching and learning. In the CBC, participants noted that there were no clear guidelines on what was installed by KICD in the laptops and tablets and what it stated in the curriculum designs. That is why majority of the teachers ignored the use of the digital devices. They had more faith in organizations at the zonal level like TUSOME, PRIEDE, EGMA which mostly used traditional methods of teaching

than in those that dealt with remote methodologies that required the use of technology. It appears that support from the ministry of Education related to computers, is virtually non-existent, a factor that is viewed as a requirement for systemic progress, as is support from those in leadership positions at schools (Kristiawan, & Muhaimin, 2019; Petko, Prasse & Cantieni, 2018).

This was echoed by Participant 7 who stated that majority of teachers had the basics of knowledge on use of the tablets, as they termly receive training organized by the ministry of education then rolled out to schools through curriculum support officers. This was resonated by one of the teachers in the zone who had been one of the trainers training Competency Based Curriculum and remote methodologies in the zone, that despite lacking fundamental computer abilities, the participants were really upbeat and eager to learn and implement the strategy, she said:

> *The staff members were positive since they want to use tablets for learning and instruction as devices that can assist with the development of digital skills. The only issue is that they never encountered that during training. There were no computers integrated in teacher training even then; it is only now that we are asked to attend weekly trainings per term funded by Kenya institute of Curriculum Development (KICD). The skills we gain during trainings and those that were shown to us by the researcher have helped us understand digital play way method as playing on the screen of a tablet and implement the activities for teaching and learning.*

Staff empowerment on computer skills can yield better results in terms of learner skill acquisition. Efforts have been made through Ministry of education who have used non-governmental organization to train the teachers on computer skills (Shatunova et al.,

2019; Tondeur, 2020). Teachers have taken part in these activities that have empowered them.

The study participants did not hesitate to express their need for sharing-based support from their schools and other schools' colleagues. In agreement with the claims of (Shatunova et al., 2019; Tondeur, 2020; Ma'rifah et al., 2021) who claim that assistance is one of the most essential aspects for achieving sustainable development of innovations, they stated that they would really recognize knowledgeable individuals, such as the school administration and ICT trainers from the sub county, observing what they do in the computer classroom in order to provide feedback (Rogers, 2003). This might be explained by the fact that the educators were unfamiliar with the tactics for implementing and regularly using tablets in the classroom and that they really desired to help improving their teaching and student learning.

Digital learning integration cannot be viewed as a straightforward classroom issue; rather, education systems and school cultures are significantly affected (Nascimbeni, 2018). There have been no pedagogical innovations, or "new teaching-learning techniques and features matching the options of digital learning," as a result of anomalous metrics such as placing computers in classrooms, trying to connect institutions to the Web, supplying course materials and access to digital resources, and supplying teacher training (Nascimbeni, 2018; Byrne, et al, 2016). Educators concur that culture must alter technology, but culture has not done so (Kristiawan & Muhaimin, 2019). Agyei (2021) asserts that governments are placing a focus on professional learning as the key to successfully implementing policy and curricula, utilizing digital skills to enhance teaching and learning, and boosting educational standards. This assertion is backed up by Kipchumba (2021). Lack of skilled teachers is a significant barrier to digital literacy in

many African nations (Plessis & Subramanien, 2021). Another issue that has to be addressed is the lack of contextually suitable course material for both teachers and pupils (Hennessy & Onguko, 2010). This notion was witnessed by the participants on the availability of digital devises in schools with no clear course content in the curriculum designs to be used to teach digital literacy.

The next theme to be discussed is on the phobia of technology.

4.5.3 Theme 2: Technology Phobia

The vast majority of teachers said they were willing to participate in the digital play strategy. Yet, when probed in terms of their confidence, it was quite low. This was due to the phobia of technology. Nevertheless, the participants did indicate that they desired to gain the knowledge, abilities, and self-assurance required to do so. The participants also had a highly favorable attitude toward the digital play technique, and they viewed it as extremely vital to utilize the tablets as a training tool and to ask for help whenever they encountered difficulties. From these vantage points, it might be claimed that while respondents did not feel particularly confident at the beginning of the digital play, they thought that as the play progressed, their skill and conviction would increase. The information showed that the individuals' perceptions of their abilities were ambiguous in the use of technology.

One's beliefs in their capacity to carry out specific duties successfully determine one's level of confidence, which is boosted by successful experiences (Bandura, 1997; Gerbino 2020; Bandura, & Hall, 2018; Valtonen, et al, 2022). This predominantly digital literacy confidence among teachers assisted them in integrating digital learning into subject areas (Dexter & Richardson, 2020) language of instruction. Moreover, educational criteria such as teachers' educational levels, literacy levels, and access to professional development all

have a significant effect in education (Kipchumba, 2021). The main obstacles impeding teachers' preparation and assurance in using digital tools were an absence of technical assistance in the schools and teachers' lack of knowledge in using these digital tools. In the project the participants' confidence grew as the digital play progressed through personal goal setting. Participants admitted to having computer-related objectives for both themselves and record them in their journals.

Observational data in the early stages of digital play indicated that the learners made many mistakes while trying to search for the games. Some of the instructions seemed difficult for them to follow as they kept clicking different games at the same time creating confusion on the gadget. This trend continued for almost three consecutive plays which the researcher documented the following on 10th September 2021 in the observation sheet (comments section). "It was noticed that the majority of the participants still struggle with the curser and arrow skills. Some had difficulty in moving the cursor and also struggle with the scroll down and up button on the tablet." Through this observational data, it made the researcher explain to the teachers more on how to give instructions to the learners which finally they were able to understand play way method of learning.

The majority of participants said during the interview that maintaining a journal was unpleasant because it demonstrated when one was not accomplishing one's objectives. When goals were not reached, it meant that more time was required for that particular play activity. This was evident in the reply of a participant 3 who said:

> *Occasionally you establish objectives for what you want and realize that you've accomplished some of them, but not in the manner you desired to. This indicates that you were disappointed because you did not achieve your aim. You're*

reminded once more that you need to return and create more time to achieve your goal. You understand that writing it down cause's discomfort.

They didn't always enjoy these activities because making goals takes time, and the participants preferred to skip the weekly journal-writing and goal-setting exercises in order to spend as much time as possible using their tablets (Plessis, 2004). The fact that you start to have a direction with your aim, she felt, gives journal writing a good value. It does facilitate concentration and guides you to plan."

Comments during interviews suggest that the activities the teachers chose were those that the learners could play with ease through discussions and communications as play took place. We must carefully consider what is pertinent for our pupils wrote participant 5. The interview provided data that was similar to what was observed on how the participants had planned to finish their play activities and what was observed was that: Work more quickly, collaborate, divide chores, be more organized, remain on task, and budget time to plan more efficiently.

In some cases not all participants were able to complete their play activities on time because of the nature of learners some were slow and also the state of their tablets which at other times could hang and needed restarting. Grouping these children made all the children participate in the play in turns. Respondents initially reported struggling to reach their objectives, however this perception altered as the digital play developed. Meaning learning developed with time. As they progressed with the play sessions the participants became more skilled in the use of tablets. According to Agyei (2021) it can be difficult for teachers to change conventional classrooms from static settings with a one-way information flow from educator to student to dynamic, learner-centered settings where students collaborate in teams and teachers play a more facilitative role. Many educators

are wary of using technology because they find their old teaching methods, which have been around for a while, to be extremely comfortable (Tondeur, 2020). Isolating digital literacy as a subject only has a limited impact on learner learning results.

The next sub theme is on timetabling and time related issues

4.5.3.1 Time Tabling and Time-Related Issues

During an interview participant 8 stated that;

> *"I would disagree that pupils have sufficient time since most of the schools with the onset of free primary education and 100 percent transition by the government, enrolments went extremely so high in that most schools are struggling with the unavailability of space. The computer room was also used as a class during the digital play session. Learners moved to the computer labs or remained in their classrooms but I made sure that the tablets were fully charged before the plays began".*

Mutwot Zone public primary schools have big enrolments, with many pupils enrolled in each class, more than 50 pupils per class. This suggests that handling large number of learners could sometimes be problematic. Other participating teachers confirmed after the play sessions that, large populations in their schools limited contact chances, making it difficult to promote digital literacy in their classrooms. The number of digital devices available per school depended on the number of grade 1 children who were available in school in the year 2016 when the heads of institution did the returns at the end of the year.

Depending on the returns to the MoE, the government brought in tablets as per the numbers given to them. If grade one learners increased annually, then the few available were the ones to be used. Grade one of 2016 are now in the year 2023 standard eight. All

the participating teachers in the schools said very firmly that the competency based curriculum did not allocate any time for computer studies but wanted the teachers to use the laptops and tablets to extend and deepen learning. A closer inspection of the journal data revealed that some sections on the course books require the teacher to visit certain links in the website in order to extend learning. Through interview data with participant 2 she said eloquently that we mostly relied on smart phones to convey any information to the learners in their course books yet we have the tablets lying in the office. In the journal reflection sheets which the participants filled, the participants indicated that they spent some more time with the slow learners. Participants organised their time in the timetable so as to cater for the slow learners.

Although filling the journal entries, after every play session was cumbersome and time consuming to them. Journal entries were not extremely enjoyable for participants as they felt that it took a lot of their time. However, participants finally stated that it had significant value to them and that they were going to use them in their normal teaching and learning even after the digital play strategy. The journals gave participants the chance to set goals, reflect on whether they had achieved those goals, and set new goals for each event. The journals also had sections where individuals had to explain how they planned to complete their projects for the digital play activities by the deadline. Early personal viewpoint revealed that participants initially struggled with the digital game, but this changed as advice on how to approach play sessions.

Topic selection was also initially problematic; the plays installed were several and were not put in any order. The participants' data revealed that it was initially difficult for participants to select specifically which plays they were to begin with. Therefore, Participants required a lot of direction on how to choose a topic and how to move forward.

This was resolved during classroom observation and appropriate guidance was given by the researcher especially after going through the initial journal reflection sheets. Participants begun with the games that were simpler like grouping objects with similar colours or objects of the same types. This too took a lot of time. Participants initially struggled to search for information especially the location of the plays and how to begin them and if the learners were to begin at a go or guided in their groups because time was a factor. This section guided them to fill whether they had reached their goal on the reflective journal at the end of every play session. Observation data supported this finding. During class observation, participants agreed that they needed to improve their computer pedagogy skills on a daily basis. Other teachers had the necessary skills said they were satisfied with the way they use technology to teach. This appears to indicate that the digital play program made teachers feel a strong need to improve their digital teaching methods.

Despite the respondents' initial lack of computer proficiency from what they wrote in their journal reflection sheets, This did not deter them; instead, as was already mentioned, as the play strategy went on, their computer skills improved. The curriculum is too frequently strict and overly demanding, leaving little time for creative teaching methods (Langthaler & bazafkan, 2020). By coordinating curricula, tests, and rewards with the desired educational outcomes, national policies need to show a stronger commitment to assisting teachers in integrating computers and tablets into the classroom. In the end, computers are merely instruments for learning and teaching and add relatively little to the learning process on their own. The UNESCO report clearly states that the teacher's ability to restructure their educational experiences and combine technology with novel pedagogies is essential for the successful implementation of digital literacy in the classroom (Fullan, 2003). There is not enough time allotted for classes, according to the

school schedule, and there is no national policy on computer use in elementary schools (Agyei, 2021; Tella et al., 2007).

4.5.4 Inadequate Tablets

The data from the reflective journals revealed that the participants felt that the resources were available; electricity, classrooms, computer rooms or labs, and the digital gadgets although they were not enough in some schools. The population had grown so big. When it came to space and the use of digital devices other participating teachers could use the time that was meant for Physical Education (P.E) to teach digital play. So when a class was going out for P.E, that space was used for the digital play sessions in some schools.

Further interrogation of the journals revealed that their schools were in need of more tablets and that since most of the tablets had been kept for a very long time without use and poor storage, some of them were faulty and needed repairs. The greatest problem was that since they were brought in by the government there were specific personnel who were in charge of all the gadgets and they were the ones in charge of repairs. Samples of journal entries stated that: We need additional tablets; there are not enough of them. Throughout the entire school, there is only one computer lab. These labs have been turned into classrooms due to large number of enrolments. When you need to practice, it presents a problem because there isn't a free classroom. Nevertheless, the tablets were to be shared per group and therefore no group missed a tablet to play on during the lesson. Spaces for this play classroom was also created.

From the interviews participant 7 complained that there is a big need for more tablets because of the fact that learners have increased in number. At some other time we rush to the neighbouring school to borrow because all the public primary schools had the donated tablets and all had the same content installed in them. Participant 11 in her interview said,

“So we have only 26 tablets and classes are up to 55 learners so we borrow some from our neighbouring schools and then group the children so that they can share” She continued to say that maintenance was also another issue (Participant 11):

Participant 8 added by saying: Sometimes children confused the right name for the right picture but I assisted them to correct- they followed instructions. Participant 6 echoed by saying, when I faced challenges in class, sometimes I called my colleagues to assist me, so that we share the workload of assisting the children were in different groups and it made work easier for me. Participant 3 had this to say: Some of the tablets could not retain battery for some time and these were replaced because for my case the charging systems were few so I took half of the tablets to class as the other half remained charged this was in agreement with what participant 7 also said. “I was also lucky in this project because in my school we have a stand by generator so when power went off I was not worried at all since my school is a boarding school and a stand by generator is very vital. I also identified one leaner to lead others, this enabled the learners develop leadership” suggested (Participant 2) she added that, when the tablets went off I had to look for an extension and a vacant room to recharge the tablets.

The necessity for more computers was also shown by interview data this was not the expectation for the digital play project. These results are consistent with those of Shatunova et al (2019); Kipchumba (2021) and Escudeiro et al (2018) who emphasize the importance of the availability of resources and infrastructure.

Schools in Mutwot zone had tremendous increase in number because of the introduction of free primary education and 100% transition- a directive that came from the ministry of education. The most common strategy for implementation in schools was to assign one teacher to be in charge of either facilitating or instructing the use of tablets and laptops to

the whole school. The findings demonstrated that despite the participants' initial admissions that they lacked the technical abilities and the essential confidence to utilize a computer as a training tool; they never became less confident about taking part in the project. The participants made it clear that they wanted to be empowered through regular trainings. Despite their initial lack of confidence in their ability to handle computers, they had a very positive attitude toward the usage of tablets as teaching tools. Also, the participating teachers stated that they needed to get clear guidance during reconnaissance to empower them in the general pedagogy skills pertaining to tablets and laptops, as well as digital play way method as a learning strategy.

It was also revealed that the participants planned their lesson prior to the practical sessions through setting of personal goals related to the use of tablets in their journal reflection sheets. The findings that various shortcomings activities in the participating schools reflect the circumstances that Tondeur's (2020) and highlight Shatunova's et al. (2019) findings required to enable the use of tablets for classroom instruction to be implemented. According to the study's findings, having a fundamental understanding of computers is essential for using tablets effectively in a school environment.

To fully integrate and deploy technology during instruction, teachers must first have a foundational understanding of computers. Yet, it was also discovered that if teachers have professional development in these areas, it may be feasible to avoid a pure adoption of their digital skills, whereby through their trainings with the CSO's, they get a chance to do practical sessions. Nonetheless, similar to circumstances happen elsewhere, many teachers in the United States are still reluctant to embrace computer technology, computer incorporation, and computer-supported training (Kopcha et al., 2021). Thus, on-going support is necessary, including assistance from fellow teachers, parents, head teachers,

and the school management team; on-going professional development is necessary for teachers on digital literacy by schools, the Ministry of Education, NGO's, and universities like Moi University; access to digital resources; and enthusiastic educators willing to make time-saving sacrifices in order to develop digital literacy skills (Milanović, & Cveković, 2021; Li et al., 2018; Sabiri, 2020) and to become more acquainted with digital skills on various fronts. Only then might digital literacy implementations become a possible reality within schools. Hence, it appears self-evident that (Ma'rifah et al., 2021; Shatunova et al., 2019) shortcomings on technology in the classroom have to be addressed before digital literacy integration is likely to occur on a wide front. In spite of some training provided by NGOs and in their schools, the teachers lacked fundamental computer literacy.

Hands-on computer practical lessons were absent from the computer instruction that had already taken place. So, it is evident that at the start of the initiative, the majority of the teachers from the selected school had not used laptops and tablets for teaching and learning. This insight was crucial to this study, as it is to any project involving teacher development, since it gave a clear picture of the amount and depth of pre-educational work and coaching that needed to be done to help teachers advance through the use of tablets for play and to extend and deepen learning. According to Rubagiza (2011), simply introducing digital literacy gear and software in schools won't achieve the potential for digital skill acquisition. As a theoretical framework for thinking about concerns of educational policy and social justice, they drew on Sen's (1992) capacity approach. They observed that certain policy measures for digital literacy can prejudice pupils who live in rural areas.

Few schools have enough digital literacy resources, according to Otieno (2020), making it impossible to integrate digital literacy into the process of learning and teaching. However, although digital literacy resources were available, they were not utilized effectively, in part due school staffing shortages and in part because pupils appeared to use their laptops and tablets more for fun than for academic purposes (Raheem et al., 2021). Otieno found out that most schools that had computers, laptops, and tablets lacked appropriate educational initiatives and internet connectivity. Castek and Gwinn, (2020) state that users of digital literacy face a myriad of challenges which include; poor knowledge to tackle technical problems; fear of making mistakes, shortage of time and time required to learn digital literacy is also agreed (Sabiri, 2020). Steiner and Mendelovitch (2016) pointed out that digital literacy integration sometimes produced fear in teachers' minds. Lack of support from the administration can hinder digital literacy use (Opati, 2013).

4.5.5 Synthesis of Challenges Faced in Developing Digital Literacy through Play Method

The four themes in response to the question *what are the challenges faced in developing digital literacy through play method?* Described the challenges teachers faced in developing digital literacy through play way method of learning. It is clear that sometimes the tablets could refuse to work. Repairs of the tablets needed some expertise which was done by specific personnel sent from the ministry. This sometimes took longer periods of time. Teachers lacked support from the school administration because digital learning was perceived to be a new process. The participants' skills in terms of digital literacy were also minimal and therefore posed a great challenge. Teachers were to create time for play because digital literacy in the CBC curriculum is not timetabled.

In the next section the researcher discusses the findings of the fourth research question/ objective.

4.6 Model Associating Play Way Strategies of Learning and Development of Digital Literacy Competencies among Pupils in Primary Schools

The fourth objective of the study was to design a model on the association between play way strategies of learning and development of digital literacy competencies among pupils in primary schools. The following research question was derived from the objective, *which model can be designed on the association between play way strategies of learning and development of digital literacy competencies among pupils in primary schools?* To answer this question the researcher read literature review and found out that there was paucity of data on the association of play way strategies of learning and the development of digital literacy competencies among pupils in primary schools. The observations in the classroom supported this claim and from the study findings of objective one, two and three, the researcher designed the Pupils digital play model that can be used to teach digital literacy. The models the researcher found out from literature review and supported the development of digital play model for digital literacy development include; Beetham and Sharpe's Framework (2010). The challenge with Beetham's framework is that it explored institutional approaches to digital literacy across a variety of stakeholder groups, including top managers, teaching personnel, instructors, researchers, librarians, officials, and technical employees leaving out the leaners. The PLUS Model, requires students to structure their learning and generate high-quality assignments. The model entails four interconnected steps Purpose, Place, Usage, and Self-evaluation. Grade one learners may not have the skills to do self-evaluation and generate assignments. This model can be applicable to the teachers who have vast knowledge on ICT.

Information Literacy Planning Overview (ILPO) Model has six steps; describing, identifying, choosing, analysing, organizing, synthesizing, creating, and evaluating. The challenge to this model is that grade one learners require a teacher to plan content for them. The Big Six Model has phases that include task description, information searching, identification and access, using the information, fusion, and assessment. One of the challenge of the Big Six model is that the model requires vast amounts of data to be effective. Grade one learners are the early stages of the development of competencies. Technology Acceptance Model (TAM) is the user's perception of the utility and perceived simplicity of the technology. The belief among users, such as educators, that a technology will facilitate their work or the work of their students will result in improved job performance. The TAM model is fit for teachers during the preparation of content. Unified theory of acceptance and use of Technology (UTAUT) suggests that the actual use of technology is determined by behavioural intention. The perceived likelihood of adopting the technology is dependent on the direct effect of four key constructs, namely performance expectancy, effort expectancy, social influence, and facilitating conditions. The effect of predictors is moderated by age, gender, experience and voluntariness of use (Marikyan, & Papagiannidis, 2023). Little has been designed on models that can be used to develop digital literacy competencies through play and more specifically to young learners in their early years of learning.

The findings from field work revealed that the learners were able to manipulate the tablet menu, they developed skills on finding digital content, on their own they could re-boot the tablet, they mastered the role of the icons and made use of the search engine. The use of play enabled learners develop skills. Even though learners faced some challenges for example; tablets hanging, lack of clear guidance on the curriculum design on how the learners should make use of the digital devises, lack of confidence to use the tablets and

digital literacy being an integrated subject is mostly ignored. These challenges did not deter them from developing digital literacy skills and competencies. Literature reviewed on the various models have not included the aspect of play and the development of digital skills by learners. These specific models on technology use have focused on the teacher's role as compared to the learner who should be at the core of the learning process. Pupils digital play model for digital literacy development puts the learner at the center stage in the learning process. These findings from the objectives led to the development of pupils digital play model for digital literacy development.

4.6.1 Pupils' Digital Play Model for Digital Literacy Development

Digital play led to digital literacy development. Pupils could perform different play activities on their tablets. Collaborative and peer learning guided the pupils learn from each other. This was revealed from the study findings that the learners' developed digital skills through play. They were able to navigate the tablet menu; they were able to search and read on screens, learnt how to type and developed computer language. In the play classroom, the role by the teacher changed from one who gives instructions to the learners to one who facilitates the learning process. Literature review on technology models have emphasized the perceived role of the teacher in teaching using technology leaving out the pupil who should be hands on so as to acquire skills by doing.

Models have been available for teaching and learning. Models have helped learners increase their social efficiency, personal talents, cognitive skills and behaviour features. Models facilitate desired changes in learners. The improvement of digital literacy is now a top priority for academics and professionals everywhere (Sefton-Green et al., 2016). Teachers in the field frequently utilize conceptual frameworks for digital literacy to this goal. Models invariably influence how the public discusses digital literacy, through the ideas and insights models put forward.

However, it is becoming increasingly clear that these frameworks are inappropriate for pupils who are still in the foundational stages of their education. Much emphasis has been given to the need to investigate more efficiently digital literacy models that are more adapted to the current initiatives to revitalize education and more particularly, in Kenyan contexts that is currently implementing the CBC curriculum. Basic education is essential to this reconstruction since it provides the chance to create skilled learners who are better placed in the 21st century. The purpose of basic education is to develop learning experiences within the subjects and to contribute to attainment of goals, exercise self-control and self-criticism (Maina, & Rosemary, 2019).

The framework places a focus on six aspects of teaching digital literacy. These components were found through book reading, case study analysis, and teaching and learning in the classroom. The six components share many characteristics with basic education programs, but they also have applications, consequences, or issues that are unique to the teaching of digital literacy and must be taken into consideration when designing basic education. The framework is first introduced, after which the literature discusses the problems related to each aspect and the case for including it in the framework. Each component helps to achieve the anticipated results, as shown in Figure 4.4. This model describes interrelationships between all the elements.

The learners' digital play model can alleviate some of the challenges on digital literacy that learners undergo. Learners digital play model is a model used for learning using the digital devises. In contrast to memorization of facts and receiving knowledge from the teacher. Direct experience challenges the learners and teaches them how to learn by making and applying skills and acquire knowledge through activities that are carried out in class. Their belief systems gradually change into learning possibilities as a result of

this learning process. The ways that people learn vary as a result of shifting worldviews, skills and attitudes. Through the use of learners digital play model, the teacher centered classrooms become replaced by learner centered classrooms. The learners are seen performing task through self-acquired skills, changed attitudes and discover knowledge that leads to peer collaboration, critical thinking, leadership, digital skills, communication and creativity among learners. These skills are a requirement for 21st century learning.

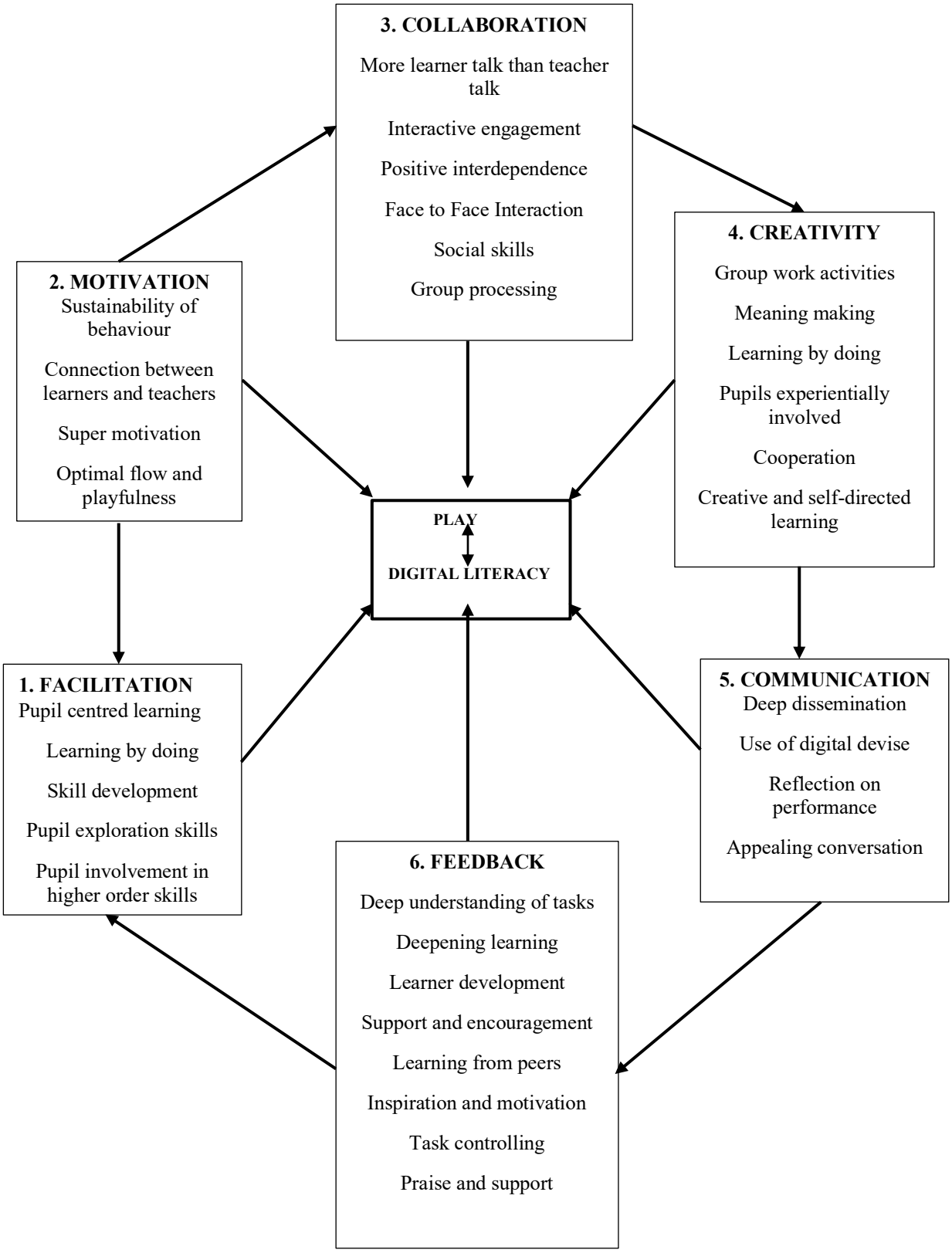


Figure 4.4: Pupils' Digital Play Model for Digital Literacy Development

4.6.2 Cores for Pupils' Digital Play Model

Pupils' Digital Play Model for Digital Literacy Development encompassed; Facilitation, motivation, collaboration, creativity, communication and feedback. Play helps learners develop new competencies and skills that lead to improved confidence with digital devises. Play leads to creativity, feelings of competence and self-confidence, collaboration and negotiation with others, flexibility in thinking, communication, self-awareness, ability to take risks, a sense of control over the activities at hand, sensory-motor functions and problem-solving. Through individual learner to learner experience, learners get the chance to share with their peers as the teacher facilitated the learning process. The facilitator of the learning process reflects upon what the learners are doing. Note down their observations in the journal reflection sheets. This helped the teacher understands how the learners learn and challenges during the learning process and how these challenges can be resolved. The activities done through play as the teacher facilitates the process, motivate the learners to learn.

4.6.2.1 Teacher Facilitation

The Concept of pupil-centered learning through teacher facilitation is the progressive movement in education that advocates a shift in emphasis from the teacher to the pupil (Davis, & Arend, 2023). The role of the teacher is to provide a setting that is conducive for learning (Dewey, 1916). According to Dewey, learning is something pupils do for themselves, so once the teacher has provided the conditions that stimulate learning, the rest lies with the learner. Teachers are leaders of group activities, who must survey the needs and capacities of individual learners and create the conditions that meet these needs (Masek, 2016). Dewey also suggested that teachers should share insights that come from their own experiences without imposing their own views on the learners. Active participation by the learner and meaningfulness of content are two constant factors

influencing the effectiveness of the teaching and learning process. Educators should function as facilitators of learning, rather than disseminators of knowledge. When pupils discover something meaningful for themselves, they tend incorporate their thoughts and feelings by being personally involved in the learning event. This personal involvement results in learning that is more pervasive; it effects the behavior, attitudes, and possibly even the personality of the learner. Through the teacher's facilitation, pupils are involved in more than listening. Less emphasis is placed on transmitting information and more on developing pupils' skills. Pupils are involved in higher-order thinking analysis, synthesis and evaluation. Pupils are engaged in activities like drawing, matching sorting reading, discussing or writing and greater emphasis is placed on pupils' exploration of their own attitudes and values which helps them become motivated to learn (Bean, & Melzer, 2021). The model emphasizes on facilitation as a starting point. The teacher who is a facilitator embraces the constructivist classroom where pupils construct knowledge by themselves and the teacher becomes a guide on the side (Castañeda, & Villar-Onrubia, 2023). The facilitator introduces the lesson then directs the learners perform tasks on their tablets. Allows time for exploration and discussion so that the learners can build their communication skills and develop the motivation to learn.

Picture 4.7 below shows one example on how pupils were carrying on with the play activity. The facilitator who is invisible observes from a distance and guides the learning process.

The next sub section of the model discusses on motivation, how the learners felt motivated to learn and develop digital competencies through play.

Picture 4.7: A Photograph Portraying Learners Play (Grouping Objects of Similar Type)

4.6.2.2 Motivation

Fundamentally motivation affects both the mind and behaviour. Motivation is described as an inner representation that evokes and drives somebody to behaviour in specific way, to keep interest in certain pursuits (Borah, 2021). So, motivation can be understood as a "force" or "trigger"-internal or external-that controls one's behaviour, thoughts, and actions. Motivation, is also the engagement of learners in actions on their own but without

duress such as enjoyment, acquiring knowledge, contentment, curiosity, and challenge. In this case, learners received rewards when they performed their plays excellently. Motivation occurs when there is the establishment of a respectful and supportive environment for learning where both teachers and pupils feel included (Tolman, 2023).

The teacher and learners establish incorporation that is handled by utilizing cooperative learning strategies, sharing with each other sharing expertise or involvement with the subject matter, indicating intentions to help, providing a reason for what must be learned, evaluating prior experiences and knowledge, introducing guidelines, and providing justifications. To create a safe learning environment, teachers should speak with learners, consider their viewpoints and attitudes, introduce comfort zones, and accept that everyone has varying levels of skill and knowledge (Malone & Lepper, 2021).

Another method of motivation involves super motivation, ideal flow, and playfulness. Based on Csikszentmihalyi's "Optimal Flow" theory, who identify the notion of "playfulness" as another crucial ingredient that might increase interest and motivation in computer-related tasks (Lepper, & Malone, 2021). Optimal flow is the situation whereby an individuals is so absorbed in a task that no one else seems to interest; the sensation is so pleasurable that pupils will engage in it even at significant expense, for the sole purpose of engaging in it (Csikszentmihalyi, 1990). Thus, it is important to encourage play in learning (Saleem et al., 2022). The learning process engages the learners become active in the learning process by the activities on the tablets. The presentation of the tablets to the learners motivates the learners to learn. Learners become active and manipulate the tablet. Motivation becomes a condition that activates the learners to learn and sustains their behavior toward a desired goal.

The process calls for an inclusive perspective, where learning and emotional development are interrelated. The learners are grouped together in their mixed abilities in order to develop learning opportunities together that leads to change towards learning. Change is typically brought about by a perceptive, intellectual, and emotional see-feel-change process rather than an analytical think-change method. As a result, learning activities for transformation incorporate both emotional and cognitive processes to lead to action into the activities learners perform. Those activities include the use of artistic digital processes like drawing pictures on the tablets, matching, sorting, grouping , searching, reading and use of icons; the collective expression process for example narration and discussion, communication and collaboration, all done through sharing and the process of trying to comprehend themselves, one another and their emotions. The next aspect of the model is that play developed collaboration in the pupils.

4.6.2.3 Collaboration

Collaboration signifies that individuals may use their collective knowledge to address issues. Participants helped one another move through the Zone of Proximal Development (ZPD) as they learned how to do so (Vygotsky, 1978). The ZPD is defined as "the difference between higher levels of prospective growth as determined by problem solving under adult guidance or in partnership with more experienced colleagues and the current developmental level as measured by independent issue solving" (Vygotsky, 1978, p. 86; Hedegaard, 1996). As a result, peers-whether pupils or teachers-could help one another through the ZPD by acting as "ferrymen" (Vygotsky, 1978). This suggests that one peer helps another peer by ferrying the other peer and, in the process, works to empower the peer being ferried to eventually become a peer who can ferry as well, helping other peers when they run into the same issues. This implies among participants and other discourses.

This study supported social constructivist concepts by promoting conversation and peer support among participants as a learning approach (Buehl, 2023).

The majority of social constructivist frameworks, emphasize the value of pupil collaboration (Zajda, 2021). This is based on the Vygotskian idea that language serves as a medium for social discourse, which in turn mediates learning (Lai, 2018). Collaboration-based learning would therefore entail more learner talk than teacher talk during the process of learning. Collaborating is not, nevertheless, limited to pupil-to-pupil interaction; the teacher can also become a co-learner. Cooperation amongst pupils can help them progress through their Zone of Proximal Development (ZPD) through interactive participation (Vygotsky, 1978). Social discourse between pupils (peers) or between pupils and teachers is crucial to the partnership process because it allows peers or teachers to offer conceivable structure or support to help pupils overcome any difficulties or misunderstandings they may have when reasoning and comprehension are made audible. Learning in the ZPD is hence learning that promotes learner development and emphasizes the process above the outcome (Wald and Harland, 2022). With a few minor alterations, Taylor and Boyer (2020) definition is utilized to describe how collaboration was perceived in this study's learning through play on their tablets as:

Working together to achieve both personal and collaborative goals through cooperation. Within collaborative efforts, participants look for outcomes that are advantageous to both themselves and the other group members. Collaborative learning is using small groups in the classroom to help pupils or peers achieve both their individual and common objectives (Zajda, 2021).

It is crucial to understand that grouping pupils does not always result in a cooperative environment (Emre, 2019). Five fundamental components must be present in a

collaborative or cooperative action in order for it to be successful in particular, positive interdependence, personal accountability, face-to-face promotional engagement, interpersonal abilities and collaborative learning.

1. Positive interdependence is the idea that we are interconnected with others in such a way that we cannot achieve unless they do. We benefit from their efforts, and they benefit from our work.
2. Individual accountability is present when each learner's performance is evaluated and the results are communicated to the team and the individual. Cooperative learning groups are designed to strengthen each participant as a person. Together, pupils learn in order to eventually achieve higher levels of performance as individuals. Learners are held personally responsible for their fair portion of the job in order to make sure that every member is reinforced.
3. Face-to-face interactions are encouraged so that pupils can support one another's efforts to succeed by lending a hand and providing encouragement.
4. Social skills: Interpersonal and small group abilities are necessary for cooperation to succeed. Even if you put socially uncooperative pupils in a group and tell them to collaborate, that doesn't mean they will be able to do it well. Leadership, decision-making, confidentiality, communication, and dispute resolution abilities need to be taught to pupils with the same intentionality and precision as academic skills.
5. Group processing: Group processing exists when group members discuss how well they are achieving their goals and maintaining effective working relationships. Groups need to describe what member actions are helpful and unhelpful and make decisions about what behaviours to continue or change.

Otieno, (2020) state that there are four types of cooperative learning that may be used in combination with instructional technology, namely formal cooperative learning, informal cooperative learning, cooperative based groups and academic controversy. Within this study, stable cooperative based groups were used to ensure stable membership in order to help the participants develop connections both within their own groups and within the larger learning practice-based community like the classroom where discussions could be done to the whole group. Picture 4.8a and 4.8b shows collaboration among the pupils. Their ability to be able to work together as a team. Learners are seen to be able to assist one another and share ideas together in a collaborative manner. The next aspect is on creativity.

Picture 4.8a: Photographs Portraying Learners' Cooperation through Working Together

Picture 4.8b: Photographs Portraying Learners' Cooperation towards Attainment of Digital Skills

4.6.2.4 Creativity

Group work activities done by the learners on the tablets gave a creative context. The classroom set up, should create some form of creativity. These environments promote flexibility, awaken sensitive awareness, and draw individual pupils into the zone of transformative meaning creation in learning teams or groupings. The learning group requires some ideas to master learning; cooperation, sharing and doing; observation and working in turns so as to keep the learning process successful. The activities performed should be those that the learners can perform, share and assist one another reach a goal. The sincerity of the learners towards themselves and others can be an anchor towards the learning process. The advantages for the pupils are as follows: they become aware of their passions, acknowledge the interests of other pupils, comprehend that their desires may differ from those of the teacher, show mutual respect, and result in a comprehension that is situational and influences behavior or exercise. They are interconnected and practice in a setting that fosters both solitary and collaborative learning and collaboration. The

contrast between learners digital play model and the traditional models is that the pupils digital play model referred to as learning by doing is seen to be at the core of the learning process that motivates the learners to learn. While the traditional models referred to as learning by transmitting and the ongoing process develops from traditional ones where learning is done by receiving from a knowledgeable person.

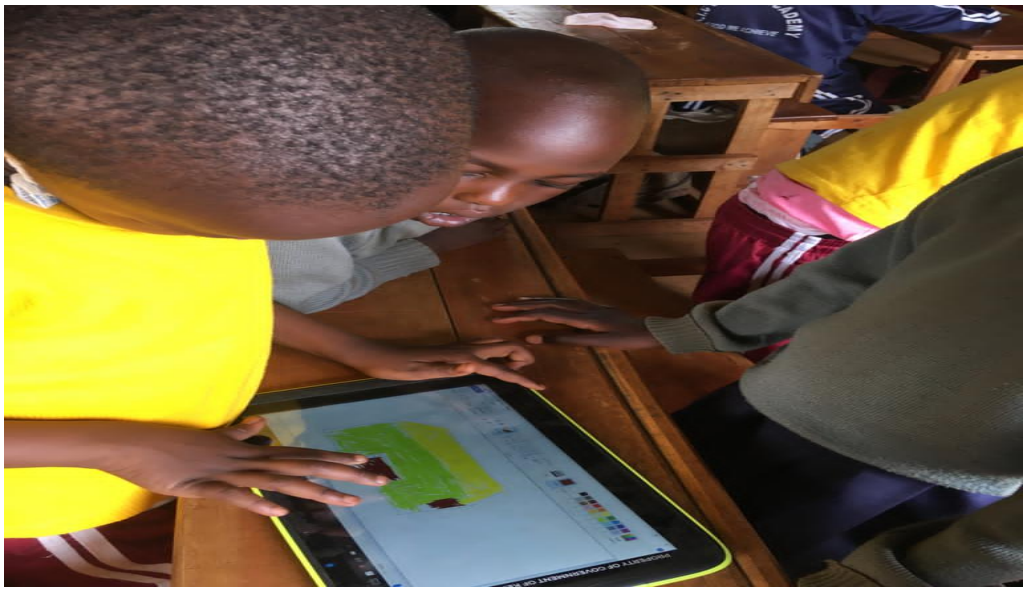
The process of learning in the learners digital play model related to all three learning domains-cognitive, emotional, and psychomotor-and is primarily centered on an innovative and personal focused learning environment. These areas develop activity-based learning, cooperative learning, and technology-based learning, which are all integrated together through an artifact of active learning. These areas involve pupils in doing tasks while also thinking about the activities they seem to be doing through play. The learning activities are applicable to the learners and they are urged to consider the significance of what they have learned and tackle the problem to generate learning tasks reflected in the activities conducted for learning. This model involves learners more actively than in a traditional setting. Through performing a task and reflecting on what they are accomplishing, learners engage in the process of learning. There are many phases of active learning based on the involvement of the learner in this educational setting, where pupils are actively or behaviorally engaged in the educational process. Learners must do more than just listen: They must read and search, navigate and perform tasks, discuss, share and demonstrate to the group the activities performed, or be occupied with problem-solving.

Problem-based learning utilizing digital tool demonstrations is the first of the learning methodologies and strategies. To improve personal and social knowledge via first-hand experience in creating something and conversing with peers, all these learning techniques,

methods, and tools are combined and put into reality. In this style, teachers accompany learners as they engage in some problem-solving exercises and use resources that stress imaginative and individual focused learning. Students are given an issue to solve, and via group discussion, they are able to draw on existing knowledge. They brainstorm potential solutions to the issue within their group. They decide which learning-related problems to look at together. Facilitators offer scaffolding, which is a structure on which learners can build problem-related knowledge. After the initial group work, pupils conduct independent research to look into the problems they have discovered. The pupils gather once more to examine their results and improve their original arguments in light of what they have discovered. Learners are offered the opportunity to investigate issues and obstacles, which increases the likelihood that knowledge and skills will be retained over the long term, in contrast to typical, teacher-led classes.

The basic tenet of the pupil's digital play model of learning is that pupils are guided to generate knowledge, acquire knowledge, and apply that knowledge in a problem-solving context through engaging activities that arouse their attention and encourage serious thought. The instructor serves as a facilitator who collaborates with pupils to formulate important questions, designs assignments that are relevant, mentors knowledge growth and social abilities, and critically evaluates what pupils have gained from the encounter. Other conventional modes of instructing such as textbook, chalk, and conversation are replaced by this mode of learning. Instead of standing and delivering material, this instructional paradigm enables teachers to support and analyze deeper knowledge. With the goal of communicating a deeper comprehension of key ideas and prowess of 21st century vital educational abilities, including problem solving, close cooperation, logical analysis, inventiveness, and communication, pupils' problem solving and innovative product creation skills are intentionally developed through the use of a digital play model

in the classroom. When teachers facilitate pupils to learning such that pupils can gain knowledge from the procedures involved in creating activities, learners transform into active digital consumers and evaluators of their personal learning. Pictures 4.9a and 4.9b shows how pupils were creative in their digital play. Their capability to draw on their tablets and colour the drawn pictures. The next aspect of the pupils digital play model is on how digital play developed communication.



Picture 4.9a: A Photograph Portraying Pupils' Creativity; Drawing and Colouring

Picture 4.9b: A Photograph Portraying Pupils' Creativity by Painting

4.6.2.5 Communication

The model entailed appealing conversation**.** Appealing conversation created inner peace of mind and trust between learners and the teacher and among learners themselves. Appealing conversation help to detect and reveal deep hidden thoughts and ideas inside each one's mind. This is developed through what the learner portrays as they perform play activities with the digital devises during learning. Using his or her facilitator's role, the teacher promoted thorough investigation by asking, "How do you do that?" To do this, there is need to be harmony within, confidence between the pupils, teachers and cooperation among the pupils as they work cooperatively in their groupings. Group collaboration is pointless without inner calm and mutual trust. As communication proficiency in the target, language is improved as a result of language learning and communication skills are developed. This method does not educate using a set of

textbooks, rather uses digital devises tablets and Laptops to teach and learn. The teacher performs a critical role of reflecting upon what the learners are performing, fills in through writing of journals. The filling of reflection sheets is crucial because it gives participants the chance to express their implicit thinking. So, the practice of reflection might aid in the production of individual and group knowledge. The reflections guide the participants to check whether the learners understand or not. It calls for improvements on how to handle challenges faced during the lesson and gives way for feedback. The teacher keeps improving on his or her mode of lesson delivery as challenges faced in ongoing lesson are improved in future upcoming lessons. The challenges faced as the teacher observes gives room for guidance towards the right path and provision of feedback. Picture 4.10 shows how the learners were sharing ideas through communication. The next aspect discusses on feedback.

Picture 4.10: A Photograph Portraying Learners Sharing through a More Knowledgeable Other

4.6.2.6 Feedback

Feedback is another important element in the pupils digital play model, The teacher should be capable of providing sufficient feedback by using it as constructive criticism throughout the learning experience, at the end of class, after personal experience, or after carefully examining the participants' (learners') work on the tablets. This will help with the planning and preparation for the following session. During the lesson, sharing amongst the learners takes center stage. Learners discuss and share ideas together. In order for pupils to express their tacit knowledge, encounters, triumphs, and aspirations to their colleagues in groups or in front of the entire class, the instructor must provide opportunity for them to exchange their learning encounters with one another. Feedback is probably the most effective way to move learner learning to deep understanding of tasks in class. The feedback given is embedded in the goals, learning intentions and success criteria. The focus must be on the deepening of the learning.

The growth of pupils as autonomous learners may be aided by teacher feedback. Meeting needs and expectations in the on-going classroom setting is the primary priority of teachers while providing feedback. The reason for the teacher's concern about the pupils' low esteem in the group may be related to their behavioral and emotional requirements. The instructor sees the pupil as someone who needs encouragement and help to advance. This justification is typically used when praising someone who lacks confidence. As a result, the instructor exhibits an inspiring strategy by recognizing and demonstrating caring for those pupils more frequently by complimenting and supporting their accomplishments. In order to satisfy each pupil's unique needs, the teacher must be open to their learning and knowledge processes. Instructors emphasized that all pupils have a variety of knowledge bases and hence require learning and developing a variety of skills. The learner's preferred skills and knowledge are recognized by the teacher. By directing

learners' focus to those who did as well as possible, the remainder will imitate their role models and learn from their peers in the process. The learners would seek assistance from one another more frequently if they viewed their peers as "knowers".

A potential source of motivation and inspiration is peer learning modelling. Pupils start to get some inspiration from one another to keep working on their plays. Therefore, it is believed that peer learning modelling is stimulating and beneficial to both the viewer and the model. When a teacher is trying to ensure that a group discussion remains on the intended topic through comments, task managing is significant. Learners may have questions about what to do, how to do something, or just want affirmation. This justification encouraged the teachers to assist as many pupils as they could by providing brief, focused feedback that was thought to be adequate for the learners to continue their work. If a teacher praises a learner it motivates other learners to work hard so as to receive the praise too. This justification is compatible with Bandura's (1977) idea of positive experience, which is frequently explained and demonstrated through commendation. Pupils with poor self-esteem were more likely to receive sympathetic feedback from teachers and were frequently thought to need extra praise to enhance their self-esteem: The teachers are extremely concerned with instructing, assisting, and providing feedback depending on the unique needs of the learners. They talked about attempting to simultaneously address each learner's unique needs.

Learners need to develop teamwork, cooperative learning and ongoing support. Support is essentially required for the learning process to run smoothly. This indicates guidance from the teacher when working with his or her pupils, as well as guidance from other skilled colleagues (the peer-facilitators, who may be other teachers or pupils within the classroom context) during classroom implementation in order to provide support or

discuss the successes. In the classroom, the engaged instructor encourages his or her pupils, and in a similar way, the peers assist one another. The goal is to provide support where it is needed and to plan how to deal with the immediate problems that have been recognized. Support also denotes that the head teacher and the senior management team provide the respondents from their institution with the essential learning environment and support them on an intellectual, inspirational, and material level. This support enables the pupils understand how well they are doing and what they need to do differently when they are offered the class feedback. In general, the six discussed aspects have given a detailed explanation of the learners digital play model for digital literacy development.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter goes over the research questions from the first chapter again and offers conclusions and suggestions based on the study's outcomes. This study's main inquiry was to explore play way method of learning in developing digital literacy among pupils in primary schools in Nandi Sub County. The main results of the study are presented in the chapter's opening paragraph. Following this, conclusions from the research are drawn and recommendations are given.

5.2 Summary of Findings

Mutwot zone in Chesumei constituency Nandi County, has been connected to electricity. Participants in the study indicated that the schools that were sampled for the study received the government donated laptops. Although in some schools, the laptops were few, faulty and needed repairs. This resulted to the sharing of the laptops by the learners who worked in groups. In some instances participating teachers could borrow the laptops from other schools since the schools were so close to each other and the plays were done in different days in these schools. The following are the summary of the findings from the participants.

5.2.1 Teachers' Perception of Play Way Method of Learning

Teachers perceived play way method of learning with the tablets as effective for digital skill acquisition, child centred approach and a method that changed the role of the learner. Learners were seen to have owned the learning process in an enjoyable manner. These are some of the excerpts from the participants; *Digital play encompassed the entire process that aids the learners learn aspects of technology and their ability to select*

through the various plays by creating spaces on the tablet screen for them to play participant 6. *Digital play method was different, learners could search and scroll* Participant 3. Participant 4 added by saying. Play way refers to *managing to open the tablets and identifying some games, sorting and matching of different objects with same color playing with colors and painting pictures on the tablet, drawing different types of objects and opening and shutting down the tablets*. *The capability of the learners to identify buttons in their tablets that are used to direct the plays like the curser. Identification of the tools for drawing and painting on the tablet and learners ability to arrange objects correctly*. Participant 4 succinctly added that play way refers to *"having the basic skills - opening, searching for games and search for subject areas for the learners."* Participant 8 had the following to say, *"The digital play way method of learning has given learners a chance to develop and advance in technology*."

Participant 4 added "… this programme of digital play has helped learners to be computer literate." The teachers did see their learners as those envisaged in the Kenyan Competency Based Curriculum Statement. Participant 3 stated that learners enjoyed working with technology while the teacher guided the learning process. This was narrated clearly by the word of Participant 1 that, *" Learners were able to operate on a tablet, find information on their own and share learned information to each other through the guidance that we gave."*

In regards to learning and teaching, the instructors believed that the digital play strategy would entail that: The learners' responsibility was to utilize digital devices, and the educator would support and oversee the learners. The instructor will provide the pupils with direction, and they will work as a team towards searching and starting the plays.

An interesting response was noted to the statement in the journal reflection sheets that that use digital devices like the ones used in this study are not similar to other projects in class,' A possible explanation could be that participants had seen that the tablets were being used for digital play, the tablet based project gave positive attributes as the medium to the study was the tablet. The medium has a significant impact on innovative way of teaching and learning. The participants' comments at the end of the discussion further emphasize the positive attributes of the tablet as a medium for creativity in the digital play, that participants enjoyed working and learning through the aid of a tablet. Teachers were seen as facilitators of learning. The methodology was perceived to be new and different compared to the conventional "chalk and talk" method, as indicated by Participant 3 that *all pupils are actively engaged in their learning throughout the digital play sessions, they must still pay attention to what you are directing them to do. Hence, there is a distinction between 'normal' traditional classrooms and the play way method of learning. Where most of the work is done by the learner and guidance is only given by the teacher.* Digital play changed the educational beliefs that states that many times, teachers instruct in the same manner as they were instructed. Participants indicated that digital play strategy having the potential to alter the conventional methods of instruction because they are novel, interesting and puts the learner active throughout the lesson.

5.2.2 Digital Literacy Competencies Demonstrated through Play Way Method of Learning

Digital literacy competencies demonstrated through play way method of learning included; manipulating the tablet menu, finding digital content, Booting up, use of Icons and search engine. This is what the participants had to say; participant 1 suggested that *the digital play sessions had a positive impact on searching for information, restarting and locating information***.** *Learners were able to identify the Icons and their use,* said

participant 5. Participant 11 said that; *I was able to observe my class shut down their tablets by clicking the start button, then selected from the menu by searching and locating the power symbol. Then clicked on it and the tablet could shut down.* Participant 8 stated that; *Learners developed the skills on computer language like: scroll, minimize, maximize, search, increase brightness and darkness on the screen, increasing and reducing volume, click, open and shut.* Participant 7 *said "When children are busy playing they get more insight and improvement in their reading skill as they will be required to do a lot of reading and also listening because some instructions were given in audio.* Participant 1 suggested that *the digital play sessions had a positive impact on searching for information, restarting and locating information***.** Learners guided their plays using the track pad on their tablets, added participant 3 they either press or tap the track pad to click. Learners were seen to have developed the skills on typing. Participant 2 stated *at some other time when the learners could not go through the tablets menu, They could type the name of the game for example spider and spider game popped out on the screen.*

5.2.3 Challenges Faced in Developing Digital Literacy through Play Method

With all the positive aspects of digital play strategy, the approach never missed some shortcomings. Tablets could sometimes stop working and were seen to be hanging. The participants felt that they lacked support from the school administration. There was also inadequate confidence to use the tablets meaning there was an aspect of fear related to technology. Lack of time to learn digital literacy was another challenge because digital literacy is not part of the timetable in the primary school curriculum. These are the summary excerpts from the participants' challenges: Participant 7 lamented that *some tablets could occasionally stop working, some other time, every learner wanted to be the one controlling the tablet, because of curiosity they wanted to click the tablet at the same*

time. I encouraged them to hold it in turns which in turn promoted the spirit of patience and sharing. Maintenance was also another issue (Participant 11): Participant 8 added by saying: *Sometimes children confused the right name for the right picture but I assisted them to correct- they finally followed instructions*.

Participant 5 said, *the staff members are eager to learn, because they wanted to use the tablets for teaching and learning as tools that can help in learning digital skills. The only issue is that they never encountered that. Even through teacher education, computers were not used for practical learning.* Participant 9 also lamented her challenge by saying that *some of the learners did not understand English language had to use Kiswahili to explain some concepts on computer language to grade one. I resorted to using Kiswahili language which is also a medium of instruction.*

Participant 2 complained that, *at the beginning I needed to teach the leaners how to open, search and show them how to play.* This took time. Sometimes the tablets could not work required an expertise in terms of maintenance which was not the norm in the project. The tablets were availed in schools yet the teachers struggled to implement and embrace the use of technology in their teaching and learning due to their educational believes and little expertize. Interview with participant 7, complained that *there is a big need for more tablets because of the fact that learners have increased in number. At some other time we borrow from our neighbouring school because all the public primary schools had the donated tablets and all had the same content installed in them.* She continued to say that *sometimes the computers are less because some of them are faulty.* Further challenges included negative attitudes among school administrators towards computers and the internet. With all the aforementioned challenges, these challenges never stopped the teachers from the play classroom. Extra tablets were available and learning continued.

Through the study findings and reading of literature the study came up with a model that associates play and the development of digital literacy competencies. This formed the next objective.

5.2.4 Model Associating Play Way Strategies of Learning and Development of Digital Literacy Competencies among Pupils in Primary Schools

Models have been available for teaching and learning. Models play a role in shaping the public debate on digital literacy. However, there has been paucity of frameworks suited for learners at the basic level of their education. Basic education is key as it offers the potential for developing skilled learners who are better placed in the 21st century. The learners digital play model which the study designed emphasises six elements of digital literacy that encompassed; play, motivation, collaboration, creativity, communication and feedback. Learners digital play model is a model used for learning using the digital devises. The learners are given real-world challenges that allow them make meaning by themselves and discover how to learn by creating and utilizing learning abilities and methods through activities that are performed in class rather than learning from the educator and memorization of facts.

Play as the first aspect in the learners digital play model aims to promote the development of skills for academic change. Play lays the basis for early learning and academic success. Thus, through play children learn to engage analytically with each other's ideas. The availability of the digital devises in the classroom for teaching and learning developed in the learners serious thought-provoking play activities, full of aspects of motivation, learning, development and progress. Play helps learners develop new competencies and skills that led to improved confidence with digital devises making the learners motivated to learn.

Motivation as the second aspect becomes a condition that activates the learners to learn and sustains their behavior toward a desired goal. Through motivation the learners were aroused to take part in activities in a collaborative manner.

Collaboration in this model shows the cooperative nature among the pupils to use their collective knowledge to address difficulties. During the collaboration process, social discourse among learners (peers) played a significant role in interactions between pupils and teachers since it allows classmates or the teacher to offer potential scaffolding or support to help pupils cross any misconceptions or challenges they may have. Learners develop their creative skills as they engage one another in their creative contexts.

The digital play strategy connects to all three learning domains; cognitive, emotional, and psychomotor which are primarily centered on a creative and self-directed learning environment. These areas encourage learners to actively participate in their learning through play, generate activity-based learning, teamwork, and technology-based learning, all of which are combined through an artifact to create active learning. The learning tasks are relevant to the learners, and they are urged to consider the significance of what they have learned and to deal with the situation to generate learning tasks that are reflected in the learning activities they engage in.

Using the facilitator’s role, the teacher promoted thorough guidance by asking, "How do you do that?" To do this, there must be mental calmness and respect for one another among the pupils, instructors, and other learners as they work collaboratively in their groups. Communication skills developed as learning of language was done to improve one's capacity to communicate in the target language.

In the process of learner engagement with the play on the tablets the teacher gave feedback. Feedback is probably the most effective way to move learner learning to deep

understanding of tasks. The feedback given is embedded in the goals, learning intentions and success criteria. The focus must be on the deepening of the learning. Teacher feedback can potentially support learner's development as independent learners. Meeting perceived needs in the current classroom setting is the primary priority of teachers while providing feedback. The reason for the teacher's concern about the pupils' low esteem in the group may be related to their behavioral and emotional requirements. The instructor sees the pupil as someone who needs motivation and help to advance. This justification is typically used when praising someone who lacks confidence. As a result, the instructor adopts an inspiring strategy in which they recognize and show concern for such pupils more frequently by complimenting and motivating their accomplishments.

5.3 Conclusion

In this study, play way method of learning in developing digital literacy among pupils in primary schools in Nandi sub County was explored. Teachers' perceptions of play way strategies of learning in developing digital literacy among pupils in primary school was also explored. Primary school pupils' digital literacy competencies demonstrated through play way method of learning was examined. Challenges primary school pupils face in developing digital literacy through play method was assessed. Finally, a model on the association between play way strategies of learning and the development of digital literacy competencies among pupils in primary schools was designed. The sampled schools were connected to electricity, charging points were available and schools had the government donated tablets. Participants were therefore very enthusiastic about the digital play approach. The following conclusions were made based on the study's findings;

i. Teachers perceived play way method of learning as digital skill acquisition, child centred approach and a method that changed the role of the teacher.

ii. There was development of digital literacy competencies like manipulating the tablet menu, finding digital content, booting up, use of icons and the search engine.

iii. The challenges that were faced included hanging tablets, inadequate support and confidence, time tabling and time related issues.

iv. This study has designed model that associates play and the development of digital literacy. This model can be used by teachers to teach digital literacy effectively as an innovative method of teaching. This is with the consideration of the need for more guidance and inclusion in curriculum design on how learners can learn and develop digital skills.

5.4 Recommendations

The following recommendations were made from the study findings:

i.) Teachers to embrace the play way approach because play interests children and was perceived to be child centered approach

ii.) Teachers to continue to teach digital literacy through play because play led to the development of digital literacy competencies like finding digital content.

iii.) The tablets being valuable resources in the schools should be used frequently to avoid hanging and the school administration should offer support to the teachers to teach digital literacy.

iv.) Teachers should adopt the learners' digital play model for teaching to enhance the acquisition of digital literacy skills in primary schools.

5.5 Recommendations for Further Research

Due to the study limitations, this investigation was unable to tackle some significant issues. The researcher felt that some areas of play and digital literacy need additional investigation. The following issues need further research.

1. In other parts of the nation, there is a need for research with a similar design. This will enable researchers to establish if the study's findings apply to other contexts and plan for teacher development sessions.
2. Investigate factors that hamper the learning of digital literacy despite that availability of resources and materials for digital learning.
3. Find out whether play way method has an impact on pupils learning and school in general.

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APPENDICES

APPENDIX A: TEACHER INTERVIEWS AT END OF PROJECT

1. What do you understand by play way method of learning?
2. How did you experience playing on the computer?
3. Is it different from the other forms of play? Why or why not?
4. What skills do learners need to play on the computer screen?
5. What activities were learners engaged in during the play sessions?
6. What are some of the digital literacy competencies learners demonstrated through play?
7. What are some of the challenges learners faced during the play sessions?
8. Were the journals of any value (the sheets that you completed after every play session)? Explain?
9. How do you feel about the completion of reflection in the weekly journals? Explain.
10. Would you use weekly journals in your classroom? Why or why not?
11. Did you experience any time problems? Explain why/why not?
12. What is the role of the teacher during this activity (or this type of learning digital play)?
13. Would the digital play classroom be different from your normal classroom? Is it the same or different? Explain why you say so.
14. What do you find hard? (Problems experienced). What problems have you experienced?
15. What do you find easy?
16. Do you think this project have benefited you in any way? Why? Why not?

APPENDIX B: OBSERVATION SCHEDULE

The sections to be observed shall be filled as Observed Frequently (OF), Observed (O), and Observed rarely (OR), Never Observed (NO)

TEACHER'S NAME
DATE:

DIGITAL PLAY

OBSERVATIONS AND EXPERIENCES					
CLASSROOM ENVIRONMENT	**OF**	**O**	**OR**	**NO**	**COMMENTS**
1. Availability of electricity					
2. Availability of enough sockets (charging systems)					
3. Availability of space and enough tables.					
4. Classroom well aired with enough lighting					
LEARNERS SKILLS: General observation					
1.Do not understand what to do					
2. Never listens and gets challenges in following instructions.					
3. Asks questions					
4. Struggles with computer skills					
5. Struggle to find relevant information					
6. Difficulty in self-expression					
7. Struggle to ask questions					
8. Cannot work in with classmates					
PROBLEM SOLVING SKILLS	**OF**	**O**	**OR**	**NO**	

1. Can complete a task within stipulated time					
2. Can share ideas with classmates					
3. Can finish on time.					
4. Can seek assistance from classmates in case of difficulty					
LEARNING TO LEARN	**OF**	**O**	**OR**	**NO**	
1. Can switch the computer on					
2. Can click on a game installed					
3. Can decide on which game to play first					
4. Can show others how to search for play games on their tablets					
5. Can ask questions					
DESCISION MAKING	**OF**	**O**	**OR**	**NO**	
1. Can sit upright and ensure that the tablet is well placed on the table					
2. Can charge the tablet when need arises					
3.Can switch off following the right procedure					
SELF DIRECTION	**OF**	**O**	**OR**	**NO**	
1. Can click on a game to play directly					
CRITICAL THINKING SKILLS	**OF**	**O**	**OR**	**NO**	
1. Can share skills learnt					
2. Can demonstrate to the class how the play activity begins					
3. Can show how to end the play session					
4. Can share their achievements in terms of what went well and what did not go well					
COMMUNICATION 1)	**OF**	**O**	**OR**	**NO**	
1. Giving and receiving help and assistance					
2. Share ideas and information					

3. Able to ask each other questions					
4. Influence each other					
5 Share lessons learnt from the play activity					
SELF DIRECTION	**OF**	**O**	**OR**	**NO**	
1. Collaboration in what needs to be done					
2. Accepts each other's opinions					
COMMUNICATION	**OF**	**O**	**OR**	**NO**	
1 Learner – learner interaction					
2 Teacher – learner interaction					
3. Talks a lot and not concentrate on the task					
4. Disturbs other learners					
5. Never follows rules					

APPENDIX C: TEACHER JOURNALS AT END OF EACH PLAY SESSION

NAME AND SURNAME: _____

SCHOOL: _____ DATE: _____

AT BEGINNING OF THE SESSION

1. What are your goals for today?

AT THE END OF THE SESSION

2. Did you reach your goals today? What did you do today?

3. What do you think about when you are showing the learners how to begin their play sessions using tablets.

4.Have you experienced any problems today? Did you struggle with anything?

With what did you struggle?

5. Were these problems solved? How?

6. What did you find easy today?

7. Were the learners working together in a collaborative manner?

8. Were they able to follow instructions?

9. Were there learners who had challenges? If yes, how did you assist them to overcome the challenges faced?

10. Did the learners finish their tasks on time?

11. Did the learners enjoy the digital play sessions?

12. Were they cooperative every time you entered the class for the session?

APPENDIX D: TEACHER JOURNALS AT END OF THE PROJECT

NAME AND SURNAME: _____
DATE: _____ SCHOOL: _____
AT BEGINNING OF THE SESSION
1. What are your goals for today?
2. What can you say about the play way method of learning?
AT END OF THE SESSION
3. Were you satisfied with the whole process of play using tablets? If NOT, please tell me about the dissatisfaction.

4. Were there any skills demonstrated through the play way method?
5. What will you do differently next time?
6. Did you experience any challenges? With what did you struggle?
7. Were these challenges/problems solved? HOW?
8. If you had a problem during a session, who did you ask for help? Why did you ask that person for help?
9. What did you enjoy during the play sessions?

10. Was there any change in the learners in terms of the development of digital skills? If yes tell me

APPENDIX E: LETTER OF INTRODUCTION

SCHOOL OF EDUCATION
DEPARTMENT OF CURRICULUM INSTRUCTION AND EDUCATION MEDIA

Dear Respondent,

I am a student at Moi University pursuing a PhD Degree in the Department of Curriculum Instruction and Educational Media, carrying out research on "play way method of learning in developing digital literacy among pupils in primary schools in Nandi sub county: Kenya"

I am requesting for your assistance by accepting to fill in entries in the journal reflection sheets and my interview. The information will be utilized only for research purposes.

Thank you.

Yours sincerely,

…….
Sarah Jemutai.

APPENDIX F: CONSENT FORM FOR THE TEACHERS

CONSENT TO PARTICIPATE IN THE RESEARCH STUDY

Title of the Project; Play Way Method of Learning in Developing Digital Literacy among Pupils in Primary Schools in Nandi Sub-County, Kenya.

Investigator; Sarah Jemutai.

Supervisors; Prof. Violet Nabwire Opata, Moi University

Dr. Josephine Musamas, Moi University

Invitation to Participate in the Research Study
I invite you to participate in my research study about Play way method of learning in developing digital literacy among pupils in primary schools in Nandi Sub County.

Description of Your Involvement
During the interview I will ask you to tell me about your involvement and experiences during the digital play activities that you undertook with the pupils. You will also be required to fill in the journals about your reflection on the play activities that you undertook. The filling on the journal reflection sheets will be done immediately after the play activity has ended.

Benefits of Participation
As you participate in this interview it will give me a better understanding of how young learners can develop digital literacy skills which will enable me gain rich data generated from the interview and corroborate with the findings from the journal reflection sheets. We hope that you as the interviewee will also benefit through your own reflection of the whole process and how the learners participated and responded to the play sessions if they were of benefit or not.

Confidentiality
The results obtained are of the benefit of this study only. We will not include any information that will identify you. Your privacy will be upheld and your research records will be confidential.

Storage and Future use of Data
The data shall be stored for future research studies. Your name and any other identifying information will be secured and will remain anonymous. Research data may be shared with other investigators but will not contain any information identifying you.

Voluntary Nature of the Study
It is through your willingness that I will get feedback from you. If a question is difficult and you are not able to answer, then you are free to say you are not able to answer it then we can move to the next question.

Contact Information for the Study

If you have a question concerning this research you may contact Sarah Jemutai at sarahjemutai81@gmail.com or Prof Violet Nabwire Opata vknabwire@gmail.com or Dr. Josephine Musamas musamaskem@yahoo.com

Consent

By signing this document, you are agreeing to be in the study.

I agree to participate in the research and that the audio/video interview will be recorded and the journals written

TRUE……

FALSE…….....

Name

Signature.

APPENDIX G: PARENT CONCENT FORM

SCHOOL OF EDUCATION
DEPARTMENT OF CURRICULUM INSTRUCTION AND EDUCATION MEDIA

Dear Parent/Guardian,

I am currently a Doctor of Philosophy student at Moi University Eldoret under the supervision of Professor Violet Nabwire and Dr Josephine Musamas of Moi University. The focus of my research is to gain a better understanding of play way method of learning in developing digital literacy among pupils in primary schools in Nandi Sub County. Play lays the basis for early learning and academic success.

During this research project, your child's teacher will use tablets supplied by the government to public primary schools to perform some play activities. This is therefore a friendly request to you, as the parent or guardian, to allow your child to participate in this research project. Consent to conduct my research has been granted by your child's principal and teacher as well as the National Commission for Science technology and innovation (NACOSTI).

By granting your child permission, your child will be asked to do some playful activities on the tablets. The teacher will guide the children develop skills on technology. These activities will be carried out during school hours.

Assurance is given that throughout this study the data collected will remain anonymous and confidential and will be used solely for my research project with the aim of facilitating the development of young learners' digital literacy skills through play.

If you consent to your child participating in this research project, please complete the attached reply slip and return it to your child's teacher. Should you have any queries, please do not hesitate to contact me at the number below.

Yours Faithfully

Sarah Jemutai, (Researcher)
Faculty of Education
Moi University
0724740512

CONSENT OF PARENT/GUARDIAN

I,

_____

__, parent/guardian

of_____

_ (child's name) in

grade one_____ hereby give consent for my child to participate in the above-mentioned research project.

Please tick the dominant language spoken at home:

Home language	**Kiswahili**	**Bantu**	**Nilote**	**Other (Please specify):**

Parent/Guardian Signature: _____ Date:

APPENDIX H: RESEARCH PERMIT FROM NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **607692**

Date of Issue: **27/July/2021**

RESEARCH LICENSE

This is to Certify that Ms.. Sarah Jemutai of Moi University, has been licensed to conduct research in Nandi on the topic: PLAY WAY METHOD OF LEARNING IN DEVELOPING DIGITAL LITERACY AMONG PUPILS IN PRIMARY SCHOOLS IN NANDI SUB-COUNTY: LENYA for the period ending : 27/July/2022.

License No: **NACOSTI/P/21/11997**

607692

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

APPENDIX I: ANTIPLAGIARISM CERTIFICATE

SR180

ISO 9001:2019 Certified Institution

EDU 999 THESIS WRITING COURSE

PLAGIARISM AWARENESS CERTIFICATE

This certificate is awarded to

SARAH JEMUTAI

EDU/D.PHIL/CM/1014/18

In recognition for passing the University's plagiarism Awareness test for the thesis titled: **PLAY WAY METHOD OF LEARNING IN DEVELOPING DIGITAL LITERACY AMONG PUPILS IN PRIMARY SCHOOLS IN NANDI SUB COUNTY, KENYA** with a similarity index of 8% and striving to maintain academic integrity

Awarded by:

Prof. Anne Syomwene Kisilu
CERM-ESA Project Leader Date: 23/05/2023