ANALYSIS OF MEDIATED INSTRUCTIONAL STRATEGIES IN LITERACY SKILLS ACQUISITION AMONG PUPILS WITH CEREBRAL PALSY IN SPECIAL SCHOOLS IN KENYA

BY

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DECLARATION

This is to declare that this is my original work and has never been presented for a degree in any other University.

Sign..... Date .....

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DECLARATION BY THE SUPERVISORS

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ABSTRACT

Learners with Cerebral Palsy (LCP) experience difficulties in acquiring literacy skills. This has adversely affected their academic performance. A baseline survey conducted in 2013 in 3 special schools in Kisumu, Kiambu and Mombasa Counties in Kenya shows that, from the year 2009 to 2011, more than a half, 28(88%) out of 32(100%) LCP repeated grades due to inability to read and write. Studies conducted have focused on general and specific areas of instruction to LCP. Research has shown that when mediation is used appropriately, learners improve in learning. Little is known, however, about how mediation can be used as a strategy in instructing LCP on literacy acquisition. The purpose of this study was to analyze the use of mediated instructional strategies in acquisition of literacy skills among LCP in special schools in Kenya. Objectives of the study were to: Examine types of mediated instructional strategies used by teachers to teach literacy skills to learners with cerebral palsy; analyze strategies used by learners with cerebral palsy to acquire literacy skills; examine teacher competence in using mediated instructional strategies to teach literacy skills to learners with cerebral palsy; establish the constraints faced by teachers in using mediated instructional strategies to teach literacy skills to learners with cerebral palsy. The study is based on socio-cultural theory- the Vygotskyian framework of Zone of Proximal Development that advocates for mediation by a more capable person in learning situations. Descriptive and embedded case study designs were adopted. Target population was 72 teachers and 18 LCP. Saturated sampling procedure was used to sample 65 teachers and 18 LCP. Observation schedule, document analysis guide and questionnaires were used to collect data. Reliability of instruments was 0.8 at $p<.05$ when determined through test re-test. Expert opinion was sought from the School of Education to determine both face and content validity of the instruments. Qualitative data was coded into categories and themes. Quantitative data was analysed through descriptive statistics using frequency counts and percentages. Results revealed that there were variations in the types and use of the strategies in which individualized adaptations (47(72.3%), Scaffolding (47(72.3%) and artifacts (46, (70.8%) were the most used with direct instruction in combination. Most learners (11, (61.1%) depended on association of objects or pictures paired with experience to read. Majority of the teachers (36, (55.4%) were found to be competent in using mediated strategies. As for the constraints faced by teachers, most challenges were found to be in Peto strategies and differentiation with 46, (70.8%) each. Other challenges from qualitative data included varied needs of learners, lack of resources and time constraints. The study concludes that with appropriate use of mediated instructional strategies, learners' strategies, teacher competence and minimal constraints, LCP can acquire literacy skills. The study recommends that teachers should be sensitized on how to scaffold and differentiate literacy instructions to LCP; fade out learner support to minimize overdependence in literacy acquisition; in-service training on mediated instructional strategies for teachers of LCP to upgrade their skills on mediation; It is further recommended that there is need to address/ minimize the constraints that teachers face in using mediated strategies. The outcome of the study may be of value to the teachers and inform policy on improvement of instructional strategies for mediating learning of literacy skills to LCP.

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The learners with cerebral palsy, whom I worked with, will equally be cherished for their great unconditional support.

DEDICATION

To my beloved parents; Daddy, Obinga (RIP) and Mama, Maritha (RIP)

With love

You laid the foundation for my education

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ABBREVIATIONS AND ACRONYMS

AAC - Augmentative and Alternative Communication

CP - Cerebral Palsy

D.R.P.I - Disability Rights Promotion International

K.D.H.S - Kenya Demographic and Health Survey

KNBS - Kenya National Bureau of Statistics

LCP - Learners with Cerebral Palsy

LS - Literacy Skills

LSIS - Learning and Skills Improvement Service

MIS - Mediated Instructional Strategies

MLE - Mediated Learning Experience

MOE - Ministry of Education

MOEST - Ministry of Education Science and Technology

NCAPD - National Coordinating Agency for Population and Development

NINDS - National Institute of Neurological Disorders and Stroke

PH - Physically Handicapped

PD - Physical Disabilities

SNE - Special Needs Education

UCP - United Cerebral Palsy

W.H.O - World Health Organization

ZPD - Zone of Proximal Development

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Teaching literacy skills requires approaches and strategies that meet the diverse learning needs of learners within a classroom (Owen, Violette, Weber & McLaughlin, 2009). Certain approaches have been found useful in teaching reading and writing skills to beginning readers including those with special needs in education. One such approach as spelt out in the Public Law- P.L. 94-142, the Individuals with Disabilities Education Act (IDEA) of 2004, stresses that a written Individualized Educational Program (IEP) that sets out current performance level, educational goals, and related services be developed (Agunloye, Pollingue, Paul Davou & Osagie, 2011). The IDEA provides a guideline on education of children with disabilities (ILO & Irish AID, 2009). This Act, however does not spell out the guidelines specific to learners with specific categories of special needs. The Kenyan National Special Needs Education Policy Framework of 2009 provides a road map for the education of children with disabilities in Kenya (Republic of Kenya, 2009). This Policy, however, does not specify the exact approaches that need to be taken for educating learners with specific categories. It lumps learners with special needs under one category. Other approaches that are relevant to teaching literacy include whole language approach, look and say methods, basal readers and phonics approaches. These strategies, however, are the typical ways of teaching literacy skills which are too general and do not indicate extra support that learners with special needs would require; support that is referred to as mediation.

The approaches relevant to teaching literacy to all learners stress on mediation which is embedded in theories and systems that are useful in teaching reading and writing. These approaches include mediated learning, active learning and conductive education, also referred

to as Peto program (Vygotsky, 1978; Conductive Learning Centre, 2012). Mediation as an approach is one of the ways of teaching reading and writing to children (Kozulin, 2004; Dixon-Krauss, 1996). Mediated Learning is a special quality of interaction between a learner and a person, normally referred to as a "mediator." In this mode, the mediator provides a suitable stimulus and then observes the learner's response to the stimulus. Based on the response, the mediator interacts with the learner and the process is continued until either the mediator or the learner is satisfied or time runs out (Feurstein, Klein, & Tannenbaum, 1999). Instructional strategies that differ from typical literacy instruction may be necessary for students to master the task (Basil & Reyes, 2003; Swinehart-Jones & Heller, 2009). According to Kozulin, Gindis, Ageyev, & Miller (2003),

Literacy is not a subject but rather a set of skills that include speaking, listening, reading and writing. These skills are not confined to the English learning area (Nothern Territory Department of Education and Training, Australia, 2010). From all perspectives, literacy embodies reading and writing skills. The most common understanding of literacy is that it is a set of tangible skills – particularly the cognitive skills of reading and writing (UNESCO, 2006). They include awareness of the sounds of language, awareness of print and the relationship between letters and sounds (Bainbridge, 2014). Reading requires the acquisition of skills such as phonemic awareness, letter recognition, encoding, decoding, and word recognition (Dahlgren-Sandberg, 2006). Learning to read and write is essential in the development of each child, because literacy skills are important aspects in one's development and functioning in day to day life (Owens *et al.*, 2009). Future success of students hinges upon their ability to become proficient readers (Moats, 1999 cited in Khiang Loh (2009). Further, Curtiss (2012) asserts that reading is a task of decoding; that is, extracting meaning from symbols on a page while writing is a matter of encoding; i. e. communicating meaning

by creating symbols on a page. It is possible that teaching students to read will improve their ability to write (Curtiss, 2012).

Student's overall academic success can be compromised by lack of well-developed reading and literacy skills (Alvermann & Phelps, 2002). Writing skills are also built on reading skills, and many students with special needs require extra assistance in this area (Saddler, 2004 cited in Lewis & Doorlag, 2011). High levels of achievement in literacy are important for learning across the curriculum (Raphael & Au, 2005 cited in Owens *et al.,* 2009). Reading and writing are therefore, the integral part of the general curriculum (Erickson, Hanser, Hatch & Sanders, 2009). Literacy is therefore necessary for all learners with or without disability. Among those with disabilities are children with cerebral palsy. Cerebral palsy is one of the types of physical disabilities with disorders that occur due to the involvement of the central nervous system (Friend, 2008; Hallahan, Kauffman & Pullen, 2012).

According to Friend (2008), the term cerebral palsy literally means ''paralysis of the brain". *Cerebral* refers to the brain and *palsy* to muscle weakness and poor control (Hardman, Drew & Egan, 2005). The disability is a group of conditions that involves muscle control, posture, and movement that is not progressive. This means that, it does not get worse over time (Friend, (2008). People with cerebral palsy have permanent disorders of the development of movement and posture. This condition causes activity limitations that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain (Bax, Goldstein, Rosenbaum, Leviton, Paneth, Dan, Jacobsson & Damiano, 2005). The injury hinders the brain's ability to control the muscles of the body properly (Martin, 2006). Persons with CP experience problems in motor coordination which is necessary for reading and writing (Hallahan *et al,* 2012; Friend, 2008). Learners with cerebral palsy who experience speech and motor difficulty related to oral-motor difficulties such as dysarthria are at increased risk of

experiencing literacy problems (Hallahan *et al.*, 2012; Bigge, Best & Heller, 2005; Peeters, Verhoeven, van Balkom & de Moor, 2009).

The United Cerebral Palsy (UCP) Foundation estimates that nearly 800,000 children and adults in the United States are living with one or more of the symptoms of cerebral palsy (NINDS, 2010). Population-based studies from around the world report prevalence estimates of CP ranging from 1 to more than 4 per 1,000 live births or children of a defined age range (Centers for Disease Control and Prevention - CDC, 2016). It is estimated that, in developing countries, there is 1 in every 300 babies with cerebral palsy. In Kenya, there is inadequate accurate data on persons with disabilities even though some are enrolled in schools. The World Health Organization (W.H.O.) and the Kenya Demographic and Health Survey (K.D.H.S.), estimate that about 10% of the country's total population has a form of disability. With a population estimated at 32.2 million in 2003, approximately 3.2 million persons in Kenya have a disability (Disability Rights Promotion International - D.R.P.I., 2009; Ingstad & Grut, 2007).

Results on population of persons with disabilities (PWDs) conducted in 2008 shows that PWDS are 4.6%, out of whom 1.6% have physical disabilities (The National Coordinating Agency for Population and Development (NCAPD, 2008). The population census conducted in 2009 shows that Kenya has a population of 38.6m, out of which 3.5% are persons with disability and 1.57% (411,980) with physical and health care problems that include those with cerebral palsy (Kenya National Bureau of Statistics - KNBS, 2011). The data is all-inclusive and does not specify the types of physical disabilities. Therefore, it is clear that, in Kenya, data on the actual population of children with cerebral palsy may seriously be wanting.

With regard to their characteristics, children with cerebral palsy are uniquely different. They exhibit a wide variety of symptoms. These include: lack of muscle coordination (*ataxia*); stiff or tight muscles and exaggerated reflexes (*spasticity*); variations in muscle tone, either too stiff or too floppy; excessive drooling or difficulties swallowing or speaking; shaking (*tremor*) or random involuntary movements (*athetosis*); and difficulty with precise motions, such as writing or buttoning a shirt (NINDS, 2010). Some children with CP have a mixture of almost all the above characteristics while some individuals show only one indication of brain damage, such as motor impairment while others show combinations of symptoms (Hallahan *et al.,* 2012). Some of these children also experience problems in non-motor areas of functioning, such as hearing impairments, speech and language disorders, intellectual deficits, behavioral disorders, visual impairments, and general perceptual problems or some combination of several of these disabling conditions in addition to motor disability (Hardman *et al*., 2005; Hallahan *et al.,* 2012). Cerebral palsy is more common among boys than girls (Friend, 2008).

Some children with CP demonstrate poor hand function due to spasticity in the wrist and finger flexor (Mehl-Madrona, 2001 cited in El-Maksoud, Sharaf & Rezk-Allah, 2011). Thus, spasticity in the flexor muscles of the upper limbs poses a great deal of functional limitation in the hands. One common problem associated with poor hand function as a result of spasticity is the inability of an individual to grasp objects ; and difficulty with fine motor tasks, such as writing or cutting with hands (Scheker, Chesher & Ramirez, 1999; Mehl-Madrona, 2001 cited in El-Maksoud *et al.,* 2011). Spastic CP is the most common type of cerebral palsy, followed by athetoid then ataxic CP (Kirk *et al.,* 1997; Hallahan *et al.,* 2012; Bigge, Best & Heller, 2005; Friend, 2008).

The most important point about CP is that the brain damage affects a person's strength and the ability to move parts of the body normally. This difficulty may involve the limbs, as well

as the muscles which control facial expressions and speech (Hallahan *et al.,* 2012). However, these effects of brain damage do not necessarily mean that the person's intelligence or emotional sensitivity has been affected by the damage affecting muscle control (Hallahan *et al.,* 2012). Though cerebral palsy is one of the most complex of all physical impairments, individuals with severe motor involvement may be intellectually gifted (Bowe, 2000). It therefore, follows that, children with cerebral palsy are diverse in their conditions such that they cannot be characterized by any set of homogenous symptoms (Kirk *et al*., 1997). Their heterogeneity is due to the nature of their conditions that present a variety of problems in differing forms and in degrees of severity (Mecham, 2002; Bigge, *et al*., 2005; Kirk *et al*, 1997). This implies that it is not possible to point at any one child as a typical case of cerebral palsy.

Studies reveal that students with severe speech and physical impairments receive less literacy instruction than their peers without these disabilities. They also experience frequent interruptions and diminished interactions with peers during instruction **(**Heller, Fredrick, Tumlin, & Brineman, 2002). This is in line with a study by Peeters *et al*., (2009) who observe that children with cerebral palsy with speech or fine motor impairments are disadvantaged in a number of literacy activities. Their literacy success may further be hampered by inadequate instructional strategies, lack of instructional adaptations and inappropriate use of assistive technology (Heller *et al.,* 2002). According to Heller, Fredrick and Diggs (2000), teaching reading effectively to students who were born with physical disabilities that impede speech and movement is one of the most critical problems in the field of physical disabilities. However, the critical problems are not clear. This notion is not conclusive as some researchers also argue that, with proper instructional strategies, learners with cerebral palsy can acquire literacy skills (Bigge & Best, 2005).

Learning reading and writing begins in the lower grades or classes, which constitute the foundation level of literacy acquisition in primary school. Once students reach fourth grade, most of the information they need is given to them in textual format where the focus changes from learning to read, to reading to learn (American Institutes for Research -AIR, 2012). People who are able to read and write find it easy to access vital information and to respond to the same appropriately while those who are not able to read and write experience difficulty accessing information. It implies that poor readers may have difficulty interacting with content in the curriculum (Higgins, Boone, & Lovitt, 2002 cited in AIR, 2012). According to Learning and Skills Improvement Service (LSIS (2012), basic literacy skills of listening, speaking, reading and writing may be more or less difficult for an individual, depending on the disability. Speech and hand control limitations have a significant effect on some of these skills, as do other physical disabilities (LSIS, 2012). These disabilities have a significant effect on students' lives and educational needs such that they require special equipment, special procedures, or other accommodations for their disabilities (Hallahan *et al.* 2012). Literacy instruction needs to focus on both reading and writing, and very often writing is neglected in terms of literacy intervention especially with individuals who require Augmentative and Alternative Communication (AAC) systems (Light & McNaughton, 2012). These are individuals with speech and motor difficulties, and those without speech whose communication needs to be facilitated, such as learners with cerebral palsy (Baugmart, Johnson & Helmester, 1990; Kirk, Gallagher & Anastasiow, 1997).

A child with CP faces many challenges in school given the limitations, and is likely to require individualized support that can be accorded through mediation (National Dissemination Centre for Children with Disabilities, 2010). These studies stress on mediation. The exact mediated instructional strategies that teachers may be using in teaching literacy skills to learners with cerebral palsy are, however, not clear. Whether the teachers use phonics

approaches (synthetic & analytic phonics), whole language approaches, look and say method or basal reader approaches, learners with disabilities like those with CP require mediation by an adult or teacher to grasp the skills (Schmidt & Harriman, 1998).

A study on Teacher-Mediated Instructional Strategies in USA by Hirn, and Park (2012) focused on students with emotional or behavioural disorders (EBD). Their article describes teacher-based environmental and instructional strategies for use in typical classroom settings with students who exhibit E/BD and challenging behaviours. The study shows how teacher-mediated interventions (i.e., antecedent and consequence strategies) are integrated for better inclusionary practices for students with behavioural concerns. This study has shown some success with the use of teacher-mediated instructional strategies in the classroom with learners experiencing emotional and behavioural difficulties. Their study, however, did not link these strategies to any academic area. Therefore, teacher-mediated instructional strategies in literacy acquisition among learners with CP are wanting. It was necessary to establish the types of mediated instructional strategies used by teachers to teach literacy acquisition to learners with cerebral palsy in Kenya.

In USA, Pyle, Pyle, Lignugaris-Kraft, Duran & Akers (2016) conducted a study on the academic effects of peer-mediated interventions with English language learners. Their study synthesized the extant research on peer-mediated interventions (PMIs) with English language learners (ELLs) in kindergarten through Grade 12. They examined fourteen studies that were published in peer-reviewed journals from 1983 to 2013 in terms of study characteristics, the effects on academic outcomes, study quality, and overall effectiveness. In their study, they used structured, heterogeneous grouping in the 10 peer pairing and 4 collaborative/cooperative grouping PMIs with ELLs. Eight of the 14 studies included high methodological quality. Their study revealed that, overall, PMIs with ELLs were associated

with medium to large effects on measures of phonemic awareness, vocabulary, and comprehension when compared to teacher-mediated comparison conditions. The study looked at peer-mediated interventions and they focused on academic achievements. Whereas Hirn, & Park (2012) study focused on teacher-mediated instructional strategies, Pyle *et al*. (2016) focused on peer-mediated strategies. These studies were based on experiences of learners other than those with cerebral palsy. None of the two older studies combined both teacher and peer-mediated strategies. The current study focused on instructional strategies that included both teacher and peer-mediation. At the same time, the older studies focused on intervention measures and not acquisition of skills while the present study sought to establish the mediated strategies used by teachers in acquisition of literacy skills among learners with CP.

The studies conducted in Kenya on teaching literacy to learners with CP by Obinga and Kochung (2011) captured mediated instructional strategies. Nonetheless, only two mediated instructional strategies of individualization and use of materials featured. The study further revealed that teachers individualized their instructions to suit individual learners. Their study also focused on the teachers and they used multiple case studies only while the current study focused on both the teachers and learners with CP using both descriptive and embedded case study designs. Though individualization is an aspect of mediation, other mediated instructional strategies were not studied by Obinga and Kochung. The current study considered other twelve mediated instructional strategies that were not included in Obinga and Kochung's study.

In a study on inclusion of learners with CP in reading and writing lessons, Obiero (2009) focused on an aspect of mediation, namely interaction, which she recommended should be fostered among the group of learners with CP. However, the exact mediated instructional

strategies that these teachers use in literacy skills acquisition were not captured by this study. Examples of which are scaffolding, differentiation, peer support, Peto strategies, individualization among others. Mediated learning emphasizes social interaction that serves as a tool for transmitting knowledge of learning how to construct problem–solving activities (Dorn, 1996). Mediation encompasses different kinds of support that would enable learners with CP reach a higher zone of proximal development in their literacy skills acquisition (Vygotsky, 1978). It is important to remember that not all students learn in the same way or at the same rate, and that it is important to vary approaches to account for this (Cole, 2016). The study therefore, sought to analyze mediated instructional strategies used in literacy skills acquisition among learners with cerebral palsy in special primary schools for the PH in Kenya.

Smith (1992) observes that challenges emanating from reading difficulties are commonly reported in the non-speaking cerebral palsy population. Research by Peeters *et al*.(2009) in Netherlands on home literacy predictors of early reading development in children with cerebral palsy demonstrated that, although phonological awareness and phonological short-term memory were the most important precursors for word decoding skills in typically developing children, for children with CP, the most important precursor for word decoding was speech production. This study, however, focused on the home literacy environment and not the classroom environment. The study also looked at the precursors for word decoding skills but did not look at the strategies used by learners with CP in acquiring literacy skills.

Dahlgren-Sandberg (2006) longitudinal study in Sweden also focused on reading and spelling abilities in children with severe speech impairments and cerebral palsy aged 6, 9, and 12 years in relation to cognitive development of phonological abilities, and short-term memory. The study stretched from preschool level and revealed that children with cerebral

palsy with severe motor problems and unintelligible speech had difficulty acquiring literacy skills. She, however, recommended further research to establish the strategies used in literacy acquisition in these children with cerebral palsy. This information is therefore limited.

Studies conducted in Kenya by Obinga and Kochung (2011) on teaching literacy skills to learners with CP focused on how teachers individualized their strategies. Obiero (2009) studied how teachers included learners with CP in reading and writing lessons. These two studies focused on the strategies used by the teachers. On the other hand, a study conducted in United States of America (USA) by Asbell, Donders, VanTubbergen & Warschausk, (2010) revealed that, within the group with cerebral palsy, there was an indirect effect of functional expressive ability on reading comprehension, mediated by phonemic awareness. Their study dwelt on reading comprehension. Asbell *et al.* (2010) study is more in line with the present study in that it focused on aspects that mediate reading comprehension such as phonemic awareness. Even though the older studies focused on teaching reading to learners with CP, they did not establish the strategies used by learners with CP in literacy skills acquisition. This information is limited.

Studies conducted by Smith (1992), Asbell *et al.* (2010), Peeters *et al.*(2009) and Dahlgren-Sandberg (2006) focused on teaching of literacy skills among learners with cerebral palsy from different environments and countries. The length of their studies also varied from cross sectional to longitudinal studies that produced in-depth information about literacy skills of learners with CP. These studies that looked at strategies used by teachers did not, however, focus on the strategies used by learners with CP in acquiring literacy skills. This information is also scanty. The current study, therefore, sought to analyze the strategies used by learners with CP to acquire literacy skills.

With regard to teacher competence, it is not clear whether studies conducted so far on teaching literacy to learners with CP have addressed teacher competence in the use of mediated instructional strategies in teaching acquisition of literacy skills to learners with CP. Hall and Harding (2003) focused on teacher effectiveness by synthesizing 12 studies conducted in teaching literacy. Their study empirically established teacher effectiveness, following attributes of important pedagogical practices that teachers brought to their teaching of literacy and its learning which qualified them as competent teachers of reading and writing. Their study, however, dwelt more on general teaching. Teacher competence in teaching literacy skills to learners with cerebral palsy has also not been addressed by studies conducted in Kenya. This information is limited. It has been observed that teaching a child with CP demands competence in many aspects of special needs education and experience in working with a variety of disabling conditions in a multidisciplinary setting (Best, Heller & Bigge, 2010; Heller, Alberto, Foroney & Schwartzman, 2009 cited in Hallahan *et al.,* 2012). In teaching literacy skills to learners with cerebral palsy, systematic sequencing, teacher modeling, direct instruction, and modified reading strategies could be used in addition to typical reading instruction (Bigge *et al.,* 2005; Swanson, Hoskyn, & Lee, 1999 as cited in Swinehart-Jones & Heller, 2009).

A study conducted in Kenya by Obiero (2009) on inclusion of learners with CP in reading and writing revealed that teacher training in a specific area of disability had an influence in the teacher's understanding of the educational needs of learners. This understanding helped them to plan for teaching of literacy skills. This study relates to the current study as it focused on the training of teachers, an aspect of competence that was part of the indicators in the current study. The study, however, focused only on training aspect of teacher competence and not how effective they were with their training with regards to teaching acquisition of literacy skills to learners with CP. At the same time, the study did not specify the teaching methods

used by teachers in teaching reading and writing to learners with CP. The current study, therefore, sought to determine how competent teachers were in using mediated instructional strategies to teach literacy acquisition to learners with CP.

With regard to challenges faced by teachers of learners with CP, Chinombwe (2011) conducted a study on challenges that teachers face when teaching children with cerebral palsy in Zimbabwe. The study revealed that teachers were not adequately trained in teaching children with CP in Zimbabwe. Chinobwe's study, however, focused more on general teaching of CP and did not specify any constraints in teaching an academic subject or skill area in the curriculum. A study conducted in Kenya by Wairimu (2015) on analysis of predictors of participation in learning among learners with cerebral palsy in special and regular schools in Thika municipality looked at challenges faced by teachers while handling learners with CP. Her study revealed that teachers lacked adequate equipment and resources to follow the curriculum; lacked enough time, had inadequate manpower and even cited poor handwriting, pronunciation of words in Kiswahili and English, and learners getting sick. These were findings that focused on general teaching of learners with CP, and none of the predictors focused on constraints faced by teachers in teaching of literacy skills to learners with CP.

At the same time, Kanana (2015) conducted a study on instructional challenges facing learners with cerebral palsy in selected schools in Machakos and Kiambu Counties, Kenya and revealed lack of curriculum adaptation issues and assistive devices and materials for learners with CP as instructional challenges. This study did not focus on any specific academic area neither did it reveal any challenges faced by teachers in teaching acquisition of literacy skills to learners with CP. It was necessary to study challenges faced by teachers in the use of mediated instructional strategies in teaching literacy acquisition to learners with CP

as this could be a contributing factor to the issues affecting the acquisition of literacy skills among learners with CP.

Research conducted in USA reveals that, one out of every four children in the United States fails to achieve basic reading skills by the eighth grade (National Centre for Educational Statistics, 2009). In the population of children with neuro-developmental conditions such as CP, data suggest that these failure rates are even higher (Asbell, Donders, Van Tubbergen, & Warschausky, 2010).

A policy on forced repetition was put in place in Kenya. Through the policy, forced class repetition was abolished, yet, not all schools complied with this directive as observed in a study by Ochieng (2012). He stated that the non- compliance was mainly due to the factors that affected the delivery of adequate and effective learning in schools, especially to the struggling learners and those from poor households (Ochieng, 2012).

Learners with cerebral palsy fail to achieve reading and writing skills that are necessary for learning other academic subjects in school thereby affecting their overall performance (Ogono, 2008). A baseline survey conducted by MOE (2009) highlighted the barriers that existed in transition and retention rates for learners with disabilities in Kenya. The SNE Policy of 2009 is to ensure that there was barrier free transition of learners with special needs and disabilities through the various educational levels in accordance with their abilities (MOE, 2009).

Learners with cerebral palsy are exposed to so much repetition of grades unlike other learners due to poor academic performance. These children with CP attend school in special education institutions for the physically handicapped (PH) and special units attached to regular primary schools (Ministry of Education Science and Technology (MOEST, 2005). Children with CP

experience difficulty in academic work resulting in rampant repetition of grades. This interferes with normal grade transition. Table 1 is the preliminary data depicting this repetition of grades, with examples drawn from three special primary schools in Kiambu, Kisumu and Mombasa counties in Kenya. These learners were not able to read or write according to the level of their grades.

Table 1: Transition of learners with and without cerebral palsy to subsequent grades between 2008 and 2011 in three selected special primary schools for the PH in Kenya

	2008		2009		2010		2011	
Disability	**CP**	**NCP**	**CP**	**NCP**	**CP**	**NCP**	**CP**	**NCP**
School X								
Grade 1	12	20	5	2	3	1	2	0
Grade 2			**7**	18	5	1	5	1
Grade 3					**4**	18	2	3
Grade 4							**3**	15
School Y								
Grade 1	10	13	6	1	3	0	1	0
Grade 2			**4**	12	4	1	3	0
Grade 3					**3**	12	6	2
Grade 4							**0**	11
School Z								
Grade 1	10	25	7	2	5	0	2	0
Grade 2			**3**	23	3	2	5	1
Grade 3					**2**	23	2	3
Grade 4							**1**	21

Source: Baseline survey data from admission registers, class registers and progress reports from three schools for learners with physical disabilities in Kenya (2013).
CP= Cerebral palsied; NCP = Non cerebral palsied

The annual transition of learners with and without cerebral palsy to subsequent grades in the three schools in Kenya was covered and recorded (Table 1.). In school X, 12 learners with cerebral palsy were enrolled in grade one in 2008 alongside other 20 learners without cerebral palsy. Out of the twelve, seven learners transited to grade two in 2009 while five repeated

grade one. Among the 20 without cerebral palsy, 18 transited to grade 2 while 2 repeated grade 1. In the subsequent years, only 3 learners with cerebral palsy from school X and one from school Z managed to transit to grade four in 2011without repeating any grade. Nine from school X and Z and 10 from school Y repeated grades. These were the same cohort of students admitted in grade one in 2008 in the three schools.

Table 2: Transition of learners with cerebral palsy to subsequent grades between 2008 and 2011 in three selected schools for the PDs in Kenya

Year/Grade School	2008 G1	2009 G2	2010 G3	2011 G4
X	12	7	4	3
Y	10	4	3	0
Z	10	3	2	1
Total	32	14	9	4

Source: Baseline survey on admission registers, class registers and progress reports from three schools for learners with physical disabilities in Kenya (2013).
CP= Cerebral palsy; G=Grade

From the three special schools, it is evident that the transition of learners to subsequent grades has been decreasing from 32 admitted in grade 1 to 14 in grades 2, 9 to grades 3 and 4 to grade 4 due to low literacy level.

Table 3: Transition and repetition of grades by learners with cerebral palsy (2008 cohort) between 2008 and 2011 in three selected schools for the PDs in Kenya

(N=32)

Year/Grade	Transition (f)	%	Repetition of grades (f)	%	Total%
2009 (G2)	14	43.8	18	56.3	100
2010 (G3)	9	28.1	23	71.9	100
2011 (G4)	4	12.5	28	87.5	100

Repetition of grades among learners with cerebral palsy had steadily increased by grade 4, 28(87.5%) up from 18 (56.3%) in grade 2, while transition to subsequent grades had declined from the year 2009, up from 14(43.8%) to 4(12.5%) in 2011. It is evident that the higher the repetition rate, the lower the transition rate of learners with CP to upper grades. This could also imply that the lower the literacy skills, the higher the repetition rates due to weak performance in overall academics. The scenario that is evident in all the three schools is that, while those without cerebral palsy steadily transit to upper grades at a higher rate, those with CP steadily repeat grades (Table 1.). Repeating of grades was caused by poor performance in academic subjects which could be due to difficulties with reading and writing skills, use of inappropriate instructional strategies and/or problems associated with the disability. It is against this backdrop that the study set out to analyze mediated instructional strategies in literacy skills acquisition among learners with cerebral palsy in special primary schools for learners with physical disabilities in Kenya.

1.2 Statement of the problem

A learner is supposed to acquire literacy skills for learning other academic subjects in school. Learners with CP are supposedly taught by teachers who are trained in special needs education. Those who specialize in the area of physical disabilities are trained on strategies for teaching learners with physical disabilities including those with CP. Despite the teachers' training, children with cerebral palsy still have inadequate literacy skills even after being in school for several years. This inadequacy seems to affect their transition to upper grades at the same rate as other children. Their ability to cope with academic work in school is, therefore, hampered.

Evidence from the three schools of learners with cerebral palsy highlighted in Table 1 depicts how learners with and without cerebral palsy who were admitted in grade one in 2008 have

been transiting to upper grades at different rates. Those with cerebral palsy have been repeating grades due to inadequacy in reading and writing skills. Studies also show that difficulties with literacy skills may also be attributed to the limitations imposed on them by the disability and/or inappropriate strategies used by teachers in literacy instruction. They also experience difficulties with muscle coordination that affect the use of hands in performing writing tasks and the speech muscles that are either weak or paralyzed, thereby affecting reading.

It is assumed that learners with CP are taught by skilled teachers who use appropriate instructional strategies to promote their understanding, though; it is not clear whether these teachers are competent in teaching literacy skills to learners with CP. Similarly, it is unclear whether they are aware that the strategies they use fall under mediated instructional strategies and whether they are competent in using them in literacy instruction among learners with CP in lower primary schools. It is also not known whether there are constraints that teachers may be experiencing in using mediated instructional strategies.

Learners with CP take several years learning in the same grade, but make little progress in mastering the necessary academic skills. The strategies they use in acquisition of literacy skills are however not clear. Therefore, there is not much research focusing on learners with cerebral palsy with regard to the use of mediated instructional strategies.

Strategies used by learners with cerebral palsy in literacy acquisition, the mediated instructional strategies used by teachers, their competence and constraints they face in using mediated instructional strategies in teaching literacy skills among learners with cerebral palsy in Kenya as well as grade transition issues have not been researched on. The Kenya government's focus is on educating cerebral palsied learners with the physical disabilities as one category in the special schools for learners with physical disabilities; yet, their needs are

unique and require varied approaches in teaching them. There is, therefore, need to analyze mediated instructional strategies used in acquisition of literacy skills among learners with cerebral palsy in special schools for learners with physical disabilities in Kenya.

1.3 Purpose of the study

This study was to analyze the mediated instructional strategies used in literacy skills acquisition among pupils with CP in schools for learners with physical disabilities in Kenya.

1.4 Objectives of the study

The specific objectives of the study were to:

i) Examine the types of mediated instructional strategies used by teachers to teach literacy skills to learners with cerebral palsy in schools for learners with physical disabilities in Kenya.

ii) Analyze the strategies used by learners with cerebral palsy to acquire literacy skills in schools for learners with physical disabilities in Kenya.

iii) Examine teacher competence in using mediated instructional strategies to teach acquisition of literacy skills to learners with cerebral palsy in schools for learners with physical disabilities in Kenya.

iv) Establish the constraints faced by teachers in using mediated instructional strategies to teach acquisition of literacy skills to learners with cerebral palsy in schools for learners with physical disabilities in Kenya.

1.4.1 Research Questions

The study sought to answer the following questions:

i) What type of mediated instructional strategies do teachers use in teaching acquisition of literacy skills to learners with cerebral palsy in schools for learners with physical disabilities in Kenya?

ii) What strategies do learners with cerebral palsy use to acquire literacy skills in schools for learners with physical disabilities in Kenya?

iii) How competent are the teachers in the use of mediated instructional strategies in teaching literacy skills acquisition to learners with cerebral palsy in schools for learners with physical disabilities in Kenya?

iv) What constraints do teachers face in the use of mediated instructional strategies in teaching literacy skills acquisition to learners with cerebral palsy in schools for learners with physical disabilities in Kenya?

1.5 Assumptions of the study

i) Mediated instructional strategies are used with learners with cerebral palsy in literacy skills acquisition.

ii) Teachers of learners with cerebral palsy are trained to use mediated instructional strategies.

iii) Learners with cerebral palsy perform better in literacy skills acquisition with mediated instructional strategies.

1.6 Scope of the study

The focus of this study was on the use of instructional strategies that meditate learning of literacy skills among learners with cerebral palsy in special schools for the PH in Kenya. Class one to three of learners with CP experiencing difficulties with speech and hand use, and teachers of English in the lower grades were the main targets of the study.

1.7 Limitations of the study

The limitations anticipated included:

a) The main part of the study was limited to lower classes only.

b) The multiple-case study cannot be generalised to a larger population.

1. 8 Significance of the study

The findings of this study may:

a) Help shed light on the importance of mediated instructional strategies when used with learners with cerebral palsy in the acquisition of literacy skills.

b) Facilitate teacher trainers in revising and evaluating the curriculum on the aspects of instructional strategies for learners with cerebral palsy, to incorporate teaching of literacy skills acquisition.

c) Contribute to the existing knowledge of teaching and learning strategies in literacy skills for learners with CP who are experiencing speech and motor difficulties.

d) Inform on policy to streamline education of learners with cerebral palsy in Kenya.

1.9 Theoretical Framework of the Study

The research revolves around the socio-cultural theory of learning and the main focus is on the Vygotskian framework - the concept of the Zone of Proximal Development (ZPD). The Zone of Proximal Development is defined as the distance between what a child can achieve on his own and what he is capable of achieving when under the guidance of adults or more capable peers (Vygotsky, 1978). The idea is that children learn through their interactions with more experienced adults and peers, who assist them in engaging in thinking beyond the "zone" in which they would be able to perform without assistance (Rogoff, 2003). The zone of proximal development is one of the concepts in the sociocultural theory in which Vygotsky believed that any pedagogy creates learning processes that lead to development and this sequence results in zones of proximal development (Gallagher, 1999). It is the concept that a child accomplishes a task that he/she cannot do alone, with the help of a more skilled person. Tudge and Scrimsher (2003) on the other hand, note that Vygotsky was not only interested in what more knowledgeable others brought to the interaction, but also in what the child himself or herself brought to the interaction, as well as how the broader cultural and historical setting shaped the interaction. Within the ZPD, the child is not a mere passive recipient of the adult teaching, nor is the adult simply a model of expert, successful behavior, instead, the adult-child dyad engages in joint problem-solving activity, where both share the knowledge and responsibility for the task (Wells, 1999, pg140).

Children with cerebral palsy have an uphill task of learning "how to learn" since they lag behind in functional skills that are prerequisite in acquisition of literacy skills. They are taught general principles to assist them in learning, which they later generalize into learning how to read and write. The concept of mediation is one of the central notions of Vygotskian concept which is conducive to teaching reading and writing skills to learners with severe cerebral palsy. The ZPD advocates for mediated learning, a dual process of learning that

takes place in two planes- first in the social plane and then individual plane unassisted (Vygotsky, 1978). Mediated learning involves a social set-up where two people are engaged in a task and the more capable offers assistance to the one in difficulty to enable him/her overcome obstacles in learning. The focus is on addressing a child's weaknesses and strengths, working especially to mediate through weaknesses to a place of success.

In this sense, the teacher or a more capable peer and the learner interact in the learning process. It advocates for mediation in learning that assists a child to 'learn how to learn'.

Kozulin (2004) points out that, in reality, the Vygotskian approach is probably one of the theory-based educational paradigms most consistently implemented in the classroom. In this regard, learners with cerebral palsy would need support in the literacy lesson in task performance. They also need an environment that is stimulating for enhancement of these skills. This can be enhanced when a care giver (teacher or any capable adult or peer) accords responsive assistance, one of the distinct forms of guided participation, so that a child learns through imitation, correction and practice (Rogoff, 2003). The teacher can also enlist the help of more capable peers to assist in the learning process. This encourages collaborative learning in skills acquisition so that development in reading and writing goes to the next zone. In her analysis of the phenomenon, Rogoff (2003) explains the need for responsive assistance by the caregiver, who in a classroom situation, is actually a teacher. She points out that being poised to help is a responsive way to assist the children that leaves the pace and direction of children's efforts up to them. It involves helping according to the child's needs, rather than organizing instruction according to adult plans.

Flexibility in the selection or choice of relevant instructional mediation strategies for use with learners with cerebral palsy in the literacy classes is crucial given their heterogeneity: Each child has unique abilities and needs as no single strategy would fit all at one given time (Kirk

& Gallagher, 1997). At the same time, a teacher is expected to vary the strategies within the learning situation in the literacy classes. Vygotsky suggests the zone of proximal development as one of the directions of assisting learners in academic performances with regard to teaching reading and writing, where the teacher and significant others strive to enhance a child's grasp of concepts (Vygotsky, 1978). According to Vygotsky; "good instruction is aimed at the learner's zone of proximal development" (Vygotsky, 1986 as cited in Dixon-Krauss, 1996, p.14). In her analysis, Dixon- Krauss (1996) observes that learner–centered classrooms are important, and in those classroom settings, meaningful writing is emphasized, which should be learner-centered. This idea is quite relevant to children with cerebral palsy in the enhancement of their learning of reading and writing skills since they require the aspect of mediation into their programs (Obinga & Kochung, 2011).

The extent of mediation would depend on their ability and the experiences they have had before joining school. At the same time, Vygotsky's concept covers more than just human mediation unlike Feurstein's mediated learning experience that focuses only on a human being as the mediator (Kozulin, 2004). Instead, it covers tools/ materials as well as human beings. All these aspects of mediation would be imperative for learners with cerebral palsy for acquisition of literacy skills. The child with cerebral palsy has the ability to learn, but due to limitations in motor ability that involve speech and hand use, he or she cannot achieve much on his or her own hence, needs mediated instructional strategies in the form of guidance from the teacher, to achieve maximum potential.

1.10 Operational definition of terms

Acquisition refers to the act of gain or attainment of a skill

Constraints, used interchangeably with challenges, refer to factors that hinder or interfere with the teachers' instructional abilities in a classroom situation.

Literacy skills refer to the skills of reading and writing such as awareness of sounds of language, awareness of print and relationship between letters and sounds, vocabulary knowledge and comprehension.

Literacy acquisition refers to the act of learning readability

Mediation is the act of assisting/supporting a learner in the learning process when he or she is faced with challenges in skill acquisition or task performance.

Mediated learning refers to a process of acquiring new skills/ concepts and behaviors through a special interaction and assistance/support from an adult/teacher or a more capable peer causing a change in the ability to learn and effective thinking skills are developed in the child.

Mediated learning strategies are different ways used to assist a learner experiencing difficulties to learn how to acquire new skills in the learning process.

Mediated Instructional strategies refer to the approaches that include the methods of teaching, learning activities initiated and use of learning and teaching resources used in a learning situation to help learner to learn how to acquire new skills and concepts

Special Schools refers to institutions for learners with disabilities whose needs cannot be adequately met in a regular school.

Teacher competence refers to the ability of the teacher to instruct learners using a combination of relevant and appropriate methods and techniques. It is a teacher's ability to teach effectively and efficiently. It is measured in terms of a teacher's behaviour in classroom practices.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this section, related literature has been reviewed. Theories that are relevant to mediated instructional strategies are reviewed based on the teaching of literacy skills (reading and writing) and the acquisition of the same skills by young children in primary schools; and relating to how young learners with cerebral palsy acquire the same skills with the use of mediated instructional strategies. They are reviewed under the following topics:

i) Mediated Instructional strategies for literacy skills acquisition among children with cerebral palsy
ii) Literacy skills acquisition among children with cerebral palsy
iii) Competence in the use of mediated instructional strategies in literacy instruction among learners with cerebral palsy
iv) Constraints faced by teachers in the use of mediated instructional strategies in teaching literacy skills to learners with CP
v) Theories of mediation relevant to teaching reading and writing to learners with cerebral palsy

2.2 Mediated Instructional strategies for literacy skills acquisition among children with cerebral palsy

Effective beginning of reading instructional practices make a difference, particularly for children at risk of experiencing reading difficulties (Calhoon, Otaiba, Cihak, King,&Valos, 2008). This has been proved to be true when dealing with young learners learning literacy skills for the first time. According to Spear-Swerling (2006), children who do not appear to monitor their own comprehension while reading should clearly be encouraged to do so.

However, any instructional strategy that, implicitly or explicitly, discourages careful attention to the entire sequence of letters in a word will be maladaptive for an alphabetic language like English, where every letter counts, and where learning new words is greatly facilitated by close attention to individual letters.

Several strategies have been tried on different categories of learners in teaching literacy skills. Francis *et al*. (2006) identified several guiding instructional principles to improve English language learners' reading development in America. These principles include: a) provision of early explicit code-focused instruction; (b) increasing opportunities for vocabulary development through structured academic talk; (c) promoting fluency through vocabulary and repeated readings in meaningful texts; and (d) train comprehension strategies using narrative and expository texts (Francis *et al.,* 2006 as cited in Calhoon *et al.,* 2007).

Mediated relationship has been found to be the key to meaningful instruction for all children, particularly young and low-functioning children (Feuerstein & Feuerstein, 1999 cited in Kozulin, 2004). Access to reading events helps children develop concepts about books and print. Children with severe cerebral palsy are among those who are low functioning and have delays in developmental milestones, particularly, in speech and motor skills (Bigge *et al.,* 2005; Kirk *et al*., 1997; Hallahan *et al.,* 2012). These difficulties impact significantly on their academic performance due to difficulties with reading and writing.

Children with cerebral palsy have different learning styles and learning needs just like other ordinary people or those with other special needs and the strategies can vary according to individual needs of children in a classroom situation (Heller, Fredrick & Diggs, 2000). Therefore, no single strategy will fit all children with cerebral palsy in a literacy class. They have to be customized for each child to address their learning needs; strategies that promote active student participation and engagement (Ogono, 2008).

A study on teacher-mediated instructional strategies in USA by Hirn and Park (2012) focused on students with emotional or behavioral disorders. Their article describes teacher-based environmental and instructional strategies for use in typical classroom settings with students who exhibit E/BD and challenging behaviors. The study shows how teacher-mediated interventions (i.e., antecedent and consequence strategies) are integrated for better inclusionary practices for students with behavioral concerns. This study has shown some success with the use of teacher-mediated instructional strategies in the classroom with learners who experience emotional and behavioural difficulties. Their study, however, did not link these strategies to any academic area. The current study sought to link the teacher-mediated instructional strategies to literacy acquisition to establish the types of mediated instructional strategies used by teachers to teach acquisition of literacy skills to learners with cerebral palsy in Kenya.

In USA, Pyle, Pyle, Lignugaris-Kraft, Duran and Akers (2016) conducted a study on academic effects of peer-mediated interventions with English language learners. Their study synthesized the extant research on peer-mediated interventions (PMIs) with English language learners (ELLs) in kindergarten through Grade 12. They examined fourteen studies that were published in peer-reviewed journals from 1983 to 2013 in terms of study characteristics, the effects on academic outcomes, study quality, and overall effectiveness. In their study, they used structured, heterogeneous grouping in the 10 peer pairing and 4 collaborative/cooperative grouping PMIs with ELLs. Eight of the 14 studies included high methodological quality. Their study revealed that overall PMIs with ELLs are associated with medium to large effects on measures of phonemic awareness, vocabulary, and comprehension when compared to teacher-mediated comparison conditions. These studies were on learners other than those with cerebral palsy. The current study evaluated peer-mediated interventions and focused on academic achievements. Just like the study by Hirn and Park (2012) on

teacher-mediated instructional strategies, Pyle *et al*. (2016) focused on English language learners. None of these two studies however, dealt with literacy acquisition yet literacy has a lot to do with the academic achievement. It would be important to analyze the mediated instructional strategies used by teachers of learners with CP in teaching literacy acquisition.

The studies conducted in Kenya on teaching literacy to learners with CP by Obinga and Kochung (2011) captured mediated instructional strategies. Only two mediated instructional strategies of individualization and use of materials, however, featured. The study revealed that teachers individualized their instructions to suit individual learners. Their study also focused on the teachers and they used multiple case studies only while the current study focused on both teachers and learners with CP using both descriptive and embedded case study designs. Though individualization is an aspect of mediation, other mediated instructional strategies were not studied by Obinga and Kochung. The current study looked at other twelve mediated instructional strategies that were not included in Obinga and Kochung's study.

Obiero (2009) conducted a study on inclusion of learners with CP in reading and writing lessons and looked at an aspect of mediation, namely, interaction which she recommended should be fostered among the group of learners with CP. The exact mediated instructional strategies these teachers use in literacy skills acquisition were, however, not captured by Obiero's study. Mediated learning emphasizes social interaction that serves as a tool for transmitting knowledge of learning how to construct problem–solving activities (Dorn, 1996). Mediation encompasses different kinds of support that would enable learners with CP to reach a higher zone of proximal development in their literacy skills acquisition (Vygotsky, 1978). It is important to remember that not all students learn in the same way or at the same rate, and that it is important to vary approaches to account for this (Cole, 2016).

Some of the strategies used by teachers to mediate learning include scaffolding, collaborative learning, use of artifact or materials, peer mediation, and guided participation (Rogoff, 2003; Bigge *et al.*, 2005). At the same time, modifications of the techniques used are essential for enhancing learning of the basic literacy skills. Lewis and Doorlag (2011) give three adaptations that are considered beneficial to learners with special needs. These include provision of prompts, giving additional instruction, and allowing extra guided practice. It would be vital to establish whether these types of mediated instructional strategies are used by teachers of learners with CP in Kenya, during literacy acquisition lessons. This information is limited. Mediation comes in varied forms which are applicable even to learners with CP as discussed from various studies in subsequent subsections of this chapter.

2.2.1 Scaffolding

According to Kong (2002), scaffolding is an instructional strategy for mediating students' learning. In the case study, scaffolding was shown to create opportunities for students to practice and develop their literacy knowledge and skills. According to Stewart (1995), the assistance provided by adults and the more knowledgeable peers is often referred to as scaffolding. When Scaffolding is provided to learners, they can construct meaning and complete tasks that are otherwise too difficult to accomplish alone (Stewart, 1995).

Alber (2014), states that scaffolding entails breaking up the learning into chunks then providing a tool, or structure, with each chunk. When teachers scaffold instruction, they typically break up a learning experience, concept, or skill into discrete parts, then give students the assistance they need to learn each part (Great Schools Partnership, 2015). When scaffolding reading, for example, you might preview the text and discuss key vocabulary, or chunk the text and read and discuss as you go (Alber, 2014). It involves forms of temporary and adjustable supports that teachers give students that help students move from the current

abilities to the intended goal (Monda –Amaya & Pearson, 1996; Rosenshine & Meister, 1992 cited in Sands *et al.,* 2000). Scaffoldees learn to grasp the skills of tackling the tasks independently.

Hallahan *et al.* (2012) observe that in scaffolded instruction, teachers provide assistance to students when they are first learning tasks, and then gradually reduce assistance so that eventually students do the tasks independently. In this strategy, fading and modeling are involved. In modeling, the teacher scaffolds by creating assistance to learners in understanding what they read or write (Kong, 2002). Use of scaffolding allows students to engage in complex tasks that they might not otherwise be able to manage on their own, until they can understand how to do it and when to apply it (Monda-Amaya & Pearson, 1996 cited in Sands *et al.,* 2000).

Sands *et al* (2000) spell out forms of support that teachers can use. These include prompts, cues, questions, error analyses, metaphors, elaboration, and cognitive modeling. Gallagher (1999) asserts that if scaffolding is successful, a child's mastery and level of performance can change. This means that it can increase a child's performance on a particular task. This is in line with Kong (2006) who observes that instructional scaffolding assists learners to extend the current skills and knowledge that they bring to the classroom to a higher level of competence. In this case, the adult provides a scaffold to help the child move from assisted to unassisted success at the task (Spector, 1992).

Scaffolding strategies for reading and writing are essential for those learning to read and write because these are complex tasks that are unique and involve the recognition and use of meanings (David, Lui-Chivizhe, Mcknight & Smith, 2003). It must be used at the level of the learner's zone of proximal development and should be able to alleviate the needs of the child already identified (Verity, 2004). The scaffolding strategies for reading and writing can be

used by the teacher to guide learners in reading more complex texts which they may not be able to read when left to read on their own. It leads to development of reading and writing skills that would help learners read independently (David *et al*., 2005). When children are learning to read and becoming independent readers, scaffolding becomes an invaluable teaching strategy (Stewart, 1995).

Teachers may scaffold learners in various ways such as by use of a variety of tools, including technology, to support students as they develop literacy skills and move from dependence to independence over time (Northwest Regional Educational Laboratory, 2005). This implies that students' performance needs to be guided and mediated in order for learning to take place (Maloch, 2001; Chinn, Anderson & Waggoner, 2001 cited in Kong, 2002). Use of visual support is also an essential scaffold in reading. Pointing at the letters while saying each of the sounds slowly to form a word eg rrrr uuuuu nnn. Say and point at the letters in sequence as each sound is said, r, u, n. The letters provide a visual support to help the student hold the sounds in memory (Light & McNaughton, 2012).

According to Alibali (2006), visual scaffolds include pointing (call attention to an object); representational gestures (holding curved hands apart to illustrate roundness; moving rigid hands diagonally upward to illustrate steps or process), diagrams such as charts and graphs as well as methods of highlighting visual information.

Accommodation

In all aspects of learning universally, there is need for instructional accountability and accessibility of the curriculum for learners with special needs (Friend 2008). This implies that all learners are supposed to be accommodated in all the learning situations in order for them to reach their full potential. The teacher can enhance a learner's ability through provision of a high quality instruction so that they reach their potential (Friend & Pope, 2005; Idol,

2006).With this, a teacher ensures mediation through adjustments as necessary in teaching strategies chosen to be used with learners with CP as soon as they enter school.

Guided Participation

Guided participation is a concept which highlights that cognitive development occurs in a social context. Guided participation is an interpersonal process of learning. According to Rogoff (2003), the term "guided" in the concept guided participation broadly means, to include but go beyond interactions that are intended as instructional. It builds on Vygotsky's framework of the ZPD. The child requires the set social environment to be able to learn new concepts and skills. According to Rogoff (1990), children's cognitive development is an apprenticeship that occurs through guided participation in social activity with companions who support and stretch children's understanding of a skill in using the tools of the culture. Rogoff (2003) explicitly states that guided participation focuses more centrally on the interrelatedness of children and caregiver interactions and the fact that the "guided" does not necessarily mean face to face (Scott, 2011). Guided participation could also be executed through use of artifacts (Rogoff, 2003). This implies that, once a learner has been introduced to concepts, the goal of instruction is to support students to engage in the activities, talk, and use of tools in a manner that is consistent with the practices of the community to which students are being introduced, in this case, the literary community (Scott, 2011).

Lewis and Doorlag (2011) assert that in the guided practice, students are given the opportunity to perform the task under the supervision of the teacher and the teacher gives immediate feedback regarding the accuracy of their responses. The teacher can monitor performance during practice, enlist the aid of a peer tutor or adult volunteer, or use self-correcting materials (Lewis & Doorlag, 2011). For either social partner, adult or peer, the extent to which the child, as the learner, participates, or engages himself or herself, in a

shared thinking process with the support of a more skilled partner is what is crucial (Zhang, 2006). It is however, yet to be proven whether the same scaffolds can apply to learners with CP in a literacy class.

Prompting during instruction

Teachers and other service providers of individuals with physical and multiple disabilities use a variety of prompting techniques such as verbal instruction, demonstration, gestures, visual cues and physical assistance (Downing & Demchak as cited in Best & Bigge, 2005). Prompts structure the task and help the student know exactly what to do (Lewis & Doorlag, 2011). Students require enough time to respond after any prompt. This allows them to think and execute a response which can either be the use of motor, or motor and speech (Bigge & Best, 2001; Downing & Demchak as cited in Best & Bigge, 2005).

Alibali (2006) outlines some of the instructional strategies which include:

Prompts: physical or verbal cues to remind —to aid in recall of prior or assumed knowledge. **Physical:** Body movements such as pointing, nodding the head, eye blinking, foot tapping. **Verbal:** Words, statements and questions such as —Go!, —Stop!,—It's right there,! —Tell me now! —What toolbar menu item would you press to insert an image?! —Tell me why the character acted that way!

Explanations: More detailed information to move students along on a task or in their thinking of a concept: Written instructions for a task; verbal explanation of how a process works (Alibali, 2006).

Examples: Samples, specimens, illustrations, problems: Real objects; illustrative problems used to represent something.

Best and Bigge (2005) further advise that teachers must resist the impulse to immediately provide additional prompts or physical assistance, which may confuse the students and that

some students with motor and cognitive disabilities may need several minutes to respond. The teacher can physically prompt a learner with hand-coordination problem during the lesson activities or tasks. Best and Bigge (2005) state that, occasionally, the teacher may reposition the student's hand to facilitate writing (physical assistance).

2.2.2 Differentiation of instruction for learners with cerebral palsy

According to Westwood (2004), the term "differentiation" is often used to describe the adaptive approach to meeting individual needs. In the classroom situation, learners require differentiation in various aspects to benefit from instruction. This would involve the curriculum, which, according to Van Kraayenoord (1997) refers to teaching that is adapted to take into account the individual differences and needs of students in any given classroom.

Differentiation of instruction is a notion that changes can be made in many different aspects of teaching\learning process that enables students' diverse learning needs to be met (Tomlinson & McTighe, 2006). According to Hardman *et al*. (2005), teachers must use multilevel instruction in which multiple teaching approaches within the same curriculum is adapted to individual need and functioning level. Multilevel instruction in this case is the differentiated instruction which is designing for diversity (Peterson and Hittie, 2003); and designing for diversity suits the heterogeneous group of CP (Kirk *et al*., 1997).

Bigge and Best (2005) observe that, since severity of cerebral palsy varies greatly from child to child they require programs that encompass individualized adaptations and differentiation of the classroom learning tasks and exercises. It is the strategy of mediating their learning which can cut across all other disciplines. Motor deficits of cerebral palsy must not be allowed to interfere with meaningful participation in educational experiences (Best & Bigge, 2005). For instance, a student who has difficulty speaking due to cerebral palsy may need an alternative presentation format in place of an oral presentation (Torreno, 2015). It implies

therefore, that given the limitations imposed on them by their disabilities, teachers should not be capitalizing on the limitations as an excuse of not teaching them or involving them in basic skills that include literacy. Children with motor impairments must be actively involved in the lessons. Students who struggle with communication should have the option of using assistive technological equipment in the classroom. Teachers can also modify assignments that require a good deal of writing or request the assistance of an aide or student mentor (Zachry, 2011) to aid those with cerebral palsy in task performance. This notion on differentiation would be used by teachers, depending on whether they have the correct perception on what differentiation entails and whether they actually practise it.

2.2.3 Use of Artifacts

According to Merriam-Webster dictionary (2014), artifact refers to something characteristic of or resulting from a particular human institution, period, trend, or individual. Artifacts are also referred to as tools or materials (Vygotsky, 1978; Erben, Ban & Castañeda, 2009). Vygotsky distinguished between two types of tools, physical (such as concrete objects) and psychological (such as language). In this same vein, speech may in effect be seen to be a cultural tool used by individuals for the organization of thinking (Erben, Ban & Castañeda, 2009). Echoing directly a Vygotskian (1978) conception of the Zone of Proximal Development (ZPD), Lankshear and Knobel (2004) elaborate that "to learn something is to progress toward a fuller understanding and fluency with doing, in ways that are recognized as proficient relative to socially constructed ways of being". It involves developing the skill of "visual literacy" (Lim, 2006).

The central thesis is that the structure and development of human psychological processes are co-constituted by the interaction with tools (Lim, 2006). These are historically developed and could be of different types such as "psychological tools", "material tools" and language is

also a tool. Using tools makes it possible to act in more powerful and functional ways and enhances and alters human development (Lankshear & Knobel, 2004 cited in Lim, 2006). This notion is in line with Erben, Ban and Castañeda (2009) who assert that psychological tools are artefacts that serve to broker individual mental activity and ultimately to mediate individual cognitive development.

These tools (artifacts) are simultaneously material and ideal/conceptual. In the view of Vygotsky, we can see the learner as an individual-in-society learning and thinking through artifacts. Vygotsky thus transcends dualistic thinking (Bernhard, 2007). Research also indicates that successful learning also involves an interaction of the learner, the materials, the teacher, and the context (Tinzmann, Jones Fennimore, Bakker, Fine & Pierce, 1990). This represents concreteness in the learning process that learners with cerebral palsy require in literacy instruction (Ogono, 2008).

Teachers may structure the resources in the classroom to provide a diversity of genres and perspectives, to use and build upon cultural artifacts from the students' homes and communities, and to organize various learning activities (Tinzmann *et al.,* 1990). This will aid a learner to move from a zone of learning disability to a new zone of proximal development (Mendéz, Lacasa & Matusov, 2008). This is in line with the study conducted by Sandberg (1998) where she asserts that access to, or availability of printed material and the quality of the interaction pattern in shared literacy events are crucial. She further affirms that there are indications that availability alone is not enough for a positive development of literacy abilities. Rather, the interaction mode, which concerns the participants' type and degree of activity, seems to have a considerable impact.

When children interact physically and socially with an object, they are in a position to conceptualize easily and express their ideas about it. According to Vygotsky, this is how their

thinking transforms from concrete to abstract (Dixon-Krauss, 1996). People, adults and children, with various degrees of expertise; use of artifacts, such as books, videos, wall displays, can be active agents within the zone of proximal development (Brown *et al.,* 1993 as cited in John-Steiner & Mahn,1996) as they help to elevate a child's level of functioning which is the potential performance level.

2.2.4 Peer support and mediation

A teacher can use peer models. Peers may serve as powerful natural supports for students with disabilities in academic and social areas (Maheady, Harper & Mallette, 2001). Peer mediated approach could be used, which can either be structured or unstructured. Both would involve interaction between two or more students under direct supervision (Hardman *et al.,* 2005).

Peer support programs may range from simple creation of opportunities for students with significant disabilities to interact with other children with mild disabilities to highly structured peer mediated instruction programs (Hardman *et al*., 2005). In instructing the learners, a teacher may use peer and cross age tutoring for effective mediation in the classroom practice. According to Sands, Kozleski and French (2000), peer-mediated learning holds individuals accountable, enhances a student's academic achievement and expands individual repertoires of problem- solving techniques. It could thus assist a learner with CP learn the literacy skills.

MacLean (2001) asserts that peer tutoring is beneficial to learners with cerebral palsy since it provides an opportunity for social interaction and academic support. It is an aspect of mediated learning that could be applied to reading and writing instruction (Dixon-Kraus 1996). Both the tutor and the tutee learn through the process of receiving one-on-one help and learning through teaching (MacLean, 2001).

Cooperative learning

According to Johnson, Johnson and Holubec (1994), "Cooperative learning is the instructional use of small groups through which students work together to maximize their own and each other's learning." In classrooms where collaboration is practiced, students pursue learning in groups of varying size: negotiating, initiating, planning and evaluating together. Rather than working as individuals in competition with every other individual in the classroom, students are given the responsibility of creating a learning community where all students participate in significant and meaningful ways.

Cooperative learning requires students to work together to achieve goals which they could not achieve individually, as in the concept of the zone of proximal development (Johnson, *et al.,* 1994; Vygotsky, 1978). It results in higher academic achievement (Slavin, 1990; Slavin & Karweit, 1985 cited in Sands *et al*., 2000). This argument points out that cooperative work among peers provides opportunities for them to model for one another thereby expanding their individual repertoires of problem-solving strategies (Sands *et al,* 2000). This assists in generalization of knowledge and skills learnt which a learner can use in solving problems in a variety of subject areas. Learners learn cooperatively to facilitate their learning; harnessing them in various peer teaching arrangements (Walton, 2006).

Cooperative learning emphasizes the simultaneous learning of students as they seek to achieve group goals. It has been established that cooperative learning is beneficial to all students, from the highest to those at risk of school failure, and this includes learners with CP (Hardman *et al.,* 2005). According to Johnson and Johnson (2009), cooperative learning could be organized in two forms: formal and informal cooperative learning.

Formal cooperative learning consists of students working together, for one class period to several weeks, to achieve shared learning goals and jointly complete specific tasks and

assignments (Johnson & Johnson 2009). As for the informal cooperative learning, students work together to achieve a joint learning goal in temporary, ad-hoc groups that last from a few minutes to one class period (Johnson & Johnson, 2009). Successful mediation helps students connect new information to their experiences and to learning in other areas, helps students figure out what to do when they are stumped, and helps them "learn how to learn" (Johnson & Johnson, 2009). This information is limited on studies conducted on strategies used in teaching literacy skills to learners with CP in Kenya. The current study sought to establish whether the teachers use cooperative learning as an aspect of mediation in literacy acquisition among learners with CP.

Encouragement

Motivation is an important consideration for all learners, but it presents particular challenges for persons with disabilities who, more often than not, live in the face of low expectations, perceptions of incompetence, and a lack of access to experiences that build confidence (Erickson, 2005). The success a learner anticipates requires the learner to have enough self-confidence to believe that it is possible to be successful (Erickson, 2005). Motivation is clearly an important literacy issue to consider, and reason enough to look specifically at disability when considering literacy.

2.2.5 Peto program

Peto program or Conductive Education is an intensive, multi-disciplinary approach to education, training and development for individuals with cerebral palsy, spina bifida and other motor challenges. Conductive Education was developed in 1945 in Hungary by Dr. Andras Peto. Peto theorized that people with disabilities are characterized by disintegrated function. His theory was that this may be overcome, and that co-ordinated functioning can be developed through an indirect cognitive route involving teaching and learning (Conductive Learning Centre, 2012).

Many of the activities are done with the use of simple folk songs that relate to the activity. This is referred to as rhythmical intention. By pairing rhythm with the movement, movements become more fluid and the lyrics provide verbal cues to the child.

2.2.6 Collaborative teaching and learning

Hardman, Drew and Egan (2005) define collaboration as the process of professionals, and students working together to achieve the mutual goal of delivering an effective educational program designed to meet individual needs. It should always be viewed as a cooperative, not a competitive endeavor. Collaboration is a style of direct interaction between at least two co-equal parties voluntarily engaged in shared decision making as they work towards a common goal (Friend & Cook, 2007). Maddux, Johnson and Willis (1997) assert that students must construct understanding and knowledge in their own minds. That process is facilitated by collaboration.

According to Friend (2008), collaboration refers to the way in which professionals interact with each other and with parents or family members as they work together to educate students with disabilities. It also concerns the quality of professional relationships - a means of achieving other goals which never exists as a goal in and of itself. Collaboration is a powerful approach when used appropriately (Caron & McLaughlin, 2002). Programs that support collaborative problem-solving and interactive decision making enrich the learning environment.

Mediation during classroom instruction could be achieved through a special form of collaboration, co-teaching (Friend, 2008) that is interacting effectively with other adults so that learners with cerebral palsy are accorded relevant support in learning literacy skills. This implies shared accountability, where all participants have contributed to planning and

implementing a strategy and that they fully accept the outcomes of these decisions, whether they are a positive or a cause for concern (Friend, 2008).

Friend (2008) asserts that co-teaching is a service delivery model in which two educators or other specialists combine their expertise to jointly teach a heterogeneous group of students, some of whom have disabilities or other special needs, in a single classroom for part or all of the school day. Since learners with cerebral palsy are diverse in their characteristics and needs, they require co- teaching that would address their diverse needs in a learning situation. Whether teachers of learners with CP use co-teaching during literacy lessons is not known. Walton (2006) asserts that in-class support model provided by teacher to teacher or teacher to learner facilitates delivery of lesson content through motivation, ultimately helping with level of concentration.

These experts would include special needs education teachers, therapists (physiotherapists, occupational therapists and speech therapists) (Bigge *et al.*, 2005; Kirk *et al.*, 1997) as each one of them has a vital role to play in the education of children with cerebral palsy in learning new tasks and concepts. No single teacher can be skillful at teaching so many different students. The teacher needs a little help from colleagues and this would tailor learning better for all students when teachers with different areas of expertise and skill work together (National Institute for Urban School Improvement, 2003).

2.2.7 Direct teaching

Literacy skills should be taught using the principles of effective instruction – combining direct instruction with application in the context of meaningful and motivating reading and writing activities (Light, McNaughton & Mayer-Johnson, 2012). Teachers can apply direct instruction in literacy classes for learners with cerebral palsy. Direct Instruction involves

explicit, systematic, teacher-directed instruction (Child Trends, 2007). An example of direct instruction in teaching reading is repeated reading strategy.

Repeated reading

Repeated reading is when a student reads the same text over and over again until the rate of reading has no errors (Cox, 2017). This strategy can be done individually or in a group setting. Cox (2017) further outlines some of the guidelines and steps to follow when you use the repeated reading strategy: Choose a story that is approximately 50-200 words. (A passage that is 100 words long seems to work the best); b) Select a story or passage that is decodable verse predicable; c) Select a few words that you think will be hard for the students to learn and explain them; d) Read the story or passage you chose aloud to the students; (e) Have students read the selected passage aloud; (f) Have students re-read the passage as many times as needed until the text is fluent.

2.2.8 Nonverbal reading approach as used by teachers of learners with cerebral palsy

Many children with cerebral palsy are limited in their ability to communicate. For this reason, they are sometimes deemed to have much less intellectual ability than they actually do, as teachers may not be able to tell whether or not the child understands the lesson if they are unable to speak. Due to this, many children with cerebral palsy are unnecessarily placed into special education programs, many of which focus much of the time in school on different therapies, to the detriment of academic progress. Heller *et al*. (2002) assert that even though there are several factors that impede literacy development, several strategies have been found to be helpful in promoting literacy. These include exposing students to large amounts of reading material, promoting experiences with print, reading to students, having high parental and teacher expectations, and promoting personal motivation (Koppenhaver *et al*., 1991 cited in Heller *et al*., 2002).

One approach designed to teach decoding skills to students who have severe speech and physical impairment like the CP is the nonverbal reading approach (NRA) (Heller, 2002; Heller *et al*., 1999 cited in Swinehart-jones & Heller, 2009). The NRA has been used successfully to teach students with severe speech and physical impairments to read. In a study by Heller *et al*. (1999), three students used this approach in conjunction with a Direct Instruction reading program over a school year (Heller *et al*., 2002 cited in Swinehart-Jones & Heller, 2009). In using non - verbal approach, the teacher mediates through explicit instructions and closely follows the responses the student gives during this interaction process. The study by Obinga and Kochung (2011) also revealed that teachers used verbal and non-verbal approaches and applied different or a combination of instructional approaches to address the individual needs of each learner.

The literature reviewed in this section clearly gives the strategies or approaches used in teaching learners with disabilities, including those with cerebral palsy and ordinary learners. Various researchers have given insights on preferred methods to use in teaching literacy skills to both ordinary learners and those with special needs and other disabilities. The area that is still wanting is the use of mediated instructional strategies in teaching literacy skills to learners with cerebral palsy. The current study therefore set out to establish this phenomenon. Use of mediation has been found to be beneficial in learning new skills as is seen for instance, in guided participation, and use of artifacts. These have, however, been tried on the general population but not on CP. The area that has been found to directly touch on teaching literacy skills to CP is a study that was carried out by Heller *et al.* (1999) in teaching decoding skills to students who have severe speech and physical impairments in which Non-verbal Approach coupled with Direct Instruction were used with positive results. `At the same time, Obinga and Kochung (2011) study revealed an aspect of mediation, individualized adaptation in teaching literacy skills. These two studies, however did not establish other

mediated instructional strategies used by teachers, neither did their studies focus on literacy acquisition among learners with CP. This information is limited. The current study set out to establish the types of mediated instructional strategies used by teachers in literacy acquisition among learners with CP. `

2.3 The strategies used by children with cerebral palsy to acquire literacy skills

Children with cerebral palsy experience difficulties with speech and hand use that affect the ease of literacy skills acquisition, unlike other children of the same age. Some of these children also have difficulties with receptive and expressive vocabulary that correspond to their experiences (Bigge *et al.*, 2005; Hallahan *et al.*, 2012). It is also during this time of preschool age that some of them are beginning to learn to crawl, sit, or even control their posture. A large population has difficulties with the voluntary motor activity (Bigge *et al.*, 2005) which is vital in learning reading and writing skills. Children with cerebral palsy often have additional impairments that can limit their literacy experiences (Smith, 1992). For example, speech impairments can limit the interaction during storybook reading (Pennington & McConachie, 2001). Fine motor impairments can lead to difficulties in handling literacy materials, e.g., books or crayons, and can affect the ability to scribble or draw (Pierce & Mc William, 1993).

An ethnographic study of literacy and cerebral palsy on factors influencing literacy was conducted by Mike (1995) at a school for children with cerebral palsy. The factors identified as facilitating literacy learning were (a) the room as a text-rich environment, (b) the latitude often given students to govern their own literate behavior, (c) the regularly conducted story reading sessions, and (d) the constructive use of computers. Factors identified as hindering literacy learning were (a) restriction of instructional time, (b) overreliance on individual

instruction, and (c) lack of student literate interaction. Strategies used by these learners, ho in learning literacy, however, were not addressed by this study.

According to Friend (2008), a child with speech and language difficulties experience problems learning reading and writing skills. Friend (2008) further states that, when students have physical disabilities that include muscle weaknesses as occurs in the cerebral palsy disorder, they may not be able to produce sounds needed for speech and language. Consequently, the types of reading difficulties students experience are directly related to their speech and language problems (Catts, Gillispie, Leonard, Kail, & Miller, 2002). Speech is therefore, vital in reading for proper pronunciation and intonation; and learning to sound out words. This is difficult for learners with CP.

It has been observed that children who are experiencing significant speech or language delays like those with CP are at high risk `reading difficulties (Catts, Hogah & Fey, 2003; Smith, Pennington, Boada, & Shriberg, 2005; Friend 2008). This is in line with the findings reported in the study by Hay and Fielding-Barnsley (2009) in Australia on Competencies that underpin children's transition into early literacy. The findings confirm the notion that children's oral language competencies underpin children's transition into literacy, and it is argued that successful initial literacy experiences are directly and indirectly linked to students' later school achievement (Barrett & Hammond, 2008; Catts & Kamhi, 2005; Snowling, 2005 cited in Hay & Fielding-Barnsley, 2009). According to Blake and Blake (2002), young learners who are learning to read spend a great deal of time sounding out letters and syllables before they can understand the meaning of words. Thus, beginning readers spend a long time on oral reading and rote memorization before they can advance to reading for meaning (Blake & Blake, 2002).

Apart from the speech difficulty, children with cerebral palsy also lack exposure to essential experiences due to limited motor function that impede the interaction with the print- rich learning environment (Foley, 1993). This is in line with Smith (1992) who observes that cerebral palsy population experience difficulties in areas related to deficits in perceptual functioning, language skills, or learning experiences. The learning experiences for learners as well as those with CP come from exposure to print-rich environment at home and the school; and the teachers' efforts to provide the opportunities for learning experiences.

Dahlgren-Sandberg (2006) conducted a one year longitudinal study in Sweden, Europe on reading and spelling abilities in six children with severe speech impairments and cerebral palsy. The study revealed that children with cerebral palsy with severe motor problems and unintelligible speech had difficulty acquiring literacy skills, although intellectual level and phonological ability predicted a different trend. Thus, phonological ability does not seem to have the same predictive power for literacy development in children with severe speech impairments and CP as in typically developing children. Dahlgren- Sandberg study recommended further studies to clarify the role of phonological abilities, working memory, and strategies used in literacy acquisition in these children. Such studies might also clarify the importance of articulatory abilities in early literacy acquisition.

Recent research by Peeters *et al.* (2009) in Netherlands on home literacy predictors of early reading development in children with cerebral palsy demonstrated that the most important precursor for word decoding for children with CP was speech production. Various studies have provided evidence that children with CP are vulnerable to difficulties in learning to read and write due to the disability (Dahlgren-Sandberg, 2006; Smith, 1992; Hay and Fielding-Barnsley (2009). On the other hand, another study conducted in America by Smith (2014) on literacy challenges and early intervention for children using aided communication revealed

that neither the presence of CP nor limited speech intelligibility necessarily prevents these children from learning to read and write. This means that learners with CP can learn literacy skills with or without speech production. These studies dwelt on precursors of reading and writing difficulties among typical learners as well as those with CP. None of these studies, however, revealed the strategies used in literacy acquisition by children with cerebral palsy. Such information is scanty. Therefore, the current study set out to establish the strategies used by these learners to acquire literacy skills.

In USA, Asbell, Donders, VanTubbergen & Warschausk, (2010) Studied predictors of reading comprehension in children with cerebral palsy and typically developing children revealed that, within the group with cerebral palsy, there was an indirect effect of functional expressive ability on reading comprehension, mediated by phonemic awareness. It emerged, however, that, children with cerebral palsy continue to rely on phonological processing for a more protracted period of time. Apart from the mediation by the phonemic awareness, the exact strategies these children use in learning reading comprehension was not highlighted by this study. Researches touching on theoretical models of reading do not reflect scientific evidence about how children learn to read (Spear-Swerling, 2006). It is therefore, not clear as to the strategies learners with CP use to acquire reading and writing skills.

In an analysis of use of context cues in reading Spear-Swerling (2006) assert that, when children encounter an unfamiliar word in reading, they may make use of context cues, that is, information from pictures or from sentences surrounding the unknown word. Spear- Swerling further denotes that, although heavy reliance on context to aid word identification is common among unskilled readers (both normally-achieving beginners and older struggling readers), it is ultimately undesirable, because the child is guessing rather than attending carefully to all the letters in the word. It implies that learners rely heavily on guess work and that guess work

impacts on reading acquisition. It is not clear whether learners with cerebral palsy also rely on guess work as a strategy in acquiring reading skills.

Other strategies that could be used in acquiring literacy skills include:

Contextualizing

The assertion by Salisbury University (2009) on critical reading strategies is that when you read a text, you read it through the lens of your own experience. Your understanding of the words on the page and their significance is informed by what you have come to know and value from living in a particular time and place.

Word Guess

Afflerbach, David Pearson and Paris (2008) study on clarifying differences between reading skills and reading strategies stated that some strategies are simply incorrect ideas about reading, such as guessing a word based on its initial letter. The actions are indeed strategic; they connect specific means to specific goals but they are inappropriate and ineffective for reading.

2.4 Teacher competence in the use of mediated instructional strategies in literacy instruction among learners with cerebral palsy

Oxford Advanced Learners Dictionary (2005) defines competence as the ability to do something well. Competence is the proven abilities and improved capabilities. It can include a combination of knowledge, basic requirements (capabilities), skills, abilities, behavior, and attitude (Celine, 2016). She goes further to assert that competence" is the improved version of "capability," and means the degree of skill in the task's performance and that competence is more in the field of "specialist. The teacher's role becomes one of purposeful instruction, a

mediator of activities and substantial experiences allowing the learner to attain his or her zone of proximal development (Blanton, 1998; Rueda *et al*., 1992 cited in Subban, 2006).

Mediation in the classroom is important for young learners and more so for those with difficulties that affect learning. Vygotsky (1978) advises that the best method of teaching literacy uses the mediation method, which both guides and evolves through the social interaction that occurs during the learning activity. During this process, the teacher does not impart knowledge. Rather, she mediates learning through the social interaction between the learner and the teacher (Dixon-Krauss 1996; Lampert & Clark, 1990).

Children with cerebral palsy require mediated learning and it works well when there is proper choice of strategies, clear planning and execution of the plan to meet their learning needs in reading and writing tasks (Bigge *et al*., 2005). A teacher should be knowledgeable about different learning styles to use the best suited approach for a particular child with CP, based upon that child's learning abilities as well as physical abilities (National Dissemination Centre for Children with Disabilities (NICHCY), 2010).This calls for exceptional instruction. A review conducted in London by Hall and Harding (2003) on systematic review of effective literacy teaching in the 4 to 14 age range of mainstream schooling highlighted the qualities or characteristics of an effective teacher of literacy. This study revealed the indicators in teaching literacy from different studies conducted in Europe, America and United Kingdom. Various researchers were able to construct their understanding of effective literacy teaching and to delineate its salient features as well as share a number of important pedagogical practices (Hall & Harding, 2003).

In their study, Hall and Harding (2003) scrutinized 12 studies in their review and came up with three studies that were subjected to more rigorous interrogation and that empirically established effectiveness following attributes of important pedagogical practices that teachers

brought to their teaching of literacy and its learning which qualified them as competent teachers of reading and writing. Their meta-analysis of 12 in-depth research studies found that:

> *.....effective literacy teachers avoid strict coherence to one approach but rather balance direct skills teaching with more authentic, contextually-grounded literacy activities* (Hall & Harding, 2003, p.3).

Hall and Harding maintain that effective literacy teachers have a wide and varied repertoire of teaching practices and approaches which included: Balance, integration, pupil engagement and instructional density, classroom management, a positive environment, and teaching style.

i) Balance

Effective teachers obtain a balance between skills teaching and the application of literacy for meaningful purposes. Direct skills teaching is balanced with more authentic, contextually-grounded literacy activities (e.g. reading real books, connected text), not just completing worksheets to practise a single skill; using skills and strategies in combination in authentic writing and talking about text. Effective teachers of literacy manage to blend the teaching of skills like phonics, spelling and vocabulary with an immersion into literature. This includes non-fiction and writing.

ii) Integration

Effective teachers integrate the modes of language so that literacy lessons involve reading, writing, listening and talking. Integration also occurs between literacy and other curriculum areas.

iii) Pupil engagement and instructional density

Effective teachers manage to keep their pupils on task most of the time. They are distinguished from their less effective colleagues by the amount of teaching they manage to

do in a given amount of time. They are more adept at making links across topics and connecting with pupils' prior experiences.

iv) A positive environment

Effective teachers create a 'can do' approach in their classrooms (Hall &Harding, 2003). A positive environment has the elements of encouragement and reinforcement. Student motivation and engagements are critical determinants of quality literacy outcomes. They propose using strategies such as providing stimulating texts and learning tasks, allowing students to have some say in their learning, collaborative learning and positive feedback (Northwest Regional Educational Laboratory, 2005).

v) Teaching style

Effective teachers make extensive use of scaffolding and they monitor their pupils' literacy progress carefully. They are skilled at differentiating according to pupils' needs. According to Hall and Harding (2003), the effective teacher integrates reading and writing activities and the various literacy modes, so that children regularly and consistently talk and write about what they have been reading. Each literacy mode stimulates and supports the other. They regularly read and write with their teacher and for their teacher, with classroom helpers and for classroom helpers, with each other and for each other; Integration also occurs between literacy and the other areas of the curriculum (Hall & Harding, 2003).

Education majors are initially better at lesson planning, classroom management and instructional differentiation than their counterparts who did not have teaching preparation (Ferguson & Womack, 1993 as cited in Stronge *et al*, 2003). This preparation typically results in higher levels of student achievement (Stronge *et al.*, 2003). In the study by Hall and Harding (2003), effective teachers made extensive use of 'scaffolding' and this contributed to the density of their instruction. They monitored their pupils' progress carefully

and regularly and interacted with just enough help to facilitate learning but not so much that it would lessen their need to strive (Hall & Harding, 2003). This agrees with Bigge *et al.*, (2005) on scaffolding students needs. The competencies included here are the knowledge and skills critical to a teacher's role as literacy skills teacher. These teachers were sensitive to students' literacy progress, they were skilled at matching task to ability and recognized the necessity to pace teaching in line with their students (Hall & Harding, 2003). They further state that these teachers scaffolded their instruction, that their teaching style was more akin to coaching' in which student understanding and skill development was prompted through the use of structuring comments, the probing of incorrect responses, and the scaffolding of instruction (Hall & Harding, 2003).

vi) Excellent classroom management skills

According to the study by Hall and Harding (2003), effective teachers are effective classroom managers. They collaborate with their pupils to develop class rules and routines, and are persistent and consistent in applying them. Great instructional skills won't matter if students in the classroom are disengaged or out of control. Both novice and experienced teachers consider classroom management to be a high priority and an area of concern (Sokal, Smith & Mowat, 2003). In the studies synthesized by Hall and Harding (2003), students were kept on-task, their conversations were task-oriented and little time-wasting; effective teachers were distinguished by their ability to foster several aspects of learning in one short teaching episode. In the same studies by Hall and Harding, during literacy instruction, students received a lot of positive reinforcement for their efforts and accomplishments both privately and publicly. In addition, students were also consistently encouraged to work co-operatively (Hall & Harding, 2003).

This study by Harding and Hall relates to the current study. It was, however, conducted in mainstream schools while this study was conducted in special schools for the PH. And little is known on teachers' competence in teaching literacy acquisitions to learners with CP using mediated instructional strategies in Kenya.

A case study conducted in a special school in Kenya by Obiero (2009) on inclusion of learners with CP in reading and writing revealed that teachers' training in a specific area of disability had an influence on the teacher's understanding of the educational needs of learners. Even though training in a specific area of disability is a contributing factor to teacher's competence, the study by Obiero did not focus on teacher competence in using mediated instructional strategies in teaching acquisition of literacy skills. Her study focused on inclusion in reading and writing and general teaching as a practice in the classroom setup. Training of teachers has also been an issue as supported by MOE (2009) findings, that inadequate skilled manpower was one of the challenges the government of Kenya had experienced in the provision of educational services for persons with special needs and disabilities.

Perez (2002) supports the need for the teacher to identify students' needs through frequent formal and informal assessment to help make instructional decisions both for the class and for individuals. Individual assessment of students as readers could be conducted using a developmental reading assessment. It is also crucial to track the progress of the entire class as they work their way through a sequence of leveled reading tasks during instruction (Preez, 2002). This is possible with the teachers who are trained and are competent enough to teach literacy skills. Stronge, Tuker and Hindman (2003) assert that teacher certification enhances effectiveness so long as teachers are assigned to teach in the field of preparation. Unfortunately, the adequacy of teacher training in developed as well as developing nations is questionable (Erickson 2005). The problem of inadequate teacher training is exacerbated by

the fact that teaching reading is not an easy, unitary skill (Erickson, 2005). Findings of MOE (2009) stipulated in the SNE Policy background that apart from inadequate institutions for learners with special needs, there are other challenges faced by this category of learners. These include inadequate specially trained teachers, skilled counselors, specialized resources and facilities.

Exceptional instruction is the key to improving education of learners with special needs (Kauffman & Hallahan, 2005; Kauffman & Lanrum, 2007); that involve modifications or alterations of the instructional process (Kauffman & Hallahan, 2005) to mediate the learning experiences of all learners. Adaptations can make it possible for someone with a physical disability to function as efficiently as a person without disabilities in a home, school, or community (Hallahan *et al.,* 2012). A teacher can use different ways to involve a learner in a mediated kind of learning. This is in line with the study by Obinga and Kochung (2011) on instructional strategies in teaching literacy skills to learners with cerebral palsy where they assert that teaching literacy skills to these learners call for commitment and creativity on the part of the teacher in order to make learning and the learning environment meaningful and child friendly. There is very little information from studies done among teachers of learners with CP. How effective teachers of CP are in Kenya is unclear as this goes beyond training in the area of physical disabilities. Different ways in which a teacher can involve a learner is by use of motivation or encouragement, accommodation, use of assistive devices, concrete learning materials as well as differentiation of the learning process.

The study by Hall and Harding (2003) considered teachers' knowledge and beliefs about pupils, teaching and literacy that effective literacy teachers bring to their classroom tasks. The study revealed that teachers had strong beliefs about their own effectiveness. They also believed that they could adapt instruction to meet individual student literacy needs and that

no barrier to a student's literacy development was greater than their own professional competencies to overcome it (Hall & Harding, 2003). In addition, Hall and Harding assert that competent literacy teachers appear to be aware of how and why their teaching works for individual pupils and for their class as a whole. Children with cerebral palsy require accommodation in various aspects of the learning process (Bigge *et al.,* 2005) since they have different needs and learning styles that need to be addressed for them to be able to acquire literacy skills. Three adaptations that are recommended include: provision of prompts, giving additional instruction, and allowing guided practice (Lewis & Doorlag, 2011).

A survey study conducted on special education teachers by Sepetys (2013) in Michigan, USA revealed that teachers perceived they were better equipped to differentiate after co-teaching. Both general and special education teacher observed their partners and increased their instruction repertoire. This study focused on co-teaching and differentiation which are aspects of mediation. The study also focused more on the teachers of the general classrooms and not those of a specific category of learners with special needs; neither did it focus on a specific academic area. It, however, related to teacher competence as it looked into efficacy. Studies on teacher competence in teaching literacy to learners with CP in primary schools are scant. The current study therefore sought to determine how competent teachers are in using mediated instructional strategies to teach literacy acquisition among learners with CP.

2.5 Challenges teachers face in teaching literacy skills to learners with cerebral palsy

The difficulties children with cerebral palsy experience also pose challenges to the teachers for they have to plan and organize their instruction in a way that would enable each and every child with cerebral palsy access the curriculum and learn to read and write (Kirk *et al.,* 1997; Heller *et al.,* 2002; Bigge *et al* 2005; Obinga & Kochung, 2011). It is therefore, the responsibility of the teacher as the mediator to discover the untapped potential of each child.

Chinobwe (2006) conducted a study on challenges teachers' face when teaching children with Cerebral Palsy in Zimbabwe. The study revealed that teachers were not adequately trained to teach these learners. This study, however, focused more on general teaching of CP and did not specify any constraints in teaching an academic subject or skill area in the curriculum. It also did not specify any instructional strategies they had used that posed the said challenges.

Kanana (2015) conducted a study in Kenya in selected schools in Thika and focused on instructional challenges facing learners with cerebral palsy and revealed that schools did not provide learners with specialized equipment or adaptive devices, the available facilities were not adequately adapted or modified, teachers did not have knowledge of learners with CP in their initial primary teacher education. Kanana's study confirms findings of Kenyan MOE (2009) as stipulated in the SNE Policy of 2009 background, that, apart from inadequate institutions for learners with special needs, there are other challenges faced by these category of learners that include inadequate specially trained teachers, skilled counselors, specialized resources and facilities.

A study conducted in Kenya by Wairimu (2015) in special and regular schools in Thika municipality focused on challenges faced by the teachers while handling learners with CP and the study revealed that teachers lacked adequate equipment and resources to follow the curriculum; lacked enough time, had inadequate manpower and even cited poor handwriting; pronunciation of words in Kiswahili and English, and learners getting sick. These were findings that focused on general teaching of learners with CP, and none of the predictors focused on challenges they face in teaching literacy skills to learners with CP using mediated instructional strategies. The current study set out to bridge this gap.

The studies by Chinobwe (2006) and Wairimu (2015) are in agreement as they focused on challenges faced by teachers in teaching learners with CP. On the other hand, Kanana (2015) and MOE (2009) studies are also in agreement on instructional challenges faced by learners with CP. While Chinobwe (2006) and Wairimu (2015) studies focused on challenges facing teachers who teach learners with CP, Kanana (2015) and MOE (2009) studies were on instructional challenges faced by learners with CP, though MOE revealed the challenges facing learners with special needs in general which includes CP. At the same time, these studies revealed inadequate training of the teachers. Wairimu (2015 and Kanana's (2015) were restricted to a smaller region in Thika, while the current study was based on special primary schools for learners with Physical Disabilities in Kenya. These older studies, however, focused on general teaching of learners with CP but did not focus on a specific subject or skill area. They also did not focus on use of specific instructional strategies. Therefore, little is known on the constraints faced by teachers in using mediated instructional strategies in teaching acquisition of literacy skills among learners with CP. This limited information is what the current study set out to establish.

Erickson (2005) wrote a paper on literacy and persons with developmental disabilities and revealed that class size and materials present additional challenges for those attempting to teach children with disabilities to read in developing countries. While class sizes in developed countries typically average below 20 students per teacher, classes in developing countries have been recorded in excess of 60 (Abang, 1994; Anderson, 1996). Even if these overcrowded classes are committed to teaching the children with disabilities in their communities, the additional demands of a child with disabilities seems impossible to manage (Erickson, 2005). The same scenario was revealed in Kenya by Obinga and Kochung (2011) in their multiple-case study that highlighted class size as a challenge, and recommended that it should be looked into by the government. It would be important to establish whether class

size was a challenge when teachers used mediated instructional strategies to teach literacy acquisition skills to learners with CP.

Studies that have been conducted so far stress on teacher preparedness for effective literacy teaching (Best *et al.,* 2005; Hallahan *et al.,* 2012; Friend 2008). Lack of teacher preparedness in teaching literacy skills to learners with CP could be another challenge. Despite the limited training that teachers have, they have to meet the reading instructional needs of the children they teach, including those without disabilities. It is therefore, not difficult to understand why it is challenging to teach children with disabilities (Erickson, 2005). It is also observed that the literacy success of learners with CP may be further hampered by inadequate instructional strategies, lack of instructional adaptations, and inappropriate use of assistive technology (Heller *et al.,* 2002). These studies have so far focused on general teaching of learners with cerebral palsy but have not focused on teaching of literacy skills using mediated instructional strategies. It would therefore, be vital to examine the constraints faced by teachers when using mediated instructional strategies in teaching literacy skills to learners with CP.

2.6 The performance of learners with CP in literacy skills acquisition with mediated instructional strategies

Learning is normally improved where mediated learning is used. Learners' level of understanding of concepts is enhanced. At the same time, they are capable of transferring the skills learnt in solving related problems in other areas. It means therefore, that a learner's zone of proximal development improves greatly with mediated practice (Dizon-Kraus 1996; Kozulin, 2004).Vygotsky (1978, p. 90) argued that "properly organized learning results in mental development".

According to Sands *et al.* (2000), use of mediated learning strategies in classrooms with diverse learning needs provides evidence of several benefits. Research has shown that, for instance, use of cooperative learning results in higher academic achievement, promotes active learning, and develops social skills (Slavin, 1990; Slavin & Karweit, 1985; Johnson & Johnson, 1989; Putnam, Rynders, Johnson & Johnson, 1989 cited in Sands *et al*., 2000). Studies which have included peer-mediated activities for students with and without disabilities have concluded that academic achievement is enhanced for all learners (Sands *et al*., 2000).

Learners with cerebral palsy could benefit from the same strategy if it is used in teaching reading and writing. They also require being actively involved in the learning process for better results in their academics. According to Kozulin (2004), a technique based on the ZPD for assessing learning potential for reading comprehension that was developed by Kozulin and Garbin Israel demonstrated that one can indeed distinguish between the students' current reading performance level and their comprehension potential that can be revealed only under condition of mediated learning.

One child may do his/her best on his own, while the other needs some assistance. Therefore, the ZPD is crucial for identifying each child's readiness to benefit from instruction (Gallagher, 1999). Rogoff (2003) and Vygotsky (1978) contend that young children grasp concepts and skills much better when guided by an adult or a more capable peer. It implies that when mediation takes place, a learner sharpens his or her thinking ability and becomes more efficient than when left on his own. In this case, mediation assists a learner with cerebral palsy to develop better in cognitive aspects of learning as they require assistance to be able to move to a higher zone of literacy development.

Successful mediation helps students connect new information to their experiences, and learning in other areas helps students figure out what to do when they are stumped, and helps them learn how to learn. This helps to maximize active, hands-on learning (NICHCY 2010). Besides their motor impairments, these children with cerebral palsy are often characterized by additional speech and cognitive impairments that put them at risk of limited language and literacy development, even at preschool age (Bax *et al.* 2005; Peeters *et al.,* 2008). For example, Peeters *et al.* (2008) indicated that preschool children with CP lagged behind their peers without disabilities in emergent literacy skills, such as oral language and phonological awareness. This study was conducted among preschoolers and not those in the primary schools. It is therefore important to analyze the mediated instructional strategies on literacy acquisition among learners with CP.

Teale and Sulzby (1987) studied home literacy experiences of children with cerebral palsy and pointed to two important components namely, access to reading events and mediation, i.e. the interaction pattern in which the parent and the child are engaged during shared reading, both positively correlated with reading achievement (Dahlgren-Sandberg, 1998). This is a clear indication that mediated instructional strategies have a positive impact on literacy acquisition. This study, however, was conducted on home literacy experiences and not on school experiences. It is vital to establish whether the mediation in school involving teacher and learner also produces positive results with children with CP in acquisition of literacy skills.

Access to, or availability of printed material and the quality of the interaction pattern in shared literacy events are crucial. Dahlgren-Sandberg (1998) affirms that there are indications that availability alone is not enough for a positive development of literacy abilities. Rather,

the interaction mode, which concerns the participants' type and degree of activity, seems to have a considerable impact.

For reasons of limits in speech and motor ability, there must obviously be problems in the non-vocal, cerebral palsied group to get access to reading events and to achieve the sort of interaction that promotes reading (Pierce & McWilliam, 1993). Light & Kelford-Smith (1993) pointed at differences, not so much in availability of printed material or interest in reading activities, but rather in opportunity to use such materials. When teachers use mediated learning strategy and accord ample opportunities during classroom practice to learners with cerebral palsy in the learning process, they would acquire the literacy skills.

Vygotsky (1978) contends that mediation is the best method of teaching literacy, during the learning activity as it both guides and originates from social interaction. The teacher as the mediator does not impart knowledge but mediates learning through the social interaction during this process (Dixon-Krauss, 1996; Lampert & Clark, 1990). Social interaction in the learning environment enhances a child's participation in the learning process since the development of the mind of the child is both individual and social at the same time (Vygotsky, 1978). Little is known, however, as to whether the mediated instructional strategies would influence the performance of learners with CP in the acquisition of literacy skills.

The study aims at analyzing mediated instructional strategies in literacy acquisition among learners with cerebral palsy, and if the strategies used by teachers to mediate the difficulties these learners experience in the acquisition of literacy skills.

2.7 Theories of mediated learning relevant to teaching reading and writing to learners with cerebral palsy

Several theorists have come up with theories that are pertinent to the education of young children. The theories reviewed here are generally touching on socio-cultural aspects because learning takes place in a social setup and involves interaction in one way or another, with an individual, group, or with tools, in a given culture. These include the socio-cultural theory, the zone of proximal development and mediated learning experience.

2.7.1 Socio-cultural theory

Proponents of socio-cultural theory postulate that learning involves interaction. According to Vygotsky, social interaction leads to continuous step-by-step changes in children's thought and behaviour that can vary greatly from culture to culture (Woolfolk, 1998). Basically, Vygotsky's theory suggests that development depends on interaction with people and the tools that the culture provides to help them form their own view of the world (Gallagher, 1999). The school forms part of a culture where children follow practices set by the school. At the same time, the tools used in that learning environment aid the learners in acquiring knowledge and skills. These tools are also referred to by Vygotsky (1978) as the psychological tools, language and materials.

2.7.2 The Zone of proximal development and literacy skills acquisition

The zone of proximal development, as earlier defined refers to the distance between what a person is able to do on his own and with the assistance of a more capable peer or an adult. According to Tudge (1992) the second key concept of the ZPD is that of intersubjectivity or the process whereby two participants in a task who begin with different understandings of it arrive at shared understanding in the course of communication. It is adequate to say that the zone is not some clear-cut space that exists independently of the process of joint activity

itself. Rather, it is the difference between what the child can accomplish independently and what he or she can achieve in conjunction with another person who is more competent.

This notion is supported by Vygotsky(1978) who asserts that the zone is something that is created in the course of social interaction. He further proposes that an essential feature of learning is that it creates the zone of proximal development. This implies that learning awakens a variety of developmental processes that are able to operate only when the child is interacting with people in his environment and in collaboration with his peers (Vygotsky, 1978).

Echoing directly a Vygotskian (1978) conception of the Zone of Proximal Development (ZPD), Lankshear and Knobel (2004) elaborate that, to learn something is to progress toward a fuller understanding and fluency with doing, in ways that are recognized as proficient relative to socially constructed ways of being (Lim, 2006). This refers to the zone where teachers and students work as students move towards independence and this zone changes as teachers and students move past their present level of development towards new areas of knowledge.

Considering the observations under mediation as in the ZPD, learners with CP, given their heterogeneity, require mediated learning to move to the next level in reading and writing. Mediated learning is imperative among diverse nature and level of difficulties that hamper learning. They would be better placed with the interactive process to learn the essential ways of learning how to learn as this would assist them in literacy skills acquisition.

2.7.3 Mediated Learning Experience

According to Kozulin (2004), Feuerstein's theory that was apparently developed without direct influence of Vygotskian ideas, focuses on the role of a human mediator in creating the

cognitive prerequisites of learning in children and adolescents. It does not dwell on other aspects of mediation other than a human mediator playing the vital role of facilitating the learning process. Vygotsky (1978), however, does not only dwell on human as the mediator but also includes materials and tools as other forms of mediation that can assist a young learner to learn new concepts that he or she would not otherwise learn effectively without assistance.

Feuerstein developed an elaborate taxonomy of mediated interactions and those deficient cognitive functions that can be "repaired" through mediated learning (Kozulin, 2004). This theory would not help learners with cerebral palsy much in acquisition of literacy skills as other tools of mediation do not feature prominently apart from human mediation.

The theories reviewed base their arguments on support that a learner in need is accorded to be able to improve in task or skill performance. This is an act of mediated learning. Although they do not address learners with cerebral palsy, the theories are applicable in this context of literacy instruction and acquisition. Vygotskian theory, however, is more applicable to this study since it does not only dwell on the human as the mediator but also includes artifacts (materials and tools) as other forms of mediation that can aid a young learner to learn new concepts that he or she would not otherwise learn effectively without assistance.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

Descriptive and embedded case study research designs were used in this study that generated both quantitative and qualitative information on the phenomena under study. Descriptive design was used in order to describe the phenomena under study. Gall, Gall, and Borg (2007) state that, descriptive measures describe precisely and accurately the phenomena of interest. Creswell, Plano Clark, Gutmann and Hanson (2003) assert that embedded design is a mixed method design in which one data set provides a supportive, secondary role in a study based on the other data type. The embedded case study design that involved multiple cases, for an in-depth study of the phenomenon in its natural setting was used to generate rich data and to provide an understanding of the participants' frame of reference, setting, and voice (Mann & Hinds, 2007). Yin (2003) contends that an in-depth study of a phenomenon can be carried out in its natural context. Bogdan and Biklen (2007) refer to this design as a multi-case and state that it is a study that involves studying more than one subject, settings, or depositories of data in different settings. Gall *et al* (2007) argue that, in a multiple-case study design, the unit of analysis needs to be at least two or more individuals or two or more instances of a phenomenon, selected on the basis of either being similar to each other or different from each other in some way that is of interest to the researchers.

In this study, the teachers who were the cases were selected in order to study the similarities and differences of the phenomena. This was intended to bring out clearly the aspect of mediation from different perspectives for better analysis. The study required to answer the "How" question on how the teachers were using the mediated instructional strategies to teach literacy skills to learners with cerebral palsy. The study entailed asking and discussing information that required the use of multiple sources of data in analyzing the mediated

instructional methods in the classroom environments, which could not be obtained from using questionnaires alone.

3.2 Area of Study

The study was conducted in Kenya in four out of the 47 counties in Kenya. These were the counties of Kisumu, Mombasa, Kiambu and Kakamega. These areas were selected because special schools for learners with physical disabilities with programs for learners with cerebral palsy are few and are located in these 4 counties only, across Kenya. Kenya is located on the eastern part of Africa. The countries that border Kenya are Uganda in the western side, Somalia in the east, Ethiopia in north, Sudan to the northwestern part and Tanzania in the southern side. Indian Ocean is in the eastern portion of the country and Lake Victoria lies on the west of Kenya (Appendix N). Kenya lies along the equator. The country has both rich agricultural lands in the highlands and arid and semi-arid lands. The population census conducted in 2009 shows that Kenya has a population of 38.6m. Out of this, 3.5% are persons with disability and 1.57% (411,980) with physical and health care problems (KNBS, 2011). The population of persons with disabilities (PWDs) conducted in 2008 shows that PWDS comprise 4.6%, out of which 1.6% have physical disabilities, the bracket under which CP falls (NCAPD, 2008).

3.3 Study Population

There are a total of 97 special schools in Kenya that provide specialized education (Kenya Directory, 2011). These special schools in Kenya cater for different categories of learners with special needs. Out of the 97 special schools, seven are for learners with physical disabilities, often referred to as special schools for learners with physical disabilities. Five out of the seven schools for learners with physical disabilities have programs for learners with cerebral palsy. There are a good number of special units attached to regular or general

education schools in Kenya (MOE, 2009). These special units cater for mild cases of special needs.

The target population for this study comprised 72 special needs education teachers from five special primary schools for learners with physical disabilities. Learners with CP, 18 in number, were drawn from three special schools with programs for learners with CP. Mugenda (2008) affirms that a statistical population is the set of all elements in the universe of interest; with common attributes or characteristics.

3.4 Sampling

Saturated sampling technique was used in this study to sample 65 teachers in five special schools for learners with physical disabilities because the population was small having taken 7 for piloting. Mugenda and Mugenda (2003) assert that at times, the target population is so small that selecting a sample would be meaningless. Therefore, taking the whole population in such cases is advisable. Purposive sampling was then used to select nine teachers, three from each of the three schools with CP and 18 learners with CP in lower primary grades, for classroom observations to obtain rich data. There was one teacher per class per school for the three classes 1to 3. Gall *et al*. (2007) state that, in purposive sampling, the goal is to select cases that are likely to be "information- rich". Cases are picked because they are informative and possess the required characteristics (Mugenda, 2008).

The teachers and learners sampled had to meet certain criteria. Therefore, under purposive sampling technique, criterion sampling strategy was used to select the nine teachers of literacy in classes one to three for lesson observations and interviews. Patton (2002) states that criterion sampling can be useful for identifying and understanding cases that are "information rich". It involves the selection of cases that satisfy an important criterion, and would yield rich information about aspects of the phenomenon (Gall *et al.,* 2007).

Selected teachers were those who had trained in special needs education and were teaching learners with cerebral palsy in lower primary grades one to three; were teachers of language who taught reading and writing, and must have taught for at least one year in the same school. Language teachers were the most preferred since literacy is acquired in a language, and English was the language chosen because it is used as the medium of instruction in Kenyan Schools (Muthwi, 2001). The 18 learners selected from class 1 to 3 were those with cerebral palsy and were experiencing difficulty with speech and hand use. These are the learners who have difficulties learning reading and writing skills. The lower primary grade was crucial for this study because it is the foundation stage for the development of literacy skills, amongst other skills in education.

Table 4: Sampling Frame

Category of Respondents	Total Population	Sample Size	Percentage
Teachers	72	65	90%
Pupils with cerebral palsy	18	18	100%

3.5 The Instrument of Data Collection

The instruments that were used in this study were the observation guide, document analysis guide and questionnaires. The triangulation of data collection methods was to help generate rich data for the study. Yin (2003) asserts that use of many different sources of evidence is a major strength of case study data collection.

3.5.1 Observation guide

Observation guides were used to observe the strategies used by learners with cerebral palsy to acquire literacy skills; examine the types of mediated instructional strategies used by teachers in mediating learning for learners with cerebral palsy during literacy instruction. It was also used to check how competent the teachers were in using mediation strategies during literacy

skills instruction; and the constraints they faced in using mediated instructional strategies to teach literacy skills to cerebral palsied learners (Appendix B, Apendix C & Appendix D). Ngigi, Wakahiu and Karanja (2016) contend that, sometimes, the best way to gain the real picture of a research setting is to see the happenings for yourself, rather than depend on the respondents.

3.5.2 Questionnaires

A questionnaire for teachers was used to obtain information on teachers' use of mediated instructional approach and the constraints they faced in using mediated instructional strategies (Appendix A). The questionnaire was ideal because it was used by a good number of teachers sampled and it helped collect data in a short duration of time. Gall *et al*.(2007) contend that in using questionnaires, the cost of sampling respondents over a wide geographical area is lower, and the time required to collect the data is typically much less.

3.5.3 Document Analysis Guide

The school attendance registers and admission registers were analyzed (Appendix D) to establish the transition rates of learners with CP. Continuous assessment records and exercise books (Appendix D) were also analyzed to establish the performance of learners with CP.

3.6 Validity and Reliability of Research Instruments

Validity is used to determine whether research measures what it is intended to measure and to approximate the truthfulness of the results (Tariq, 2009). Reliability on the other hand refers to the aspect of demonstrating that the operations of a study such as the data collection procedures can be repeated with the same results (Yin, 2003). In order to ensure that the instruments produced dependable results, they covered the representative sample of the content domain of the study as per the objectives (Gall, *et al*. 2007).

3.6.1 Validity

The validity of the instruments was ensured through expert opinion. The instruments were presented to the experts in the area of study from the School of Education, Maseno and Kenyatta Universities, who have content and research expertise to validate whether they addressed the study objectives. This was to verify the content of the instruments. All the corrections suggested by the experts were subsequently used to adjust the instruments before embarking on the actual study. Use of multiple sources of evidence also helped to ensure validity of the study as they were to corroborate the data (Yin, 2003).

3.6.2 Reliability

The instruments were piloted for reliability using 7(10%) of the teachers who did not participate in the main study. Test-retest method was used on the teachers' questionnaire which was administered twice within an interval of two weeks which was correlated to 0.8 at $p < .05$, and was therefore considered reliable. Befring (2004) observes that the main issue of reliability is to what extent the measurement results are stable and precise, and it tells us something about the overall stability. Necessary adjustments on the anomalies and inconsistencies that were noted with the instruments were made accordingly before finally embarking on the actual study.

3.7 Data collection procedures

A letter of introduction was sought from the School of Graduate Studies, Maseno University, to obtain a research permit. Permission to carry out the study was obtained from Maseno University Ethics Review Committee (MUERC). Informed consent of the sampled teachers was sought and obtained (Gall *et al*, 2007) through the assistance of the head teachers of the schools. They were also assured of protection of their dignity and identity *(*Adams, 2014). Study codes were used to protect the confidentiality of research participants. The researcher

was aware that success in gaining entry into the study area depends on one's presentation (Gall *et al*, 2007).

During data collection, questionnaires were first administered to 65 teachers in all the five special primary schools for learners with Physical Disabilities that have programs for learners with cerebral palsy in Kenya. Nine (9) teachers from three schools who teach English to class 1to 3 were singled out to participate in lesson observations and informal interviews. Three classroom observation sessions were carried out and recorded on each of the nine teachers' literacy lessons. A total of twenty seven lessons were observed and recorded for the whole study. During the observations, data was recorded using a video camera and field notes. Each teacher had a chance of viewing the video recordings. The observation schedules were used as guides to help capture as much data as possible based on, types of mediated instructional strategies used by teachers, Strategies used by learners, teacher competence and constraints they faced in using mediated instructional strategies to teach literacy skills to learners with cerebral palsy. Descriptive and reflective notes were written down during data capture.

Informal and unstructured conversational interviews were conducted for the nine teachers after subsequent observation of the lessons. Unstructured interviews are more free-flowing conversations where the interviewer can probe and explore topics as they come up. Interviews are particularly useful if one wants to know how people feel or react to something (WikiHow, 2016). In addition, Patton (2002) points out that informal conversational interview involves spontaneous generation of questions in a natural interaction and the participants may not even realize that they are being interviewed. During the conversational interviews, short hand was used to record the points. At the same time, note taking was avoided in the presence of a respondent, who was not at ease with the recording of

information. The points were then written down immediately after the discussions. In the process, data was constantly analyzed and interpreted so as not to become so complex (Gall *et al*, 2007).

3.8 Data analysis procedure

Data was analyzed in phases. Quantitative data was analysed first using frequency counts, percentages, following the four study objectives on: the types of mediated instructional strategies used by teachers to teach literacy skills to learners with cerebral palsy ; the strategies learners with cerebral palsy used to acquire literacy skills, , teacher competence in using mediated instructional strategies in literacy skills instruction to learners with cerebral palsy and constraints teachers faced when using mediated instructional strategies to teach literacy skills to learners with cerebral palsy. These constructs were analyzed using SPSS in relation to teachers' training in physical disabilities and in teaching of literacy skills. This helped in organizing and summarizing a set of numerical data (Gall *et al.,* 2007).

Interpretational analysis was used to analyse qualitative data on the types of mediated instructional strategies used by teachers to teach literacy skills to learners with CP, strategies used by learners with CP in acquisition of literacy skills, teacher competence in the use of mediated instructional strategies to teach literacy skills to learners with CP and constraints faced by teachers in using mediated instructional strategies to teach acquisition of literacy skills to learners with CP. Interpretational analysis involves examining data closely and organizing and re-grouping through assigning codes to record themes or categories and sub-themes or sub-categories from a data base (Creswell and Plano Clark, 2007). Interpretational analysis is appropriate when examining a case study for it examines data closely in order to find constructs, themes, and patterns that can be used to describe and explain the phenomenon under study (Gall *et al.,* 2007). Creswell and Plano Clark (2007) assert that

"the analysis of qualitative data (words or text or images) typically follows the path of aggregating the words or images into categories of information and presenting the diversity of ideas gathered during data collection" (p.6).

Data was transcribed and coded to identify themes and patterns that were eventually organized into coherent categories to summarize and bring meaning to the text. These were based on the four study objectives. Analyses of themes were conducted within and across the cases. These were each presented following a similar pattern to clearly show the aspects of the phenomenon studied. Gall *et al.* (2007) assert that organization of cases in a similar form facilitates comparisons between them. Gall *et al* further state that analysis for each case are reported, including their detailed description so that the participants, events and context come alive for the reader. Next, cross-case analysis is given which notes consistencies and differences in constructs, themes and patterns across the cases that have been studied.

Triangulation convergence model was used in which results from different sources, both qualitative and quantitative data were analysed separately then merged and discussed. Creswell and Plano Clark (2007) assert that, in a convergence model, the researcher collects and analyzes quantitative and qualitative data separately on the same phenomenon and then the different results are converged (by comparing and contrasting the different results) during the interpretation. Use of results from questionnaires was meant to corroborate the qualitative results with quantitative findings (Creswell & Plano Clark, 2007).

3.9 Ethical Considerations

Collected data was used for the intended purpose. Privacy and anonymity was assured by replacing names and other information with encoded identifiers (Clinical Tools Inc., 2015). Notebooks or questionnaires were kept together securely and away from public access until the study was complete before they were finally shredded (Clinical Tools Inc., 2015).

Relevant data from video recordings were stored electronically in a computer using a secured password.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the findings and discussion of the data collected using various test instruments. This study analyzes the mediated instructional strategies used in acquisition of literacy skills among learners with CP. This is in light of the inadequate literacy skills among learners with CP in special schools for physically disabled children in Kenya. The findings are organized into four sections based on the b objectives of the study and the results presented in figures, tables, graphs and narratives. The first section examines types of mediated instructional strategies used by teachers in the teaching of literacy skills acquisition to learners with cerebral palsy; the second section analyzes the strategies used by learners with CP to acquire literacy skills; the third section examines teacher competence in using mediated instructional strategies to teach literacy skills acquisition to learners with cerebral palsy; finally, the fourth section establishes the constraints faced by teachers in using mediated instructional strategies in imparting literacy skills acquisition to learners with cerebral palsy. Cross-case results are presented in each section.

Descriptive, correlation and interpretational analyses have been used. Teachers and learners observed have been presented using pseudonyms. Confidentiality and anonymity has been observed in concealing the identities of the teachers and the learners in this study. The nine teachers who are the cases are referred to as T1, T2, T3, T4, T5, T6, T7, T8, and T9. The learners with cerebral palsy in these classes are presented using constructed names. In T1's class are Jaba and Tieni; T2, Boby and Linsa; T3, Linta and Juddu; T4, Korry and Koddy; T5, Timi and Teffi; T6, Jeffi and Jerro; T7, Mimi and Lisia; T8, Brany and Tabbia; T9, Munzi and Jenna. Information gathered from the nine cases is presented within-case,

thereafter cross-case on similarities and differences on categories generated from observations and informal interviews are presented.

4.2 Demographic information of the respondents

A total of 65 teachers from five schools for the physically handicapped in Kenya participated in this study. Information about their training in special needs education, level of training, areas of specialization and duration of service in teaching learners with CP in the same schools are presented in Table 5.

Table 5: Demographic information of teachers (n=65)

Demographic information	No. of teachers F	Percent %
Trained in special needs education (n = 65)		
Yes	61	93.8
No	4	6.2
Level of training		
Masters	5	7.7
Undergraduate	26	40.0
Diploma	27	41.5
Certificate	6	9.2
Non committal	1	1.5
Training in physical disabilities		
Yes	35	53.8
No	28	43.1
Non committal	2	3.1
How long teachers taught learners with cerebral palsy		
Below 1 year	5	7.7
1 – 2 years	12	18.5
3 – 4 years	16	24.6
5 years and above	31	47.7
Non committal	1	1.5

Source: Field data (2013)

4.2.1 Teachers' training in special needs

Out of the 65 teachers sampled, 61 (93.8%) were trained on special needs education while 4 (6.2%) had no training in special needs education. The highest trained teachers constituting 31(47.0%) had undergraduate and master's degrees in education while 33(50.7%) had Diplomas and certificate levels in education (See table 5).

Based on the foregoing information, we can infer that professional training for majority of teachers who teach learners with CP in schools for the PH held Diploma qualifications at a frequency of 27 and a percentage of 41.5 and a frequency of 26 at a percentage of 40.0% for undergraduate degree levels. This shows that majority of teachers in schools for PH had a Diploma and undergraduate degree combined, at a frequency of 53 and a percentage of 86.8%. It is also interesting to note that the highest trained teachers in SNE had a Masters Degree level in the schools for the PH that registered at a frequency of 5 and a percentage of 7.7. This was followed closely by the least trained in SNE at the certificate level at a frequency of 6 and 9.2%.

4.2.2 Training in physical disabilities

Out of the 65 teachers, 35 (53.8%) were trained specifically in physical disabilities while 28 (46.2%) were not trained in physical disabilities. The results show that not all the teachers who teach learners with CP in schools for PH are trained in these areas of disability. According to MOE (2009), sometimes teachers trained in special needs are posted to schools where their services are not required while those whose services are required are not posted at all. Even though a large percentage of teachers (93.8%) had trained in special needs education, not all of them had specialized in teaching learners with physical disabilities, yet they were all teaching in schools for the physically handicapped. Even the few 4(6.2%) who were not trained in special needs education were teaching learners with CP alongside other learners in the same schools. The current study is in agreement with Erickson (2005) who asserts that, it is unfortunate that the adequacy of teacher training in developed as well as developing nations is questionable (Erickson 2005). This present study reveals that not all the teachers who teach learners with CP had been trained in the area of physical disabilities. The result shows a frequency of 35 and a percentage of 53.8%, slightly over half of the

population as trained in this area. Conversely, teachers who were not trained in the area of physical disabilities had registered a slightly lower frequency of 28 (43.1%) than the trained.

The present study reveals that many teachers were not trained in physical disabilities yet they are in PD schools teaching learners with CP. This study is in agreement with a study by Wairimu (2015) which shows that there was inadequate man power to teach learners with cerebral palsy. Similarly, MOE (2009) also highlighted inadequate skilled manpower as one of the challenges the government of Kenya had experienced in the provision of educational services for persons with special needs and disabilities. This should be a cause of concern because teaching learners with physical disabilities require special training in methods of teaching these learners including those with CP. Obiero (2009) revealed that teachers training in a specific area of disability had an influence on the teacher's understanding of the educational needs of learners. One would therefore question how the teachers who are not trained in either special needs education or the area of physical disabilities would influence learners' acquisition of literacy skills, especially learners with CP. There is need to establish the staffing norms for schools for the PD.

4.2.3 Duration of teaching learners with cerebral palsy

In teaching learners with cerebral palsy, the number of years varied from less than one year to over five years. The result shows those teachers who had taught for less than 5 years were 50.7 % (n=33) while those who had taught for 5years and above registered 47.7%(n=31) of the teachers (see Table 5), where16 (24.6%) had taught for 3 – 4 years, 12 (18.5%) had taught for 1 -2 years while 5 (7.7%) had taught for below one year.

4.2.4 Qualitative analysis of teachers' profile based on the observation

Observation was conducted in the lower classes, one to three, in three special schools for learners with physical disabilities with programs for learners with CP. Nine English teachers

participated. Out of the nine teachers observed, three were holders of Bachelors degree in SNE, 5 had Diploma in SNE and one had a Diploma in ECD and was already pursuing a Diploma course in SNE. In their current schools, it was established that, the teachers had taught for not less than one year. One of the teachers had taught in the same school for a period of eight years, one for seven years, one teacher for six years, one for four years , two for three years, two teachers for two years and one teacher had taught for one year in the current school at the time of the study.

4.2.5 Courses in special needs education undertaken by the teachers

The information aimed at establishing the areas covered in the training of teachers of learners with CP was obtained through teachers' questionnaire. The data obtained on specific courses undertaken by teachers in special needs education were reported by them then summarized and categorized as:

i) Adapted PE, rehabilitation and Habilitation, ADL training, material development
ii) Child growth and development, Neurological and physical impairment, anatomy of the body, physiotherapy
iii) Conductive method (Peto) of teaching and collaborative method
iv) Management of children with CP in classes, instructional strategies in teaching literacy skills, communication devices for children with CP; Management of learners with CP, identifying learners for placement in appropriate schools and different types of cerebral palsy
v) Trained in learners with physical disabilities, CP speech difficulties, hemiplegic and paraplegic
vi) Causes of C.P, types of CP, management of CP, learning strategies for learners with CP, Adaptive equipment /devices for learners with cerebral palsy

vii) Psychology of learners with PH, Management (medical intervention and education), PH, Assessment of learners with PH.

viii) Functional exercises, resources, types of cerebral palsy, treatment and therapy, teaching and learning strategies for learners with Cerebral palsy

As evident from the list, these were courses that teachers indicated were covered in their training as special needs education specialists. The list contains general as well as specific areas in SNE. From the responses obtained, strategies for teaching learners with cerebral palsy emerged severally. Mediated instructional strategies were captured as areas trained in. These were the conductive education (Peto), collaborative method, and other teaching and learning strategies. This confirms that teachers who were trained in physical disabilities were trained on instructional strategies of teaching learners with physical disabilities in which CP is a subset and their training includes mediating literacy instructions for learners with CP. This agrees with the findings by Obiero (2009) and Obinga and Kochung (2011) that teachers were trained in methods of teaching learners with CP.

4.2.6 Teaching literacy skills (reading and writing) to learners with cerebral palsy

The study also went further to establish whether teachers in schools for learners with physical disabilities had taught literacy skills to learners with cerebral palsy. Teachers indicated whether they had taught or had not taught literacy skills to learners with CP as shown in Table 6 and illustrated in Fig 4.1.

Table 6: Teachers who had taught literacy skills to learners with CP

	F	%
Teachers who had taught literacy skills	45	69.2
Teachers who had not taught literacy skills	18	27.7
Non committal	2	3.1
Total	65	100.0

The information in Table 6 is further illustrated in Figure 4.1

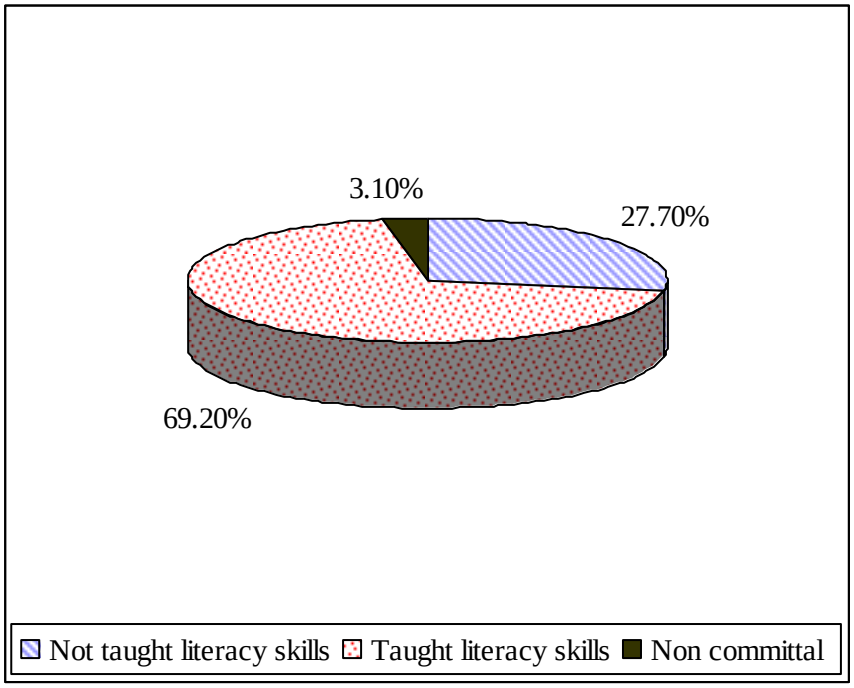

Figure 4.1: Teaching of literacy skills (reading and writing) to learners with cerebral palsy

This study revealed that majority (45, (69.2%) of teachers had taught literacy skills (reading and writing) to learners with CP while a smaller number (18, (27.7%) of them had not taught literacy skills to learners with CP. A smaller number (2, (3.1%) of teachers did not indicate whether they had taught or had not taught literacy skills to learners with CP. Therefore, not all the teachers who taught these learners had taught them literacy skills.

4.2.7 Grade Level at which the teachers taught literacy skills to learners with cerebral palsy

The study established the grade levels at which these teachers had taught literacy skills to CP learners as shown in Table 7.

Table 7: Grade levels the teachers taught literacy skills (n = 65)

Level of training	F	Percent (%)
Class 1 – 8	10	15.4
Kindergarten/Nursery	3	4.6
Special classes	8	12.3
Lower primary	17	26.2
Upper primary (Class 4 – 8)	5	7.7
Never taught literacy skills	22	33.8

The highest grade levels the teachers ever taught literacy skills to learners with CP were upper primary grade levels (Grade 4 to Grade 8). Out of the 65 teachers sampled, the highest number of teachers (17, (26.2%) had taught literacy skills in lower primary and 5 (7.7%) of the teachers had taught upper primary while 3 (4.6%) had taught in Kindergarten. Those who taught special classes registered a frequency of 8 (12.3%) whereas 10 (15.4%) had taught literacy skills across the classes from class 1 to class eight. The teachers who had never taught literacy skills registered a frequency of 22 (33.8%).

Therefore, in the primary schools, the highest number, 17, (26.2%) of teachers had taught lower primary grades only, the lowest number, 5 (7.7%) of teachers had taught upper primary grades only whereas 10 (15.4%) had taught literacy skills across the classes from class 1 to class eight. The data shows that the 65 teachers had interacted with learners with CP and taught them literacy skills at the foundation level of formal schooling. It is evident that only 2(3.07%) teachers had never taught literacy to learners in lower grades and 9 (13.8%) were

non committal. This was an indication that they had never taught literacy skills to learners with CP in these schools.

4.2.8 Learners' demographic information

Information about eighteen learners, their admission, transition and present grades were obtained from document analysis as shown in Table 8.

Table 8: Admission and grade transition of learners with cerebral palsy in three special schools in Kenya

Name of learner	Date of admission	Grade admitted	Present grade at 2013	Expected grade as at 2013	Researchers' remarks
Jaba	2011	G1	G1	G 3	Repeated G1 Twice
Tieni	2013	G 1	G1	G1	Not repeated any grade
Boby	2010	G1	G2	G4	Repeated G1&2
Linsa	2012	G1	G2	G2	Not repeated
Linta	2011	G1	G3	G3	Not repeated
Juddu	2009	G1	G3	G5	Repeated G1 & G 2 Twice each
Korry	2013	G1	G1	G1	
Koddy	2013	G1	G1	G1	Not repeated
Timi	2010	G1	G2	G4	Not repeated
Teff	2010	G1	G2	G5	Repeated G1 Twice
Jeffi	2010	G1	G3	G4	Repeated G1 twice
Jerro	2012	G2	G3	G3	Repeated G2 Not repeated
Mimi	2013	G1	G1	G1	
Lisia	2013	G1	G1	G1	Not repeated
Brany	2010	G1	G2	G4	Not repeated
Tabia	2011	G1	G2	G3	Repeated G 1 & G2
Munzi	2008	G1	G3	G6	Repeated G1
Jenna	2008	G1	G3	G6	Repeated G1 and G3. She has been in the same grade 3 for three years.

Source, Field data(2013)
Key: G= Grade

Learners with CP were admitted to grade one between 2008 and 2013 as shown in Table 8. Out of the 18 learners observed across grades one to three, 11 (61.1%) learners had repeated grades while only 7 (39%) learners had not repeated any grade; Moreover, 8 (44.4%) had

repeated grade 1 at least once; 3 (37.5%) had repeated grade 2, and 2 (11.11%) had repeated grade 3.

Table 9: Learners repeating grades

Grade	Number of learners who repeated grades (f)	Percent %	Number of learners who had not repeated grades (f)	Percent %
Grade one	8	44.4%	7	38.9%
Grade two	3	37.5%	1	5.55%
Grade three	2	11.11%	2	11.11%

Based on document analysis, the research revealed that there was a lot of repetition of all the grades among the learners. Out of the 18 learners, 8 (44.4%) repeated grade one during their studies; and 3 (37.5%) repeated grade two while 2 (11.11%) of them repeated grade three. The average level of repetition of a grade among the learners with CP was therefore computed to be 31.0%. Wairimu (2015) cited difficulties handling learners with CP in the mainstream in both the regular and special schools. Instead of transiting, they were retained in school for several years or taken to special classes to learn life skills only. This study confirms the repetition of grades among learners with CP in special schools for the PH in Kenya. It implies that learners with CP lack literacy skills that can assist them to keep up with the academic subjects taught in school. Alvermann and Phelps (2002) note that students' overall academic success can be compromised by the lack of well-developed reading and literacy skills. Lack of literacy skills in turn hampers achievement in academic subjects which overally affects grade transitions.

4.3 Types of Mediated Instructional Strategies used by Teachers to Teach Literacy Skills to Learners with Cerebral Palsy

The first objective of this study was to examine the types of mediated instructional strategies used by teachers to teach literacy skills to learners with CP. The first section consists of quantitative data that depicts frequency and percentages of the teachers' use of the mediated instructional strategies, and previous use of the strategies in relation to their training; and the types of mediated strategies, shown in Table 10, Figure 4.2, Table 11 and Fig 4.3. The second section presents the qualitative data resulting from observation in the types of the mediated instructional strategies used by the 9 teachers (Table 13) and how they used them; this is followed by a presentation of cross-case results of the 9 teachers' use of the strategies in Table 14 and subsequent paragraphs.

4.3.1 The frequency of Teachers' use of Mediated Instruction Strategies to teach Literacy skills to learners with CP

Data on the frequency of teachers' use of mediated instructional strategies to teach learners with CP are presented in Table 10.

Table 10: Frequency on the use of mediated instruction strategies during instruction

How often use mediated strategies	Number of teachers (f)	Percent (%)
Very rarely	5	7.7
Rarely	6	9.2
More often	34	52.3
Most often	17	26.2
None committal	3	4.6

Results show that 34 (52.3%) of the teachers more often used mediated instructional strategies in teaching literacy skills to learners with CP while 26 (26.2%) of the teachers most often used mediated instructional strategies when teaching learners with CP. It also emerged that 6 (9.2%) rarely used and 5 (7.7%) used mediated instruction very rarely as summarized in Table 10.

The result shown in Table 10 indicates that not all the 65 teachers who participated in this study used mediated instructional strategies. The study shows that 62 of them used mediated instructional strategies. The degree of usage, however, varied from more often with 34 (52.3%) responses, most often 17 (26.2%), rarely at 6 (9.2%) to very rarely which registered 5 (7.7%) of the teachers' responses, 3(4.6%) did not indicate whether they used mediated instructional strategies or not. Yet, instructional strategies that differ from typical literacy instruction may be necessary for students to master the task (Basil & Reyes, 2003 cited in Swinehart-Jones & Heller, 2009).

4.3.2 Previous usage of Mediated instructional strategies by the teachers

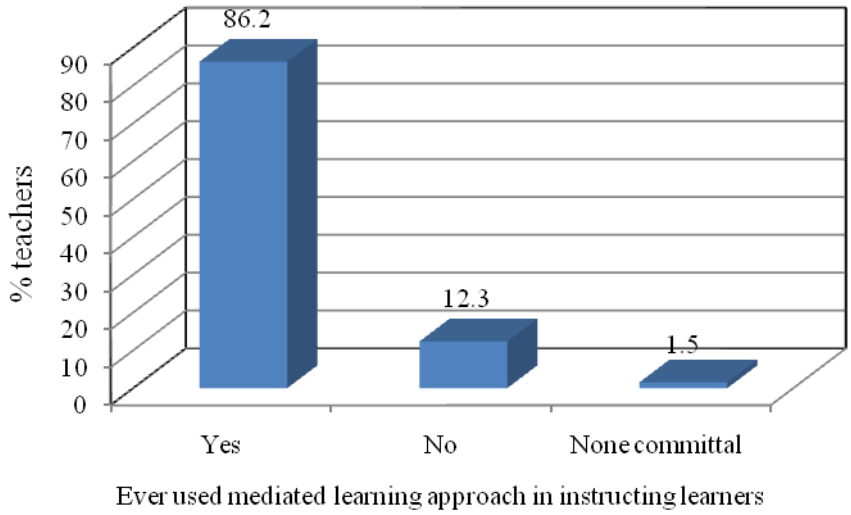

Figure 4.2: Teachers who had used mediated instructional approach in instructing learners with cerebral palsy.

Most of the teachers, 56 (86.2%) stated that they had used mediated approach to instruct learners with CP. The rest of the teachers, 8 (12.3%) had not used mediated approach in their instruction while one (1.5%) of the teachers was not aware if he or she was using mediated approach or not. This is an indication that not all the teachers were using the appropriate instructional strategies as required yet the teaching of literacy skills requires approaches and strategies that meet the diverse learning needs of learners within a classroom (Owen, Violette, Weber & McLaughlin, 2009). The current study concurs with a study by Peeters *et al*., (2009) who observe that children with cerebral palsy with speech or fine motor impairments are disadvantaged in a number of literacy activities. The lack of use of mediated instructional strategies could be a cause of limited literacy among the group of learners with CP. It is therefore important to establish why only a section of teachers use this method.

Table 11: Training in physical disabilities with use of mediated (supported) Instructional approach in instructing learners with cerebral palsy?

	Have you ever used mediated (supported) instructional approach in instructing learners with cerebral palsy		
	Yes	**No**	**Total**
Trained in physical disabilities	31 (91.2%)	3 (8.8%)	34 (100%)
Not trained in physical disabilities	23 (82.1%)	5 (17.9%)	28 (100%)

4.3.3 Cross tabulation of teachers' training in physical disabilities and the use of mediated instructional approach

The study went further to establish the relationship between the teachers' training in physical disabilities and the use of mediated instructional approach. Use of mediated instructional approach in instructing learners with cerebral palsy was not significantly different (χ^2 = 1.115, P = 0.450) with teachers' training in physical disabilities. The majority (31, (91.2%) of those who were trained in physical disabilities had used mediated instructional approach

while a smaller number, 3, (8.8%) had never used mediated instructional approach. However, 23 (82.1%) of those teachers who had not trained in physical disabilities used mediated instructional approach while only 5 (17.9%) of them never used mediated instructional strategies as shown in Table 11.

Mediation encompasses different kinds of support that would assist learners with CP reach a higher zone of proximal development (Vygotsky, 1978) in their acquisition of literacy skills. The results show that only 26.2% of the teachers who used the strategies most often and 52.3% used mediated instructional strategies more often. It implies that not all the teachers were using these strategies. This is further confirmed by the cross tabulation of results, which did not show a significant difference ($\chi 2 = 1.115$, $P = 0.450$) between teachers' training and use of the mediated instructional strategies. This study also revealed that 1.5% of the teachers who participated in the questionnaire surveys were not aware whether they were using or had used any mediated instructional strategies.

4.3.4 Types of Mediated Instructional Strategies used by the Teachers in Teaching Literacy Skills

The types of mediated instructional strategies used by teachers are presented. These are then analyzed against the teachers' training and their use in teaching literacy skills.

Multiple responses from the teachers' questionnaire were registered on the types of mediated instructional strategies they had used to teach literacy skills to learners with cerebral palsy as shown in Table 12.

Table 12: Types of mediated instructional strategies used by the teachers to teach literacy skills to learners with cerebral palsy (n = 65)

Type of instructional strategy	F	%
Direct teaching	38	58.5
Repeated reading	39	60.0
Peer support	45	69.2
- Cooperative learning	43	66.2
- Flexible grouping mediation	28	43.1
Collaborative teaching	41	63.1
Scaffolding by:		
- Prompting	47	72.3
- Teacher modeling,	29	44.6
- Shaping	23	35.4
Peto strategies	15	23.1
Use of artifacts(tools and materials	46	70.8
Differentiation	28	43.1
Individualized adaptations	47	72.3

Source: Field data (2013)

The responses registered mainly included: Individualized adaptations and scaffolding by prompting as the highest strategies used at a frequency of 47 a resulting in a percentage of 72.3 of the teachers. This was followed closely by artifacts/materials at a frequency of 46 and a percentage of 70.8% of the teachers. Peer support registered 45 (69.2%) teachers, and collaborative teaching was used by 41 (63.1%) teachers, while fewer teachers, 28, (43.1%) used differentiation. Peto strategies registered the least number 15(23.1%) of teachers who used it to teach literacy skills to learners with cerebral palsy.

The results therefore show that the most frequently used mediated instructional strategies by teachers were individualized adaptations, scaffolding by prompting, use of artifacts/materials, peer support, and collaborative teaching. It implies that, where they are used, learners acquire

literacy skills and therefore are able to read and write. On the other hand, a major strategy that is valuable in helping learners with CP acquire skills readily registered a lower frequency. This was differentiation (28, (43.1%). This low frequency could be due to inadequacy in its use or biases in the use of other strategies. Analysis of how teachers used the mediated instructional strategies to teach literacy skills to learners with CP was therefore necessary.

The study further examined how teachers used the mediated instructional strategies in practical teaching of literacy skills to learners with CP. The results from classroom observations on types of strategies used are thus presented first in a summary table (Table 13) followed by the description of the lessons observed and interview excerpts.

Table 13: Mediated Instructional Strategies observed being used by Teachers to teach Literacy Skills to Learners with CP (n=9)

Mediated instructional strategy	**Teachers who used the strategies (f)**	**%**	**Teachers who did not use the strategies (f)**	**%**	**Total f (%)**
Direct teaching	9	100	0	00	9 (100)
Repeated reading	5	55.6	4	44.4	9 (100)
Peer support	3	33.3	6	66.7	9 (100)
Collaborative teaching	4	44.4	5	55.6	9 (100)
Scaffolding by:					
- Prompting	9	100	0	0	9 (100)
- Teacher modeling	6	66.7	3	33.3	9 (100)
Peto strategies	3	33.3	6	66.7	9 (100)
Use of artifacts(tools and materials	9	100	0	00	9 (100)
Differentiation	4	44.4	5	55.6	9 (100)
Individualized adaptations	6	66.7	3	33.3	9 (100)

Source: Field data (2013)

Information in Table 13 shows that, the most frequently used strategies observed among teachers were artifacts and scaffolding by prompting that were both used by all the 9 (100%) teachers. This was followed by individualized adaptations which registered a frequency of 6 teachers at a percentage of 66.7. The least used mediated instructional strategies were peer support and Peto strategy that each registered a frequency of 3 at a percentage of 33.3 of teachers. Differentiation was used by 4(44.4%) teachers only.

Quantitative results from the observations agree with the results generated by the questionnaires. The two data sources revealed that individualized adaptations scaffolding by prompting and use of artifacts/materials were used more by the teachers. These are some of the most appropriate mediated instructional strategies for teaching literacy acquisition to learners with CP. Though a good number of the teachers indicated in the questionnaire that they used these mediated instructional strategies to teach literacy acquisition skills to learners with CP, it was not possible to verify how they used them. Data from observation therefore revealed the trend as presented.

4.3.5 Qualitative data on Teachers use of mediated instructional strategies in teaching literacy skills to learners with cerebral palsy.

The study further examined how teachers used mediated instructional strategies to teach literacy skills to learners with CP. Classroom observations were conducted on 9 teachers of literacy in the classroom. The teachers' use of the mediated instructional strategies is thus presented thematically as was observed.

Teachers' use of direct teaching

All the 9 teachers were observed using direct instruction in all their lessons, which they combined with other mediated instructional strategies as shown in Table 12, and selected examples presented in the subsequent paragraphs.

T2: the teacher was observed teaching reading of new words to grade two learners in the first lesson. He explained to the learners why the word 'spoon' sounds differently. Using chalkboard illustration, he wrote 'oo- u' and explained that, *"the double 'oo' produces the sound /u/, so the word 'spoon' would read /spu:n/ we pull the sound for double 'oo' (he reads it with a prolongation of the /u/ sound)"* He went on to introduce other new words as he engaged the learners in oral reading.

In teaching reading in the second reading lesson, **T3** asked the learners to state the new words they had learnt previously. She said to the learners, *"today we are going to look at the new words we learnt yesterday and then we shall read the story. Before we read the story I want us to look at the words on the blackboard...Yes, can somebody read for us the word on the blackboard?"* A learner volunteered and read it as, *"discharge"*. This continued with the rest of the words then she asked them to state the new words learnt. Individual learners stated.*"Malaria", "AIDS", "fever", "stomachache".* She then engaged the learners in reading aloud a story about *"Common Diseases".* She read the first paragraph aloud as learners followed her reading from their New Primary English, Pupils' book 3, page 79, as, "*Of all the diseases, AIDS is the most feared disease. This is because there is still no known cure for it....."* After reading, the learners answered comprehension questions.

T4: The teacher explained to the learners in her second lesson observed that they were going to write the letters of the alphabet from A to Z, both the capital and small letters (lower case). They first recited, "*Capital* 'A', small *'a', capital 'B', small 'b'....."* they continued up to letter ***"z".*** She drew ruled lines on the chalkboard using a blackboard ruler and wrote the letters of the alphabet in a sequential order, each letter consisting of both upper and lower case as, 'Aa Bb Cc Dd.....up to Zz' and asked learners to copy neatly in their exercise books. As she wrote on the chalkboard, some letters were not written proportionately. Examples

were letters *'b','d' and 'j'* . The ascenders passed the upper line, longer than the capital letters within the same line, while the descenders like *'j'* were way up instead of descending. Despite this, She did not correct the mistakes.

T6: T6 started off her lesson by asking learners to remind themselves of the words learnt in the morning. One by one, learners stated the words individually as, *'dressing',' bleed', 'cutting'....."*. These were some of the new words they were going to meet in the story to be read from their course book, New Primary English Pupils' Book 3. T6 then engaged the learners in reading aloud in turns, the story on page 74, *"Dressing can be dangerous*". Individual learners were asked to read sentences, one after the other. Those who managed to read correctly were told to sit down while those who failed were asked to remain standing. The whole class was then involved in reading in unison, "*In his room he has only one socket. It is very dangerous because it has too many...."* then they answered comprehension questions.

T8: In the first lesson observed, **T8** wrote letter 'A' on the chalk board and asked, *"Brany, letter 'a' says?"* Brany responds with a slurred *'/a/'* sound. The other learners were asked the same question in turns. She again asked another learner, "*Boby, 'A' for?"* He responded by saying, *"apple".* The class was asked to clap for him. She then drew a sketch of an apple on the chalkboard and asked Tabia, *"Tabia, 'A' for?" "A", Apple"*, said Tabia, instead of "A for apple.

Teachers' use of repeated reading/ guided practice: Five teachers were observed using repeated reading during their literacy lessons.

T3: The teacher used repeated reading during reading for comprehension. This teacher engaged the learners in reading a story about *"Common Diseases".* She read aloud the first

paragraph as learners followed her reading silently from their New English Primary, Pupils' book 3, page 79, as, "*Of all the diseases, AIDS is the most feared disease. This is because there is still no known cure for it....."* Linta was then given the first opportunity to repeat the reading of the first paragraph which she struggled to read with slurred speech. The rest of the class was then engaged in repeating after the teacher.

T4: After teaching the new words, T4 engaged her learners in the identification of the words. Individual learners were asked to identify the words. For example, the word '*white*'. T4 says, "Nataka *wenye wanakumbuka hizi colours* (I need those who can remember these colours)". She then displays the word and a learner identifies it correctly. When asked to spell it, she does sot correctly as,"*w...h...i...t...e", the word is white!".* "*Nataka Kody a spell the word brown"("I want Koddy to spell the word brown")*. He struggles with slurred speech, but says at the end of spelling of the word as, "*brown"*. Learners were engaged in repeating the words and spelling them.

T7: In T7's class, repeated reading was observed when the teacher engaged the learners in reading new words taught in all the lessons observed. During the second lesson, learners were engaged in repeating over and over reading of the words on parts of the body. This continued for each and every child. Towards end of the lesson, T7 engaged her learners in singing, "*Head shoulder knees and toes.... eyes ears mouth and nose"* as they touched and named parts of the body learnt. In the second lesson on vowels, the learners repeated each vowel introduced with the visual support. After teaching the vowels, T7 led the learners in reading them over and over again from the flash cards, the alphabet chart, and the chalkboard. T7 then engaged the learners in singing a song to piece them together as, "*a e i o u' hizi ni nukta ndogo hesabuni mmoja kwa mmoja kama a e i o u* (a e i o u, these are small letters, count them one by one as a e i o u)".

T8: T8 led the learners in practicing the identification of the letters of the alphabet and the names of items whose first letters correspond with the letters of the alphabet introduced. These were: *'A' for apple; 'B' for Ball; and 'C' for Cat.* In the second lesson, they were again led in practicing the same but with two additional names; *'A' for aeroplane; 'B' for ball; 'C' for Cat and 'D' for Dog.*

T9: learners were engaged in repeated reading. They read the new words over and over. In the writing lesson, the teacher wrote the words learnt on the chalkboard and led the learners in reading them repeatedly before embarking on writing.

Teachers' use of Peto Strategies: Only 3 Teachers used this strategy. These were T7, T8 and T9, all from the same school but different grades. Rhythmic intentions in singing or reciting words, or phrases and actions or dance were the major Peto strategies used by the teachers as presented in the excerpts.

T7: In one of the lessons observed, **T7** tells the class*, "everybody, touch your head", head". Maria, head; Geogie, head. My head, head. Very good!"* says T7. *"Look at Jogo's head (learners turn to look), Very good officer! "Sonko, your head, shika kichwa"(touch the head), very good. Let's touch our hair. "Shika nywele" (touch hair), your hair. Bigi, hair; Babu, hair; Lisa's, hair".* Parts of the body` are identified and touched as learners together with the teacher continue to read orally from a chart.

The second lesson observed started with a musical tune and body movement which was repeated over and over as they sang and danced using words that they had learnt in the previous lesson., as "*Head shoulder knees and toes, knees and toes knees and toes, head shoulder knees and toes, ears eyes nose and mouth".* This was used to learn parts of the body.

T8: The teacher started off her lessons by singing the song, "*Head shoulder knees and toes…*' together with the learners and touching parts of the body as they sang. She then introduced the reading lesson. In the second lesson observed, T8 greeted the learners and started in rhythmic fashion, *"today is Thursday, and tomorrow will be?"* Learners are assisted to answer, *"Friday". "Count the days of the week"*, says T8. They start, with T8 leading them and they follow in chorus: *"Monday, Tuesday, Wednesday....."* A poem is then recited. *"I wake up in the morning, I brush my teeth, I wash my body, I take my breakfast, I put on my uniform, I take my bag, and I run to school!"* Then they sing together, *"Good morning, good morning teacher, teacher, we are happy to see you teacher, teacher we are ready to learn here teacher, teacher* (they shake hands as they sing) *good morning good morning, good morning to you and how do you do?"* and they respond, *"Fine!"* In the next stage, they are asked questions to which they respond in unison.

T9: T9 started off her lessons by singing. In the first lesson, she greeted her learners by singing. Holding each other's hands and swinging as they sang the 'Good morning' song:"*Good morning! Good morning! Good morning to you, and how do you do!"* She then introduced the reading lesson by singing "ABCD" song together with the learners. In her second lesson, T9 started off by greeting the learners and calling out each learner by name through singing until each learner was greeted in a rhythmic fashion. She used the same method to teach the new vocabulary.

Teachers' use of collaborative teaching

Only 4 teachers were observed to be using collaborative teaching as a mediated strategy. These were T6, T7 T8, and T9 (see Table 13).

T6: In one of the literacy lessons of T6, she taught handwriting skills in collaboration with her co- teacher. T6 taught writing skills in a separate lesson from reading lessons. It was observed that in one of the literacy lessons, she taught handwriting skills together with a co-teacher, Ms Ombije (not the real name). T6 entered the class with the madam teacher, greeted the class, introduced the lesson and said, "….*and today I want you to write so well; neat, neat things that can be seen; things that are legible. And you shall shape letters well like madam"*. Ms Ombije is then welcomed. *"So we are going to learn about handwriting the way madam has said,"* says Ms Ombije. *"In handwriting we deal with what we call upper case and lower case"*. She draws ruled lines on the chalkboard using a metre ruler then reads the first sentence aloud, "*She likes reading, so is her brother*". The learners repeat then she writes the sentence neatly on the ruled lines drawn on the chalkboard as learners copy in their exercise books. Both teachers checked learners' work and assisted individual learners with their work during the exercise.

T7: This teacher taught grade one together with a co-teacher. During the literacy lessons observed, this teacher taught her lesson while the co-teacher assisted the other learners in either repeating statements with the learners or assisting individual learners physically with activities. An example was observed in the first lesson when T7 was teaching 'our body', the 'head'. Mimi could not touch her own head. The co-teacher held her hand and placed it on her head instead.

T8: In this class, the co- teacher assisted in reading aloud, repeating words, or sentences and performing actions together with the learners.

T9: In one of the writing lessons observed, T9 taught reading and writing skills with her female co-teacher. She engaged learners in a writing activity of filling in blanks with correct choice of letters to complete the words.

Teachers' use of Artefacts/materials

Different materials were used by the teachers to teach reading and writing to learners with CP.

T1: The teacher used a chart on parts of the body to teach the new words: *head, hands, fingers, eyes, ears, legs.* She also used her body parts as well as those of the learners, for example fingers, and hands.

T2: Apart from the New Primary English Pupils' books for grade 2, this teacher used materials from the home such as plate, spoon, brush, broom and bucket to teach new words in the first reading lesson observed. While displaying one item at a time, he introduced the new words. This teacher seemed unsure of some of the items he brought to class to teach the vocabularies. An example was when he displayed a hair brush and asked, "*Linsa what is this?"* Linsa looked up and said*, "Brush"*. He corrects her and says*, "it is a comb". Linsa, what is it?* Linsa reluctantly responds with slurred speech and says, *"a... c...o....mb (prolonging the sound /o/.)".* He then writes the word 'comb' on the chalkboard for learners to read aloud. The remaining vocabularies were taught the same way with physical items to associate them with. In the second lesson, the same items were used to teach the sentence pattern, "*This is a....It is used for....,"* An example of a sentence was*, "This is a broom. It is used for sweeping".* The other materials used were the bucket, basin, jembe , spoon, and a knife. In the other lessons observed, no other teaching material was used.

T3: This teacher did not use any other materials apart from The New Primary English book 3 and chalkboard illustrations. An example was observed in the first reading lesson when she taught reading of the vocabularies. The word "cake" could not be read by Juddu until the teacher drew a sketch of the cake on the chalkboard for Juddu to associate the sketch drawn

with the word. She asked her, "*Juddu what is that (pointing at the sketch)?"*This was to aid her in reading the word.

T4: The teacher used different items of different colours to teach the new words. She used yellow, blue and red files. Other items were a white plastic plate, her brown skirt and a black handbag. Chalkboard illustrations were used to explain the letter- sounds, and spelling of words. She also used New Primary English book 1, both teachers' guide and pupils' book during the reading lessons.

T5: In T5's class, flash cards with new words and charts with sentences were used to teach the reading lessons observed. Other items included plates, cups, jug, mug, and a glass that were used to teach vocabulary. T5 adapted sentences from the English course book for class two and wrote on a chart, which she used to teach reading of sentences.

T6: This teacher used pictures in pupils' English text book. This was observed when she told the learners, "*Open page 74, look at it and tell me what you can see"*. T6 also used a ball pen to trace the words along the line for Jerro to read. There was no adapted material used during the reading lesson. All the learners read the passage in the text book, New Primary English Pupils' book 3. During the writing lesson observed, the chalkboard illustration was used with ruled lines drawn to teach handwriting skills.

T7: The use of artefacts was in all the lessons taught. In the first lesson on parts of our body, this teacher used a chart showing parts of the body, with the title, 'Our body'. Lisia is asked to identify the 'head' on the chart brought closer to her. She struggles to reach out to the chart and touches a boy's head in a picture. This implied that she had acquired the vocabulary 'head'.

Real objects like an umbrella and flash cards with pictures and letters were used to teach the vowels. In the second reading lesson, the teacher taught the vowels and the sounds they make. Flashing a card with a picture of an apple with letter 'a', the teacher says, *"/a/ for apple"* and the learners repeat the same. She then flashes it at each child until all of them have had a chance to attempt the same statement. She picks on a card with a steam engine and letter 'E' (capital letter), following the same pattern, she goes ahead to say, "*/e/ for engine, /i/ for ice cream, /o/ for orange and /u/ for umbrella".* All this time, this teacher was using the letter names and not the vowel sounds to teach the vowels.

T8: She used different materials in teaching reading and writing. This teacher used flash cards with letters of the alphabet, chalkboard illustrations, pictures and pupils' books, "The ABC alphabets read, write and colour, by KIE. In lesson one, each learner was issued with a work card with letter 'C' both upper and lower case (C c) and a drawing of a cat and crayons for colouring the drawing.

T9: T9's class had a variety of materials that she used to teach literacy skills. These were flash cards with vocabularies hanging on a word tree, pictures on the walls and charts, plastic and wooden models of letters on trays. This teacher also used the learners' and the teachers' clothes to construct sentences. For instance, '*Look at teacher Momo's (not her real name) dress, her dress is blue".* This sentence was used to introduce the word **'her'.** Another sentence was, "Munzi *is a boy.* ***'His'*** *shirt is white and blue. He is not she. We use* ***'he'*** *because he is a boy. We use* ***'she'*** *for Jena".* She made use of the materials on display and those available in the environment to teach learners the pronouns.

Classroom observations revealed that not all the 9 teachers brought materials to class and used them to teach reading and writing. For instance, in all the literacy lessons observed in

T3's class, there were no other materials used during the reading and writing lessons apart from the course book, New Primary English book 3 and chalkboard illustrations.

Teachers' use of Scaffolding

Different scaffolds were observed in the 9 teachers' literacy lessons. These were prompting, and teacher modelling,

Scaffolding by prompting: Different forms of prompts were used. Examples were verbal, gestural, physical and visual prompts, which were used by the teachers differently.

T2: An example was observed during the first oral reading lesson when T2 moved closer to Linsa's desk to help her pronounce the word 'bucket'. The teacher asked her, "Say /b/, /a/, /ba/; 'bucket'. Linsa repeated the single and blended sounds as demonstrated on phoneme segmentation. The word 'spoon' was also taught the same way as the teacher engaged Linsa in pronouncing it correctly sound by sound and blending of sounds phonetically to produce the words as, '/s/ /p/ /oo/ /n/ ; /s/ /sp/ /oo/ /n/ , 'spoon"; /p/ /l/ /a/ /t/, *"Plate*". This helped Linsa to pronounce the words correctly.

T8: This teacher used verbal prompts too. For example, in her second lesson, this teacher wrote the capital letter 'C' on the chalkboard and below it, the word 'Cat' and asked learners to identify what letter 'C' stands for. When they failed to do so, T8 produced the sound made by a cat, *"Mew",* and Tabia shouted out in Kiswahili, *"Paka"* (*Cat)* then the teacher said*, "C for Cat", and* the whole class repeated the statement.

Gestural prompts: In one of the reading lessons, T1 asked a learner to read a word on the chalkboard. The word was 'fingers'. The learner had difficulty reading the word 'fingers'. *T1 then gestures to him by showing the learner her fingers in a beckoning motion,* to prompt the

learner to associate the teacher's actual 'fingers' with the word written on the chalkboard. The learner then responds in Kiswahili and says, *"mkono" (hand).* The teacher shakes her head and shakes her fingers, again then she says, *"Finger". "Good, but we read this word* (*pointing with a pointer) as fingers because they are many".* She shakes her fingers at the class and says*, "Say, fingers".* They repeat the word, in chorus*, "fingers"* as they imitate the beckoning motion with their fingers.

Physical prompts: This entails physical assistance to a learner. An example was observed in one of the lessons in T5's class, when Timi was asked to write the word 'calf' on the chalkboard. He was shaking quite a lot. T5 then went and held his body to steady him up. He managed to write the word 'calf' shakily. Teffi's hand was held by the teacher to write the words '*bag' and 'box'* on the chalkboard. During the individual activity, T5 held Teffi's wrist to write the word '*child'* three times in her exercise book. Hand-over-hand writing with the teacher's hand on top of Teffi's provided assistance with drawing letters to produce the words.

This was also observed when **T7** steadied a child's head and touched his mouth while saying, *"Mouth",* during the teaching of parts of the body. Another child who was not able to touch his head was assisted to touch it. The co- teacher went to him, held his hand and placed it on his head. He was excited and the teachers clapped for him while saying, *"well done, well done, try again another day,* '*watoto hawa ni wazuri sanaaaa'*(these are very good children)!"The physical assistance was teacher-mediated.

In some instances, teachers combined several forms of prompts. An example was observed in **T3's** class. In one of the reading lessons, T3 drew a picture on the chalkboard and asked Linta to name it. As she struggled to respond, T3 used verbal and gestural prompts with Linta. Pointing at a sketch drawn on the chalkboard, she asked, "*Judu, what is that?* Judu

struggles to say, and then the teacher mediates using Kiswahili, "*Hata siku moja niliona mama alikuletea* (there is even a day I saw mum had brought it to you)," she said. This made Judu very excited. She made some vocal sounds as her body movements became exaggerated, quick and jerky as she uttered the word *'c--c--ca--ke'* (cake) with all her strength and slurred speech; dropping from her sitting position on the floor and banging her head on the floor. The teacher had used Judu's past experience and the picture to relate to the new word.

Scaffolding by Teacher modelling

Six teachers were observed using this strategy as presented in subsequent paragraphs.

T1: This teacher demonstrated to the learners during the reading lesson by touching and naming parts of the body through a song, "*Head shoulder knees and toes, knees and toes knees and toes, head shoulder knees and toes, eyes ears, mouth and nose".* This was done at the end of the first lesson as a summary of the words taught. In the second writing lesson observed, T1 demonstrated to the learners how to write the patterns of letter 'r' and 'n', the task that she later assigned Tieni and Jaba to perform. In the other lesson, T1 demonstrated an action while saying a sentence using the new word, 'leg': "*I am swinging my leg". What is the teacher doing class*?" The learners were prompted in answering, "*The teacher is swinging her leg,"* in unison.

T2: In **T2's** class, this was observed in the second reading lesson. T2 asked learners to read the new words written on the chalkboard. To prompt, them he asked, *"What do we use when we are washing?"* A learner says *"/Shop/"* Then he says, *"Shop 'ama' (or) soap?"*He writes "soap' on the chalkboard and tells the learner, "*We say /s/ /o/ /p/", 'soap' not 'shop'*. He does not explain the difference between the two words further. Instead, he continues to introduce

the rest of the items one by one as learners identify them and the words are written on the chalkboard.

T3: In this class, T3 was observed using demonstration in her lessons. For example, in one of the reading lessons,T3 tried to echo back what the other learners had said in answering the question on sounding out the vowels '/a-a-a/; /*e-e-e/; /i-i-i*/ and asks everybody to sound out the vowels as, /a/, /e/, /i/ /o/ /u/ in unison.

T4: In one of the literacy lessons, T4 wrote on the chalkboard 'Aa Bb....Zz as she said aloud, "Capital **'**A' small **'**a' Bb Cc Dd Ee', and learners repeated after her. She then instructs them in Kiswahili, *"Ukifika mwisho wa kuandika, unaruka laini mmoja na kuja chini hapa (*pointing at the lower line) *na kuendelea kuandika"* ("When you reach the end of your writing, you skip one line, you come down here (pointing) then you continue writing"). She then continues to write as the class reads out the letters aloud in unison.

T7: In T7's class, teacher modelling was observed in both lessons. In the second reading lesson, teaching the vowel sound **/a/**, she mimicked the munching of an apple to introduce the association of the letter, picture with the word 'apple'. T7 also demonstrated covering herself with an umbrella to teach the word 'umbrella', as a word that starts with letter 'u' that gives a vowel sound. She said, *"if it rains, we use umbrella".* With the umbrella and the flash card, she goes to each child, tries to cover herself and the child, shows the flash card and says, ***"/a/ for umbrella".*** Teaching vocabulary for different parts of the body was also observed when T7 demonstrated it to the whole class.

T8: Modelling was observed in the first lesson when this teacher wrote letter 'C', both upper and lower cases on the chalkboard. She told the learners, *"let us draw it in the air"*. She motions writing of the letter in the air while facing the learners as they do the same.

Tabia uses her left hand, writes **'Ɔ'** facing the opposite direction, following the teacher's hand movement. She realises her mistake then changes to her right hand and does it correctly, as **'C'.** The teacher then says, "'C' *for cat"*. She draws a cat on the chalkboard then asks the learners, "*Who is this?" "Cat", they repeat. "Tabia, who is this"? "Cat", she says.* Modelling helped the learners see how to shape letter 'C'.

Teachers' use of Differentiation

Only 4 out of the 9 teachers observed differentiated their instructions during literacy lessons. **T3:** It was also observed in one of T3's reading lessons where she initiated different activities for learners in her class. Learners were engaged in a writing exercise, which was a follow up activity after the oral reading. The teacher engaged the learners in a dictation exercise, where they listened to the words dictated and wrote them in their books. During this class activity, Judu who could not write due to spasticity of the finger muscles was asked to pronounce the words after the teacher. These were: *gate /gāt/, fade /fād/, rake /rāk/, tale /tāl/, bake /bāk/.* She repeated the words with slurred speech. Although these were two different activities, the concept remained the same for all the learners.

T5: During the whole class activity in one of the writing lessons, learners copied sentences and filled in blanks written on the chalkboard. Individual tasks were assigned to Timi and Teffi. They were assigned writing tasks on work sheets to copy in their exercise books. Timi was engaged in drawing and labelling of a mug, glass and a plate while Teffi was given a plastic mug, jug and a steel plate to draw in her exercise book. These were based on the new words taught and read orally.

T8: During the writing lesson, the learners were engaged in writing the first four letters of the alphabet while Brany was engaged in colouring the space in letter 'D' and Tabia practising writing letter "D" severally.

T9: During the writing lesson, learners were engaged in writing in their exercise books. Munzi's work was written on a slate with a piece of chalk, and he used a mouth stick to point at the missing letters to be used in filling in the blanks. Another learner also has a slate and a piece of chalk. He utters out the missing letters in each word with unclear speech as T9 writes his choices on the slate. The other learners use their exercise books and pencils to write.

Teachers' use of Peer support

Only 3 teachers used peer support. These were T3, T5 and T6. Examples of the lessons observed are presented.

T3: When asked to identify a picture, Linta in **T3'**s class tried to respond to the teacher's question "*The words have refused to come out. Who can help Linta?"* says T3. One of the learners volunteers and says, *"Cake*". Linta is then asked to repeat it and she says with slurred speech, *'c-a-k-e'*. In another reading lesson, T3 asked the learners, "*Can somebody make for me the sound made by this letter (writes letter 'b' on the chalkboard)*?" The teacher asks individual learners to attempt. "*Yes, Stanley",* says T3. He tries but can't sound it. "*Yeah, he can't make it. Somebody to help him",* says T3.The assistance accorded was verbal.

T5: In T5's class, this was observed in one of the reading lessons when Teffi was asked to read single words from sentences on the chalkboard. The teacher asked her to point at words on the chalk board. *"Teffi, can you point for us the word 'child'*?" said T5. Teffi points at the word 'sun'. *"Oh! She has pointed at this word (pointing at the word sun)". "Can you read*

*this word for Teffi?"*T5 asks the class. The class reads, *"Sun",* twice as directed by the teacher. She also pointed at the word *'child'* and asked the class to read it aloud for Teffi.

T6: The teacher used a peer to assist her understand Jerro's communication during oral reading. Jerro raised his hand to respond to the teacher's question. He said something with slurred speech, but the teacher did not get it in the first instance. She therefore sought the assistance of Jerro's peer. She turned to his peer for help instead and asked, *"What is he saying?"* The peer said, *"Blood".* This was observed once in the class of T6. In this, the peer mediation was to help the learner say Jerro's response clearly for the teacher.

Teachers' use of Individualized adaptations

Individualized adaptations cut across the content, literacy activities and materials that teachers adapted for individual learners with CP in their classrooms. Five teachers were observed using this strategy as presented.

T1: The teacher adapted a pencil for Tieni. This learner has weak grip that makes it difficult for her to write using the normal slim-size pencils.

T4: This teacher adapted pencils for the two learners in her class, Korry and Koddy who have weak grasps. The pencils they use are thickened with a sealing tape wound around it to make it large enough for the learners' grip.

T5: T5 too adapted a pen for Timi. She made it thicker by winding a sealing tape at the point where Timi holds. Teffi used a normal pencil with no modifications on it though she has a problem holding it and so she kept on repositioning it with her left hand to hold it in place. In another oral reading lesson, Teffi identified words on the chalkboard through pointing as she was asked by the teacher and learners read aloud for her because she has speech difficulty. This was adaptation of the response option for Teffi.

T6: This teacher adapted the pens for Jeffi and Terri. They both use adapted pencils thickened with sealing tape for firm grip. They use the normal ruled exercise books like the rest of the classmates.

T7: T7's level one class had the response options adapted. In this class, Lizia and Mimi do not write but respond only verbally. Other learners used actions, for instance, touching the head when asked to say the word '*head'.*

T9: In this class, Individualized adaptations were observed. For example, one response option was through eye gaze by Munzi who did not have speech. In the second reading lesson, while the rest of the class copied the words taught in their exercise books, Munzi was assisted by T9's co-teacher to write the exercise on a slate by filling in the gaps. He could not write using his limbs due to spasticity. The co-teacher did the writing as Munzi chose the letters by gazing and pointing with a mouth stick. The co-teacher then wrote Munzi's choices, both correct and incorrect answers as chosen. Jena was also assisted by T9 to write in her exercise book. She used an adapted pencil thickened for her weak grasp. She was also given more time to do the exercise since she takes longer time to write a word, due to uncoordinated movements of the hands and she uses the left hand to write.

4.3.6 Cross case analysis of the results of Mediated instructional strategies used by the 9 teachers to teach literacy skills to learners with CP

The analysis was conducted across the 9 cases on the use of mediated instructional strategies used by each teacher to teach literacy skills to learners with CP as shown in the matrix on Table 14.

Table 14: Teachers who used and those who did not use Mediated Instructional Strategies to teach Literacy Skills to Learners with Cerebral Palsy

Mediated instructional strategy	Teachers who used mediated instructional strategies	Teachers who did not use mediated instructional strategies	Cross - case analysis
Direct teaching	All teachers	None	*All the nine teachers used direct instruction with other strategies*
Repeated reading	T3,T4, T5,T7, T8 & T9	T1, T2, T6	*Six teachers used repeated reading*
Peer support	T6, T5, T3	T1, T2, T4, T7, T8, T9	*Only three teachers enlisted the help of peers*
Collaborative teaching	T6, T7, T8 & T9	T1, T2, T3,T4,& T5	*Only four teachers used collaborative teaching.*
Scaffolding by: - Prompting - Teacher modeling	All teachers	None	*All the nine teachers used prompting; six teachers used teacher modeling to scaffold*
Peto strategies	7, T8 and T9	T1, T2, T3, T4, T5, &T6	*Only three teachers used Peto strategy.*
Use of artifacts(tools and materials	All teachers	None	*All the nine teachers used artifacts/materials*
Differentiation	T3, T5, T8,T9	T1, T2, T4,T6 & T7	*Only 4 out of 9 teachers used differentiation*
Individualized adaptations	T3, T4,T5,T6,T7,T9,	T1, T2, T8	*Six teachers adapted materials and content while three did not.*

Source: Field data (2013)

Direct instruction, was used by all the participants; similarly, use of artifacts and scaffolding strategies were used by all the participants. T9 used the most number (6) of strategies combined with direct instruction followed by T3, T7 and T8 who each used 5 strategies. The teachers who used the least number of strategies were T1 who used three strategies and T2 who used two strategies. Teachers who used scaffolding, artifacts, differentiation, and individualized adaptations combined with direct teaching were T3, T5, and T9. In these classes, the teachers had their learners read and write. The rest of the teachers did not combine these strategies.

The first objective examined the types of mediated instructional strategies used by teachers in literacy acquisition among learners with CP. Results on types of mediated instructional strategies used by teachers to teach learners with CP were derived from the responses analyzed from the teachers' questionnaires and the observations conducted in the classrooms. Bigge and Best (2005) observe that, since severity of cerebral palsy varies greatly from child to child they require programs that encompass individualized adaptations and differentiation of the classroom learning tasks and exercises. This implies that mediating their learning which can cut across all other disciplines is necessary.

Results from observations and informal interviews are in agreement with the quantitative data on use of artifacts/materials, scaffolding by prompting and individualized adaptations as used more by the teachers while differentiation and Peto strategies used by few as revealed by both sources of data. On the other hand, peer mediation was higher in frequency as depicted by the quantitative data (Table 12) and lower in frequency in qualitative data (Table 13 and 14). This indicates that the teachers who indicated the higher frequency could have been biased and did not wish to expose their inadequacy in the use of peer mediation.

It is also significant to note that differentiation registered similar results from quantitative and qualitative sources as used by fewer number, 28, (43.1%); 4, (44.4%) of teachers. It implies that teachers were not differentiating literacy instructions yet given the unique learning needs and learning styles, cerebral palsied learners require teachers to embrace and use differentiation to enable them acquire literacy skills. At the same time, both data sources established that the least used mediated instructional strategies by the teachers was the Peto strategy which registered 15 (23.1%) responses from the questionnaires and 3 (33.3%) from observation, as shown in Table 12 and Table 13. This could imply that teachers were either uncomfortable using differentiation and Peto strategies to teach literacy skills to learners with

CP, or they were not knowledgeable enough on how to use them. Ignorance was seen as playing a part in teachers' knowledge on differentiation as a strategy since it registered the low frequency in both the qualitative and the quantitative results.

The results also show that all the 9 teachers observed used direct instruction to teach literacy skills, in both the reading and writing lessons while the quantitative results show only 38(58.5%) teachers who used it. Direct instruction involves explicit, systematic, teacher-directed instruction (Child Trends, 2007). Literacy skills should be taught using the principles of effective instruction which involves combining direct instruction with application in the context of meaningful and motivating reading and writing activities (Light, McNaughton & Mayer-Johnson, 2012). This study is in tandem with Light et al (2012) because the teachers observed combined direct instruction with application in the context of meaning as was indicated and observed presented in their literacy lessons. However, in the current study, the teachers combined direct instruction with mediated activities that were not included in the older study by Light *et al* (2012) study. Where teachers used mediated strategies combined with the direct instruction, learners with CP learnt to acquire reading of the new words and associated them with their meanings.

The study by Hirn, & Park (2012) was on use of Teacher –mediated strategies, which was based on inclusionary practices with learners with EBD in typical classrooms. Their study established that teacher-mediated strategies were successful with these learners. Pyle, P., Pyle N, Lignugaris-Kraft, Duran & Akers (2016) on the other hand, carried a study on peer-mediated interventions (PMIs) and they examined the academic effects with English language learners (ELLs) in kindergarten through Grade 12 in terms of study characteristics, the effects on academic outcomes, study quality, and overall effectiveness. Their study revealed that, overall, PMIs with ELLs are associated with medium to large effects on

measures of phonemic awareness, vocabulary, and comprehension when compared to teacher-mediated comparison conditions.

The current study is in line with those by Hirn and Park (2012) and Pyle *et al*. (2016). They looked at two areas of mediation, teacher–mediated and peer-mediated strategies which provided positive results. These were separate studies that considered each of the mediated techniques separately. The current study, however, covered both the teacher-mediated strategies and the peer-mediated strategies in a combination of mediated instructional strategies that highlighted both the teacher and peer mediated strategies with learners with CP.

The study by Hirn and Park (2012) examined inclusionary practices with EBD learners while Pyle *et al*. (2016) studied academics with English language learners in kindergarten through Grade 12. Both studies, however, used other learners while the present study used learners with cerebral palsy. At the same time, Hirn and Park were not specific on the grades, while Pyle, *et al* covered kindergarten through to grade 12, just like the present study. The present study relates more with Pyle *et al*. (2016) on grades used in the study since it also covered grade 1 to 8 and both were on academics. Their study revealed the effects on measures of phonemic awareness, vocabulary, and comprehension when compared to teacher-mediated comparison conditions. The present study was on mediated instructional strategies used by teachers on academics but on literacy acquisition among CP learners. The other studies were on intervention using peer and teacher mediated strategies and evaluation, while the present study was on acquisition of literacy skills using both peer and teacher mediated strategies.
These studies were on learners other than those with cerebral palsy. This study examined peer-mediated interventions and they focused on academic achievements. Just like the study by Hirn, & Park (2012) on teacher-mediated instructional strategies, Pyle *et al*. (2016)

focused on English language learners. However, none of these two studies dealt with literacy acquisition yet literacy has a lot to do with academic achievement. The present study examined the types of mediated instructional strategies used in relation to literacy acquisition among learners with CP.

The study by Hirn and Park is more in line with Obinga and Kochung (2011) which used strategies that were more of teacher mediated than peer mediated. It established that teachers individualized the teaching strategies in teaching reading to suit learners with CP. The current study is in tandem with Obinga and Kochung (2011). The current study also established that teachers used individualized adaptations for literacy instruction just like the two latter studies. Obinga and Kochung (2011), however, focused on only one aspect of mediation of individualized adaptations of instructional strategies and the learning environment while the current study focused on wider aspects of mediated instructional strategies. At the same time, the current study covered a larger population of all grades in the primary school and used mixed methods design while Obinga and Kochung's study was based on the lower primary grade 3 only and was a multiple case study. Therefore, the current study examined more mediated instructional strategies that were not part of Obinga and Kochung (2011). The current study established that majority of teachers used artifacts, scaffolding by prompting, collaborative teaching, and individualized adaptations which they combined with direct instruction to teach acquisition of literacy skills to learners with CP. According to Vygotsky; "good instruction is aimed at the learner's zone of proximal development" (Vygotsky, 1986 as cited in Dixon-Krauss, 1996, p.14). In addition, choosing and using the strategies appropriately also matters as Mike (1995) outlines that one of the factors identified as a hindrance to literacy acquisition is overreliance on individual instruction. The findings are also in tandem with the other studies that have observed that, in a classroom of learners with

special needs, it is vital to choose instructional strategies that would address learners' individual literacy needs (Bigge, Best and Heller, 2005; Dixon-Krauss, 1996).

4.3.7 Analysis of the teachers' use of mediated instructional approach in instructing learners and the teachers' training in methods of teaching literacy skills

The study further established the relationship between teachers' use of mediated instructional strategies and training in the methods of teaching literacy to learners with CP because some of the strategies were used more frequently than the others, as highlighted in Table 15.

Table 15: Use of mediated instructional strategies by teachers trained in methods of teaching literacy skills (n=65)

Type of mediated instructional strategy	Teachers using strategy (n = 65) (f)	Number trained in methods
Direct teaching	38	20 (30.8%)
Repeated reading	39	27 (41.5%)
Peer support	45	30 (46.2%)
- Cooperative	43	27 (41.5%)
learning	28	17 (26.2%)
- Flexible grouping		
mediation		
Collaborative teaching	41	28 (43.1%)
Scaffolding by:		
- Prompting	47	28 (43.1%)
- Teacher modeling	29	19 (29.2%)
- Shaping	23	18 (27.7%)
Peto strategies	15	11 (16.9%)
Use of artifacts (tools and materials)	46	30 (46.2%)
Individualized adaptation	47	27 (41.5%)
Differentiation	28	17 (26.2%)
r - value	0.469	
P - value	0.0001	

Source: Field survey (2013)

The results showed that there was a moderate, positive, significant relationship between use of mediated instructional approach and the training in the methods of teaching literacy (r =

0.469, N=65, P = 0.0001). Therefore, it means that, with training, there is an improvement in the use of the approach. The training adds value to the use of the mediated instructional strategies. It implies that the greater the number of trained teachers in mediated instructional strategies, the higher the frequency in the use of the strategies and a positive increase in literacy skills acquisition among learners with CP.

On the other hand, there were some other important strategies in which teachers were trained but the results show that few teachers used them to teach literacy to learners with CP. These were differentiation, 28, (43.1%) and Peto strategies, 15, (23.1%).This could imply inadequacy in using these strategies though the teachers were trained. It could also mean that the teachers lack the resources.

4.3.8 Analysis of variance (ANOVA) used to establish variations in the number of strategies used in teaching with the training in physical disability

When a one way ANOVA was used to establish variations in the number of mediated instructional strategies used by the teachers to teach learners with cerebral palsy with the teachers' training in physical disabilities, the result showed that there was no significant difference ($F = 0.037$, $P = 0.848$) because the value was greater than $p=<0.5$. Teachers who were trained in physical disabilities (mean number of strategies used 7.24 ± 0.61) did not significantly differ in the number of mediated instructional strategies used from those who had no training in physical disabilities (mean 7.17 ± 0.43). Therefore, there is no significant difference between the trained and untrained teachers in physical disabilities in the number of mediated instructional strategies used as illustrated in Figure 4.3.

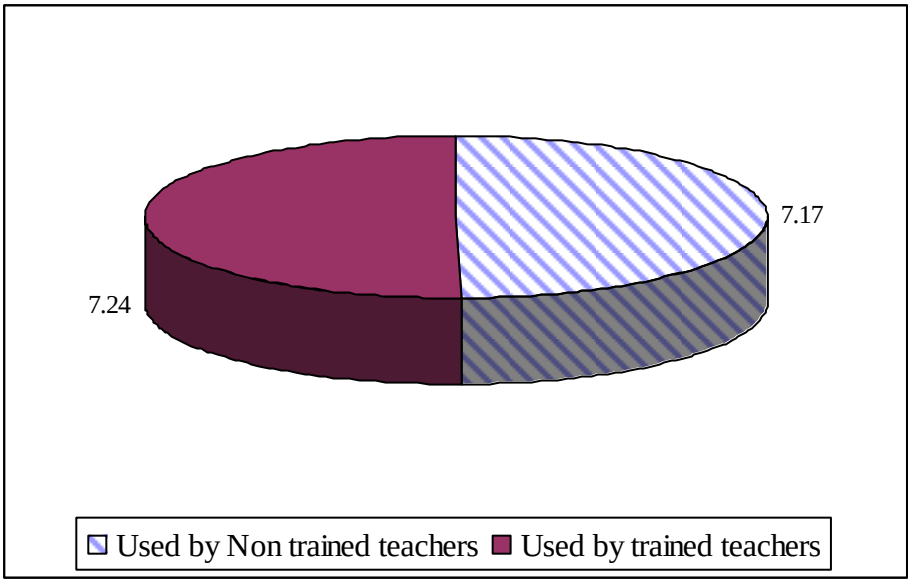

Figure 4.3: Number of mediated instructional strategies used by teachers trained and those not trained in physical disabilities

This result means that, even though both the trained and untrained teachers used the mediated instructional strategies, their training did not have an influence on the number of strategies chosen for mediating acquisition of literacy skills by learners with CP. It also did not add value to literacy acquisition among learners with CP because learners still experienced literacy difficulties.

In her study, Heller (2001) asserts that apart from the disability, literacy success of learners with CP may further be hampered by inadequate instructional strategies, lack of instructional adaptations, and inappropriate use of assistive technology. The present study agrees with Heller (2001). It could be that other factors were at play, namely inappropriate use of the strategies or wrong choice of mediated strategies that do not address individual literacy acquisition needs of CP learners. It was important to examine how teachers use the mediated instructional strategies with CP learners during literacy lessons. This helped explain why these learners were not able read.

4.3.9 The level of teachers' training in special needs education

The study established the level at which the teachers of learners with CP had trained in Special Needs Education and results are shown in Table 16.

Table 16: Teacher's level of training in SNE

Teachers' level of training	Frequency	Percent
Masters	5	7.7
Undergraduate	26	40.0
Diploma	27	41.5
Certificate	6	9.2
Total	64	98.5
Non committal	1	1.5
Total	65	100.0

The highest level of training of the teachers was at Master's level and the lowest at Certificate level. The highest number of teachers, 27, (41.5%) were holders of Diploma in SNE. This followed closely by Undergraduate level, 26, (40.0%) and the least number, 5, (7.7%) was Masters level. The study further established the variations in the number of mediated instructional strategies used by teachers in teaching with their training levels in Special Needs Education.

4.3.10 Analysis of variance (ANOVA) used to establish variations in the number of strategies used in teaching with their training levels in Special Needs Education

The number of mediated instructional strategies used by the teachers to teach learners with cerebral palsy and the teachers' training levels in Special Needs Education were established and the data was analyzed using ANOVA as presented in Table 17.

Table 17: Number of items of mediated instructional strategies used by teachers trained in special needs education

Level of training in special needs education	Mean number of items ± Standard error
Masters	4.50 ± 2.36
Undergraduate	8.25 ± 0.72
Diploma	6.85 ± 0.52
Certificate	7.50 ± 1.54

Results from Table 17 indicate that there was no significant difference (F = 1.832, P = 0.152). Teachers who were trained in special needs education at Masters level (mean number of strategies used 4.50 ± 2.36), those who had undergraduate (mean 8.25 ± 0.72), those who had Diplomas in Special Needs Education (mean 6.85 ± 0.52) and those who had certificate in Special Needs Education (mean 7.50 ± 1.54) were not significantly different in the number of mediated instructional strategies used. Therefore, level of training had no significance on the number of strategies used by the teachers. This could have been determined by other factors such as teaching experience, attitude, or age which were not the focus of this study. It would be important to establish the influence of these factors on the number of mediated instructional strategies used by the teachers to teach literacy acquisition to learners with CP.

The Other mediated instructional strategies the teachers used were;

i) **Drama and poetry; Singing and memorization**

   These are aspects of both direct teaching and Peto strategies.

ii) **Skill adaptation; adapted teaching aids** helps the learners deal with writing difficulties like in spastic cases, the writing materials like pen should be handled firmly by increasing its thickness

These strategies teachers used are aspects of individualized adaptations of the skills and materials for learners with CP.

iii) Physiotherapy; fine motor exercises

Physiotherapy is part of collaborative teaching where the teacher works in collaboration with the physiotherapists to help exercise the learners' muscles.

4.3.11 Duration of using mediation strategies in instructing learners with cerebral palsy

The study established the duration in which teachers had used the mediated instructional strategies with Cerebral Palsied learners as depicted in Table 18.

Table 18: Duration in which Teachers used Mediation Strategies to Instruct Learners with Cerebral Palsy

Use of mediation strategies	No. of teachers (f)	Percent (%)
Below 1 year	9	13.8
1 – 2 years	14	21.5
3 – 4 years	14	21.5
5+ years	25	38.5
None committal	3	4.6
Total	65	100

The information on Table 18 shows that majority (25 (38.5%) of the 65 teachers had used mediation strategies in instructing learners with cerebral palsy for more than 5 years, followed by 14 (21.5%) teachers who had used the strategy for between 1 – 2 years and another14 (21.5%) had used the strategies for between 3 – 4 years while 9 (13.8%) teachers had used the strategy for less than one year. Those who declined to indicate the duration during which they had used the strategies were 3 (4.6%) teachers.

The result means that more than half, 53, (81.5%) of teachers had good experience for they had had more than a year's duration in using mediated instructional strategies to teach learners with CP. This shows that they had practiced for a longer duration of time and could use the strategies with CP learners efficiently.

4.3.12 Reasons for use of mediated instructional strategies that were provided by the teachers

Teachers provided reasons for using mediated instructional strategies in teaching learners with CP. These were:

i) Assist the learner to understand and comprehend easily; it is for the learners to master what they have been taught and stick in their mind

ii) More often given the condition of the learners they need a lot of interaction with the teacher and fellow learners and this method gives them the opportunity to express themselves.

iii) It imparts more skills as opposed to non-mediated approach especially when a learner experiences speech difficulties and the motor problem hence the learner is able to appreciate the learning.

iv) When teaching learners with cerebral palsy, support is mostly needed due to their condition

v) The method is very effective and efficient, easy to memorize and faster method.

vi) It is best and the most effective method learners also do a lot of peer tutoring thus enhancing learning.

vii) It is appropriate for the learners and make them understand and retain what they have learnt.

viii) It enhances acquisition of literacy skills by learners since learners with cerebral palsy have challenges that wouldn't let them participate and master concepts unless they are supported.

ix) It often used because it is based on need to need basis, subject to subject matter and content at hand.

x) It is the best and most effective and appropriate method because there is always a mediator during the instructions.

xi) Learners are able to memorize concept, learners develop abilities for reading and writing skills, involves a lot of practice appropriate for learners.

xii) It's most appropriate, assist the learners to understand and comprehend easily example learners learning scope.

xiii) Rarely used because of availability and flexibility of time and people involved

The responses imply that teachers were aware of the mediated instructional strategies and they were using them with CP learners, even though some hinted that they rarely used them. Teachers also appreciated the use of mediated instructional strategies as a means of teaching literacy skills to learners with CP and that mediation helps learners with CP acquire and master concepts readily due to the support that they give them.

Based on the use of the strategies, the teachers provided information why they were using mediated instructional strategies with learners with CP as presented. Even though these sentiments were given in the questionnaire, the observed information revealed otherwise. The types of mediated instructional strategies used were appropriate; however, their usage varied among teachers as some used them inappropriately to teach literacy skills to learners with CP.

4.4 Strategies used in literacy skills acquisition by children with cerebral palsy in special schools in Kenya

The second objective of this study was to determine the strategies used by learners with cerebral palsy to acquire literacy skills in schools for the physically handicapped in Kenya. To achieve this objective, learners were observed on several literacy lesson activities of reading and writing. This was intended to determine the strategies they use in acquiring

literacy skills in special primary schools for the physically handicapped. The results of the reading and writing strategies are summarized in Table 19, 20, 21 and 22.

4.4.1 Reading strategies used by learners with cerebral palsy in acquiring literacy skills

Eighteen learners were observed during literacy lessons to establish the reading strategies they use to acquire literacy skills. Data was obtained through video recording and field notes. Multiple responses were observed and recorded as indicated in Table 19.

Table 19: Reading strategies used by learners with cerebral palsy (N=18)

Reading Strategies learners use	Frequency (f)	Percentage (%)
One word reading	3	16.6
Guess work	3	16.6
Rote reading	2	11.1
Association with picture/object experience	11	61.1
Association with sound experience	2	11.1
Association with gesture experience	2	11.1
Selective reading	1	5.5
Use of inner voice and eye gaze	1	5.5

Source: Field data (2013)

Out of the 18 learners observed, majority, 11(61.1%), used association with picture/object experience as a reading strategy in acquiring reading skills; 3(16.6%) of them used guess work and another 3 (16.6%) used one word reading strategy. Association with sound experience, association with gesture experience and rote reading were each used by 2(11.1%) pupils. It is only the use of selective reading strategy and use of inner voice with eye gaze which registered the least, 1(5.5%) of pupils in each. In total, 8 different reading strategies were observed and recorded as used by learners with cerebral palsy.

Studies conducted by Smith (1992) and Dahlgren-Sandberg (2007) on literacy among learners with CP indicated that learners with CP experience reading difficulties. These

children often have additional impairments that can limit their literacy experiences. However, they did not reveal the strategies used by learners with CP in literacy acquisition as this was not their focus. In contrast, the results of this study show a total of 8 different strategies used by the 18 learners with CP in acquiring reading skills. There were multiple responses observed in which some of the strategies were used by more than one child, or a child used more than one strategy during literacy lessons as shown in Table 19.

The results from observation during reading lessons depict association with picture/ object and experience as the strategies used by most learners with CP in reading skills. Over half of the learners observed, 11(61.1%) out of 18(100%) used these strategies (Table 19). Tudge and Scrimsher (2003) note that Vygotsky was not only interested in what more knowledgeable others brought to the interaction, but also in what the child himself or herself brought to the interaction, as well as how the broader cultural and historical setting shaped the interaction. This notion is in line with what the current study has revealed. The learners use their experiences as a strategy of acquiring literacy skills. They relate their experiences with the objects and pictures to the words and letters.

Spear-Swerling (2006) analysis of use of context cues in reading assert, that when children encounter an unfamiliar word in reading, they may make use of context cues, that is, information from pictures or from sentences surrounding the unknown word. His study relates to the findings of the current study since learners with CP also use visual scaffold to read letters, words or sentences. Pictures or objects displayed act as visual supports for which learners associated with the words to read. There was association of words and letters with pictures or objects. This study is in tandem with the research by Tinzmann *et al* (1990) that revealed that successful learning also involves an interaction of the learner, the materials, the

teacher, and the context. This implies that learners with CP use association paired with experience to acquire reading skills.

Apart from the visual support, there were others who seemed not to be sure of what they were reading. Instead, they depended on words they had heard their peers read. This was as a result of experience, based on what they had encountered before, even if they were not relevant to the words being read. This strategy was treated as 'guess work'. Afflerbach, David Pearson and Paris (2008) in their study on reading skills and reading strategies stated that some strategies are simply incorrect ideas about reading, such as guessing a word based on its initial letter. Learners in this current study read based on the letters or words already in their repertoire. They were actually not reading but guessing. Afflerbach et al further contend that the actions are indeed strategic. They connect specific means to specific goals but they are inappropriate and ineffective for reading. The study confirms the observation by Spear-Swerling (2006) that heavy reliance on contextual cues is ultimately undesirable, because the child guesses rather than attend carefully to all the letters in the word.

Other learners with CP read without attaching meaning to what they read. They engaged in "rote reading". Although children may be capable of naming letters in a robotic-like, rote memorization manner, they may fail to acquire the long-term goal— an understanding of how the letters function for reading and writing and the ability to use what they know to make sense of the print in their environment (Strickland & Riley-Ayers, 2006).

Even though Dahlgren- Sandberg (2007) revealed that children with Cerebral Palsy with severe motor problems and unintelligible speech had difficulty acquiring literacy skills, this does not mean that they are incapable of acquiring literacy skills. The learners who participated in this study had significant speech difficulties including those without speech, whom this study revealed were capable of acquiring literacy skills. A study conducted in

America by Smith (2014) on literacy challenges and intervention for CP children revealed that neither the presence of CP nor limited speech intelligibility necessarily prevents these children from learning to read and write. Munzi, a grade 3 pupil without speech in T9's class used non-verbal approach, which was treated as "inner voice" to read the new words with the teacher's scaffold. This showed that learners with CP without speech are capable of acquiring reading skills. This confirms the study by Heller *et al*. (1999), in which three students used this approach in conjunction with a Direct Instruction reading program over a school year to learn how to read (Heller *et al.*, 2002 cited in Swinehart-jones & Heller, 2009).

Asbell, Donders, VanTubbergen & Warschausk, (2010) in their study on predictors of reading comprehension in children with Cerebral Palsy and typically developing children revealed that within the group with cerebral palsy, there was an indirect effect of functional expressive ability on reading comprehension, mediated by phonemic awareness. The findings of this study from observation of strategies used by learners with CP in reading acquisition agree with the findings of Asbell et al., that learners with CP rely on sound experience (Table 16). Just like in sounding out letters of the alphabet, displaying cards of letters that make a word provide visual support to help the student hold the sounds in memory (Light & McNaughton, 2012). Another strategy that was used by learners to acquire reading was treated as 'selective reading'. Instead of reading the whole sentence, the learner selects and reads only words they find easier to read in a sentence. The results point to the association with picture, object and experience as the major strategy used by the learners with CP. It indicates that, without these scaffolds, learners with CP are not able to read the letters, words or sentences. This implies that they rely so much on support that has affected their independence as readers. Instead, they have developed overdependence on scaffolds. This has affected their reading ability, which leads to limitation in literacy skills. This dependence on visual support, gestural or auditory scaffolds has therefore affected their acquisition of

literacy skills expected of their grade levels. Learners with CP use association paired with experience as a strategy of acquiring literacy skills that they have become dependent readers as opposed to independent readers. Learners with CP use inappropriate and ineffective strategies of guess work, rote reading and overreliance on association with picture/objects that have hindered their acquisition of literacy skills. There should, therefore, be multi-strategies in literacy acquisition.

4.4.2 Writing Strategies used by learners with cerebral palsy

This was obtained through observations conducted during the writing activities. The techniques used by learners in writing have been described in Table 20 and 21.

Table 20: Writing strategies used by learners with cerebral palsy (N=18)

Writing Strategies learners use	f	%
Use of a mouth with a stick, eye gaze and teacher's support	1	5.6
Use of Hands	14	77.7
Do not write, use verbal responses with teacher's support	3	16.7
Total	18	100

Source: Field data (2013)

Out of the 18 learners with CP observed, 14 (77.7%) use their hands to write, 1(5.5%) learner uses the mouth and teacher's support to perform writing activities while 3(16.66%) learners do not write. They instead depend on verbal responses with the teacher's support.

The learners were also observed in terms of the usage of the strategies to perform the writing tasks, the pencil grip and gliding of the pencil on paper, amount of pressure exerted on the

paper/book/slate and the writing materials to perform the handwriting skills. Different styles of pencil grip and styles of writing are summarized for each learner in Table 21.

Table 21: How learners with CP write

What learners use	Pencil Grip	Writing skills	f	%
Use of a mouth stick , eye gaze	Holds the stick tightly with the lips	Arranges blocks/models of letters to write complete words	1	5.6
Use hands	Grasps the pencil with all the fingers	-Writes one letter at a time with pauses -Pressing pencil on paper -makes strokes on the paper(one student)	3	16.6
Use of hands	Grasps pencil between the fourth and the little finger	One letter at a time with pauses -Pressing pencil on paper	2	11.1
Use of hands	Grasps the pencil with thumb and index finger	One letter at a time with pauses -Pressing pencil on paper	4	22.3
Use of hands	Grasps the pencil with thumb and index finger; wrist bent towards the body	Writes slowly, one letter at a time. Shakes a lot - Strained handwriting	1	5.6
Use of hands	Grasps the pencil with Index and third finger and the thumb	One letter at a time with pauses -Pressing pencil on paper	3	16.6
Use of hands	grasps between the fourth and the little finger and rests it on the wrist at the base	Writes one letter at a time.	1	5.6
Verbal	Used verbal responses	Selects what to be written through the teachers' scaffold	3	16.6

Source: Field data (2013)

Out of the eighteen learners observed, 14 of them use hands to perform writing tasks, out of which 7 grasp pencils with unusual pencil grip. One learner depends on the mouth stick and three depend on the teacher's scaffold.

4.4.3 Handwriting skills of learners with cerebral palsy

Table 22 outlines individual performance in handwriting skills as observed during the writing lessons.

Table 22: Progress on the Handwriting of learners with cerebral palsy

G	Name of learner	Legibility	Shaping of letters	Spacing of words	Others
1	Jaba	Slightly legible but strained	Decipherable	Not well done	Applies a lot of pressure
	Tieni	Illegible	Can shape letters though some letters are reversed	Very little spaces between the words	Reversed letters 'b' as 'd'; 'e' as ∂
2	**Boby**	Illegible	-Problems with shaping letters	Crowded work	Makes strokes on paper that are not clear. Not mastered motor memory
	Linsa	Legible	Good shaping	Scattered handwriting	Exaggerated size of the ascenders in relation to other letters in a word, strained
3	**Judu**	Does not write	-	-	-Depends on verbal responses
	Linta	Legible	-Shapes well	Good spacing	Difficulties mastering letter formation. With scaffold, writes well
1	**Korry**	Displays messy handwriting	Not well shaped	Does not space words	Presses pencil on paper. Shakes a lot while attempting to write
	Koddy	Slow Messy handwriting.	Not well shaped	Does not space words correctly	Does not write on a straight line.Applies a lot of pressure
2	**Timi**	Legible	well shaped	Spaces words Correctly	Applies inappropriate pressure to the paper
	Teff	Illegible	No clear shapes	Widely spaced	Shows a tendency to use whole hand to write. Not mastered writing skills
3	**Jeffi**	Legible	Shapes well	Good spacing of words	Tried shaping the letters in a word as instructed and modeled
	Jerro	Slightly legible	Some letters cannot be identified	Irregular spacing of words	Applies a lot of pressure on the paper
1	**Mimi**	Does not write	-	-	Verbal responses
	Lisia	Does not write	-	-	Verbal responses
2	**Brany**	Legible	Largely shaped but crooked	Widely spaced	Difficulty writing on a straight line
	Tabia	illegible	Not well shaped	Words widely spaced and not easy to decipher	Struggles with the pencil grasp
3	**Munzi**	Uses a mouth stick to arrange models of letters	-	Able to space the words using block of letters	Uses models or co-teacher assists in writing his choices
	Jenna	Legible	Decipherable	Good spacing	Writing along the ruled lines is still a challenge. Has mastered writing skills

Source: Field data (2013)
Key: G =Grade

The 18 learners observed were from three different schools with 6 from each school, taught by 9 different teachers. Table 22 shows the learners' progress in handwriting skills as observed during the literacy lessons which show the legibility and illegibility of their handwriting skills. It also shows 3(Munzi, Lisia, Mimi and Judu) learners who were unable to use their hands to write but depended on either verbal responses and /or mouth sticks to write their responses (Table 21 & 22). The results show 8 out of the 18 learners with legible handwritings while 4 had illegible handwritings. At the same time, 4 learners who were not capable of writing were able to use alternative methods to the use of hands. The three used verbal responses while one (Munzi) used a mouth stick and wooden and plastic modeled letters on his slate (Table 21 and 22).

The results show the three learners who were not able to use their hands to write progressing well through verbal responses. Munzi was using either the teacher's verbal response or an alternative mode such as models of letters to form words as instructed. This is an indication that even learners with CP who cannot use their hands can learn how to write using alternative methods or means. It is also evident that learners from some specific grades in one school (T7, T8, and T9 classes) had mastered the writing skills while others were still struggling with the writing skills (T1, T2, T3, T4, T5 and T6 classes).

Various studies have provided evidence that children with CP are vulnerable to difficulties in learning to read and write due to the disability (Dahlgren-Sandberg, 2006; Smith, 1992; Hay and Fielding-Barnsley (2009). Even though they have difficulties with motor abilities, Learners with CP are capable of engaging in writing activities, depending on the strategies they use as revealed by this study. Out of the 18 learners observed, 14 (77.7%) of them use the hands to perform handwriting skills. This is a clear indication that these learners have the ability to use their hands to write, even with the co-ordination difficulty noted. The challenge

is that the coordination that has been observed and the trembling as seen in some of them, affects precision when it comes to positioning the book and placing a pen on the paper or the exercise book to write (Appendix I & J).This finding agrees with the findings of Wairimu (2015) that some learners with CP tremble a lot. This trembling interferes with coordination of task performance. Moreover, the weak muscles affect pencil grip.

At the same time, one learner, 5.5% was found to have spastic CP which has affected his hands and legs. This makes it difficult to use the limbs in grasping a pen/pencil (Table 20, 21 and 22). In line with this view, El-Maksoud, sharaf & Rezk-Allah (2011) assert that an individual with cerebral palsy may have difficulty with fine motor tasks, such as writing or cutting with scissors. However, this learner (Munzi) with quadriplegic CP has learnt to use his mouth with an aid of a mouth stick to perform writing activities. This is one of the alternative ways of writing that is adapted to suit an individual child's needs. This confirms the assertion by Kirk *et al* (1997), Hallahan (2011) and Bigge *et al* (2005) on the use of augmentative and alternative methods which can be adapted to individual learners with CP. It also confirms the use of differentiation of the writing tasks.

Learners with CP experience difficulties with motor ability. Some children with CP demonstrate poor hand function due to spasticity in the wrist and finger flexor (Mehl-Madrona, 2001 as cited in El-Maksoud, sharaf & Rezk-Allah, 2011). Spasticity in the flexor muscles of the upper limbs tharefore poses a great deal of functional limitation in the hands. The rest of the learners, 3(16.6%) observed were not engaged in physical writing activity. Instead, they depended on verbal responses (Table 20; Appendix H). This implies that learners with CP who could not physically engage in writing depended on verbal responses and teachers' scaffolds to perform their writing tasks. This shows how teacher engagement in adaptation of instruction assisted the learners in literacy acquisition in several ways. It is

evident that differentiation of writing tasks was initiated depending on the different strategies that learners with CP used. The study therefore reveals that in literacy acquisition, learners have strategies to use, but overdependence on teachers' scaffold has hindered their independence in reading and writing skills.

4.5 Teacher Competence in using mediated instructional strategies in teaching literacy among learners with cerebral palsy

This was to address the third study objective, which sought to examine teacher competence in the use of mediated instructional strategies in teaching literacy skills to learners with cerebral palsy. In examining teacher competence, information was obtained from several sources such as questions from the questionnaire that related to training in the use of mediated instructional strategies that the teachers were to respond to. Classroom observations were done during literacy lessons to cater for the shortcomings of the questionnaire survey so as to provide valid evidence of what teachers do (Hall & Harding (2003) and; a reference from literature sources on meta analyses of studies that gave the indicators of effective teachers of literacy, that were adopted and adapted by this study as indicators of teacher competency.

4.5.1 Training in methods of teaching literacy skills (reading and writing)

Out of the 65 teachers sampled, 38 (58.5%) had trained in methods of teaching literacy skills to learners with cerebral palsy, while 27 (41.5%) had not trained as depicted in Figure 4.4). however, 45 (69.2%) had taught literacy skills to learners with cerebral palsy. This showed that, 12 (46.2%) of the 65 (100%) teachers had taught literacy skills although they were not trained on it (Table 23).

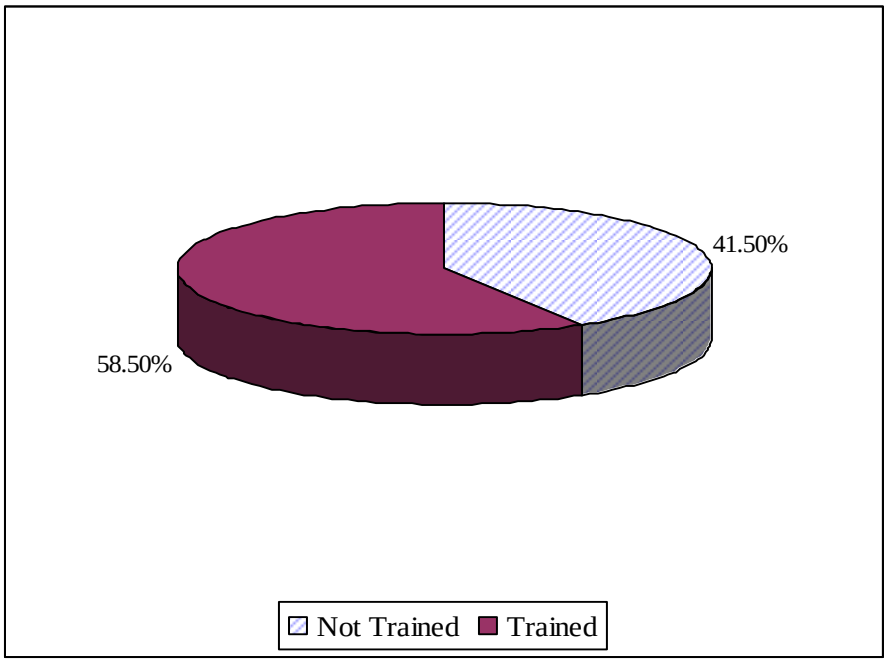

Figure 4.4: Teachers trained in methods of teaching literacy skills

A number of teachers, 12 (46.2%) out of the 27 (41.50%), who had not trained in teaching literacy skills were actually teaching it to learners with CP.

The study further sought to establish the teachers who were trained and teaching and those who were not trained but were teaching literacy skills to learners with C P. The results were as shown in Table 23.

Table 23: Teachers trained in methods of teaching literacy skills with the teaching of literacy skills to learners with cerebral palsy

	Had taught literacy skills to learners	**Had never taught literacy skills**	**Total**
Trained in methods of teaching literacy skills	33(89.2%)	4(10.8%)	37(100%)
Not trained in methods of teaching	12(46.2%)	14(53.8%)	26(100%)
χ^2- value	13.857		
P –value	0.001		

NB; two of the teachers were none committal and did not indicate having taught literacy skills. Chi value tested at $P \leq 0.05$.

The result showed that, teachers who trained in methods of teaching literacy skills significantly taught literacy skills to learners with cerebral palsy ($\chi 2 = 13.857$, $P = 0.001$). Among the teachers who were trained in methods of teaching literacy, 33 (89.2%) had taught literacy skills while only 4 (10.8%) had not taught them (Table 23). This implies that majority of the teachers who taught literacy skills to learners with CP had trained in methods of teaching it.

There are many competencies beyond teaching of literacy skills competencies which teachers of languages must possess, for example, balancing the strategies, organization of the literacy environment and combination of more instructional strategies to integrate the literacy skills. This study depicts the kind of competencies a teacher should posses. The competencies included here are the knowledge and skills critical to a teacher's role as educator (American Federation of Teachers, National Council on measurement in Education, National Education Association, 1990). This relates to the current study since teachers of learners with CP who teach literacy skills should posses these skills. Stronge, Tuker and Hindman(2003) assert that teacher certification enhances effectiveness so long as teachers are assigned to teach in the field of preparation. The findings of the current study are in tandem with these findings but not entirely because 27(41.5%) teachers with a percentage of 41.5% had not trained in teaching literacy skills to learners with CP, yet they taught them. It is therefore important to establish the staffing norms for teachers in schools for learners with CP.

4.5.2 Number of teaching strategies teachers use in teaching literacy skills to learners with CP

The study further established the number of mediated instructional strategies used by teachers to teach literacy skills to learners with CP. These included the subtypes, which gave a total 14 mediated strategies as shown in Table 24.

Table 24: Number of strategies used by the teachers when teaching learners with CP

(n = 65)

No. of teachers (f)	%	Number of mediated strategies used
3	4.6	0
5	7.7	1
1	1.5	2
2	3.1	3
5	7.7	4
9	13.8	5
4	6.2	6
5	7.7	7
5	7.7	8
3	4.6	9
4	6.2	10
6	9.2	11
9	13.8	12
3	4.6	13
1	1.5	14

Table 24 shows that teachers used a combination of the fourteen strategies asked in this study. One teacher (1.5%) had used a combination of fourteen mediated instructional strategies to teach learners with Cerebral Palsy. Most of the teachers 9 (13.8%) used 12 strategies or 5 strategies to teach; 3 (4.6%) of the teachers combined thirteen to teach; 6 (9.2%) used eleven strategies, 4 (6.2%) used ten strategies, 3 (4.6%) used nine strategies, 5 (7.7%) used nine and a similar number used eight, four or one strategy to teach literacy skills. Hall and Harding (2003) revealed the use of strategies to meet the needs of learners' literacy abilities. Even though the teachers gave the indication of having used the stated number of strategies as used to teach learners with CP, it is difficult to judge their competency by

depending on their own individual judgments of their competence in using mediated instructional strategies to teach literacy skills. This is due to the exaggerations that are likely to be exhibited by the respondents in research. Observation of how they combine these strategies was therefore necessary to establish their competence.

4.5.3 Combination of mediated instructional strategies used by the teachers

Teachers used mediated instructional strategies in different combinations to teach acquisition of literacy skills to CP learners as shown in Table 25.

Table 25: Combination of strategies used by the teachers when teaching learners with CP (n = 65)

Number of teachers(f)	%	Combination of mediated strategies used (f)
3	4.6	0
26	40	1-6
23	35.4	7-11
13	20	12-14
Total 65	100	14

Teachers used different combinations of the strategies examined in this study as depicted in Table 25. A few, 3(4.6%) teachers used none of the mediated instructional strategies as they did not indicate any, while a combination of 1-6 strategies was used by 26 (40%) teachers; a combination of 7-11 strategies was used by 23(35.4%) teachers, while a few number, 13 (20%) teachers used a combination of 12-14 mediated instructional strategies.

To establish the teachers' competence in the use of mediated instructional strategies to teach learners with CP, those teachers who used 7strategies and above (50% and above) were

considered competent while those who used 6 (4.6%) and below were incompetent as depicted in Table 26.

Table 26: Teachers competency in use of mediated instructional strategies (n = 65)

Competency	f	%
Not competent	29	44.6
Competent	36	55.4
Total	65	100

The teachers' competency based on the fourteen tested items on mediated strategies used was established by scoring out of the 14 items. Teachers who used 50% or more of the items (7 – 14 items) scored 50% and were regarded as competent while those who used below 7(0 – 6 items) were scored less than 50% and were not competent. Based on this scoring, the study established that 29 (44.6%) of the teachers were not competent in using mediated instructional strategies while 36 (55.4%) of the teachers were competent.

Children with cerebral palsy have different learning styles and learning needs just like other ordinary people or those with other special needs and the strategies may vary according to individual needs of children in a classroom situation (Heller, Fredrick & Diggs, 2000). This current study confirms that teachers use a variety of instructional strategies. To confirm this finding further, an observation of nine teachers' literacy lessons produced similar data on teacher competence.

Results from observation are presented in Table 27, 28 & 29, and in descriptive form to clearly show teacher competence in using mediated instructional strategies in teaching literacy skills to learners with CP. The analysis focuses on teacher's ability to skillfully blend these approaches in different combinations according to the needs of individual pupils with cerebral palsy. This involved observations on how teachers balanced mediated instructional

strategies, the integration of modes of language, pupil engagement and instructional density, classroom management skills, positive literacy environments, the teaching style namely blending scaffolding and differentiating. It also shows how teachers used them and the appropriate choice of the strategies for the content and skill taught as summarized in Table 27. The table shows the mediated instructional strategies teachers combined with direct teaching approach.

Table 27: Teachers' choice of mediated instructional strategies according to literacy skills taught to learners with cerebral palsy

Teacher	No. of strategies f(%)	Combination of MIS used	Skills taught	Appropriateness / relevance to skill area
1	3 (33.3%)	Scaffolding, artifacts, reinforcements,	Reading vocabulary, phoneme segmentation and blending, writing exercise	Relevant to skill area
2	3 (33.3%)	Scaffolding, use of artifacts, repeated reading	Vocabulary, oral reading, writing exercise	Relevant though erred in the use of artifacts
3	5 (55.6%)	Scaffolding, reinforcement, use of artifacts, differentiation, repeated reading	Reading comprehension, dictation, vocabulary, sentence construction	Relevant to skill areas
4	4 (44.4%)	Scaffolding, reinforcement, use of artifacts, repeated reading	Reading and writing , vocabulary	Relevant to skill areas
5	5 (55.6%)	Scaffolding, differentiation, reinforcement, use of artifacts, repeated reading	Reading and writing vocabulary, sentence construction	Relevant to skill areas
6	5 (55.6%)	Scaffolding, reinforcement, collaborative teaching, use of artifacts, repeated reading	-Reading comprehension - Handwriting skills	Relevant to skill areas
7	6 (66.7%)	Peto, scaffolding, reinforcement, use of artifacts, collaborative teaching, repeated reading	-Oral reading - vowel sounds -letter identification -vocabulary	Relevant though with some mistakes on usage
8	6 (66.7%)	Peto, scaffolding, reinforcement, artifacts, differentiation, collaborative teaching	Oral reading, letter – sound correspondence -the vowels	Relevant to skill areas
9	7 (77.8%)	Peto, scaffolding, differentiation, reinforcement, collaborative teaching , artifacts, repeated reading	Reading and writing of three- letter words spelling	Relevant to skill areas

Source: Field data (2013)

Each of the 9 (100%) teachers observed used more than a single teaching strategy between 3 to 7instructional strategies as highlighted in Table 27; out of which some of the teachers used a combination of more than two strategies in a lesson. T9 combined the most number (7, (77.8%) of mediated instructional strategies followed by T7and T8 who combined 6 (66.7%) each; T 3, 5 and 6 combined 5 (55.6%) mediated strategies, while T4 used 4(44.45) mediated strategies. T1 and 2 used the least (3, (33.3%) number of mediated instructional strategies. in teaching literacy skills to learners with CP. This finding means that the teachers who used more (5-7) number of strategies were competent as they scored above 50%. These teachers were considered competent since they varied the mediated strategies used to meet the individual literacy needs of learners with CP in their classes.

A teacher should be knowledgeable about different learning styles in order to use the approach best suited for a particular child with CP. This should be based upon that child's learning abilities as well as physical abilities (National Dissemination Centre for Children with Disabilities, 2010). This was not observed in all the teachers as some used the same strategies for all the learners as homogeneous pupils.

The 9 teachers were also observed based on the competency skills adapted from the literature reviewed on effective teachers of literacy, from Hall and Harding (2003). The results show how teachers used the mediated skills during teaching of literacy skills. These were in terms of:

i) Balance of mediated instructional strategies
ii) Integration of modes of language in literacy lessons
iii) Pupil engagement and instructional density during literacy lessons
iv) Organization of the literacy environment
v) Literacy learning atmosphere

vi) Teaching style (blending scaffolding and differentiating)

4.5.4 Individual teachers' competence in the use of mediated instructional strategies in teaching literacy acquisition to learners with cerebral palsy

The results from observations on individual teachers' competence are presented thematically as follows:

Balance of mediated instructional strategies

T1: During the observations, **T1** used a combination of visual and gestural prompts and artefacts in a reading lesson. An example is when she asked Jaba to read the word '*head'.* This teacher was able to combine scaffolding and direct teaching approaches to teach reading of the vocabularies.

T2: T2 used both the scaffold such as prompts, demonstrations and artefacts; and direct teaching during the teaching of the new words and repeated reading exercise from the pupils' text books most of the time he used prompting. T2 scaffolded learners' reading difficulties by continuously prompting individual learners. For example, in the oral reading lessons where the learners were engaged in reading a story from their course books, he kept on prompting each learner's attempts to an extent of reading whole sentences then individual learners repeating after him. This teacher did not use differentiation and other mediated instructional strategies other than scaffolding by prompting and demonstrations and use of artifacts.

T3: T3 used a combination of prompts, involving visual supports, demonstration and repeated reading when teaching reading to learners with CP. T3 supported learners' attempts at reading vocabularies and passages. In the lessons observed, T3 taught oral reading where learners learnt the vocabularies, read passages through repeated reading and reading in turns. Spelling was integrated through dictation of words to be written during the literacy

lessons. T3 used both phonics and whole word approaches while writing was also based on the stories read. For example, in one of the reading lessons, T3 engaged Linta in phoneme segmentation during reading of the word *'cake'*. She also taught reading and writing using the direct method.

T4: The teacher used prompts in the reading and writing lessons. She used these mediated instructional strategies with direct teaching. A lot of prompts were used, for instance in reading the words '*brown', 'white', 'yellow',* during the reading lesson. The teacher also used items that represented the colours such as yellow, red and blue files, brown skirt, black handbag and a white paper. The learners who could not read the words in isolation depended on the coloured items to read the words. They were able to associate the colours with the words. Others named the items instead of the colour, or used *Kiswahili* instead of reading the word in English.

T5: T5 used direct teaching method together with prompting and artifacts in reading and writing lessons observed. For instance, in the first reading lesson, she directly taught reading of sentences where she prompted individual learners' reading attempts.

T6: This teacher used direct teaching method with different scaffolds such as verbal and physical prompts. For example, in the reading lesson, she prompted the learners in reading the passage about "Dressing can be dangerous", on page 74 of New English Primary book 3. She read for Jeffi, "*Ouch! My leg",* a phrase he could not read at first. She also collaborated with a co teacher in teaching handwriting skills.

T7: She used Peto strategies with all her learners with CP and involved Lisia and Mimi in rhythmic repetition of reading the vowels. T7 also taught using direct teaching method but used Peto strategies more. She dwelt on rhythmic intentions in teaching literacy skills, and collaborated with the co teachers in assisting the other learners to respond to her instructions.

She also used prompts, for instance, T7 steadied a child's head and touched his mouth while saying, *"Mouth",* during the teaching of parts of the body.

T8: The teacher taught reading and writing directly. She used collaborative strategy with her co teacher, and used different prompts. An example was observed in the first lesson when she drew a sketch of a cat on the chalkboard to teach the word representing letter 'C'. Use of materials in reading and writing lessons was observed. T8 focused more on Peto strategies, by repeating more on the concepts taught previously.

T9: T9 engaged her co-teacher in prompting the rest of the learners in reading by repeating with them the new words taught. She taught the new words directly and demonstrated them. Materials were also used. This teacher used varied mediated instructional strategies within each literacy lesson observed.

Integration of modes of language (Integrating reading and writing activities) in literacy lessons

T1: T1 taught both reading and writing skills in single lessons. There was no separate lesson for either reading or writing. T1 engaged the learners in talking by repeating phrases or sentences with actions. For instance, in the second literacy lesson, learners were engaged in pointing at a learner and saying, *"Dodo is touching his head"*. In another instance, she introduces another word, '*Thumb'.* She asks learners, *"Show me your thumb"* while learners respond by showing their thumbs and saying,*"This is my thumb".* Individual learners were asked to spell the new words on the chalkboard. For instance, the words*, 'eyes, leg and hand'* were attempted by different learners.

T2: This teacher taught reading and writing in the same lessons. He first taught reading then engaged the learners in a writing exercise in the two lessons observed. The concepts taught in the reading lessons were reinforced in a writing lesson. He also engaged them in talking during oral reading by answering oral questions. For instance, in the first lesson, asking them

to identify the artifacts and state what they were used for. He asked learners*," What is this?''* Learners responded*, "It is a broom".* He asks, *"What is it used for?"It is used for sweeping",* the whole class responds. He engaged his learners in a talking and writing exercise.

T3: Reading and writing were taught separately by T3. In the first lesson observed, T3 taught oral reading of vocabularies and she involved individual learners in writing/spelling of the new words on the chalkboard. In the second reading lesson, T3 engaged the learners in discussing the words taught previously, they discussed the pictures in the books on the passage before reading the passage. They answered comprehension questions based on the passage read.

T4: The teacher taught reading and writing in separate lessons. She engaged learners in reading the new words orally in the first lesson. She also engaged the learners in talking about the items and spelling of the new words. An example was when T4 said, " *Nataka wenye wanakumbuka hizi colours*(*I need those who can remember these colours)".* She then displays the word and a learner identifies correctly. When asked to spell it, she does that correctly as "*w...h...i...t...e", the word is white".* "*Nataka Kody a spell the word brown"("I want Koddy to spell the word brown")*. T4 involved the learners in talking about the new words on colours and associating them with the items. An example was when, she introduced '*brown'* and *'black'* as new words using her handbag (black) and skirt (brown). T4 asked the class to identify an item, which Grace named in *Kiswahili* as *"Kibeti*" (handbag). This teacher mixed the languages during the English language lessons. She used both English and Kiswahili language and her learners did the same.

T5: Reading and writing were taught in single lessons. T5 did not teach writing skills separately from the reading lessons. In all the lessons observed, writing was handled as a follow-up of the reading lessons. This was meant to either copy down the vocabularies read orally or complete sentences using the new words taught. She also engaged the learners in

reading and talking about the sentences on a chart. For instance, after reading aloud in unison, she says, *"Now I want Timi to come and point for us the sentence which says 'the girls are playing'".* *"Timi can you come and point for us the sentence which says, 'the girls are playing'?"* He does it correctly. *Class, can you read for Timi the sentence?"* asks, T5 then the whole class reads. She then asks, "*Timi, can you point at the sentence which says 'Our teacher is dancing'?"* He again does it correctly and the class is asked to read the sentence for him.

T6: In this class, reading and writing were taught separately. She engaged the learners in oral reading of both the vocabularies and a passage. T6 also engaged the learners in talking about the story before and after reading. For instance, she asked Jeffi, "*What can you see in the picture Jeffi?"* He answered with slurred speech, "*I can see a man falling down".* T6 integrated the aspects of language in her lesson to help learners grasp the meaning of words, actions and sentences.

T7: The teacher attempted to use phonetics in teaching reading, as well as look and say method. This was observed in the second lesson where she taught the vowels. She used letter names instead. These were, /a/ for apple, she picks on a card with a steam engine and letter 'E' (capital letter), following the same pattern goes ahead to say, "*/e/ for engine, /i/ for ice cream, /o/ for orange and /u/ for umbrella".* All this while, T7 is using the letter names and not the vowel sounds. Learners did not engage in any writing activity. The teacher did all the writing on the chalkboard and used flash cards to show how the vowels are written. This teacher engaged learners in talking and acting out the words and statements.

T8: This teacher taught reading and writing as integrated skills in the same lessons. Learners were engaged in oral reading of new words and repetition of sentences using new words. An example was in the second literacy lesson where the learners were engaged in reading the

letters ‘A, B, C and D’ and reciting the items that they stand for as, *“‘A’ for apple; ‘B’ for ball; ‘C’ for cat, ‘D’ for dog.”* No spelling activity was observed in this class.

T9: The teacher taught reading and writing in the same lessons. She engaged the learners in oral reading and talking about items and activities in the classroom. An example was when she asked the class, “*Who is there at the door?” Who is that? (Pointing*) and the learners responded by saying, *“Teacher Momo”.* Writing activities were also conducted based on the new words and sentences taught.

Pupil engagement and instructional density during literacy lessons

T1: In both the reading and writing lessons observed, learners in T1’s class, both with and without CP were involved in the lessons. The observation targeted oral reading and writing exercises. For instance, in both the first and second lessons, T1 involved the learners in repeated reading of the new words and sentences using the new words learnt for between 10 to 15 minutes before engaging them in a writing exercise. She could call out names of individual learners to take part in either the demonstrations or writing on the chalkboard.

T2: The teacher engaged his learners during oral reading of the new words. He asked individual learners to identify items as he taught oral reading of the vocabularies. They did this in turns. He only engaged learners who raised their hands. This was also observed during the reading of the passage. Linsa raised her hand and was accorded the opportunity to read the word *‘spoon’*. The teacher taught reading and writing skills in the first and second lessons for 15 and 20 minutes and gave out work for learners to do collectively or individually for the remaining 15 and 10 minutes respectively. He therefore spent most of the time teaching.

T3: Learners in T3’s class were kept busy throughout the literacy lessons observed. For example, in the first reading lesson, each child was engaged in either identifying a new word on the chalkboard or reading aloud. During the reading of the passage in the second reading lesson observed, T3 involved all the learners in whole-class reading, she first read as they

followed silently from their New Primary English text books then engaged them in repeating aloud what she read from the passage. Her teaching lasted between 15 to 20 minutes then the remaining 10 minutes were meant for the learners to do the exercises.

T4: This teacher kept the learners busy in all the lessons observed. In the first lesson on new words, learners read from flash cards and identified the colours for the words. For example, T4 asked the class, *"We have another colour here, who can read it?"* A learner reads it as *'white'*. Another learner is asked to read the next word and she reads it as, *'yellow'*. The class is asked to repeat the word *'yellow'*. During the writing lesson, the learners were engaged in singing the ABCD song, "*ABCD ni ngumu sana wee! Siwezi kukumbuka, ewe mama ewe baba unisaidie!"* (ABCD is very difficult, I cannot recall, oh! mother, oh! father, do help me!). While pointing at the letters on a chart, they read from A to Z in unison before engaging the whole class in the writing exercise. Reading lessons lasted 25 minutes of engagement with the learners while writing lessons took 15 minutes of pupil's individual work.

T5: In T5's class, learners were engaged in either reading words, sentences as individuals and as a class. For instance, in the first reading lesson, learners read sentences from a chart as the teacher pointed at each sentence. Individual learners performed the reading tasks, identified items to correspond with the vocabularies taught and writing tasks that were individually performed. T5 kept her class busy throughout the 30 minutes period for each literacy lesson. In the literacy lessons observed, teaching was conducted for 15 minutes then the remaining 15 minutes was allocated for individual tasks and teacher's support to the few individual learners; and marking and correcting each learner's work.

T6: The teacher involved the learners in the reading and writing lessons. For instance, in the reading lessons observed, the learners read the passage from their text books first in unison

then individually as others followed from their text books. Pupils were involved in 20 minutes of reading and 25 minutes of writing exercise.

T7: In the first lesson observed, the first twelve (12) minutes were spent in greetings. Then the teacher went on to introduce the lesson. Learners were kept busy throughout the lesson by repeating after the teacher words, sentences and actions to go with the words and sentences. Those who were not able to perform were assisted by the teacher.

T8: In T8's class, the first 7 minutes were utilized in greetings and other pleasantries in a rhythmic fashion while standing up. This was followed by 10 minutes of teaching. In this class, not much work was observed in terms of intensive teaching. In the remaining minutes, learners were kept at task in writing individually as the teachers corrected their work. Each lesson lasted 30 minutes. The teacher taught the same concept in the two lessons observed, letters 'A B C and D', and the words and items with the same letter names. Writing was also based on the same letters.

T9 taught her learners together with the co teacher. The learners were engaged in oral reading and writing exercise. Each and every learner participated in the lesson either individually or in groups. Her learners, Munzi and Jenna were able to read and write using different modes. In the first lesson observed, T9 taught the new words as each learner was encouraged to pronounce the word. This was followed by an activity of a writing exercise. The teaching lasted for 18 minutes and in the remaining 12 minutes, the students worked on their individual exercises.

Physical organization of the literacy environment

T1: The class was organized with two large tables at the front, circular arrangement of learners' desks, including those on wheel chairs, at the sides, while Jaba sat on the floor in front of the tables, on a padded mackintosh. Three learners sat at each desk, two learners used

long padded chairs at the tables which they shared with Tieni who used a wheel chair while the rest of the learners could interact during the literacy lessons, Jaba could only interact with the teacher from his sitting position. The classroom displays were few, with charts for various subjects and for languages.

T2: Learners sat in an arrangement almost similar to a 'U" shape but not completely as others had their backs to the rest of the class including Linsa who sat in the middle front. T2's class did not have any classroom displays of reading materials in form of charts, word banks or other reading materials on shelves. The only available reading materials were the basal readers, The New Primary English pupil's book 2 that were seen with the learners.

T3: The teacher exercised control by making sure her learners were involved, including those with and without cerebral palsy. With regards to seating arrangement, the learners sat as a group, where each could see other learners' faces including the teacher. There were few classroom displays that included pictures and charts for both English and other subjects taught to this class.

T4: In this class, learners sat on desks arranged in rows. The classroom was spacious. The three learners who use wheelchairs also sat on desks during the lessons. All the learners sat facing the chalkboard. Another table was placed at the back left of the class where the teacher kept the learners' text books for English-New Primary English Book 1 and their exercise books. She also used the table during the writing lesson, where she sat to mark individual learners' work which was a writing exercise. Classroom displays consisted of used charts of words, pictures and sentences. Charts for other subjects were also displayed on the walls.

T5: In this class, learners sat on desks and three on their wheel chairs. The learners sat in three rows, all facing the front of class where the chalkboard and the teacher were positioned. Classroom displays were observed in this class that consisted of word and sentence charts.

T6: Learners sat on desks, three per desk including Jeffi. The desks were arranged in three rows. Three of the learners used wheel chairs which were arranged beside the desks. There were, however, no charts displayed on the wall. The only reading materials observed in this class were the New Primary English Book 3 text books.

T7: The seating arrangement in this class was a 'U'- shape. Learners and the teachers were thus able to see each other's faces. The space in the classroom was enough for movement by T7 and her co-teacher to reach each and every learner in class. Numerous classroom displays were on the walls and counters along the walls of the classroom. These were books, models of letters, other assorted objects, flash cards, pictures and charts of different types.

T8: The classroom was organized in an interactive seating arrangement where every learner could view other classmates' faces including the teacher. It was organized in a 'U' shape. Classroom displays were missing in this classroom. The available books and some letter cut outs were stored in a cupboard at the back of the class and could be retrieved during the writing activity.

T9: The classroom was well organized. Classroom displays were in different forms. They consisted of picture wall hangings, words and sentences and other reading materials on the shelves. Stringed card words were hanging from strings across the classroom above their heads. Charts and pictures were displayed on the walls all round while books and other objects like models of letters were placed on counters in the classroom. All these displayed reading materials were within the learners' reach. Learners used plinth tables and ladder-back chairs. Learners sat at the sides of the tables facing each other. Three learners, Jenna, Munzi and another learner with CP used wheel chairs and they also sat next to the other learners around the tables.

Literacy learning atmosphere

T1: The teacher exercised control in the literacy lessons. This was observed in all the lessons observed. For instance, in the first lesson, she set the rule straight by telling the learners, *"If you want to read, you carry up your hand. You carry up your hand is when you talk. You don't just talk; you carry up your hand first is when you talk. Sawa sawa (*okay*)?"* They responded by saying, *"Yes".* As the lesson progressed, some learners read a word without being asked to read. T1 reminded the class, *"I said you don't say Teacher, teacher. You must raise up your hand.* This teacher exercised control of her literacy class.

T1 encouraged her learners in the literacy lessons by reinforcing their efforts. For instance, during the reading lesson in one of the lessons observed, T2 engaged Tieni in reading from the chalk board, and she was able to read the word, 'eyes'. T1 said to the class, "*Everybody, clap for Tieni*", and the rest of the class applauded while saying, "*well done! Well done! Try again another day, a very good girl!"*This appreciation made Tieni happy.

T2: The teacher reinforced individual learners' efforts during the literacy lessons. For instance he responded to Linsa by saying, "*Very good*". This was when she read the word, "*Spoon*" correctly. This teacher talked so softly in many occasions. He was also friendly to his learners. There was no harsh reaction observed even when the learners responded wrongly to instructions. Throughout the lessons observed, the learners responded in chorus even when individual learners were given the opportunity to answer questions.

T3: The emotional atmosphere in her class was relaxed. T3 encouraged her learners during reading attempts. She reinforced learners' efforts with words of praise such as "*good"; "well done".* In some instances, other learners clapped for individual learners for correct response. For instance, in the first lesson observed Judu was able to pronounce the word *'cake'* with a slurred speech and the teacher asked the class to clap for her.

T4: In this class, learners were very free with the teacher and they answered teacher's questions voluntarily. T4 appreciated every individual learner's efforts in varied ways. She acknowledged through claps by the whole class, songs of praise and smiles. An example was in a writing lesson where the learners were asked to recite the letters of the alphabet. When they did it correctly, she asked them to clap for themselves as they sang, "*Well done me! Try again me! A very good me! Receive and rejoice!*" This was a relaxed emotional environment.

T5: The teacher encouraged her learners in all the lessons observed. She reinforced the learners' efforts using various modes. She used verbal praises such as "good", and "well done" in the lessons observed. Other words of encouragement to other learners when they made attempts to read were, "*Baddys, just continue, you are on the right track".* To another child*, "John has tried!", "Good!"* said the teacher to one of the learners. Learners enjoyed the words of praise for instance, Teffi danced with excitement when the class clapped and sang for her the 'well done' song.

T6: This teacher rewarded her learners during the reading and writing lessons through verbal praises; examples of which were, '*good',' yes'*. When Jeffi was asked to state what he could see in the picture on the story they were about to read, he said he had seen a man falling down. T6 said, *"good".* The only instance when some of the learners were observed to be anxious was when all of them were asked to stand up and only those who managed to answer questions correctly were allowed to sit down. The rest were expected to remain standing.

T7: T7's class was lively. She interacted with the learners freely together with her co-teacher. Each learner was recognized and called by name to respond to instructions, from greetings to reading. For instance, during the first reading lesson observed, the teacher, teaching parts of the body orally, called out learners by name to respond and each attempt was reinforced verbally. For instance, *"Everybody, touch your head", head". Maria, head; Geogie, head.*

My head, head. Very good!" says T7. *"Look at Jogo's head. Very good officer!, Sonko, your head, shika kichwa".....very good*" .This classroom atmosphere was relaxed.

T8: Learners spoke freely in this class. Teachers and the learners interacted freely. Learners' efforts were reinforced by use of words of praise and clapping. For example, in one of the reading lessons, Branny repeated the word *'Cat'* after the teacher and the teacher responded by saying, *"Very good".* This excited Branny and he emitted some sounds and body movement to show appreciation. The other learners were encouraged to participate and each effort was rewarded by T8 and her co-teacher.

T9: Every learner's efforts were reinforced through words of praise, clapping and singing. For example, she said to Munzi, *"very good!"* This was when Munzi repeated the statement after her*, "my blouse is orange".* There were instances where the learners talked and laughed freely with the teacher. An instance was in the second lesson where one learner refused to allow the teacher to put an "x", a symbol of incorrect in his book. The learner said laughingly while clinging onto his book, "*Hapana teacher! Tafadhali usiweke 'x' kwa kazi yangu, wacha ni rekebishe* uweke *tick* (No teacher! Please, don't put an 'x' on my work. Let me correct it so that you put a tick)." The teacher laughed and said to him in Kiswahili, "*Bogi (not the real name), haya fanya hivyo basi* (Bogi, do that then)*".* The literacy environment was friendly.

Teaching style (blending scaffolding and differentiating)

T1: T1 provided support to her learners as in one instance, to Jaba. This teacher attempted to blend the approaches and used scaffolded methods of prompting with one of her learners. Despite this, most of her teaching time she taught the whole class as a group using direct teaching approaches. She did not differentiate her teaching style, content or even the activities for learners with CP.

T 2 did not blend the approaches to meet the individual learners' needs. All the lessons were taught in the same way and learners were treated equally. There is just one instant when he offered an individual assistance to Linsa during a writing lesson when he moved and sat beside her. But this was just to show her what to write and did not constitute a specific or unique assistance to the learner. Bobby was also not offered any individualized assistance in all of the lessons observed. There were no differentiated objectives, content, activities or materials for individual learners with physical disabilities, including those with CP in his class. Both Linsa and Bobby were engaged in the same activities and used the same materials as the rest of the class. Linsa's pencil was too tiny and seemed to give her a hard time. She encased the whole of it in her hand; and kept on repositioning it while writing (Appendix I). No adaptation was observed in this class. However, he scaffolded learners' reading difficulties through prompting.

T3: This teacher differentiated the writing activities. This was observed in one of the writing lessons during dictation of the words. While the rest of the learners in class were engaged in spelling the dictated words, Judu was engaged in the pronunciation of the words dictated because she could not write. She also scaffolded learners' difficulties during the repeated reading, through prompting. T3, therefore blended her teaching style

T4: The teacher blended the scaffolding and differentiation during her teaching. For example, in the first reading lesson, T4 asked Kody to spell the word *'brown'* and he said '*blue'* instead. T4 said to her, "*Eh! Rudia! Rudia!* (Eh! Say it again! Say it again!), *which word is this* (*displaying the flash card for him to see*)?" *"Brown",* says Kody. "*Okay, spell for me the word 'brown'",* says the teacher. Learners were assigned different tasks. In one of the reading lessons, Kory was engaged in reading the blended sounds, *"/ra/ /re/ /ri/ /ro/*

/ru/; Kody was engaged in the identification of letters per word taught, as the rest of the class read the whole words about colours aloud from their text books.

T5: In this class, the teacher used both differentiation and scaffolding during her teaching of reading and writing skills. Both verbal and physical scaffolds were observed. Examples are when she gave Timi support by physically holding him to help steady him up during the demonstration in writing a new word on the chalkboard; she also physically supported Teffi by holding her hand to write the word *"child"* in her exercise book. They were also assigned different writing activities from the rest of the class. Differentiation was observed in the content taught and in the activities and materials used during the literacy lessons. An example was observed in a writing activity when this teacher gave out artefacts such as cups, plates and jug to Timi and Teffi during writing activity to draw and label as the rest of the class did the writing exercise from their textbooks.

T6: T6 used scaffolding and differentiation during literacy teaching. This was observed during the writing lesson when T6 sat side by side with Jeffi, took his adapted pencil, wrote in his exercise book, then gave him back the pencil and told him to try. She used physical prompts with Jerro during the writing activity by physically holding her wrist to assist her write in her exercise book. In the use of artefacts/materials, T6 adapted a pencil that was used by Jeffi. T6 had wound a thick cellotape round the pencil at the point where Jeffi grasps.

T7: She also used visual supports such as pictures, and the learners themselves. She also engaged in collaborative teaching by having her co-teacher assist learners with CP including Lisia and Mimi, to read the new words. There were no different activities, materials or content taught to individual learners. All the learners were taught using the same methods, same materials and same activities. For instance, learning new words on 'a part of the body', each and every learner was expected to utter/repeat the words after the teacher and touch that

part of the body represented by the word read. In the second lesson on vowels, they were all engaged in repeating the vowel sounds. These were presented in letter names instead. T7 did not blend scaffolding with differentiation in any of the lessons observed.

T8: This teacher used scaffolding. She demonstrated to her learners how to write letter 'C' though in the wrong direction. It was observed that she also used prompts, artefacts and reinforcement of learners' efforts. She attempted to blend scaffolding with differentiation of the learners' writing activities.

T9: This teacher used scaffolding when she collaborated with her co teacher who physically assisted Munzi during a writing activity on his slate. T9 assisted Jenna in a writing activity. T9 also differentiated Munzi's writing activity. This was observed in the second lesson where he used a mouth stick to point at the choice of letters to fill in blanks as the co-teacher wrote his choices of words on his slate while the other learners wrote in their exercise books.

From the classroom observations, it is evident that not all the teachers balanced their mediated instructional strategies, integrated forms of language during mediation, moderated their instructional density during mediation and engaged learners in literacy activities to help them acquire literacy skills. Not all the literacy classrooms were equipped with relevant learning materials and not all the teachers tried to blend their teaching styles, scaffolding and differentiation during literacy teaching.

The study shows that all the 9 (100%) teachers observed tried to make their literacy lessons welcoming, where they encouraged and motivated their learners through words of praise, claps and songs. The result however shows that only 4 teachers blended scaffolding with differentiation. The other 6 teachers did not blend the two strategies during their teaching. They taught literacy skills to learners with CP in the usual general way of teaching other

learners without CP. This implies that, these teachers were either incompetent or have no skills of blending scaffolding with differentiation to teach literacy skills to learners with CP. The indicators of competence on use of mediated instructional strategies by each teacher were summarized and recorded (Table 28).

Table 28: Indicators of teacher competence in use of mediated instructional strategies in teaching literacy skills to learners with cerebral palsy (n=9)

Indicators of teacher competence	Teachers who used the strategy	No. of teachers who used the strategy (f)	%	Teachers who did not use the strategy	No. of teachers who did not use the strategy (f)	%
Balance of strategies	T7,T3,T5,T4, T6,T9	6	66.6	T2, T1,T8,	3	33.3
Integration of modes of language	T1,T2,T3,T5, T4 T6, T9	7	77.7	T8, T7,	2	22.2
Pupil engagement and instructional density	T3, T5, T6,T7,T9,	5	55.5	T1, T2, T4,T8	4	44.4
Classroom management skills	T3, T5, T6, T7, T9	5	55.5	T1, T2,T4, T8,	4	44.4
A positive literacy environment	T1, T3, T5, T4, T6,T9,T7	8	88.8	T2,T8	2	22.2
Blending Teaching style	T3,T5,T6, ,T9,	4	44.4	T1,T2,T4,T7 T8	5	55.6

Source: Field data (2013)

Table 28 shows that half (3) of the mediated instructional strategies registered 5(55.6%) teachers in each of the 3 out of the 6 mediated instructional strategies observed. These were

pupil engagement and instructional density, classroom management skills and blending teaching; styles of scaffolding and differentiation within a literacy lesson. It is also evident that less than half the teachers, 4 (44.4) did not combine these strategies in literacy lessons (Table 28 & Table 29).

The concentration on the use of the mediated instructional strategies was on a positive literacy environment (8, (88.8%). This was followed closely by integration of modes of language (reading, writing, spelling and talking (7, (77.7%) and balance of the strategies of direct teaching of literacy skills and other modes (6, (66.6%). Blending the teaching style was less used by the teachers (4, (44.4%). This means that teachers were not conversant with blending scaffolding with differentiation in teaching literacy skills to learners with CP. It implies that, the concentration was on other strategies while the most important ones like blending and combination of the strategies were not given precedence by the teachers. Among the teachers who taught literacy skills acquisition to learners with CP, there were those who were regarded as competent in using mediated instructional strategies while some were incompetent, as depicted in Table 29.

Table 29: Summary of Teacher competence in using mediated instructional strategies as observed (n =9)

Competency	f	%
Competent	5	55.6
Not competent	4	44.4
Total	9	100

With regards to teacher competence, the main focus was how teachers used the mediated instructional strategies. It also dealt with the number of strategies they used and their ability

to use a combination of mediated instructional strategies in a single lesson taught. All the nine (9) teachers were observed teaching lessons and interviewed informally to clarify some of the areas that needed explanation from their own perspectives.

From the observation of the teachers' reading and writing lessons, it was evident that not all of them were competent in teaching literacy skills. According to Webster-Merriam dictionary (2015), competence is the ability to do something well. It is also a measure of what someone can do at a particular point in time (Smith, 2005). In reference to teaching literacy skills, it is the measure of teachers' ability to teach literacy skills using the mediated instructional strategies.

The teachers, 5(55.5%) who used half of the mediated instructional strategies were the ones considered competent because they were able to combine and blend the mediated instructional strategies according to the individual needs of learners with CP in literacy acquisition. This is in line with Hall and Harding (2003) study that highlighted the indicators of most effective teachers of literacy skills. In the present study, teachers who used less than half, 4 (44.4%) were considered incompetent in using mediated instructional strategies in teaching literacy acquisition to learners with CP as summarized in Table 29.

While the rest of the teachers observed teaching seemed to know what they were doing in using mediated instructional strategies in teaching literacy skills acquisition to learners with CP, T2 appeared shaky and unsure, and T7 seemed to lack the knowhow of teaching reading to beginners. As observed during the reading lesson, T2 taught vocabulary and confused a '*hair brush'* with a '*comb'* while the learners knew what it was, 'a hair brush' as echoed by them when they were asked to identify it. This caused some confusion as he displayed a *hair brush* and insisted that it was a '*comb'*. When teachers are unsure of the concepts they teach young learners, it is an indication that they are not competent in that area. It shows how T2

used artefacts inappropriately. The question that would arise is: “Were the learners acquiring wrong vocabulary?” This explains the retarded literacy skills in learners with CP.

It has also been observed that systematic and explicit phonics instruction improves children's word recognition, spelling, and reading comprehension, and is most effective when it begins in kindergarten or 1st grade (CIERA, 2001; NRP, 2000 cited in Vaughn & Linan-Thompson, 2015). Balancing of the strategies of teaching learners was observed in 5(55.6%) out of the 9 (100%) teachers during the lesson observations in literacy teaching to learners with CP. A teacher should be knowledgeable about different learning styles in order to use the approach best suited for a particular child with CP, based upon that child’s learning abilities as well as physical abilities (NICHCY, 2010). It is also crucial to track the progress of the entire class as they work their way through a sequence of leveled reading tasks during instruction (Preez, 2002). This was not observed in T2’s class in all the lessons observed.

Reading becomes effective when it begins as early as in kindergarten or grade one level. It can also be defective if it is taught inappropriately thereby affecting learners’ acquisition of the correct literacy skills and concepts. This was observed in the reading lessons taught, for example, in one of the reading lessons observed, where T7 taught the vowels using letter names instead of the sounds to level one pupils. The learners with CP repeated what the teacher asked them to repeat several times. Learners repeated wrong concepts until they internalized them. This means that they learnt and acquired the literacy concepts wrongly. This was evident as lack of the skills of teaching literacy skills on the part of the teachers. Though the types of reading difficulties experienced by students are directly related to their speech and language problems (Cats, Gillispie, Leonard, Kail, & Miller, 2002), the literacy lessons observed in T2 an T7’s classes showed that cases of poor reading skills could also be related to teachers’ way of teaching literacy skills. This is in tandem with a study by Peeters

et al., (2009) who observe that children with cerebral palsy with speech or fine motor impairments are disadvantaged in a number of literacy activities. Heller also asserts that their success in literacy may be further hampered by inadequate instructional strategies, lack of instructional adaptations, and inappropriate use of assistive technology (Heller, 2001).

Teachers' competence was also determined in the way teachers chose and executed the different approaches or strategies in teaching literacy lessons to learners with CP. Differentiation was observed to be used in T3,T5,T8 and T9's classes. According to Hardman *et al.* (2005), teachers must use multilevel instruction in which multiple teaching approaches within the same curriculum is adapted to individual needs and functioning level. In this case, multilevel instruction is the differentiated instruction which is designing for diversity (Peterson and Hittie, 2003). This study therefore confirms differentiation as used by a section of teachers to teach literacy acquisition to learners with CP.

It was realized that mediation combined with some form of encouragement, whether verbal or gestural, elicited positive effort from the learners. This is in line with Hall and Harding (2003) that, "*.... effective literacy teachers avoid strict coherence to one approach but rather balance direct skills teaching with more authentic, contextually-grounded literacy activities* (Hall and Harding, 2003, p.3).

Attempts at performing reading and writing tasks by learners with CP led to acquisition of the skills. This was realized in the lessons observed, for instance, in T3 with Linta, T5 with Timi, T8 with Tabia, and T 9 with Munzi. Notably, T9 was considered competent for she was able to balance the strategies in teaching literacy to learners with CP in her class.

Based on the scoring, the quantitative results established that 36 (55.4%) of the teachers were considered competent in the use of mediated instructional strategies. This was also confirmed

by the observational data, which recorded 5 (55.5%) as competent. The data obtained from the two sources are similar, therefore are in agreement. The data obtained from observation shows that the teachers who are competent in using mediated instructional strategies carefully blend them together in different combinations according to individual pupils' literacy needs.

This study agrees with Hall and Harding (2003) on the fact that effective teachers made extensive use of 'scaffolding' and this contributed to the density of their instruction. However, the present study further established that the extensive use of scaffolding did not give the learners room for independent reading abilities. Vygotsky (1978) advocates for necessary assistance that helps a child reach his zone of proximal development. This is also echoed by Rogoff (2003) that being poised to help is the responsive assistance which leaves the pace and direction of children's efforts up to them. Though the teachers used mediated instructional strategies to teach acquisition of literacy skills to learners with CP, they did not fade out the learner support during literacy lessons.

Information obtained from the questionnaires also revealed that 29 (44.6%) of the teachers were not competent in the use of mediated instructional strategies. The data from observation also revealed that 4 (44.4%) of the teachers were incompetent. The score reveals use of less than 5 mediated instructional strategies. The two sources of data were in agreement since they produced similar results. These teachers were considered incompetent because they do not tailor the mediated instructional strategies to suit individual literacy needs of the pupils with cerebral palsy. It implies, therefore, that even though a large number of teachers were competent in using mediated instructional strategies, there existed those who were incompetent, and were contributing to the limitations that learners with cerebral palsy were experiencing in acquisition of literacy skills. This was due to the large percentage (44.6%) of incompetent teachers who teach them literacy skills, using mediated instructional strategies

inappropriately. It is, therefore, important to upgrade the teachers' skills in the use of mediated instructional strategies to teach literacy skills to learners with CP competently.

Teachers who were competent balanced their literacy instruction by using multiple approaches during literacy instruction. This is also in tandem with Sepetys (2013) who revealed that teachers perceived they were better equipped to differentiate after co-teaching. Both general and special education teachers observed their partners and increased their instruction repertoire. This study focused on co-teaching and differentiation which are aspects of mediation that were also used by teachers in the present study. However, Sepetys' study focused more on the teachers of the general classrooms and not those of a specific category of learners with special needs; neither did it focus on a specific academic area. However, it related to teacher competence as it looked into efficacy. Therefore, Hall and Harding (2003) and Sepetys (2013) considered both the general and special education teachers. The present study, however, focused on special needs education teachers who teach learners with CP. While Sepetys (2013) considered only two aspects of mediation, co-teaching and differentiation, Hall and Harding (2003) considered scaffolding and differentiation and how teachers balanced their teaching approaches. The present study is more in line with Hall and Harding (2003) as both studies were on teaching literacy. Hall and Harding established teacher effectiveness in general teaching of reading while the current study established teacher competence in teaching acquisition of literacy skills among learners with CP, using mediated instructional strategies, which was not established by the older studies. The present study therefore established that a section of the teachers who teach literacy skills to learners with CP are competent while another section is incompetent. Therefore not all the teachers who teach literacy acquisition to learners with CP are competent in using mediated instructional strategies which could be a contributing factor to the lack of literacy skills

among CP learners in special schools for learners with physical disabilities in Kenya. There is need for in-service courses for teachers on the use of mediated instructional strategies.

4.6 Constraints teachers face in using Mediated Instructional Strategies to teach literacy skills to learners with cerebral palsy

The fourth objective of this study sought to establish the constraints teachers face in using mediated instructional strategies to teach literacy skills to learners with cerebral palsy. The results show that the teachers notably experienced constraints. These were obtained from the questionnaires, observation and informal interviews. Information from questionnaires is shown in Table 27 and the excerpts that follow.

4.6.1 The number of teachers who faced constraints in using mediated instructional strategies in teaching literacy skills to learners with CP

Teachers indicated the mediated instructional strategies in which they faced constraints when using them to teach literacy skills to learners with CP as indicated in Table 30.

Table 30: The number of teachers who faced constraints in using mediated instructional strategies in teaching literacy skills to learners with CP

Mediated instructional Strategies	Teachers who face constraints (f)	%
Peer support	20	30.8
Collaborative teaching and learning	36	55.4
Scaffolding	40	61.5
Peto strategies	46	70.8
Use of artifacts (tools and materials)	19	29.2
Individualized adaptation	42	64.6
Differentiation	46	70.8
Flexible grouping mediation	21	32.3
Direct teaching	5	0.1
Cooperative learning	19	29.2

Source: Field data (2013)

Teachers indicated that they faced constraints in using mediated instructional strategies as shown in Table 30. Ten strategies posed challenges to these teachers. Peto strategies and differentiation each registered a frequency of 46, (70.8%) followed closely by individualized adaptations (42, (64.6%) and Scaffolding (40, (61.5%). The strategy that registered the least, 5, (0.1%) teachers was direct teaching.

The result shows that even though teachers were using the mediated instructional strategies to teach learners with CP, the constraints they faced were reducing their effort to teach literacy skills adequately to learners with CP. It therefore implies that the acquisition of literacy skills among learners with CP is hampered by the constraints teachers faced using the mediated instructional strategies. Teachers registered the mediated instructional strategies in which they faced constraints while using them to teach literacy skills to learners with CP.

Qualitative data is in agreement with the quantitative data as was established from open ended questions in the questionnaire, the classroom observations and informal interviews as presented thematically in subsequent sections.

4.6.2 Constraints in the use of the mediated instructional strategies

Information was obtained from questionnaires, observation and informal interviews. These were analyzed thematically and categorized into three large themes that touched on mediated strategies, needs of learners and teachers' individualization.

The constraints related to the use of mediated instructional strategies were:

Teachers' constraints with the use of scaffolding

Teachers indicated that scaffolding was difficult due to multiple needs of learners in the classroom. Absenteeism was also a challenge stated by the teachers. Some of the reasons given were:

"*Due to sickness, therapy or other medical procedures, they take long either in hospitals or at home, and withdrawal sessions for therapies in schools"*

"I appreciate the fact that we have to support these learners as we teach, but it is not easy to support all of them equally during the literacy lessons."

It is not easy when I have to support each and every child with CP during the lesson. This was a constraint faced by the teachers because the learners missed a lot while out of class, warranting support on return. At the same time, teachers felt that a lot of effort was spent re-teaching concepts already covered by others in class. An example of their response was:

"We have to go back and re-teach them what we had already covered with the rest of the class. It is cumbersome and they also lag behind their peers in literacy skills".

Teachers regarded this as a pull-down since they were forced by these scenarios that warranted attention on their extra time and effort, impacting negatively on use of close attention to learners with CP.

During observation, the teachers were seen supporting learners to an extent that, in some classes, the learners waited for the teachers' every move. For example, T8's class where the learners could not read three-letter words until the teacher prompted using either a picture or a drawing.

Teachers' constraints with the use of groups

The teachers used groupings which were either permanent or flexible. They indicated the constraints they faced with the use of groups, which they said were not easy to execute as their responses were:

- "*Not easy to use groupings;*

- *Some peers may not be willing to work with other CP children, especially those who drool a lot".*
- *"Other learners with CP who do not have speech or have unintelligible speech are not easy to group as their contribution may be minimal or nil".*

These responses were regarded as attitudinal, and a sign of lack of knowledge and skills in using groupings as an instructional strategy among learners with CP. It therefore, barred the teachers from focusing on the use of groups during teaching of literacy skills to learners with CP. It would be important to establish teachers' attitudes towards the use of mediated instructional strategies in teaching literacy skills to beginning readers with CP.

Teachers' constraints with the use of Peto strategies

Teachers' responses on Peto strategies indicated that they were experiencing different challenges teaching literacy skills to learners with CP. Some of the responses were that, *"Peto strategies are too involving there is too much repetition of concepts and activities".* Another statement was, **"***Though it helps these children to learn well, it takes a longer time to teach a concept because we keep on repeating same things". It involves too much repetition, hence boring".*

It means that teachers were not ready to use Peto strategies because they said it was too involving. It implies that they could be lacking the knowledge and skills of using the strategy with CP learners, or they lack the resources.

Teachers' constraints with the use of differentiated instruction

Teachers felt that it was difficult to provide differentiated instruction in a class of learners with CP. Some of the responses that bordered on time as a resource and lack of enough knowledge and skills were:

> "*It is a great challenge coming up with different activities; different tasks; different materials to be used within a lesson".*

"It takes time to come up with differentiated instruction".

"It is difficult"; I find it taxing, involving"

"Difficult to plan for different things in the same class"

The responses depict lack of enough knowledge and skills in differentiating instructions in literacy lessons for learners with different needs. Lack of enough knowledge and skills hamper effective use of instructional strategies appropriate for meeting the unique literacy acquisition needs of cerebral palsied learners in a given classroom. The responses also depicted time constraints in planning and teaching using differentiation.

During observation, only 4 teachers, T5, T3, T8 and T9 were observed using differentiation while the remaining 5 did not use it. Examples of the constraints teachers faced were about organization of activities. They believed that they were not skilled enough to differentiate instruction for learners with CP during literacy teaching. When asked if he differentiates instructions in his literacy lessons, T2 responded thus*:*

"I don't differentiate because they have to learn the same things from the syllabus".

This indicates that he was not aware of the value of differentiation to a learner with CP in literacy acquisition.

T6 said*, "I find it easier to teach them normally. Differentiation requires a lot of skills. I am not good at it".*

T5 indicated that she tries to differentiate the activities though it is taxing. She reported that, "*I sometimes struggle on how to organize literacy activities so that Timi and Teffi can participate because, you see, their needs are very different (she smiles and looks at Teffi's*

direction). That girl Teffi cannot write well so I have to think and plan for her too. We don't have that much time."

Time factor was one of the issues that were seen to be hindering the teachers' use of differentiation.

Teachers' constraints with the use of cooperative teaching

The responses depicted uncooperativeness from their colleagues as was obtained from the teachers' response:

> "*I rarely use it; everybody is busy with his or her own area;*
>
> *"Not every teacher is willing to use cooperative teaching;"*
>
> *"Some teachers say that literacy is not their area of specialization so I struggle alone".*

The responses touch on attitudinal aspect since other teachers appear unwilling to work together in teaching the same subject.

4.6.3 Constrains on the needs of the learners with CP

The information obtained from the questionnaires and informal interviews indicated that the constraints faced by teachers were on varied types of CP related to learners' different needs and instructional resources to use with these learners as presented.

Varied needs of CP children

The teachers appreciated that children with CP are different given the types of CP. However, these differences posed constraints they had to deal with during their teaching as revealed by the excerpts:

> "*Each child with CP is unique and has to be catered for during the lessons. This drags us in covering the expected content if we have to use mediation";*
>
> *"Not easy to teach them";*

"It is too demanding teaching different children with different types of CP, for instance, in the same class, as they all need your individual attention in a large class".

"*Each child has his/or her unique needs different from the others; their needs are too demanding;*

One of the teachers interviewed responded that, *"Sometimes it is not easy to understand these learners who do not talk; you teach and just assume they have understood". "I wish we had talking computers in this school".*

These responses from teachers implied that the number of learners they were teaching at a given time was large and the learners had different needs to attend to that required a lot of their commitment. It also depicts scaffolding, individualization and differentiation becoming difficult when they talk of how to support the learners.

Lack of educational resources

The teachers' responses varied. They reiterated that due to deficits in the teaching resources, teaching literacy to learners with CP was a great challenge. Their responses were:

"*What is available in schools is not sufficient;*

"No adapted resources like books for the learners with CP to work on, for example, books with widely spaced lines; no adapted pens/pencils;

"It is a great challenge when adapting our own materials in our own way for each child."

"We don't have computers in our school to be used by CP learners who cannot talk or write".

Such sentiments were confirmed during the classroom observations and informal interviews. An example was when **T1** was asked about the constraints she faced when teaching literacy to learners with CP. She stated that, "*It is really difficult dealing with a learner without*

speech as in the case of Tieni over there (Pointing). Even teaching writing skills without appropriate furniture such as chair and writing surface for Jaba". She went on to explain that, "*It is not easy teaching Jaba while he is on the ground, especially handwriting".* Jaba cannot sit on an ordinary seat. He sits on a mat on the ground and does all his academic work on the mat.

The information obtained depicts the lack of appropriate instructional resources for both the teachers and learners with CP to use in literacy lessons. This also shows that teachers are aware that these instructional resources help learners to acquire literacy skills. However, what is within their reach may not be very helpful to learners with CP. At the same time, it implies that teachers may not be skilled enough to adapt what they have to suit the different needs of their learners. Others have cited time factor, which means that, they do not want to spend an extra time dwelling on creation or adaptation of the available resources to be used by the learners with CP. Instead, they teach the whole class with the resources without modification while they can adapt the available resources to meet the needs of their learners.

4.6.4 Other Constraints addressing individualization

The individual constraints encountered by teachers were sought and recorded as:

a) Lack of skills in teaching literacy skills to CP learners without clear speech

Teachers admitted that they lacked skills to teach literacy skills to learners with CP as quoted by one of them, "*I was not trained in teaching literacy skills; I use my own ways/methods; I don't have any point of reference".* This was also observed in T2 and T7's lessons when they appeared to teach wrong concepts during the reading lessons.

b) Time constraint

The teachers felt that time allocated for the literacy lessons was not adequate. "*The thirty minutes is too short for lessons like teaching reading or writing".* Large number of learners

was an issue that was related to time factor as mentioned by one of them, *"Not easy for learners with CP who require one-to-one attention; individualization and differentiation is difficult in a large class".*

This was evident in the literacy lessons observed, when the teachers strived to let the learners with CP accomplish the tasks within the 30 minutes scheduled for the lessons because they took a longer time to grasp the concepts.

c) Getting children with CP to compose themselves in order to write legibly

Some of the statements from the teachers were: *"Some of them shake a lot and it's not easy to calm them down to write clearly;*

Uncontrolled and uncoordinated movements affect their handwriting".

d) Difficulty in understanding their speech;

The respondents observed that it was not easy to understand the speech of learners with CP as the learners attempted to read or answer questions during reading or writing lessons, especially those with some residual speech. Teachers also mentioned the slow speed at which they perform reading and writing tasks which, according to their remarks, impacted negatively on the class performance. A respondent said, "*I feel that they are pulling the rest of the class down if we have to go by their speed".*

4.6.4 Individual Teachers' constrains observed

During classroom observation and informal interviews, the information from the 9 teachers was recorded based on the constraints they faced with the use of mediated instructional strategies to teach literacy skills to learners with CP. These results are presented thematically.

T2: Individualized adaptations: Adaptation of the content or activities was seen as a challenge to T2. Instead, all the learners were taught the same way and given the same tasks during writing lessons. It showed clearly that he did not realize that Linsa needed a better

option and not a tiny pencil (Appendix I). When asked why Linsa was not using an appropriate pencil to write, he said,

> ” *This girl can write well with ordinary pencil. You see, her handwriting is okay. But this pencil has just reduced in size because of sharpening”.*

T2 did not indicate whether he would ensure Linsa got an appropriate pencil.

T5 experienced challenges in adaptation of the instructional strategies to learners with CP. She said, *“You Know, Teffi has stiff finger muscles and my dilemma sometimes comes when I have to involve her in handwriting skills. Hawezi (She can’t)! I struggle with her quite a lot”* This implies that she could not consider other ways of adapting writing tasks or even using alternative or augmentative writing materials or devices.

T3: This teacher indicated that she had a problem teaching all the learners within 30 minutes yet some do not grasp the concepts taught. As for teaching writing to learners with CP, she noted that it was a great challenge too. According to the teacher:

> “*We do not have any other technology to use other than the book and pen*. *It’s not easy to know whether Judu can write something meaningful because she cannot write using a pen like the others due to uncontrolled shaking*”.

This teacher also lacked the knowledge and skill of adapting the writing materials for CP learners.

T6 said that her main problem was time factor, especially differentiation. “ *Lakini Mwalimu (But, teacher), this idea of differentiation is good, it is only that we do not get enough time to support and differentiate activities for an individual in the thirty minutes scheduled for a lesson.*

Time constraint was her main constraint in using scaffolding and differentiation while she had other learners in class demanding her attention.

T9: This teacher taught with her co-teacher. She was observed to be experiencing difficulty with time factor. The entire 30 minutes ended before accomplishing all that she had planned to teach. When asked why she couldn't accomplish what she had set to do with the learners, she said, "*You see, these learners learn at different paces because they are different. It is difficult to manage time*". According to T9, teaching pace dictated the time spent in a literacy lesson for learners with CP.

T4: Language: This teacher's main challenge was that she kept on mixing English and Kiswahili in teaching English language. Even her learners kept on responding in Kiswahili even when teaching English vocabulary. For example, in one of the reading lessons she said, "*Nataka wenye wanakumbuka hizi colours* (I need those who can remember these colours)". And in a writing lesson, she instructed her learners in Kiswahili, *"Ukifika mwisho wa kuandika, unaruka laini mmoja na kuja chini hapa (*pointing at the lower line) *na kuendelea kuandika"* ("When you reach the end of your writing, you skip one line, you come down here (pointing) then you continue writing").

T7's challenge was over teaching. She taught the vowels, for instance, using sounds of the letters of the alphabet. Time management was also an issue.

T8: This teacher kept on teaching the letters of the alphabet A to D. The teacher had problems with organizing enough content for the lessons observed. According to her, the learners could not grasp the concepts easily. She said, "*These learners take long to learn reading. A child like Tabia here (pointing), you have to really repeat every time....."*Though from observation, the learners had already mastered those letters.

It was evident from the lessons observed that the teachers were experiencing some challenges in teaching literacy skills to learners with CP in special schools for the PH in Kenya. What was observed was also proved by their sentiments from the questionnaires and during the informal interview sessions, when they revealed the constraints they experience, examples of which were: The varied needs of CP learners to cater for, lack of knowledge and skills in scaffolding and differentiating instructions, adapting lessons for learners with CP and teaching reading to the learners without speech. There was also lack of instructional materials, time constraints to attend to individual needs appropriately.

Heller (2001) observed that the literacy success of learners with CP may further be hampered by inadequate instructional strategies, lack of instructional adaptations, and inappropriate use of assistive technology. These teachers had difficulties adapting content, activities and materials to meet the literacy needs of learners with CP. More so, teaching literacy skills to learners with speech difficulties as reported from the questionnaires and interview excerpts. Heller *et al.* (2000) observe that learners with CP without speech can read using the inner voice. In this study, only one teacher whose lessons were observed used the non-verbal method with a child with CP without speech. This was the case of Munzi in T9's class.

Previous researches conducted reveal challenges on teaching learners with CP. Kanana (2011) revealed that learners with CP were faced with instructional challenges in selected schools in Machakos and Kiambu Counties in Kenya while Wairimu (2015) revealed that teachers faced challenges teaching learners with CP in mainstream schools in Thika. Both studies cited lack of materials, equipment and knowledgeable teachers. However, these studies focused on general teaching of learners with CP.

Chinobwe (2011) revealed that teachers were not adequately trained to teach children with CP, though Chinobwe, just like Kanana (2015) and Wairimu (2015), looked at teaching learners with CP in general. The present study is related to older studies as it revealed that teachers faced constraints in teaching learners with CP. Chinobwe's study confirms the challenges faced by teachers of learners with CP. However, the study was on general teaching and did not specify any academic area. Similarly, Wairimu's study revealed that teachers were faced with challenges teaching learners with CP as they could not speak or write well, while Kanana's study revealed the instructional challenges faced by learners with CP such as lack of resources and adaptive devices. The present study is in tandem with Chinobwe, Kanana and Wairimus' findings on the challenges faced by teachers and learners with CP, though they did not highlight specific academic areas, or even the use of specific mediated instructional strategies apart from individualization. However, the present study went further to reveal the specific mediated instructional strategies that teachers experienced difficulty using such as differentiation, scaffolding, Peto strategies and lack of resources such as computers for learners without speech. Teachers also felt that they lacked enough knowledge and skills needed to differentiate instructions during literacy lessons for learners with CP. This information was not revealed by any of these older studies.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER STUDIES

5.1 Introduction

The study was to analyze mediated instructional strategies in literacy acquisition among learners with CP. Both quantitative and qualitative data was collected. Summary of findings, conclusions and recommendations are presented in this chapter as per the set objectives of this study.

5.2 SUMMARY OF FINDINGS

Summary of the findings are presented under the four study objectives in the subsequent subsections.

5.2.1 The types of mediated instructional strategies used by teachers to teach literacy skills acquisition to learners with cerebral palsy

To establish this objective, a questionnaire that provided a list of the mediated instructional strategies was developed and filled by teachers. These were 9 strategies including some subtypes. They were peer support, Peto strategies, scaffolding, collaborative teaching, individualized adaptations, use of artefacts, differentiation, repeated reading and direct teaching. They also had an option of adding any strategy they used that was not indicated on the table. An observation schedule was also developed which was used in lesson observations.

The results from quantitative data show individualized adaptations 47 (72.3%), Scaffolding 47 (72.3%) and artifacts 46 (70.8%) used more by the teachers while differentiation was less

used (28 (43.1%) to teach acquisition of literacy skills to learners with CP. Qualitative data was in agreement with the quantitative data as the results from observation also revealed atrifacts and scaffolding used more (9, (100%) by all the teachers observed and individualized adaptations was used by 6 (66.6%) teachers, which was still more as it registered above 50% ; while differentiation was used by a few 4 (44.4%) teachers. In both sources of data, Peto strategy was registered as the least used mediated instructional strategy. Quantitative data registered 15 (23.1%) teachers while qualitative data registered 3(33.3%) teachers who used the strategy.

Although Peer support was used by a good number 45 (69.2%) of teachers as obtained from the questionnaire (Table 12), during observation, only 3 (33.3%) teachers used it (Table 13). This indicates that the teachers who indicated the higher frequency could have been biased and did not wish to expose their inadequacy in the use of peer mediation. There were also variations on the types and use of the mediated instructional strategies as observed during their literacy lessons. There were also variations based on the training in the area of physical disabilities and training in literacy skills and the teaching of literacy skills.

Use of mediated instructional strategies in instructing learners with cerebral palsy was not significantly different ($\chi^2 = 1.115$, $P = 0.450$) with teachers training in physical disabilities. However, the results showed that there was a moderate, positive, significant relationship between use of mediated instructional approach and the training in the methods of teaching literacy ($r = 0.469$, $N=65$, $P = 0.0001$).

5.2.2 The strategies used in literacy acquisition by learners with cerebral palsy

The study established that learners with CP use multi-strategies in attempting the literacy tasks that mediate their literacy task performance. They used 8 different strategies to acquire literacy skills which included association with experience/picture/object/sound; rote reading,

selective reading, one word reading and guess work in acquiring literacy skills (Table 19). The strategy used by most, 11(61.1%) learners was association with pictures/objects/ experience in acquiring reading skills. The least used strategy by learners to acquire literacy skills were selecting reading 1 (5.5%) and use of inner voice and eye gaze (1, (5.5%). The result indicates that learners are not able to read without support.

The highest used handwriting strategy was use of hands 14 (77.7%). The highest number, 4, (22.3%) of learners with CP grasp the pencil with thumb and index finger and press pen on paper as they write one letter at a time with pauses. Mouth and a mouth stick and verbal responses were other strategies used by learners observed. The pictures, objects and experience mediate their reading acquisition.

The study has shown that learners with cerebral palsy are so much dependent on visual cues and experience in association with items to read words. This has made them become dependent readers at the expense of independent readers.

5.2.3 Teacher competence in using mediated instructional strategies to teach literacy skills acquisition among learners with cerebral palsy

The teachers were rated by the number of mediated instructional strategies they used and how they used them in teaching literacy skills. This was established by the use of questionnaires and observation. Based on the scoring, the quantitative results established that 36 (55.4%) of the teachers were considered competent in the use of mediated instructional strategies (Table 26). This was also confirmed by the observational data, which recorded 5(55.5%) as competent (Table 29). The data obtained from the two sources are similar, therefore are in agreement. The data obtained from observation shows that the teachers who are competent in using mediated instructional strategies carefully blend them together in different

combinations according to individual pupils' literacy needs (Table 27). The quantitative data further revealed that not all the teachers who taught literacy to learners with CP were competent. It was established that 29 (44.6%) were not competent as seen in Table 25 and 26. The data from observation also revealed that 4 (44.4%) of the teachers were incompetent. This could explain why learners with CP are experiencing difficulties in reading and writing skills in schools in Kenya.

5.2.4 Constraints faced by teachers in using mediated instructional strategies to teach literacy skills acquisition to learners with cerebral palsy

The constraints were established by use of questionnaires which teachers responded to, classroom observations and informal interviews. These were analyzed thematically and categorized into three large themes that touched on mediated strategies, needs of learners and teachers' individualization. Quantitative information showed that the constraints were experienced most with Peto strategies and differentiation which each registered the highest frequency of 46 (70.8%) followed closely by individualized adaptations 42 (64.6%) and Scaffolding 40 (61.5%). The strategy that registered the least, 5 (0.07%) teachers was direct teaching. Qualitative data is in agreement with the quantitative data as was established by the responses from open ended questions in the teachers' questionnaire, the classroom observations and informal interviews that differentiation, Peto strategies posed greater challenge to teachers. Example of the teachers' responses on use of differentiation was that, "*It is a great challenge coming up with different activities; different tasks; different materials to be used within a lesson".* Other constraints included time constraints, needs of learners and teachers' own inabilities with regards to knowledge and skills in using mediation.

5.3 CONCLUSION

Based on the research findings on the analysis of mediated instructional strategies in acquisition of literacy skills, it can be concluded that:

5.3.1 The types of mediated instructional strategies used by teachers to teach literacy skills acquisition among learners with cerebral palsy in schools for learners with physical disabilities in Kenya

The information generated by the study reveals that teachers used relevant mediated instructional strategies to teach acquisition of literacy skills to learners with CP, and the most used included scaffolding, artifacts, individualized adaptations which they combined with direct teaching. The least used mediated instructional strategies were Peto strategies and differentiation, which are also important in teaching learners with CP. Use of mediated strategies, however, varied among teachers since some teachers used only three strategies when mediating instructions while others used more.

The study further revealed that not all the teachers appropriately used the mediated instructional strategies as they did not pay attention to important aspects of mediation. They did not fade out learner support during literacy teaching. This affected learners' ability to acquire literacy skills.

5.3.2 The strategies used by learners with cerebral palsy to acquire literacy skills in schools for learners with physical disabilities in Kenya.

The study has revealed that learners with CP use multi-strategies in attempting the literacy tasks that mediate their difficulties in literacy task performance. The study revealed eight different strategies used by learners with CP to acquire literacy skills which include

association with experience, object, picture, gestures or sounds and "inner voice" as a non-verbal strategy. All of them relied on different scaffolds to acquire literacy skills.

Although most learners with CP used association of object/picture paired with experience, the study has revealed that difficulty in acquisition of literacy skills has been hampered by over-reliance on these scaffolds to an extent that these learners have become dependent as opposed to independent readers, thus the inadequacy in their literacy skills. They were so much dependent on visual cues coupled with their experience to associate with, words or sentences in literacy lessons. This resulted in poor performance causing the repetition of grades.

5.3.3 Teacher competence in using mediated instructional strategies to teach acquisition of literacy skills to learners with cerebral palsy in schools for learners with physical disabilities in Kenya

Competent teachers were able to balance and blend the mediated instructional strategies of scaffolding and differentiation in different combinations according to the literacy acquisition needs of individual learners with CP. Their learners were able to acquire reading and writing skills. However, the teachers who were considered incompetent did not balance and blend the mediated strategies. Instead, they mostly used direct instruction without any differentiated instruction. Their learners experienced difficulties acquiring literacy skills. At the same time, a good number taught literacy skills without any training in methods of teaching the CP. This further contributed to this incompetence which negatively affected acquisition of literacy skills among CP learners.

5.3.4 Constraints faced by teachers using mediated instructional strategies to teach acquisition of literacy skills to learners with cerebral palsy in schools for learners with physical disabilities in Kenya

The study revealed that teachers faced constraints when using mediated instructional strategies. Both quantitative and qualitative information illuminated the constraints that were experienced most by teachers. Difficulties in using Peto strategies, differentiation, individualized adaptations and Scaffolding were cited more by the teachers. They were not skilled in their use. Time constraints, needs of learners and teachers' own inabilities with regards to knowledge and skills in using mediation were a hindrance in appropriate use of mediated instructional strategies in teaching literacy acquisition to learners with CP. These constraints therefore hindered the acquisition of literacy skills among learners with CP.

5.4 RECOMMENDATIONS

Based on the research findings, the study recommends that:

5.4.1 The types of mediated instructional strategies used by teachers to teach literacy skills acquisition among learners with cerebral palsy

Due to the diverse literacy needs of learners with CP, teachers should use scaffolding and differentiation more in teaching literacy acquisition to learners with CP. Teachers should also establish the untapped skills or strengths in learners with CP to help in choosing mediated instructional strategies that are appropriate in mediating their weaknesses in the acquisition of literacy skills.

5.4.2 The strategies used by learners with cerebral palsy to acquire literacy skills in schools for learners with physical disabilities in Kenya.

Students may be so much dependent on scaffolds rather than being independent readers. Therefore, it is important for the teachers not to allow overreliance on scaffolds during reading and writing lessons. Instead, teachers should consider fading out the learner support to allow learners with CP to carry out their independence in learning to read and write.

5.4.2 Teacher competence in the use of mediated instructional strategies to teach acquisition of literacy skills to learners with cerebral palsy in schools for learners with physical disabilities in Kenya

It is important to assign competent teachers who are trained to teach literacy skills to learners with CP in lower grades.

The Ministry of Education should also mount in-service courses for teachers to learn and practise more on the use of mediated instructional strategies in teaching literacy skills to learners with CP.

5.4.4 Constraints faced by teachers in using mediated instructional strategies in literacy skills acquisition among learners with cerebral palsy

The constraints that teachers face should be minimized to enable the teachers to teach literacy acquisition skills to learners with CP effectively.

5.5 Suggestions for future research

The following are the suggestions for future study:

i) There is need to establish the literacy skill levels of learners with CP in special schools to help curb the difficulties surrounding the literacy skills acquisition.

ii) It is important to establish the attitude of teachers towards the use of mediated instructional strategies in teaching acquisition of literacy skills to learners with CP.

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Appendix A: Questionnaire for Teachers of learners with cerebral palsy

Please give your facts and opinions on your training and teaching of learners with cerebral palsy. Please tick or fill in as appropriate. Your responses and information obtained will be treated with utmost confidentiality and will be used for the purpose of the study only.

1. Have you trained in special needs education? Yes ☐ No ☐

2. What level of training do you have?

3. Masters ☐ Undergraduate ☐ Diploma ☐ Certificate ☐

4. Did you train in physical disabilities? Yes ☐ No ☐

5. Did you train in methods of teaching literacy skills (reading and writing) to learners with cerebral palsy? Yes ☐ No ☐

6. How long have you taught learners with cerebral palsy?

   Below 1 year ☐ 1 – 2years ☐ 3 -4 years ☐ 5+ years ☐

7. Have you ever taught literacy skills (reading and writing) to learners with cerebral palsy? Yes ☐ No ☐

   ii) If yes, what grade level?

   ……
   ……

8. What strategies have you been using in teaching learners with CP?

   ……
   ……
   ……

9. Have you ever used mediated (supported) instructional approach in instructing learners with cerebral palsy? Yes ☐ No ☐

10. Which of these instructional strategies do you use in teaching literacy skills to learners with cerebral palsy?

    Please indicate your choice by putting a tick (√) in the table below.

Mediated instructional strategies	**Indicate if used/Not used**	
	Used	**Not used**
1. Peer support		
- Cooperative learning		
- Flexible grouping mediation		

2. Collaborative teaching and learning		
3. Scaffolding		
- Guided participation(guided practice		
- Prompting		
- Teacher modeling		
4. Peto strategies		
5. Use of artifacts(tools and materials		
6. Differentiation		
7. Individualized adaptations		
8. Direct teaching		
9. Repeated reading		

11. Please provide any other mediated instructional strategy you use that has not been included in the table.

    ……
    ……
    …….

12. Indicate any constraints/challenges that you experience when using the following strategies to teach reading skills

Mediated instructional strategy	**Challenges/constraints**
1. Peer support	
- Cooperative learning	
- Flexible grouping mediation	
2. Collaborative teaching and learning	
3. Scaffolding	
- Prompting	
- Teacher modeling	
4. Peto strategies	
5. Use of artifacts(tools and materials	
6. Differentiation	
7. Individualized adaptations	
8. Direct teaching	
9. Repeated	

13. Indicate constraints/challenges that you experience when using the following strategies to teach writing skills

Mediated instructional strategy	**Challenges/Constraints**
1. Peer support	
- Cooperative learning	
- Flexible grouping mediation	
2. Collaborative teaching and learning	
3. Scaffolding	
- Prompting	
- Teacher modeling	
4. Peto strategies	
5. Use of artifacts(tools and materials	
6. Differentiation	
7. Individualized adaptations	
8. Direct teaching	
9. Repeated reading	

14. Are there other challenges you face in teaching reading and writing skills to learners with CP using mediated instructional strategies? List any other

……
……
……
……
……
……

THANK YOU!

Appendix B: Observation schedule for learner's acquisition of literacy skills with mediated instructional strategies

Literacy skill	Mediated instructional strategies used by the teacher	Other instructional strategies used	Learning strategy used by the learner	Literacy skill acquired	Challenges faced by teachers	Remarks
Letter recognition						
Word recognition and writing						
Sentence reading & construction						
Letter-sound correspondence						

Appendix C: Observation schedule for Teachers' competence in using mediated instructional strategies

Competency skills	Teacher (T)	Teacher who combines the strategies	Teacher who does not combine the strategies	Researcher's Remarks
Balance of mediated instructional strategies				
Integration of modes of language				
Pupil engagement and instructional density				
Organization of the literacy environment				
A positive literacy environment				
Teaching style(Blending scaffolding and differentiating)				

Appendix D: Document analysis guide for pupils of class 1-3

Admission register						
S/No.	**Name of learner**	**Date of admission**	**Class admitted & Year**	**Present class & year**	**Expected class**	**Remarks**
1.						
2.						

Children's Progress record						
	Name of learner	**Class**	**Skills acquired**		**Others**	**Remarks**
1.						
2.						

Exercise Books						
	Name of learner	**Handwriting legibility**	**Shaping of letters**	**Spacing of words**	**Others**	**Remarks**
1.						
2.						

Appendix E: Demographic results

Indicate if you have trained in special needs education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	trained	61	93.8	93.8	93.8
	Not trained	4	6.2	6.2	100.0
	Total	65	100.0	100.0	

What level of training do you have

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Masters	5	7.7	7.8	7.8
	Undergraduate	26	40.0	40.6	48.4
	Diploma	27	41.5	42.2	90.6
	Certificate	6	9.2	9.4	100.0
	Total	64	98.5	100.0	
Missing	System	1	1.5		
Total		65	100.0		

Did you train in physical disabilities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	35	53.8	55.6	55.6
	No	28	43.1	44.4	100.0
	Total	63	96.9	100.0	
Missing	System	2	3.1		
Total		65	100.0		

How long have you taught learners with celebral palsy ?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 1 year	5	7.7	7.8	7.8
	1-2 years	12	18.5	18.8	26.6
	3-4 years	16	24.6	25.0	51.6
	5+ years	31	47.7	48.4	100.0
	Total	64	98.5	100.0	
Missing	System	1	1.5		
Total		65	100.0		

Did you train in methods of teaching literacy skills (reading and writing) to learners with cerebral palsy?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	38	58.5	58.5	58.5
	No	27	41.5	41.5	100.0
	Total	65	100.0	100.0	

Have you ever taught literacy skills (reading and writing) to learners with cerebral palsy?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	45	69.2	71.4	71.4
	No	18	27.7	28.6	100.0
	Total	63	96.9	100.0	
Missing	System	2	3.1		
Total		65	100.0		

Have you ever used mediated (supported) learning approach in instructing learners with cerebral palsy?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	56	86.2	87.5	87.5
	No	8	12.3	12.5	100.0
	Total	64	98.5	100.0	
Missing	System	1	1.5		
Total		65	100.0		

For how long have you used mediation strategies in instructing learners with cerebral palsy during literacy lesson?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 1 year	9	13.8	14.5	14.5
	1-2 years	14	21.5	22.6	37.1
	3-4 years	14	21.5	22.6	59.7
	5+ years	25	38.5	40.3	100.0
	Total	62	95.4	100.0	
Missing	System	3	4.6		
Total		65	100.0		

How often do you use mediation as a strategy during instruction?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very rarely	5	7.7	8.1	8.1
	Rarely	6	9.2	9.7	17.7
	More often	34	52.3	54.8	72.6
	Most often	17	26.2	27.4	100.0
	Total	62	95.4	100.0	
Missing	System	3	4.6		
Total		65	100.0		

Appendix F: Cross tabulation results

Did you train in physical disabilities * Have you ever used mediated (supported) learning approach in instructing learners with cerebral palsy? Crosstabulation

			Have you ever used mediated (supported) learning approach in instructing learners with cerebral palsy?		Total
			Yes	No	
Did you train in physical disabilities	Yes	Count	31	3	34
		% within Did you train in physical disabilities	91.2%	8.8%	100.0%
	No	Count	23	5	28
		% within Did you train in physical disabilities	82.1%	17.9%	100.0%
Total		Count	54	8	62
		% within Did you train in physical disabilities	87.1%	12.9%	100.0%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.115(b)	1	.291		
Continuity Correction(a)	.456	1	.499		
Likelihood Ratio	1.113	1	.291		
Fisher's Exact Test				.450	.249
Linear-by-Linear Association	1.097	1	.295		
N of Valid Cases	62				

a Computed only for a 2x2 table
b 2 cells (50.0%) have expected count less than 5. The minimum expected count is 3.61.

Did you train in methods of teaching literacy skills (reading and writing) to learners with cerebral palsy? * Have you ever taught literacy skills (reading and writing) to learners with cerebral palsy?

Cross tabulation

			Have you ever taught literacy skills (reading and writing) to learners with cerbral palsy?		
			Yes	No	Total
Did you train train in methods of teaching literacy skills (reading and writing) to learners with cerebral palsy?	Yes	Count	33	4	37
		% within Did you train train in methods of teaching literacy skills (reading and writing) to learners with cerebral palsy ?	89.2%	10.8%	100.0%
	No	Count	12	14	26
		% within Did you train train in methods of teaching literacy skills (reading and writing) to learners with cerebral palsy?	46.2%	53.8%	100.0%
Total		Count	45	18	63
		% within Did you train train in methods of teaching literacy skills (reading and writing) to learners with cerebral palsy?	71.4%	28.6%	100.0%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	13.857(b)	1	.000		
Continuity Correction(a)	11.829	1	.001		
Likelihood Ratio	14.144	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	13.637	1	.000		
N of Valid Cases	63				

a Computed only for a 2x2 table
b 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.43.

Correlations

		Did you train train in methods of teaching literacy skills (reading and writing) to learners with cerebral palsy?	Have you ever taught literacy skills (reading and writing) to learners with cerebral palsy?
Did you train train in methods of teaching literacy skills (reading and writing) to learners with cerebral palsy?	Pearson Correlation	1	.469(**)
	Sig. (2-tailed)	.	.000
	N	65	63
Have you ever taught literacy skills (reading and writing) to learners with cerbral palsy?	Pearson Correlation	.469(**)	1
	Sig. (2-tailed)	.000	.
	N	63	63

** Correlation is significant at the 0.01 level (2-tailed).

Correlations

		Have you ever taught literacy skills (reading and writing) to learners with cerbral palsy?	Did you train train in methods of teaching literacy skills (reading and writing) to learners with cerebral palsy?
Have you ever taught literacy skills (reading and writing) to learners with cerbral palsy?	Pearson Correlation	1	.469(**)
	Sig. (2-tailed)	.	.000
	N	63	63
Did you train train in methods of teaching literacy skills (reading and writing) to learners with cerebral palsy?	Pearson Correlation	.469(**)	1
	Sig. (2-tailed)	.000	.
	N	63	65

** Correlation is significant at the 0.01 level (2-tailed).

ANOVA

number of the strategies used by the teachers

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.326	1	.326	.035	.853
Within Groups	538.385	57	9.445		
Total	538.712	58			

Appendix G: Demographic information about the nine teachers and the learners who participated in the observations

T1

This is a female teacher. Had trained in special needs education and holds a bachelor's degree in SNE. Her area of specialization is education of children with physical disabilities. She has taught in this school for a period of eight years. She teaches grade one together with two other teachers. She teaches English alongside other subjects.

Jaba and Tieni: The two learners in T1's class.

Jaba has spastic deplegic CP. He experiences speech and motor difficulties. He sits on a canvas padded mattress on the floor. He sits with a stooped back, both legs folded at the knees facing backwards. He has contractures around the wrist, with the right upper limb more involved. He was admitted in grade one in 2011. He is expected to be in grade three but has repeated grade one twice.

Tieni has athetoid CP. She is 9 years old. She has slurred speech. She uses a wheelchair. She joined this school in 2013 in grade one, the current grade. She has not yet repeated any grade.

T2: This is a male teacher. He is a Diploma holder in SNE through distance learning program. He specializes in inclusive education. He has taught for three years in the same school. Teaches grade two English.

Boby is 10 years old. He has spastic diplegia. He was admitted in grade one in 2010. He is expected to be in grade four. He repeated grade one and two. He has difficulty communicating using speech.

Linsa is eight years old in grade two. She has athetosis. She was admitted in 2012 in grade one. She has not repeated any grade. She has unintelligible speech. She speaks in a slurred manner.

T3: This is a female teacher. She has trained for three years in special needs education through distance learning program - inclusive model (Diploma in SNE). She has taught in the same school for two years. She teaches lower primary together with T1 and T2. She teaches English to grade three.

Linta has spastic CP. She was admitted to grade one at age 8 in 2011. She is now in grade 3. She has not repeated any grade.

Juddu has spastic quadriplegia. She is 13 years old. She was admitted in this school at age 9 in 2009. She is currently in grade three though she is expected to be in grade 5. Juddy repeated grade one and two, each grade twice.

T4: She teaches grade one together with two other teachers. Teaches English in grade one. She is a holder of diploma in SNE and currently pursuing her bachelor's degree in the same field. T5 has taught in this school for three years

Korry is eight years old. She has spastic hemiplegic CP. She joined the school this year in 2013 in grade one. She has not yet repeated any grade.

Kody is ten years old. He has athetosis and speaks incoherently. She was admitted to the school this year 2013. She is in grade one. She has not yet repeated any grade.

T5: She is a holder of a bachelor's degree in special needs education. She has taught in the same school for a period of two years. She teaches English in grade two.

Timi is a boy of 11 years old. He has spastic CP that has affected his motor ability. He has speech and motor difficulties. He shakes a lot when at task. Kim was admitted in grade one in 2010. He is expected to be in grade 4. He repeated grade one twice.
Teffi is 12 years old. She has spastic CP. She has slurred speech. She uses a wheelchair. She joined the school at grade one in 2010, having transferred from another special school where she had repeated grade one. She had also repeated grade one in the current school. She is expected to be in grade five.

T6: Teacher 6 is a female. She is a holder of diploma in SNE. She has taught in this school for four years. She teaches English to grade three pupils.
Jeffi is 13 years old. He has athetoid CP. He has weak grasps and speech difficulty. He was admitted to class one in 2010. He is currently in grade three. He repeated grade one only.
Jerro is 12 years old he has spastic CP. His speech is not clear. He joined this school in 2012 in grade 2 after having transferred from another school. . He has not yet repeated any grade.

T7: Female, holder of bachelor's degree in SNE. She has taught in the same school for six years. She teaches grade one together with a male teacher. She is the teacher of English.
Mimi is 7 years old. She has athetosis. She speaks with a slurred speech. She was admitted to grade one this year 2013, from the preschool section, in the same school.
Lisia is 7 years old in grade one. She joined this school from the preschool section. She has spastic CP. She struggles with speech and use of the hands in task performance.

T8: Female teacher. She has trained in ECDE, diploma level and a diploma course in SNE. She teaches English to grade one. She has taught for a year in the same school.
Brany is 11 years old**.** He has spastic CP. He joined the school in 2010 in grade one. He has repeated each grade twice. He is expected to be in grade 4.
Tabia is a girl of 10 years old with athetoid CP. She trembles a lot. She was admitted in 2010. Tabia is in grade two. She is expected to be in grade 4. She repeated grade one twice.

T9: T9 is female, has taught in the same school for seven years. She teaches grade three and shares subjects with another female teacher. She is the teacher of English. She is a holder of Diploma in SNE.
Munzi is a boy of 13 years old. He has spastic quadriplegic CP. All the limbs are affected. He uses a wheelchair. He does not have speech. He was admitted in the same school in 2008 in grade one.
Jenna is a girl of 10 years old. She has spastic diplegia. She has slurred speech and speaks slowly. She also uses a wheelchair for mobility. Jenna joined this school in grade one in 2008. She has been in the same class (grade 3) for three years.

Appendix H: Strategies used by learners with CP in acquiring lliteracy skills (Reading and writing)

Reading Strategies

One word reading/

In one of the reading lessons, T5 asked Teffi to read a sentence written on the chalkboard, "*The dog is the mother of a puppy*" but she could not read a whole sentence. She read one word at a time, assisted by the teacher**: Jeff** in T6's class reads one word at a time, separately with a long pause, a dragging effect and slurred speech. This was observed in a reading lesson when he was asked to read a passage on "*Dressing can be dangerous*". **Teri** reads slowly with unclear speech and pauses at words she finds difficult. This was observed in a reading lesson when the class was engaged in reading of a passage aloud in turns. Teri also uses either a pen or her finger to point at each word she reads.

Guess work: For example, **Tracy** in T4's class read the word "colours" as 'Nose'. **Teffi** in **T5's** class tried out a guess work in the reading lesson. In one of the lessons, she was asked to point at the word 'box'. She chose 'bag' instead. When asked to point at the word 'child', she pointed at 'sun'.

Selective reading: **Tabia** in T8's class takes a pointer to read a sentence from the chalkboard. She reads and omits some words. This was in the first reading lesson, where she read, "A apple", instead of 'A for apple. M The word 'for' is omitted.

Rote reading: Brawny, depends on what he hears from the teacher or peers. He repeats what he is asked to repeat, for instance, the word 'cat'.

Association with experience: During the reading of new words in one of the literacy lessons, Judu in T3's class could not read the word 'cake' until the teacher told her in Kiswahili that it is what her mother had brought to her the other day**.**

Tabia in T8's class also read based on her experiences. This was observed when she was asked to read the word 'cat'. She read as *"Paka" (*cat, in Kiswahili).

Association with an object/picture: Judu (T3's class), Associated the word cake with the drawing of a cake. Teffi(T5's class) used a picture chart to relate the word with the picture in one of the reading lessons. An example is when she was asked to show the table. She pointed at it. Asked to read the word 'book', 'chair' aided by the pictures on the chart, she managed to associate them with the words. Timi (T5) was asked to identify a cup from the teacher's table. He did that correctly. He was then asked to identify and read the word 'cup' from the chart which he did correctly.

Linta (T3's class), Teffi (T5), Timi (T5); Mimi and lizia (all in T7's class) associated the letters and words with the pictures on flash cards and the chart. For instance, in one of the reading lessons, Lizia in T7's class observed a flash card with a picture of an engine train and associated it with the letter 'e' for the sound /i/ for engine.

Use of inner voice: Munzi used eye gaze and facial expressions in alerting the teacher and to select the words read to him.

Writing strategies used by learners with CP

Jaba writes when seated on a padded canvas on the floor. He copies the exercise from the chalkboard. Holds the pencil on the fourth and little finger supported by the thumb of his right hand. Strained handwriting. Difficulty with shaping of letters and spacing of both the letters and words in sentences.

Tieni Tieni uses an adapted pencil. She holds the pencil with her four fingers.. She presses the pencil hard as she writes. Shaping of letters still a problem. She has difficulty writing on a straight line. Widely spaced letters and the words

Lisia Uses a very tiny ordinary pencil to write. which she keeps on repositioning with the help of her left hand. Grasps the pencil clasped with indiex and middle finger and rests on fourth finger. She looks up for each letter as she copies the work given fom the chalkboard. She has legible handwriting, good spacing and shaping of letters though strained. No adaptation for her writing materials.

Boby writes with difficulty.Uses the right hand and holds the pencil with all the fingers. Strained handwriting, poor spacing and shaping of letters

Linta (T3's class), given a piece of chalk to write '*cake*' on the chalkboard. T3 tells her, 'letter 'a' says? She responds by saying /e/. She writes the word using her left hand. She grasps the writing material, pencil and chalk with the first three fingers and the thumb. Each time she writes a letter, the teacher acknowledges with a vocal sound. She sees it crooked, rubs and tries to write it better. 'Good', says T3**.**

In a dictation lesson**, Juddu** was asked to pronounce the words after the teacher as the rest of the class listened and wrote in their books. These were: 'gate /gāt/, fade /fād/, rake /rāk/, tale /tāl/, bake /bā k/ she does not write. She depends on verbal responses in writing lessons.

Korry in T4's class uses an adapted pencil which she grasps with thumb index finger and the middle finger. She writes one letter, looks up the chalkboard for the next until the whole word is complete. She writes lightly on the book. Handwriting is legible, good spacing and letter shaping.

Kody in T4's class uses an adapted pencil which he grasps encased in the left hand between the small finger and the fourth finger and rests it on the wrist at the base of the thumb (Appendix...). He presses the pencil on the book as he writes. He writes one letter at a time. This was observed in a Handwriting lesson when they were to copy what the teacher had written on the chalkboard on' Letters of Alphabet', capital and small letters. He looks at the chalkboard for each letter, both the upper and lower case before he writes. His handwriting is legible but strained. He has not yet learnt spacing, proportion and shaping of the letters. Alignment is also a problem.

Timi in T5's class has an adapted pencil thickened with cellotape . He grasps the pencil with the thumb and index finger and rests it on the middle finger, wrist bent towards the body. He writes with right hand, book positioned across, facing away from him. He looks at the chalkboard for each letter in a word as he writes. He writes one letter at a time and he shakes a lot. In the second lesson observed, he draws a bottle, glass, cup and a plate then writes their names. This was observed when he was given materials to draw and write their names.

Teffi grasps the pencil with all the fingers, hand tilted to the left and writes from the thumb side with pressure. She supports the book with the left elbow and writes with the right hand. , In the first writing lesson she was assigned to write the word 'child' from a word card, extracted from the sentence, "*The child is dancing*". The teacher held her hand to help her glide the pencil in her exercise book to write the word severally then left on her own to write. She has difficulty shaping the letters and writing on a

straight line. Has good spacing of letters. In the second lesson she drew a cup and plate as the rest of the class copied the words from the chalkboard.

Jeffi in T6's class was able to take a ruler, draw line on a fresh page and tried shaping the letters. He uses normal index and thumb grip. Has an adapted pencil thickened with cellotape wound around it. He grasps the pencil with the thumb and index finger, wrist bent towards the body. He writes one letter at a time and he shakes a bit. He keeps on positioning the pencil with left hand to hold it in place.

Teri in T6's class also uses an adapted pencil. She holds it with the thumb, index and middle finger. Teri writes a letter at a time, as she copies from the chalk board; struggles with shaping and spacing.

Lizia and Mimi both do not write**.** They depend on oral responses with the teachers' support. They respond with unclear speech.

Tabia in T8's class, level two uses left hand to write while holding the book with the right hand; Uses first three fingers and the thumb.

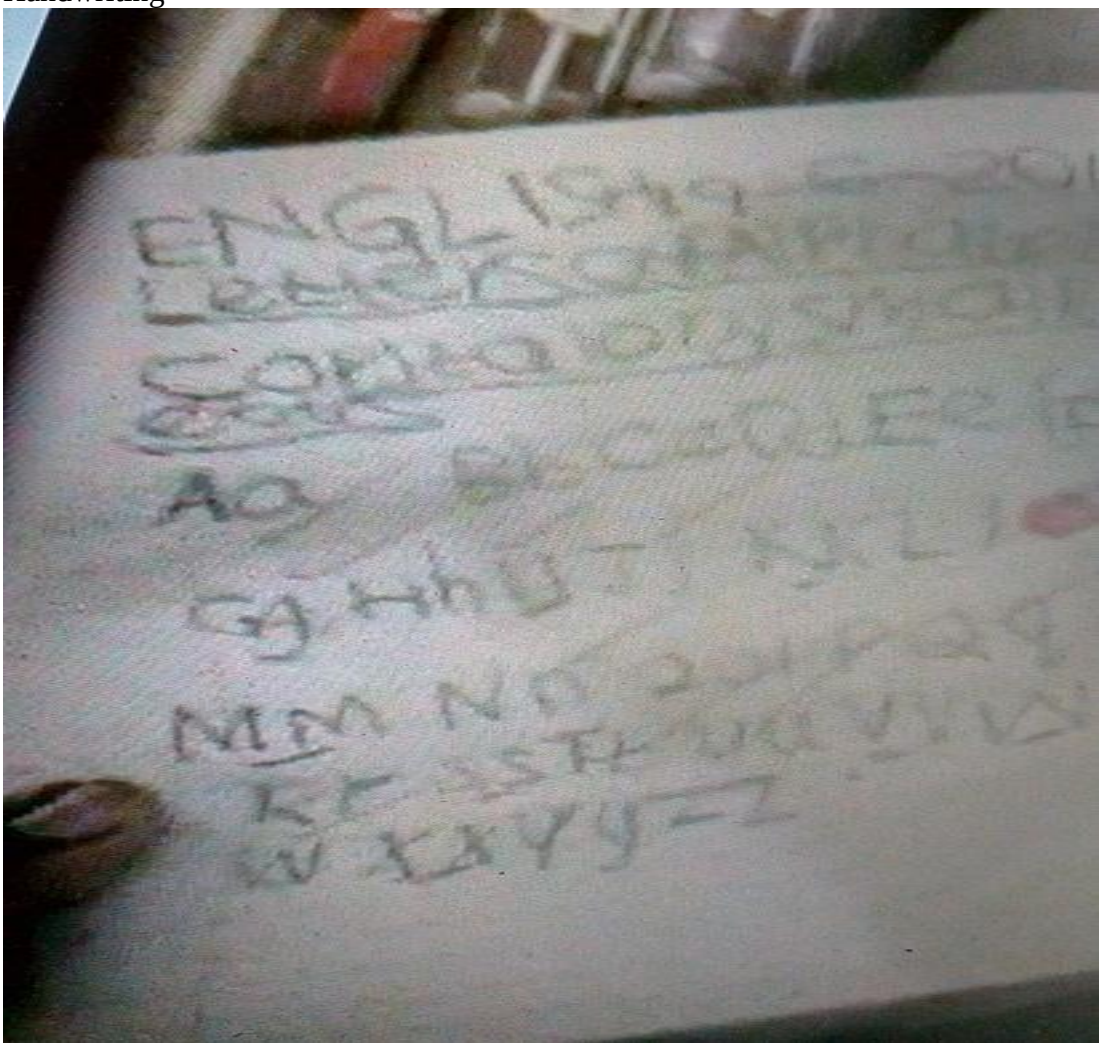
Branny holds the pencil encased in his hand, grasped with all the fingers. He uses a lot of pressure on the paper as he writes letter 'D' shakily.

Munzi does not use his hands or toes to write. He uses his mouth to hold a mouth stick which he uses to arrange blocks of letters or modeled letters to form words on his slate.

Jenna grasps the pencil with the thumb index and the middle finger passing it between the middle and fourth finger. She uses an adapted pencil. She tries to shape and space letters well.

Appendix I: Handwriting Document

Koddy's
Handwriting



Source: Field data (2013)

Appendix J: Lisia's pencil grip and book positioning

Source: Field data (2013)

Appendix K: Timi's pencil grip and book positioning

Source: Field data (2013)

Appendix L: Clearance letter from School of Graduate Studies

MASENO UNIVERSITY

SCHOOL OF GRADUATE STUDIES

Office of the Dean

Our Ref: PG/PHD/091/2010

Private Bag, MASENO, KENYA
Tel:(057)351 22/351008/351011
FAX: 254-057-351153/351221
Email: sgs@maseno.ac.ke

Date: 24th July, 2015

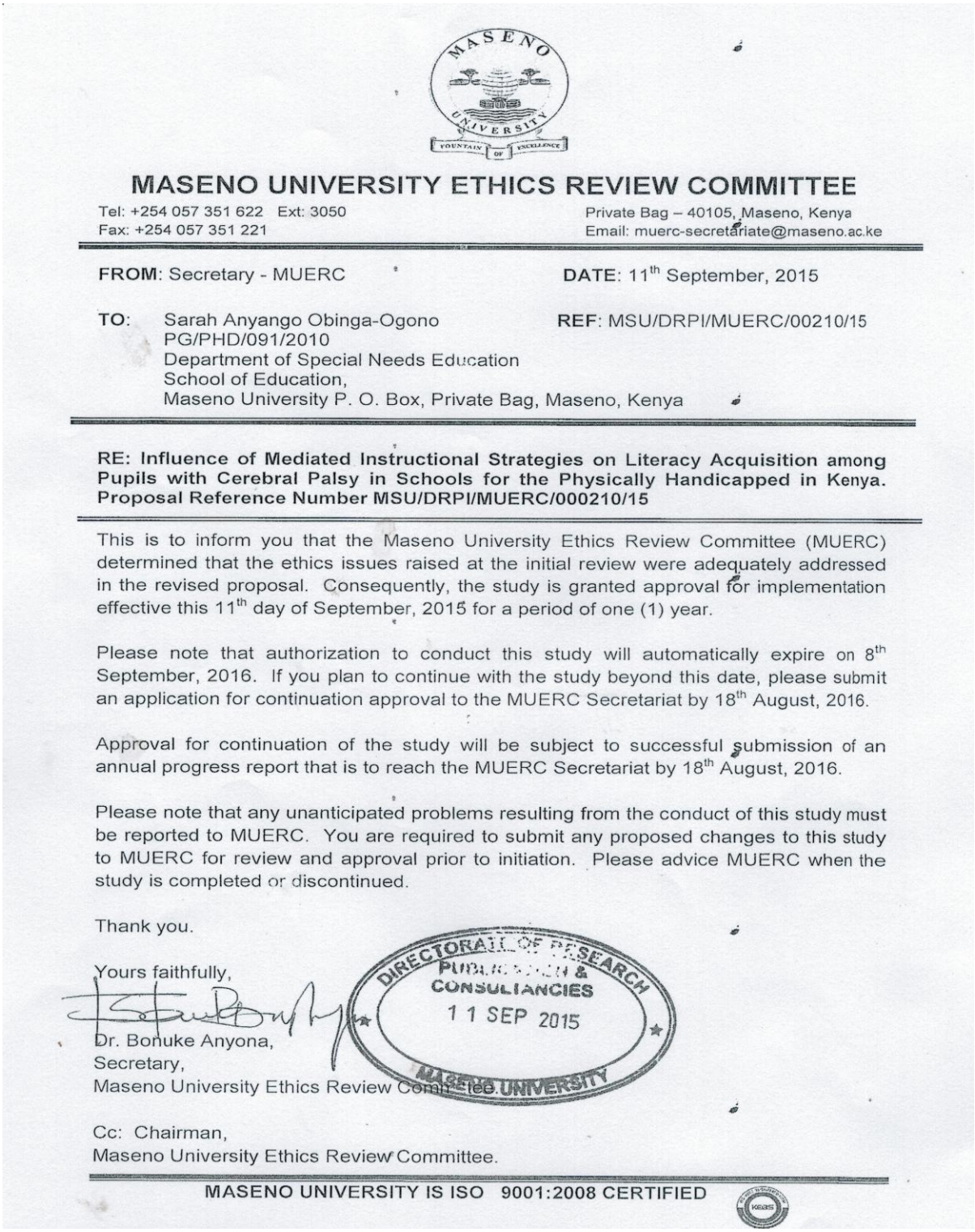
TO WHOM IT MAY CONCERN

RE: PROPOSAL APPROVAL FOR SARA ANYANGO OBINGA— PG/PHD/091/2010

The above named is registered in the Doctor of Philosophy in Special Needs Education Programme of the School of Education, Maseno University. This is to confirm that her research proposal titled "Influence of Mediated Instructional Strategies on Literacy Acquisition among Pupils with Cerebral Palsy in Schools for Physically Handicapped in Kenya" has been approved for conduct of research subject to obtaining all other permissions/clearances that may be required beforehand.

Prof. P.O. Owuor
DEAN, SCHOOL OF GRADUATE STUDIES

Appendix M: Authorization letter from Maseno University Ethics and Research Committee



MASENO UNIVERSITY ETHICS REVIEW COMMITTEE

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Private Bag – 40105, Maseno, Kenya
Email: muerc-secretariate@maseno.ac.ke

FROM: Secretary - MUERC

DATE: 11th September, 2015

TO: Sarah Anyango Obinga-Ogono
PG/PHD/091/2010
Department of Special Needs Education
School of Education,
Maseno University P. O. Box, Private Bag, Maseno, Kenya

REF: MSU/DRPI/MUERC/00210/15

RE: Influence of Mediated Instructional Strategies on Literacy Acquisition among Pupils with Cerebral Palsy in Schools for the Physically Handicapped in Kenya. Proposal Reference Number MSU/DRPI/MUERC/000210/15

This is to inform you that the Maseno University Ethics Review Committee (MUERC) determined that the ethics issues raised at the initial review were adequately addressed in the revised proposal. Consequently, the study is granted approval for implementation effective this 11th day of September, 2015 for a period of one (1) year.

Please note that authorization to conduct this study will automatically expire on 8th September, 2016. If you plan to continue with the study beyond this date, please submit an application for continuation approval to the MUERC Secretariat by 18th August, 2016.

Approval for continuation of the study will be subject to successful submission of an annual progress report that is to reach the MUERC Secretariat by 18th August, 2016.

Please note that any unanticipated problems resulting from the conduct of this study must be reported to MUERC. You are required to submit any proposed changes to this study to MUERC for review and approval prior to initiation. Please advice MUERC when the study is completed or discontinued.

Thank you.

Yours faithfully,

DIRECTORATE OF RESEARCH PUBLICATION & CONSULTANCIES 11 SEP 2015 MASENO UNIVERSITY

Dr. Bonuke Anyona,
Secretary,
Maseno University Ethics Review Committee

Cc: Chairman,
Maseno University Ethics Review Committee.

MASENO UNIVERSITY IS ISO 9001:2008 CERTIFIED

Appendix N: Map of Kenya