EXPLORING THE EFFECT OF CAREGIVERS' TRAINING ON PRESCHOOLERS' LITERACY AND NUMERACY LEARNING OUTCOMES IN MACHINGA DISTRICT – MALAWI

BY

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A dissertation submitted to the University of Zambia in partial fulfillment of the requirements for award of the degree of Master of Education in Early Childhood Development, Care and Education.

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DECLARATION

I, Nellie Masamba, do hereby declare that this is my own work which has never been previously submitted for degree at the University of Zambia or any other universities. However all the work of other persons has been properly acknowledged**.**

Signature:  (Candidate) Date: 26th November, 2024

CERTIFICATE OF APPROVAL

This dissertation by Nellie Masamba is approved as a fulfilment of the requirements for the award of the Master Degree of Education in Early Childhood Development Care and Education of the University of Zambia.

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DEDICATION

This work is dedicated to my son Kumbukani Maneya who continuously supported me throughout my first part ensuring that he manages his siblings in support of his dad while enduring my absence. It is very painful that Kumbu passed on during my study period. May your departed Soul Continue to Rest in Peace my beloved only son! To my husband Paul Maneya; thank you for the encouragement and support throughout the studies. To my daughters Mwayiwathu and Favour Maneya, thank you for enduring my absence during the study period. To my brother Professor Wellington Riach Masamba, am so much grateful for the unwavering support and encouragement. Lastly to my late parents Rev. Riach Liamba Masamba and Margret Masamba; your motivation continues guiding me throughout my life.

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ABSTRACT

This research investigated the effect of trained caregivers on the literacy and numeracy learning outcomes of preschoolers'. The purpose of the study was to investigate the impact of caregivers' training on the literacy and numeracy learning outcomes of preschoolers in Machinga District -Malawi. The objectives were to assess the effectiveness of trained caregivers in improving literacy and numeracy learning outcomes of 5years old children in CBCCs, to establish how ECD caregivers employ strategies that have a significant impact on preschoolers' literacy and numeracy skills from the training program and to explore influence of strategies employed by caregivers that support literacy and numeracy learning outcome in preschoolers.

The research employed mixed-methods approach to comprehensively explore the impact of caregiver training on preschoolers' literacy and numeracy learning outcomes. Sequential exploratory design was used. Quantitative data was collected through quasi experiment whereby children in Community Based Childcare Centres (CBCCs) which are public preschools in Malawi with trained caregivers were assessed through administering of an assessment test using International Development and Early Learning Assessment tool (IDELA) while children of the same age in CBCCs with untrained caregivers was a control of the study. The standardized tests measured literacy and numeracy proficiency.

A sample size of 70 children aged five years who have been at the CBCC for not less than one year, 5 caregivers and five parents drawn from 3 CBCCs with all trained caregivers and 3 CBCCs with untrained caregivers to control using purposive, random and stratified sampling. The data was statistically analyzed to determine if there is a significant difference in numeracy and literacy learning outcomes between the two groups of children. Classroom observation of how Early Childhood Development (ECD) caregivers interact with children, pedagogy used and the environment was done using Measuring of Early Learning Environment (MELE) tool. Analysis of variance (ANOVA) was used to compare variances across the means and regression analysis was employed to establish how some confounding variables may impact literacy and numeracy learning outcomes in children.

On the other hand, qualitative data was gathered through semi-structured interviews and observational guide from caregivers and parents on how caregivers interact with children respectively. The qualitative component provides valuable insights into the specific practices and strategies employed by trained caregivers, as well as the experiences of caregivers and parents.

The findings from the research are that mean score of expressive language was 73.26% in CBCCs with trained caregivers which is slightly high than mean score in CBCCs with untrained caregivers at 66.81. Similarly receptive language with a mean score of 68.03 which is higher than 41.23. A mean of 68.19, Standard deviation of 16.392. In CBCCs with untrained caregivers scored a mean of 55.87, standard deviation of 26.678. This suggest that children in CBCCs with trained caregivers scores better than children in CBCCs with untrained caregivers hence caregiver training effect on literacy and numeracy learning outcomes.

The study provides actionable insights of recommendations including having standardized ECD trainings, reinforcing play based learning and resourcing the CBCCs. The findings of the study are expected to contribute significantly to the field of early childhood education care and development by shedding light on the effectiveness of caregiver training program in improving preschool children's literacy and numeracy skills. This study holds the potential to inform policymakers, educators, and caregivers about evidence-based practices that can positively impact early literacy and numeracy learning outcomes.

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LIST OF ABBREVIATIONS

ABREVIATIONS	
CBCC	Community Based Childcare Centre
ECD	Early Childhood Development
ECE	Early Childhood Education
IDELA	International Development and Early Learning Assessment
IEYP	Investing in Early Years for growth and Productivity Project
MELE	Measuring of Early Learning Environment
NGO	Non-Governmental Organization
SPSS	Statistical Package for the Social Sciences
TA	Traditional Authority
TET	Teacher Efficacy Theory
UNICEF	United Nations Children's Fund
USA	United States of America

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CHAPTER ONE

1.0 Introduction

Early child education (ECE) has been widely acknowledged as the foundation for lifelong learning, specifically with literacy and numeracy skills as the essential building blocks for future academic success. As the first educators of young children, caregivers play a significant role in fostering a conducive environment for learning. However, the effectiveness of this role depends on training and resources available to them. This chapter explored the impact of caregivers' training on the literacy and numeracy learning outcomes of preschoolers in Machinga District in Malawi. This chapter provides an overview of the study in terms of background of the study, problem statement, purpose and objectives of the study, study questions, significance of the study, and limitations and delimitations of the study.

1.1 Background of the Study

The first eight years of life are critical because the brain experiences the most rapid growth and development during the early years, with synaptic connections forming at an astonishing rate. This is a period of neural plasticity which means the brain's ability to reorganize its structure, functions, and connections in response to experiences, learning, and environmental changes (Kuhl , et al. 2021). The early years are also a prime time for language acquisition. Children's brain is highly receptive to language sounds and patterns, enabling them to learn multiple languages more easily and develop strong language skills. Fundamental cognitive skills, such as attention, memory, problem-solving, and reasoning, begin to develop in the early years. These skills provide the basis for academic learning and higher-order thinking (Diamond, 2020).

In the realm of education and child development, literacy and numeracy skills, encompassing the ability to read, write, and understand numerical concepts, are not only fundamental to academic achievement but also essential for meaningful participation in society (Neuman & Dickinson, 2016). One factor that has garnered attention in recent years as a potential catalyst for improved literacy and numeracy outcomes in young children is caregiver training. ECD caregivers, parents, guardians, and early childhood educators, play a pivotal role in shaping a child's early learning experiences (Yoshikawa, et al, 2018). It is therefore imperative that deliberate efforts be made to

give children the chance to grow up in an environment conducive to the development process where a trained caregiver is entrusted with the responsibility to initiate activities that will promote learning and growth in all developmental areas of the child (UNICEF, 2018). The early years are also important in laying the foundation for adulthood. Preschool therefore provides a sound basis for learning and helps children develop skills, knowledge, personal competence, and a sense of social responsibility (Messner & Levy, 2022).

According to the Malawi Integrated Early Childhood Development Policy (2017), the Early Childhood Education (ECE) programme is for children aged 3 to 5 years. ECE was introduced in order to assist and bring early learning, stimulation, and child care within the reach of the majority of Malawian children, particularly those in rural communities. Public ECE in Malawi is being implemented through the Community-Based Childcare Centre (CBCC) model. CBCC is a public preschool which is managed by community members to provide ECD services such as early learning, care, stimulation, nutrition and health with technical support from the Government. There are a total of 13,265 CBCCs and children in these CBCCs are handled by ECD caregivers who are responsible for the care, stimulation and early childhood education by facilitating structured and unstructured activities which promotes development of children physically, cognitive, socially and emotionally (Malawi Government, 2023). The National integrated ECD Policy and National ECD operational Guidelines give direction on the programming and implementation of ECD and ECE. The mid line Investing in Early Years (IEYP) report (2023), indicates that inadequate capacity building for caregivers and other carders, non-professionalization, poor infrastructure, low funding, and low visibility of ECD have negative consequences on the quality of ECE in Malawi, which include high caregiver turnover, an unorganized classroom, poor management of CBCCs, and most children being below average on numeracy and literacy skills at the transition age.

The Malawi government is implementing a school readiness program in all the 13, 265 CBCCs to support children in transitioning smoothly from CBCC to primary school. Transition, in this context, is a process in which a child moves from CBCC to primary school. Transition aims at preparing children for formal schooling. However, while some children in CBCCs are handled by trained ECD caregivers, most of the children are being managed by untrained caregivers since only 48.4% of ECD caregivers had received training by 2023 (Malawi Government, 2023). The basic

ECD caregiver training in Malawi is conducted for 14 days based on the ECD Caregivers Training Manual and the caregivers are certified by the Ministry of Gender, Community Development, and Social Welfare (Malawi Government, 2021). According to Olaleye & Omatayo (2020), young children learn best by experimenting with the environment through hands-on activities and play. A well-trained caregiver provides a wide range of age-appropriate play materials and initiates activities in a well-organized classroom that help children learn and motivate them to interact positively with each other, which in turn enhances the child's learning outcome (Guedes, 2020). Kholowa (2013), alludes to the fact that caregivers in Malawi work as volunteers who get trained on the job after they have worked for some time. However, despite this initiative, most of the caregivers are not yet trained, and there are no clear guidelines as to when the caregivers should be trained after they have started working. Further he alludes that the two weeks training is parked with a lot of information which makes it hard for the caregivers to understand due to their low education qualification. According to National Association for the Education of Young Children, (2016), caregiver training can positively influence children's learning outcomes because caregivers can be empowered with knowledge and skills to create nurturing and intellectually stimulating environments, use of pedagogy which helps children to learn freely and naturally literacy and numeracy and ability to handle children. However, disparities in literacy and numeracy outcomes persist, particularly among young children from disadvantaged backgrounds (Ferjan Ramírez, et al. 2020).

In light of the current policy context across the globe, early childhood educators must have a complex understanding of child development and early education issues so that they can provide rich, meaningful educational experiences for all children and their families in their care (UNICEF, 2018). Yoshikawa *et al.* (2018) argue that, among all the factors that influence the success of an ECE programme, none is more important than the quality of the teaching force. The most effective teachers offer cognitively stimulating and emotionally supportive interactions and are able to teach the young children the early literacy, math, and social-emotional skills that they need to thrive. However, very few children have access to caregivers with the required caregiver competencies for effective teaching and children's learning experiences as it is in Malawi about half of the caregivers are not trained (Malawi Government, 2023).

1.2 Problem Statement

Since the commencement of the National Integrated Policy on ECD, which seeks to ensure an accessible, optimally professionalized, and quality ECE, there have been concerns raised in respect of the quality of early education in CBCCs and its actual implementation, including the type of training that caregivers undergo. Despite all the measures put in place by the Government of Malawi, there are still some lapses in the implementation and non-implementation of the program requirements as stipulated in the policy and the National ECD strategic plan. While the government is expected to provide a necessary training strategy for ECD caregivers, which is well resourced, there are still gaps in this area. According to Shallwani (2018), most caregivers in Malawi do not receive the training at a prompt time and the training is conducted for a short period, only two weeks, with caregivers of mostly low academic qualification.

Midline report for the Malawi Investing in Early Years Project (IEYP), indicate that 55% of caregivers in Malawi are trained in the project districts but only 31.5 % of children aged 48 to 59 months are developmentally on truck in literacy and numeracy (Malawi Government, 2023). While numerous studies have explored the influence of how caregivers are trained in Malawi and how the academic qualification of caregivers affect learning outcomes, there is a gap on research focusing on exploring the effectiveness of trained caregivers on literacy and numeracy learning outcomes in preschoolers. Further the previous studies specificity did not address the linkage between caregiver training and measurable literacy and numeracy outcomes. Hence, the present study investigated the impact of caregivers' training on the literacy and numeracy learning outcomes of preschoolers in Machinga District in Malawi.

1.3 Purpose of the Study

The main objective of the study was to investigate the impact of caregivers' training on the literacy and numeracy learning outcomes of preschoolers in Machinga District in Malawi.

1.4 Objectives

In a relation to the main objective above, the following supporting objectives were used:

i. To assess the effectiveness of trained caregivers in improving expressive, and receptive language skills as components of literacy learning outcomes in CBCC transitioning children.
ii. To assess the effectiveness of trained caregivers in improving number sense, counting, and shapes in transitioning CBCC children.
iii. To explore influence of trained caregivers on the literacy and numeracy learning outcome in children aged 5 years in the CBCCs.
iv. To establish strategies employed by ECD caregivers that have a significant impact on children's literacy and numeracy skills from the training program.

1.5 Research Questions

The overall research question was: what is the impact of caregivers' training on the literacy and numeracy learning outcomes of preschoolers in Machinga District in Malawi? Specifically, the study was guided by the following questions:

i. What is the effectiveness of trained caregivers in improving expressive and receptive language skills as components of literacy learning outcomes in CBCC transitioning children?
ii. What is the effectiveness of trained caregivers in improving number sense, counting, and shapes in CBCC transitioning children?
iii. How does trained caregivers influence the effectiveness literacy and numeracy learning outcomes?
iv. What are specific teaching strategies employed by trained ECD caregivers that have a significant impact on children's literacy and numeracy skills?

1.6 Significance of the Study

The study is vital in the following ways.

First, the study may enhance ECE by understanding the impact of trained caregivers on literacy and numeracy learning outcomes, which can contribute to the improvement of ECE programmes by identifying effective caregiver training methods.

Second, hopes to bring the understanding of teaching strategies that are effective in literacy and numeracy skills in children may help fostering of such strategies such as, interactive read-alouds, play-based learning, phonological awareness activities, hands-on math manipulatives, language-rich environment, guided writing practice, storytelling and role playing, and integrating literacy and numeracy in daily routines to address achievement gaps in learning.

Furthermore, the study hopes to provide evidence-based recommendations for training programmes that empower caregivers with effective instructional techniques and strategies, ultimately improving their ability to support children's literacy and numeracy learning. Thus, the findings may inform policymakers so that they may align research outcomes with policy to create a supportive environment that contributes to building a strong foundation for children's literacy and numeracy educational journey. It was therefore imperative to conduct this study to seal the existing gap and to enormously contribute to the body of knowledge.

1.7 Limitations of the Study

The study faced the following limitations:

The reliance on self-reported data from caregivers and other participants may introduce bias, as responses could be influenced by social desirability or memory recall issues.. On the other hand, the generalizability of the findings may be limited due to the specific context in which the study is conducted—Machinga District. Further, the variability in the number of caregivers across CBCCs as these caregivers are volunteers, and community management practices differ. The educational qualifications of the caregivers may vary despite attempts to standardise qualifications for comparative analysis, potentially affecting the consistency and reliability of the results.

In attempt to address these limitations, multiple data collection tools including observation was employed to ensure that the data collected is valid. The researcher also sampled caregivers who

have been volunteering for more than five years to ensure that they can respond accordingly based on the experience accumulated and caregivers of the same qualification were sampled.

1.8 Delimitations of the Study

The study specifically targeted 5-year-old children who are transitioning to primary school. This allowed for a more focused analysis and reducing the complexities associated with a broader age range. The research was also designed to examine the effect of trained caregivers on the literacy and numeracy learning outcomes of these children. It deliberately excluded other variables such as additional educational interventions or parental involvement that might influence learning outcomes. The study was conducted within the particular context of Machinga District and within a specific educational setting, recognising that the findings may not be directly applicable to other contexts. The study utilised a mixed-methods approach within a quasi-experimental design to explore the research questions in depth.

1.9 Operational Definitions

1.9.1 Community Based Childcare Centre (CBCC)

This is a public preschool which is managed by community members to provide early childhood services such as early learning, care, stimulation, nutrition and health with technical support from the Government (Malawi Government, 2017)

1.9.2 Early Childhood Development (ECD)

Refers to the physical, cognitive, social, and emotional growth of children from birth to around eight years old. It encompasses key developmental milestones in areas such as motor skills, language acquisition, problem-solving abilities, emotional regulation, and social interactions (Yoshikawa, et al, 2018).

1.9.3 Early Childhood Education (ECE)

Refers to the informal teaching and care provided to children from birth to around eight years old, with a primary focus on the preschool years (ages 3-5). It includes a range of programs, such as

preschool, CBCC, kindergarten, and early primary education, designed to promote children's cognitive, social, emotional, and physical development(Yoshikawa, et al, 2018)..

1.9.4 School Readiness Initiative (SRI)

is a program to ensure that young children, particularly those aged five years at a preschool , develop the necessary skills and abilities to successfully transition into formal schooling (Malawi Government, 2017).

1.10 Structure of the Study

This study is organised into six chapters as follows. Chapter one provides an overview of the research topic, including the background, problem statement, research objectives, questions, and hypotheses. It also highlights the significance of the study, and discusses its limitations and delimitations. Chapter two delves into the existing literature relevant to the study. It scrutinises empirical literature, theoretical, and conceptual frameworks. It offers a critical analysis of prior research and identifies gaps. Chapter three describes the research design and methodology. It details the study population, sampling techniques, data collection methods, and the instruments used to gather information. This chapter also outlines the data analysis procedures and discusses the ethical considerations that guided the research process. Chapter four presents the findings of the study analysed in relation to the research questions objectives. Chapter five includes a discussion of the findings by comparing them with existing literature and theoretical insights. The chapter also summarises the key findings of the study and discusses their implications for early childhood education. Chapter six offers practical recommendations, as well as suggestions for future research.

1.11 Chapter Summary

This chapter has established the foundation for exploring the impact of caregiver training on the literacy and numeracy outcomes of pre-schoolers. It has discussed the research problem, objectives, and questions. It also addressed the study's limitations and delimitations, focusing the research on a specific context and age group. This chapter concluded by providing an overview of the dissertation's structure.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The chapter comprehensively examines the existing research and theoretical perspectives related to the impact of caregivers' training on ECE, particularly on literacy and numeracy outcomes. It reviews studies conducted on the specific objectives of the present study. This chapter also presents the conceptual framework of the study. Research based studies examining the role of caregiver training in influencing preschoolers' learning outcomes has grown significantly in recent years. This body of research explores various dimensions, such as literacy, numeracy, and socio-emotional development, underscoring the importance of professional development for early childhood educators. Below is an overview of key findings from relevant empirical studies.

2.1.1 ECD Caregivers' Training

Preschool education plays a critical role in shaping children's early academic and cognitive development. One significant factor that influences the quality of preschool education is the training of preschool teachers (Yoshikawa *et al.,* 2018). According to Mickelson et al. (2023), a trained ECD caregiver possesses a combination of education, skills, and qualities that enable them to effectively nurture and educate young children in a preschool or early childhood education setting. Effective training programs for preschool teachers have the potential to enhance the literacy and numeracy learning outcomes of young learners. Similarly, Piasta et al. (2017) found that preschool teachers trained in phonics-based instruction improved children's letter recognition and phonemic awareness significantly compared to those without such training. Research on the direct impact of pre-service teacher education and Continuous Professional Development (CPD) is inconclusive. The research highpoints that Initial training is not always adapted to the challenges teachers face (Best, Tournier, & Chimier, 2018). Research is inconclusive about the minimum academic level required for teaching, especially at primary level. Some studies show that beyond a certain threshold, academic level has moderate or no effects on primary level learning outcomes (Best, Tournier, and Chimier, 2018). Conversely, a study in sub-Saharan African countries demonstrated that teachers with upper secondary education affect learners more positively than

those with lower secondary education (Bernard, Tiyab, & Vianou, 2004). However, ‘in India, pre-service teacher training and holding a Master’s level qualification were found to have a significant positive correlation to learner outcomes’ (UNESCO, 2019: 47).

Neuman & Cunningham (2019), in their study "The Role of Preschool Teacher Training in Fostering Literacy Development", expound that understanding the characteristics of effective training programs is crucial. The study alludes to the fact that training programs that incorporate evidence-based instructional strategies, active learning approaches, and ongoing support have shown promising results in enhancing children's literacy and numeracy skills. Effective preschool teacher training programs share several key characteristics that contribute to their success in enhancing the quality of early childhood education.

Teachers trained in evidence-based methods are more likely to implement strategies that yield positive learning outcomes. Effective training programs incorporate active learning approaches, allowing teachers to engage in hands-on activities, play-based learning, role-playing, and reflective discussions. Active learning encourages teachers to practice new skills and strategies, reinforcing their understanding and application in real-life classroom situations (Wasik & Hindman, 2018).

In Malawi, according to Malawi ECD country report, (2021), a lack of appropriate training and resources makes it hard for CBCCs to handle children, including those with special needs, despite caregivers being trained. The study further found that the training for caregivers is conducted within two weeks with too much information for ECD caregivers who have as low as a primary education qualification. The report further highlighted that there is less time allocated for practical sessions hence ECD caregivers are not given ample time for hands on experience but rather theoretical content. Nevertheless, the study concluded that, despite the fact that most CBCC premises and structures fell short of the standards laid down by the government, the activities and services provided were mostly to the book. Children were provided with nutritious foods and subjected to play that stimulated their development. This, however, still poses a question: do these trained caregivers impact positively on literacy and numeracy learning outcomes?

2.1.2 Effectiveness of Caregivers' Training and Literacy Learning Outcomes of Preschoolers

Receptive and expressive language are two important components of language development and communication. Receptive language focus on understanding and comprehending spoken or written language and other forms of communication. While expressive language focus on producing and conveying language through speech, writing, gestures, or other means to express thoughts, ideas, and emotions. However, both receptive and expressive language skills are crucial for effective communication and social interaction. Language development involves the simultaneous growth of both of these skills, and they often develop in tandem as individuals acquire and refine their language abilities. Strong receptive language skills lay the foundation for effective expressive language since children typically develop receptive language skills before expressive language skills (Owens, 2016).

The research findings by Busch at al. conducted in Germany regarding the relevance of caregivers' professionalization for the realization of language support in ECE in their meta-analysis, Fitton et al. (2018) reported an overall positive effect of trained caregivers on children's language outcomes. However, in contrast to additive language support interventions, integrated interventions implemented through professionalization of caregivers have the advantage of being highly frequent in everyday pedagogical situations (Kammermeyer, 2019).

Empirical studies indicate that trained caregivers are more adept at using evidence-based strategies, such as dialogic reading, open-ended questioning, and interactive play, to enhance children's expressive and receptive language abilities. Study by Mol et al. (2018) found that caregiver training in dialogic reading resulted in significant gains in vocabulary and sentence complexity, both key indicators of expressive language. Similarly, Wasik and Hindman (2019) demonstrated that professional development programs focusing on intentional language modeling improved children's ability to comprehend and follow instructions, reflecting growth in receptive language. These interventions are particularly effective in early childhood settings, where consistent exposure to enriched language input fosters cognitive and social-emotional development. Despite these positive outcomes, challenges such as caregiver-to-child ratios, limited access to training in underserved areas, and the need for sustained professional support remain barriers to maximizing impact. Overall, the evidence underscores the effectiveness of

trained caregivers in improving language outcomes, emphasizing the importance of integrating such training into early childhood education policies and practices.

The impact of preschool teachers' training on literacy learning outcomes in children has been a subject of interest for researchers and educators. Several studies have investigated this relationship, and while the findings are not entirely consistent, there is evidence to suggest that well-designed and effective teacher training can positively influence children's literacy development. Studies investigating the effects of teacher training on literacy learning outcomes in preschool children have provided mixed findings. For instance, a study on the “Phonologically Based Preschool Reading Curriculum Randomized Trial” by Whitehurst et al. (2017) found that preschool teacher training focused on phonemic awareness and language development positively impacted children's early reading abilities. In contrast, other research by Johnson & Smith (2019) on "Enhancing preschool literacy and numeracy instructions through teacher training", reported limited effects of teacher training on children's literacy skills. The variability in results suggests the need for more research to identify specific training components that yield the most significant benefits. Preschool teachers who receive specialized training in literacy instruction tend to implement more effective and evidence-based teaching techniques in the classroom. These techniques may include explicit phonics instruction, interactive read-alouds, vocabulary development strategies, and storytelling. As a result, children are exposed to a rich literacy environment that enhances their language skills and comprehension abilities (Mashburn et al., 2018).

Teachers trained in supporting language development can create language-rich classrooms that encourage communication and language exploration. They may engage children in meaningful conversations, introduce vocabulary words, and promote storytelling, all of which contribute to improved language skills and foundational literacy (Sénéchal et al., 2020). Preschool teacher training that emphasizes phonemic awareness and phonics instruction can positively impact children's early reading abilities. Phonemic awareness is the ability to recognize and manipulate individual sounds in spoken words, while phonics involves the relationship between sounds and letters (Kilpatrick, 2015). Teachers who are trained in these areas can design activities that enhance children's phonological awareness, which is a strong predictor of later reading success. Effective teacher training programs equip teachers with the ability to assess individual children's literacy skills and tailor instruction to meet their specific needs. This personalized approach

ensures that struggling readers receive targeted support and advanced readers are appropriately challenged (Johnson & Smith, 2019). Training programs often focus on the early identification of children at risk of reading difficulties. Teachers trained to recognize early signs of reading challenges can implement intervention strategies promptly, reducing the likelihood of reading difficulties persisting into later grades. The report on Protecting Early Childhood Development (2016) in Malawi, explains that centers with caregivers who were trained for 6 months in a phased approach showed modest language and numeracy skills effects. However, the study also mentioned that the training content for ECD caregivers lack content in emergent numeracy, phonics and other literacy components. However, the report did not further provide an insight into how effective that is in terms of literacy and numeracy learning outcomes.

2.1.4 Trained Caregivers in Improving Number Sense, Counting, and Shapes

Baker and Jones (2020), in their study on "Evaluating the Efficacy of Preschool Teacher Training in Numeracy", reported modest effects of teacher training on numeracy outcomes. The findings indicate the need for further investigation into effective training approaches that specifically enhance numeracy skills in preschool children. The impact of preschool teachers' training on numeracy learning outcomes in children is an essential aspect of early childhood education research. There is evidence to suggest that effective teacher training can have a positive influence on children. The results of their study further suggested that increasing teachers' education is not sufficient for improving classroom quality or for increasing children's academic gains. The authors recommended that a broad range of professional development activities that directly support a teacher's interactions with children is essential to improving the academic gains of young children's literacy and numeracy skills.

Preschool teachers who receive specialized training in numeracy instruction gain a deeper understanding of mathematical concepts and pedagogical strategies. This improved knowledge allows them to design developmentally appropriate and engaging activities that support children's early numeracy skills. Adequate training enhances teachers' confidence and competence in teaching numeracy skills. Confident teachers are more likely to implement effective strategies and create a positive learning environment that encourages children to explore and engage with mathematical concepts (Johnson et al., 2021). However, Brown et al. (2022) submits that integrated training programmes, which focus on linking literacy and numeracy instruction, yielded

more substantial gains in children's overall learning outcomes compared to isolated training in either domain. Zulkarnaen, Zulkarnaen & Zulfakar, Zulfakar. (2021), expounds that achieving of the learning outcomes in preschool children depends on the effectiveness of educators based on their knowledge, skills and training among others. The patchiness in the research findings explains the need to explore the training program for ECE caregivers in Malawi if it comprises elements that supports literacy and numeracy learning outcomes.

2.1.5 Teaching Strategies Employed by Trained ECD Caregivers That Have a Significant Impact on Children's Literacy and Numeracy Skills

Recent studies have explored the impact of trained caregivers on improving children's numeracy skills. A meta-analysis by Nelson et al. (2024) examined 25 math interventions involving caregivers and children from preschool to third grade. The analysis revealed a statistically significant positive effect on children's math achievement, with larger effects observed in interventions that included follow-up support for caregivers and comprehensive early numeracy measures.

A study, "Effectiveness of Project COUNTS in Improving Students' Numeracy Skills," (Munda, et al., 2024) conducted in Philippines, investigated an intervention program aimed at enhancing numeracy among low- and non-numerate high school students. The findings indicated a statistically significant improvement in students' numeracy skills following the intervention, confirming the program's effectiveness.

Another study by Schmerse et al. (2022) evaluated the effects of a caregiver-implemented picture book intervention designed to support children's mathematical language and numeracy skills. Eighty-four children aged 3 to 5 were randomly assigned to either an intervention group, which received picture books with embedded mathematical content, or an active control group. Families were asked to read each book four times over four weeks. The intervention group showed significant improvements in mathematical language and numeracy at the posttest, with numeracy effects persisting at a delayed posttest, suggesting that such interventions can have lasting positive impacts

Training programs that emphasize the development of mathematical language and vocabulary can positively impact children's numeracy learning outcomes. Teachers who use precise mathematical language during instruction help children build a strong foundation for understanding mathematical concepts and problem-solving (Starkey & Klein, 2020). Teachers trained in promoting conceptual understanding in mathematics can help children move beyond rote memorization to grasp the underlying concepts and relationships in numerical operations. This deeper understanding fosters long-term retention and application of numeracy skills (Baker & Jones, 2020). Effective teacher training often incorporates play-based learning approaches that enable children to explore mathematical concepts through hands-on activities and games. Playful and engaging experiences can enhance children's motivation and enjoyment of mathematics, leading to more positive learning outcomes (Baroody et al., 2019).

Teachers trained in promoting mathematical problem-solving skills can help children apply numeracy concepts to real-life situations. Problem-solving opportunities foster critical thinking, logical reasoning, and the ability to use numeracy skills in practical contexts (Clements & Sarama, 2020). Training programmes that emphasise early identification of numeracy difficulties enable teachers to provide timely and targeted interventions for children at risk of falling behind in mathematical skills. Early intervention can prevent long-term difficulties and ensure that children receive appropriate support (Baker & Jones, 2020). A well-structured and comprehensive training programme equips teachers with the necessary skills and knowledge to support children's development in critical domains like physical, literacy, and numeracy. Research on "Preschool Teacher Training and Children's School Readiness", has shown that teachers' competencies significantly influence children's academic progress and school readiness (Powell et al., 2018).

The ECD Training Needs Assessment report by Kholowa et al. (2013) highlights that caregivers that are trained in Malawi mostly have very low education qualifications to facilitate child development and learning. The report further alluded to the fact that caregivers' trainability is quite uncertain since some might just attend the training, but the acquisition of knowledge is very minimal because the training is informal and done only in two weeks (14 days). It further holds that there is little or no warrant that these caregivers can transfer any competences to children in the CBCC or use the recommended pedagogical skills that prepare children for formal primary education. ECE quality is closely linked to the level of staff qualification, which may indicate that

it is important to have teachers with qualification higher than secondary education working with young children. The professionalization of the early childhood sector through more qualified staff may lead to significant gains for children and their families, contributing towards life-long outcomes that will benefit all of society. This concurs with (Nawaz, et al., 2021), who says that learning occurs faster in the early years of life and (ECE) programs generally with well qualified educators of good qualification facilitates well the learning hence achieving the learning outcomes for children. Collectively, these studies suggest that caregiver training, especially when coupled with follow-up support and structured materials, can effectively enhance children's numeracy skills.

2.1.6 Factors That Influence the Effectiveness of Caregivers' Training Interventions

The demographics of children and parents can significantly affect literacy and numeracy learning outcomes. These demographic factors include; environment, caregiver characteristics training design and delivery

A study undertaken in South Africa by the Departments of Basic Education and Social Development and UNICEF, (2018) on assessing the delivery of ECD services for children in preschools reveals that poverty, poor infrastructure, and a lack of resources in preschools have a significant negative influence on the ability of the educators to provide quality services to children, which in turn impact literacy and numeracy learning outcomes.

Reardon, (2011) alludes that, children from lower socioeconomic backgrounds tend to have lower literacy and numeracy skills compared to their peers from higher socio-economic families. Low socio-economic households may have limited access to books, educational materials, and extracurricular activities that promote literacy and numeracy skills.

According to Sirin (2020), parents with higher levels of education often provide more stimulating home environments and are better equipped to support their children's learning. They tend to engage in activities such as reading, which promotes literacy skills, and help with homework, which supports numeracy skills. Children who speak a language at home that differs from the language of instruction may face language barriers in school. This can impact their ability to acquire literacy and numeracy skills (August & Shanahan, 2006). Additionally, children with

limited access to resources such as books and other reading materials at home may struggle to develop their literacy and numeracy skills (Duncan, & Murnane, 2011). A literacy-rich home and classroom environment that exposes children to written and oral language in a wide variety of ways and gives children the opportunity to develop their literacy skills (Mwanza-Kabaghe, et al, 2022).

Similarly, Matafwali (2010), in a study which sought to explore the role of oral language in the acquisition of literacy skills with particular focus on Zambian languages and English language, further established that the literacy levels of a majority of Zambian children were remarkably low despite having a rich literacy programme in place.

Munthali et al. (2014) found out that most CBCCs are not well equipped with play materials, as only 40% of the CBCCs in Malawi reported having some play materials from their study, which raises a question as to how caregivers facilitate learning and stimulation for children to develop in all domains as it makes difficult for caregivers to handle children. In Malawi, research by Neuman et al., (2019), has found the severe challenges in both the sustainability and quality of ECD centres . ECD programmes of low quality are unlikely to produce the desired child and family outcomes (Britto, et al., 2019). This means that apart from the training of caregivers there are other factors that influence effectiveness of the trained caregiver.

2.2 Theoretical Framework

The study utilised Teacher Efficacy Theory (TET) by Albert Bandura.

The researcher is guided by TET developed by Albert Bandura, a renowned psychologist known for his work on self-efficacy, in the 1980s. It is a psychological framework that focuses on the beliefs and perceptions teachers have about their ability to influence student learning and outcomes. Teacher efficacy theory posits that a teacher's confidence in their own teaching abilities significantly impacts their instructional practices, student engagement, and overall classroom performance. This theory is rooted in social cognitive theory (Bandura, 1997).

According to Bandura, key components of TET include; teacher self-efficacy which refers to a teacher's belief in their capacity to perform specific teaching tasks effectively. It encompasses the belief that a teacher can manage classroom behaviour, design and implement effective instructional

strategies, and help students succeed academically. According to Bandura, teachers with high self-efficacy are more likely to believe that their efforts will result in positive student outcomes, while those with low self-efficacy may doubt their ability to make a difference. Further, Bandura identified four primary sources of confidence that contribute to teacher self-efficacy: mastery experiences (successes and accomplishments), vicarious experiences (observing others succeed), social persuasion (feedback and encouragement from others), and emotional and physiological states which is the self-regulation and stress management (Tschannen-Moran & Woolfolk 2001).

The influence of TET on education is significant in a number of ways including; teachers with high self-efficacy are more likely to adopt innovative teaching methods, set challenging goals, and persist in the face of obstacles. They are also more likely to adapt their instruction to meet the diverse needs of their students. In addition, teacher efficacy is linked to student motivation and achievement. When teachers believe in their ability to make a difference, they can inspire and motivate students to strive for success. Further, TET plays a role in professional development, as educators who believe in their own efficacy are more likely to engage in lifelong learning and seek out opportunities to improve their teaching skills. A school with a culture that fosters teacher efficacy can lead to improved teacher morale, collaboration, and a positive impact on student outcomes (Hattie, 2009). This shows the correlation between the study and the learning of preschoolers who interact with teachers or caregivers with efficacy. The theory is selected based on the merit that it is quite useful for studying caregivers as it puts across key components of TET that helps in the study. When teachers have a strong sense of efficacy, they are more likely to create positive learning environments and contribute to students' success. Further, higher Self-Efficacy in trained caregivers leads to greater engagement. Caregivers who receive training and feel confident in their ability to teach numeracy are more likely to engage in educational activities with children (Tschannen-Moran & Hoy, 2001). Studies show that when caregivers believe they can positively impact a child's learning, they provide more frequent and higher-quality math interactions (Friedman-Krauss et al., 2014).

TET also relate to persistence and adaptability in teaching strategies. Caregivers with higher self-efficacy are more likely to persist in teaching numeracy despite challenges (Bandura, 1997).Trained teachers who believe in their ability to help children develop math skills are more likely to seek out and implement effective strategies (Hamre & Pianta, 2005).

Research also suggests that when caregivers are confident and skilled, they create more supportive learning environments, leading to better numeracy outcomes (Rimm-Kaufman & Hamre, 2010).

Training programs designed to improve caregivers' teaching skills also boost teacher self-efficacy (Sarama & Clements, 2009). As caregivers see improvements in children's numeracy, their confidence grows, reinforcing their effectiveness.Teacher Efficacy Theory suggests that the effectiveness of trained caregivers is influenced by their self-efficacy. Training enhances caregivers' confidence, leading to more frequent, persistent, and effective numeracy interactions, ultimately benefiting children's mathematical development.

High teacher efficacy often leads to greater motivation, persistence, and adaptability in the classroom, which can enhance teacher effectiveness. However, a teacher can have high efficacy but still be ineffective if their methods are outdated or lack proper training. Conversely, a well-trained teacher with low efficacy may struggle to implement their knowledge effectively due to self-doubt or lack of confidence. Therefore the role of Training is to Enhancing Teacher Efficacy. Further, improving teacher effectiveness, the best outcomes occur when training develops both efficacy and effectiveness simultaneously—giving teachers' confidence in their skills and ensuring their methods are effective (LeFevre et al., 2010).

However, the theory oversimplifies the complex interactions between teachers, learners and the environment, it implies that teacher effectiveness is the primary factor influencing student outcomes neglecting other critical factors such as learners motivation, parental involvement and social economic factors. The theory also fails to account for diverse contexts in which teaching and learning occur. It assumes that effective teaching are universal and can be applied regardless of the specific school, classroom, or learner population. Further, the theory fails to consider the complexity of student learning. The theory implies that student learning is a direct result of teacher effectiveness neglecting the complex and multifaceted nature of student learning such as experience, motivation, learning style which can influence learning outcomes.

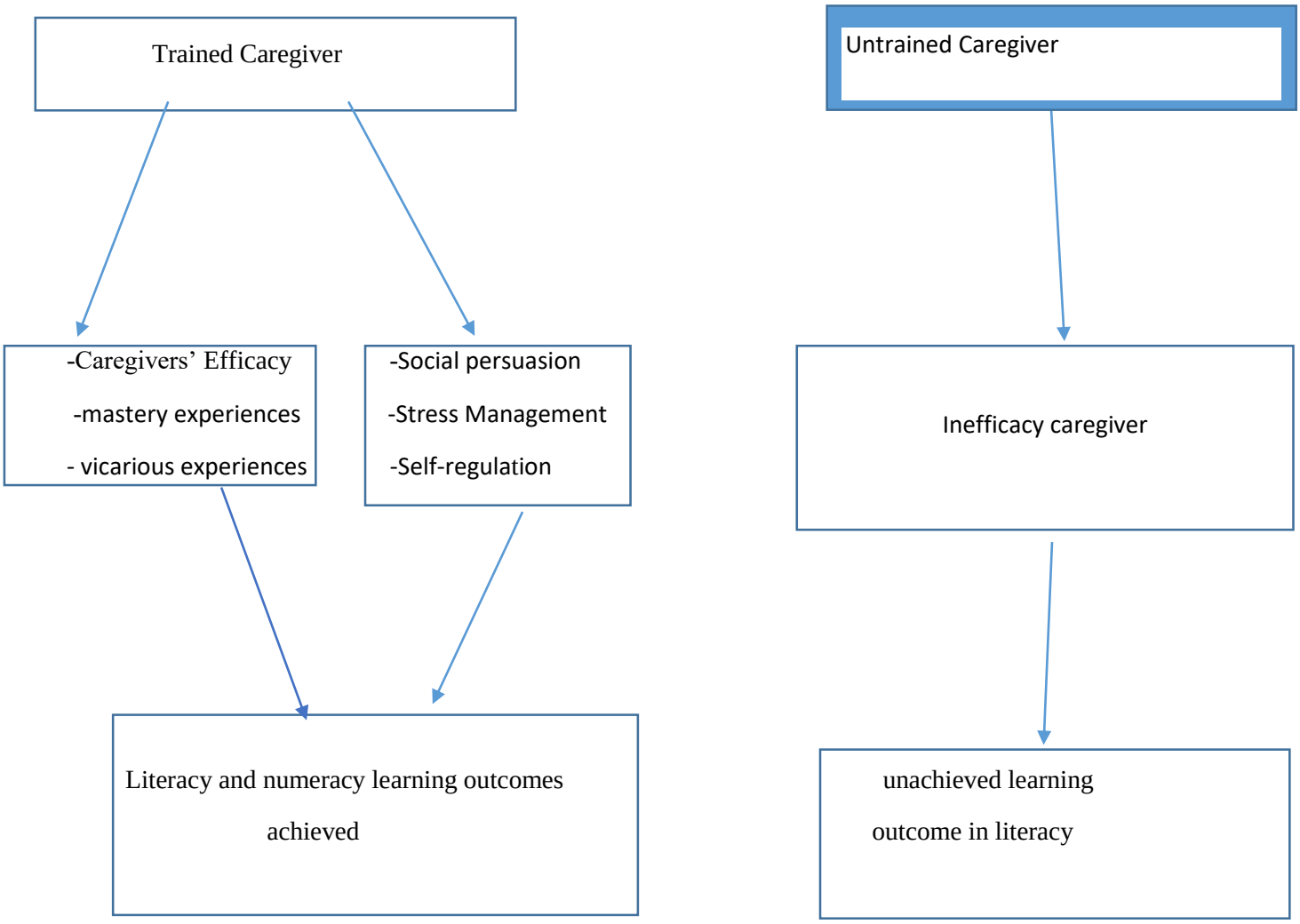
The researcher considering the weaknesses, contextualized the study by conducting it in the rural community in Malawi and in CBCCs where access to quality early learning is limited and the caregivers are volunteers. The researcher, acknowledged that potential impact of systematic

inequalities on the effectiveness of the ECD caregiver training and the learning outcomes of preschoolers by recruiting only caregivers who have more than five years' experience and children who were assessed were the five year olds and have been at the CBCC for more than one year.

2.3 Conceptual Framework

The conceptual framework illustrates key components and relationships within the research proposal. It focuses on how caregivers' training may influence the literacy and numeracy skills of CBCC children.

Figure 1: Conceptual Framework



2.4 Definition of Terms

2.4.1. The Independent Variable

Caregivers' Training. Caregivers who were trained for two weeks in basic early childhood development are the independent variables. According to the Malawi Government (2018), the training of caregivers encompasses a structured program designed to enhance caregivers' abilities to support and facilitate the holistic development of preschoolers. The training includes strategies, techniques, and other resources for caregivers to effectively engage children in literacy and numeracy and is conducted for fourteen days.

2.4.2 Dependent variables

2.4.2.1 Age of learners: The age of children could impact the effectiveness of caregiver training. Assessing of learning outcomes is age based.

2.4.2.2 Caregiver engagement: This reflects the degree to which caregivers actively participate in the implementation of the training content. Caregivers who are engaged apply the acquired skills and strategies, leading to more active support for literacy and numeracy, hence achieving the learning outcomes.

2.4.2.3 Literacy and numeracy Learning Outcomes: These are specific skills, knowledge and abilities that children demonstrate as a result of their literacy and numeracy learning experiences.

2.4.2.4 Supportive learning environment: The creation of an environment that fosters literacy and numeracy skills is vital. Caregivers who create conducive environments enable learners to practice their skills in relation to life contexts, reinforcing their learning outcomes.

2.4.3 Confounding Variables

2.4.3.1 Home Learning Environment

The learning environment at home, including the availability of books, educational toys, and parental support, can impact a child's learning. Caregivers' training might influence the home

learning environment, but the environment itself could also be a confounding variable affecting the outcomes (Mwanza-Kabaghe, et al, 2022).

2.4.3.2 Parental Involvement

This refers to the participation and engagement of parents in their child's education and development. There might be differences in the learning outcomes of children whose parents are actively involved in their child's education and this might independently contribute to literacy and numeracy outcomes (Reardon, 2011).

2.4.3.3 Socioeconomic Status

Preschoolers from different socioeconomic backgrounds might have varying access to educational resources and support at home. Socioeconomic status can significantly impact a child's learning outcomes, potentially confounding the relationship between caregivers' training and literacy/numeracy skills (Sirin, 2005).

2.5 Chapter Summary

This chapter has provided an extensive review of existing literature. It has highlighted the importance of effective training programs in equipping caregivers with the skills necessary to foster children's cognitive and academic development. The chapter also highlighted the theoretical framework for the study. Teacher Efficacy Theory by Albert Bandura which posits that a teacher's confidence in their own teaching abilities significantly impacts their instructional practices, student engagement and children performance. Various studies have demonstrated the potential of trained caregivers to positively influence children's language and numeracy skills, though the effectiveness of these training programs can vary depending on the context, quality of training, and support provided to caregivers. However, despite the considerable research in this field, significant gaps remain. Most studies focus on high-resource settings, leaving a gap in understanding the impact of caregivers' training in under-resourced and rural environments, such as those found in Malawi. Additionally, there is limited research on the effects of caregivers' training on children's literacy and numeracy outcomes, particularly in the context of CBCCs. This study aims to address these gaps by exploring the effectiveness of caregiver training in Machinga District, Malawi, and its influence on pre-schoolers' literacy and numeracy development.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter outlines the methodological approach adopted in this study. A mixed-methods research design, specifically a sequential explanatory design, was employed to comprehensively address the research questions. The study began with a quantitative phase to establish the statistical significance of the impact, followed by a qualitative phase to delve deeper into the contextual factors influencing the results. The chapter details the research design, study population, sampling procedures, data collection methods, and analytical techniques used to gather and analyse data. Additionally, the chapter discusses the measures taken to ensure the rigor, reliability, and validity of the research, alongside ethical considerations.

3.1 Research Design

This study adopted a sequential explanatory mixed-methods design. This design is characterised by the collection and analysis of quantitative data followed by qualitative data. The rationale for selecting this design was to obtain robust statistical evidence of the impact of caregiver training and then explore the contextual and perceptual factors underlying these results through qualitative inquiry. Creswell (2014) and Ivankova et al. (2006) highlight that this design is particularly effective when a study seeks to explain relationships and build upon quantitative findings with qualitative insights.

3.2 Quantitative Phase

The quantitative phase employed a quasi-experimental design, specifically a non-equivalent control group design. This approach was selected due to the practical constraints of random assignment in educational settings. Instead, children attending CBCCs with trained caregivers formed the treatment group, while those with untrained caregivers constituted the control group. This design allowed the researcher to measure the impact of caregiver training on literacy and numeracy while controlling for potential confounding variables (Shadish, et al., 2002). The International Development and Early Learning Assessment (IDELA) tool, widely validated in low- and middle-income countries (Pisani, et al., 2018), was adapted to assess literacy and numeracy

outcomes. The adaptation process involved translating the tool into the local language, Chichewa, and piloting it to ensure cultural and contextual relevance (UNESCO, 2015). The IDELA tool measured literacy (receptive vocabulary, phonics, comprehension) and numeracy (counting, number recognition, shape knowledge) (Pisani et al., 2018)

3.3 Qualitative Phase

A qualitative phase was conducted to gain insights into the experiences and perceptions of caregivers on strategies that promote literacy development in children. Semi structured interviews and observations were employed to collect data. Both trained and untrained caregivers were interviewed to understand their perspectives on the teaching strategies and its impact on literacy and numeracy learning outcomes. Further, observation of preschoolers and caregivers in their learning environment using Measuring of Early Learning Environment (MELE) was done. Data was then analysed to identify themes, and factors that may explain the findings in an in depth. Qualitative research was conducted because it emphasises on the in-depth understanding associated with the phenomenon. It also attempts to tap into the deeper meanings of particular human experiences and is intended to generate richer observations that are not easily reduced to numbers (Rubin, 2001).

The integration of the quantitative and qualitative findings provides a comprehensive understanding of the impact of trained caregivers on preschoolers' learning outcomes in literacy and numeracy. This has provided a holistic interpretation of the findings, considering not only the statistical significance but also the qualitative insights, that has offered a nuanced understanding of how caregiver training influences preschoolers' literacy and numeracy outcomes.

3.4 Study Population

The study population were five ECD caregivers, seventy sampled children who were five years old but have been at the CBCC at least for one year and five parents of children sampled for assessment totaling to eighty. Seventy children were engaged in the assessment of child’s development while parents and caregivers were engaged in semi structured interviews using different checklists.

3.5 Study Site

The study was conducted in Traditional Authority (TA) Sitola in Machinga district- Malawi. The was purposively selected because it is where there are caregivers who are all trained within a CBCCs, and also in the same traditional authority there are CBCCs with all caregivers who are not trained unlike most Traditional Authorities which have a combination of both trained and untrained caregivers in a CBCC.

3.6 Sample Size

A sample size of eighty (80) participants was engaged in this study of which seventy (70) (five) year-old (5) children who were transitioning to primary school and who have been enrolled in the CBCCs for at least one year in both CBCCs with trained and untrained caregivers in 5 schools, 5 caregivers(CG) in the same schools and 5 parents (P) of children were purposively selected, . The researcher calculated the standard deviation, which is the measure of how dispersed the data is in relation to the mean, so that it gives an average of how far each value lies from the mean (Hughes, 2005).

3.7 Sampling Techniques

3.7.1 Purposive Sampling

Purposive sampling is a non-random sampling technique where researchers deliberately selected participants based on specific criteria that are relevant to the research objectives (Palinkas et al., 2015). Purposeful sampling was used to identify caregivers and children to participate in the study. Purposive sampling involves deliberately selecting specific individuals, groups, or data points that possess unique characteristics or insights related to the research objectives. This approach ensures that the sample consists of individuals who have directly experienced the training, allowing for a focused assessment of its impact. This method allows researchers to target specific attributes that are of interest, resulting in a focused and specialised dataset (Patton, 2015).

3.7.2 Purposive Random Sampling

Caregivers to participate in the study were purposively random sampled . Simple random sampling involves selecting a subset of participants from a larger population in a completely random manner. Each individual in the population has an equal chance of being chosen, ensuring that the sample is representative and minimises bias (Trochim, 2006). The researcher used simple random sampling to select a group of caregivers from a list of all caregivers identified in CBCCs in the targeted area.

The researcher assigned a unique identification number to each caregiver in the selected schools and then use a random number generator to select a specific number of ECD caregivers' participants for the study. This approach helps ensure that every ECD caregiver in the population has an equal chance of being included in the study, reducing the potential for bias in the selection process (Kothari, 2004).

3.7.3 Stratified Sampling

The researcher divided the population into strata based on CBCCs in the TA according to two stratas thus CBCCs with all caregivers trained and all those with untrained caregivers. Random samples were taken from each stratum, ensuring proportional representation of various segments of the population.

The combination of purposeful and random sampling methods enabled the researcher to harness the benefits of both targeted insights and broad representation. By including purposefully selected caregivers, the researcher captured perspectives and unique scenarios. Simultaneously, random sampling ensured that the overall dataset remains unbiased and representative of the larger population. By employing these sampling techniques, researchers effectively assessed the impact of trained caregivers on literacy and numeracy learning outcomes while considering various contextual factors.

3.8 Data Collection Tools and Methods

Primary data was collected by administering an assessment test to five-year-old children to explore their literacy and numeracy skills. This involved engaging children in activities that made them

demonstrate their abilities in literacy and numeracy. In literacy, the following items were assessed: receptive language, comprehension, phonics, and story comprehension. In numeracy, counting, number recognition, and knowledge of shapes were measured. An adapted version of the IDELA was administered. In addition, five classroom lesson observation-specific teaching strategies employed by trained ECD caregivers that have a significant impact on children's literacy and numeracy skills by exploring techniques such as play-based learning, story time, interactive activities, responsiveness, scaffolding, communication styles, and differentiation of instruction was observed using MELE observational tool.

On the other hand, semi structured interviews were administered to caregivers to collect data on the pedagogy approaches and teaching strategies by the caregivers, the skills and knowledge that influence literacy and numeracy learning outcomes based on what they were trained in. Semi structured interview questionnaire was used to parents to collect data on teaching methods they know which caregivers use with their children and other demographic data. A semi-structured interview is a qualitative research data collection tool where the researcher conducts a face-to-face or virtual interview with participants. The interview was guided by a set of predetermined open-ended questions, but there was flexibility for the interviewer to ask follow-up questions or explore unexpected avenues based on the participant's responses. This allowed researchers to delve deeper into participants' responses, probe for more details, and adapt the conversation based on the context and participant's perspective. This method often yields rich and nuanced data, as participants are encouraged to elaborate on their thoughts and experiences (Fowler, 2013). The use of multiple tools helped to triangulate the results of this research, which brings about validity and credibility.

3.9 Data Analysis

Descriptive statistics was used to describe and summarize a dataset to provide a clear and concise overview of the main characteristics and features of the data. The researcher calculated measures including mean and median for both children in CBCCs with trained and those children with untrained caregivers for both literacy and numeracy scores. Standard deviation and range were computed to calculate and show the variability of data. Then inferential statistics in this case Analysis of Variance (ANOVA) a statistical formula was used to compare variances across the means. On the other hand, qualitative data from semi structured interviews undergo thematic

analysis. This method allows for the identification and interpretation of recurring themes within the transcribed interview data, enhancing the depth of our understanding (Braun & Clarke, 2006).

The integration of quantitative and qualitative data involved a comparative analysis approach, where key themes identified in the qualitative data was cross-referenced with patterns emerging from the quantitative data (Creswell & Clark 2018). the analyzed data is presented using bar charts and piecharts to visually represent the descriptive statistics for easy understanding and more engaging. NVivo which is a computer software program that allows researcher to manage, analyze and visualize data systematically was used to come up with the qualitative analysis. Verbatim from interviews was also used in the findings.

3.10 Rigorousness and Trustworthiness

The researcher used multiple data sources, including observation, administering an assessment to children on literacy and numeracy learning competencies, and a semi-structured interviews to caregivers and parents. The choice of mixed methods stemmed from the fact that results can be triangulated. Triangulation of results brings about validity and credibility (Hesse-Biber, 2010). The data collected from one type of tool was checked against the data deriving from the other type (Hughes, 2005). In this regard, data from the semi structured interviews has been triangulated by observation. The value of research hinges on its credibility and validity. Credibility pertains to the believability and trustworthiness of research findings, while validity concerns the accuracy and soundness of the methods employed and the inferences drawn. Ensuring high levels of credibility and validity is paramount to producing rigorous research outcomes that contribute meaningfully to the academic, scientific, and practical realms (Lincoln, 2018).

3.10.1 Researcher Flexibility

The researchers reflected on their own assumptions, beliefs, and potential prejudices that might affect their approach to the research question. Further, the researchers were open to considering alternative perspectives, even if they challenged one's own preconceived notions, which helped the researcher overcome their biases and promote a more balanced investigation. Researcher flexibility is the ability of researchers to acknowledge, recognize, and mitigate their personal biases throughout the research process. In addressing the researcher’s own biases, the researcher shall be

aware of their own biases and be willing to critically examine how these biases might impact their research through self-awareness (Polit &Beck, 2017).

3.10.2 Reliability

The researcher ensured consistency in data collection by employing standardised, approved but adapted version of MELE and IDELA data collection tools. The researchers Pre-tested the questionnaire, thoroughly documented the research processes, and used the established measurement scales and statistical test.

3.10.3 Internal Validity

The researcher controlled extraneous variables that confound the results and threaten internal validity. In this research, a control group was CBCCs that whose caregivers did not receive caregiver training serves as a baseline for comparison. Any differences in outcomes between the trained group and the control group has been attributed to the training. Internal validity ensures that the study's design and methods accurately measure the intended variables and establish causal relationships. Caregivers with the same qualification and experience were sampled.

3.10.4 External Validity

CBCCs form the same Traditional Authority was sampled for both trained and untrained caregivers and a recommended sample size of eighty (80) participants was used so that the study's results can be applied beyond the immediate study sample and conditions to extend the research findings to wider populations, settings, or contexts.

3.11 Ethical Considerations

Ethical considerations are upheld throughout the research process. Ethical clearance was granted by The University of Zambia and Permission to conduct the study was sought from the Ministry of Gender, Community Development and Social Welfare and District Council at Machinga District. Furthermore, the ECD caregivers were informed and consent was obtained from parents of the participating children including asserting from the participating children. Confidentiality of information and anonymity of respondents by using research codes instead of names of

respondents was ensured during data collection. All collected data was stored securely in compliance with institutional guidelines and data protection regulations (Smith, 2020).

3.12 Chapter Conclusion

The methodological approach described in this chapter provided a framework for investigating the effects of caregivers' training on early childhood education outcomes. The study combines quantitative and qualitative methods, not only to quantify the impact of caregiver training but also uncover the underlying reasons and contextual nuances that contribute to these educational outcomes. The integration of rigorous data collection and analysis techniques, along with adherence to ethical standards, ensured that the research findings are both credible and applicable to broader educational contexts.

CHAPTER FOUR

PRESENTATION OF FINDINGS

4.0 Introduction

This chapter presents findings of the study. The study sought to explore the effect of caregivers' training on preschoolers' literacy and numeracy learning outcomes in Machinga District – Malawi. The result of the study are based on the data collected from 70 children aged 5 years for the quantitative part which handled objective one and objective two including 5 caregivers and 5 parents of children aged 5 years attending CBCC for the qualitative part to respond to third and fourth objective. These participants were purposefully selected to give information on children's literacy and numeracy.

4.1 Objectives

The findings of the study are organized according to the research objectives as presented below:

1. To assess the effectiveness of trained caregivers in improving expressive, and receptive language skills as components of literacy learning outcomes in CBCC transitioning children.

2. To determine the effectiveness of trained caregivers in improving number sense, counting, and shapes in transitioning CBCC children.

3. To discover specific teaching strategies employed by trained ECD caregivers that have a significant impact on children's literacy and numeracy skills.

4. To explore factors that may influence the effectiveness of caregivers' training interventions in Malawi**.**

Objective 1 To assess the effectiveness of trained caregivers in improving expressive, and receptive language skills as components of literacy learning outcomes in CBCC transitioning children.

Introduction

Objective one (1) aimed at assessing the effectiveness of trained caregivers in improving expressive, and receptive language skills as components of literacy learning outcomes in CBCC transitioning children. To better understand the study context, the study assessed children in CBCCs where caregivers were trained and CBCCs where caregivers were not trained so that children in CBCCs with untrained caregivers can provide the baseline data.

4.1.1 Descriptive Statistics Findings

4.1.2 Descriptive Statistics

	Were caregivers trained at this CBCC?	**Mean**	**Std. Deviation**	**N**
Expressive Language	No	61.36	23.457	39
	Yes	73.26	12.902	31
	Total	66.63	20.269	70
Receptive Language	No	41.23	25.040	39
	Yes	68.03	24.013	31
	Total	53.10	27.854	70

Table 1: Descriptive statistics

Mean score of expressive language was 73.26 in CBCCs where caregivers were trained which is slightly high than mean score in CBCCs where caregivers were not trained at a mean of 64.8. Similarly children from CBCCs where caregivers were trained scored high in receptive language with a mean score of 68.03 which is higher than 41.23 for CBCCs where children were not trained. The findings also indicate that expressive language and receptive Language in CBCCs where caregivers were trained have relatively high mean score.

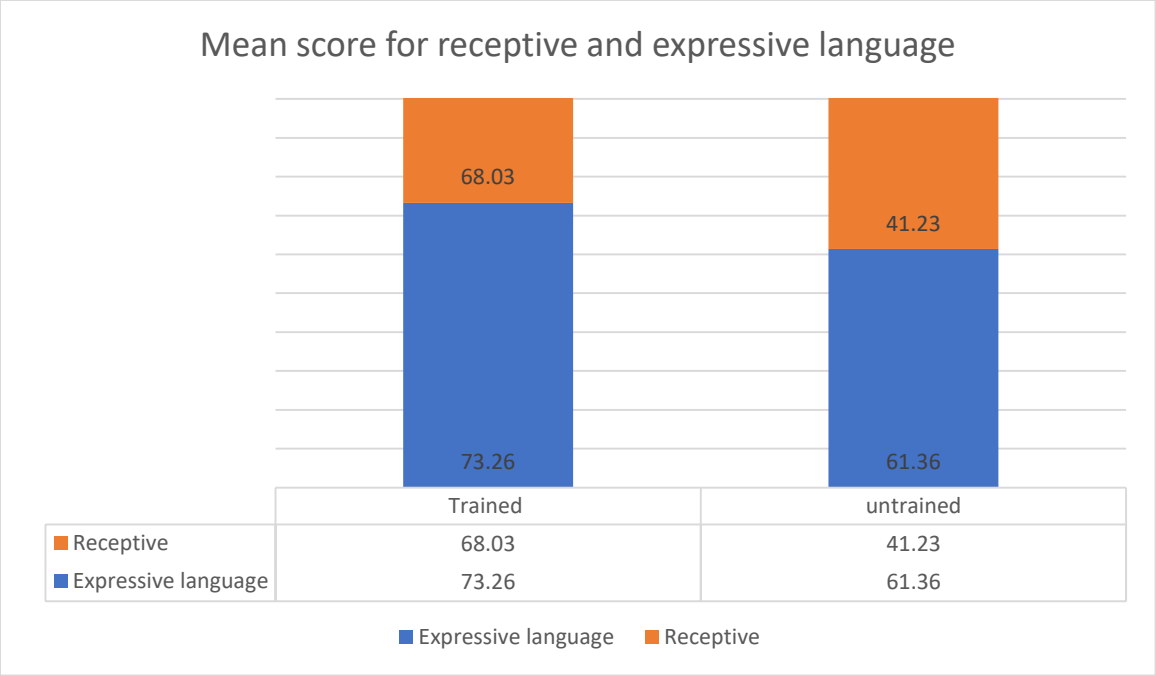


Figure 2: Mean for receptive and expressive language

4.2 Objective 2. To assess the effectiveness of trained caregivers in fostering numeracy in transitioning CBCC children.

Overview

The second primary objective of the research was to assess the effectiveness of a training program for caregivers in fostering numeracy development in 5-year-old children. The study aimed to determine whether providing caregivers with targeted training would enhance their ability to support children's early mathematical skills, including number recognition, counting, basic arithmetic, and problem-solving.

The study found that children whose caregivers received training showed significant improvement in various numeracy-related skills compared to those children who are in CBCCs with untrained caregivers. These included gains in counting, number sense, basic operations, and recognizing number patterns.

In terms of Numeracy skills, children in CBCCs with untrained caregivers scored a mean of 68.19, Standard deviation of 16.392 out of a sample size of 31 while for children in CBCCs with

untrained caregivers scored a mean of 55.87, standard deviation of 26.678 and the sample size of 39.

Score on numeracy skills

	Were caregivers trained at this CBCC?	**Mean**	**Std. Deviation**	**Sample Size (N)**
Numeracy Skills	No	55.87	26.678	39
	yes	68.19	16.392	31
		61.33	23.383	70

Table 2: mean for numeracy

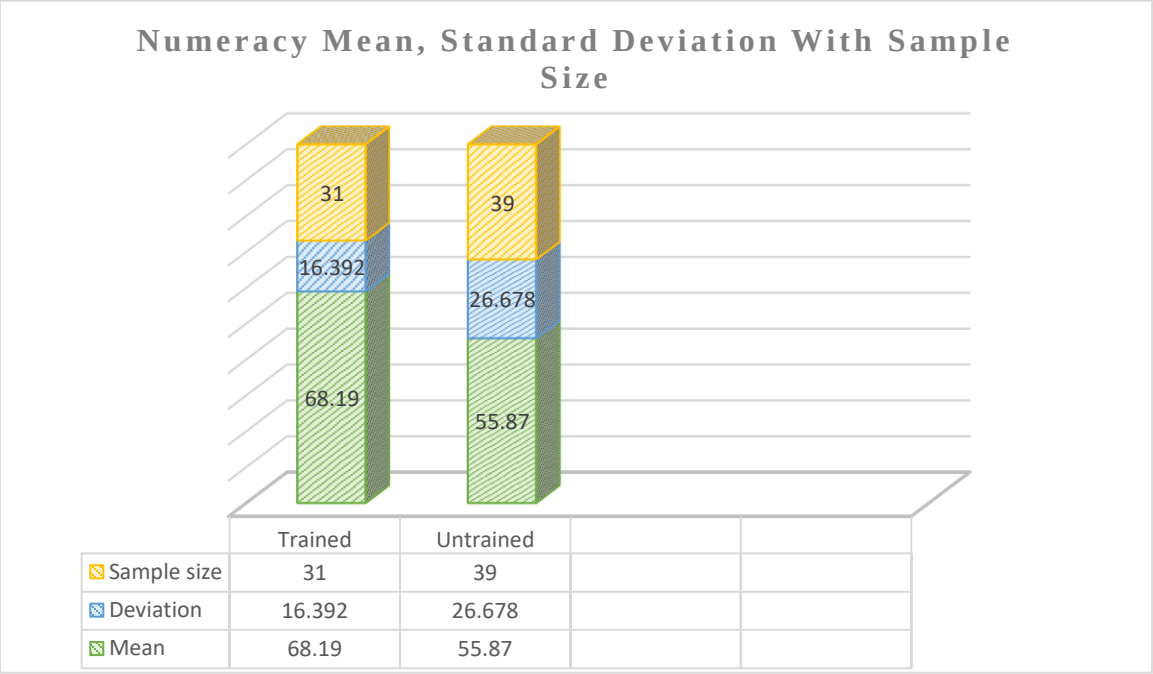


Figure 3: Numeracy mean

Arithmetic

Out of 70 children, 52 correctly solved the problem of adding 3 and 2 (74.2%), while 45 correctly added 2 and 2 (82.85%), and 55 successfully subtracted 1 from 3 (61%). Incorrect responses were more common for adding 2 and 2 and subtracting 3 from 1 compared to adding 3 and 2. The high percentage of correct answers in each arithmetic operation suggests a generally strong grasp of basic numeracy among the children in CBCCs with trained caregivers. On the other hand, in CBCCs with untrained caregivers the scores were lower, as 31 correctly solved the problem of adding 3 and 2 (44.2%) 19 correctly added 2 and (27%) and 32 (45%) subtracted 1 from 3

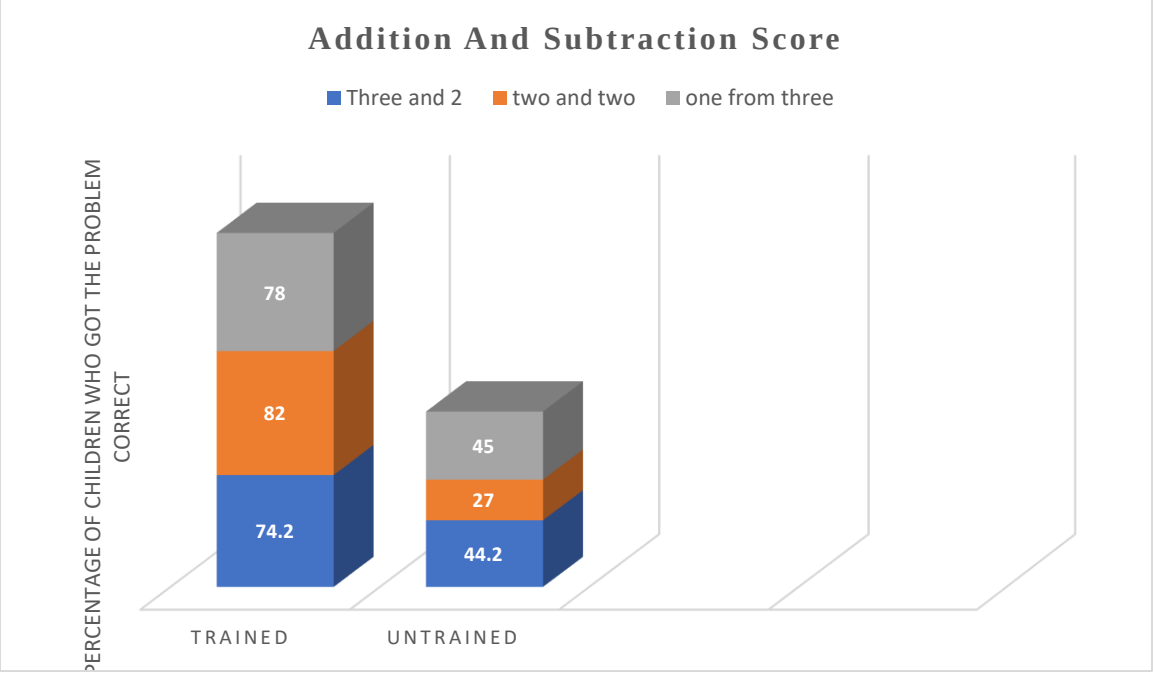


Figure: 4 Score for addition and subtraction

Number of Puzzle Pieces Fit Together

In CBCCs with trained caregivers, out of 31 children 96.7% of children solved the two piece puzzle, 93.5% three pieces, 82.8%, five pieces puzzle 74.1%. However, in CBCCs with untrained caregivers, 51.2% successfully fit together two puzzle pieces, and 48.7% fit three pieces and 11% five pieces puzzle . The results suggest that while many children were able to fit a few pieces, completing more complex puzzles was less common.

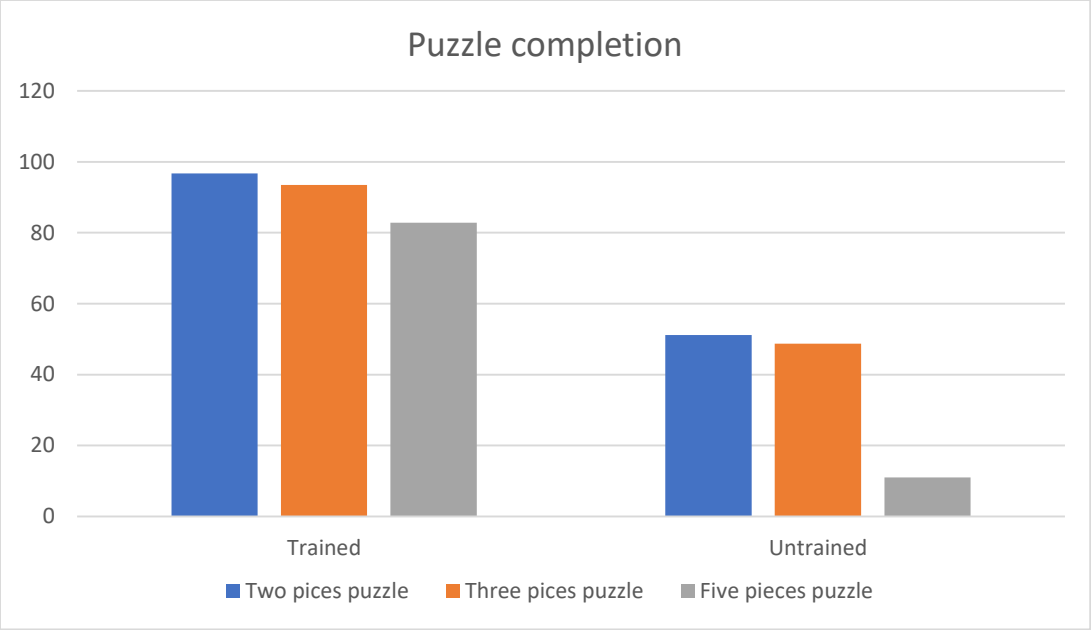


Figure 5: Puzzle Completion

4.3 Objective 3 To explore influence of trained caregivers on the literacy and numeracy learning outcome in children aged 5 years in the CBCCs.

To explore the influence of trained caregiver on literacy and numeracy learning outcomes, MANOVA was used and below are the findings;

Test for equality of error variances (MANOVA - Multivariate Analysis of Variance)

Tested the null hypothesis that the error variance of the dependent variable is equal across groups. Design: Intercept + Were caregivers trained at this CBCC

Table 3 Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
Expressive Language	13.367	1	68	.001
Receptive Language	.000	1	68	.997
Numeracy skills	7.936	1	68	.006

Using Levene's test, the table above shows the calculated test statistic (F), degrees of freedom and p values for the dependent variables

Expressive Language has F value of 13.367 with a p value of 0.001, this implies that error variances for Expressive Language is significantly different between CBCCs where caregivers were trained and those that caregivers were not trained hence there is a positive impact on the training of caregivers in preschoolers'' influencing positively in expressive language On the other hand, receptive Language has a p value of 0.997 which is insignificant. Therefore, this means that there is no significant difference in error variance for receptive language between CBCCs where caregivers were trained and those were not trained. This implies that the training of caregivers does not impact positively in the receptive language of preschoolers'.

In terms of numeracy skills, the p value for Numeracy skills is 0.006 implying that there is significant difference in error variances of Numeracy skills between CBCCs where caregivers were trained and those that were not trained nence the training of caregivers positively impact preschoolers'' numeracy.

Table 4: Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Expressive Language	2445.433[a]	1	2445.433	6.420	.014	.086
	Receptive Language	12406.409[b]	1	12406.409	20.513	.000	.232
	Numeracy skills	2622.245[c]	1	2622.245	5.079	.027	.070
Intercept	Expressive Language	312988.462	1	312988.462	821.653	.000	.924
	Receptive Language	206193.381	1	206193.381	340.932	.000	.834

	Numeracy skills	265845.445	1	265845.445	514.952	.000	.883
Were caregivers trained at this CBCC	Expressive Language	2445.433	1	2445.433	6.420	.014	.086
	Receptive Language	12406.409	1	12406.409	20.513	.000	.232
	Numeracy skills	2622.245	1	2622.245	5.079	.027	.070
Error	Expressive Language	25902.910	68	380.925			
	Receptive Language	41125.891	68	604.793			
	Numeracy skills	35105.198	68	516.253			
Total	Expressive Language	339104.000	70				
	Receptive Language	250905.000	70				
	Numeracy skills	301011.000	70				
Corrected Total	Expressive Language	28348.343	69				
	Receptive Language	53532.300	69				
	Numeracy skills	37727.443	69				

a. R Squared = .086 (Adjusted R Squared = .073)

b. R Squared = .232 (Adjusted R Squared = .220)

c. R Squared = .070 (Adjusted R Squared = .056)

Expressive Language has a p value of 0.014 and this means that there is significant difference between children from CBCCs where caregivers were trained and those that were not trained however, receptive language has a p value of 0.000 and this implies that there is significant

difference between children from CBCCs where caregivers were trained and those that were not trained in Receptive Language score.

Expressive Language Vs Caregivers training

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.294[a]	.086	.073	19.517

a. Predictors: (Constant), Were caregivers trained at this CBCC?

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	61.359	3.125		19.633	.000
	Were caregivers trained at this CBCC?	11.899	4.696	.294	2.534	.014

a. Dependent Variable: Expressive Language

The tables above present regression output between Expressive Language as literacy outcome and caregivers training. Coefficient of 11.899 for caregivers training with a p value of 0.014 implies that, caregivers training has a significant effect of increasing Expressive language by 11.89 marks. Similarly from the model summary, R Square of 0.086 means that 8% change in the mark of Expressive Language of a child is caused by caregivers training.

Table 6: Model Summary **Receptive Language Vs Trained caregivers**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.481[a]	.232	.220	24.593

a. Predictors: (Constant), Were caregivers trained at this CBCC?

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	41.231	3.938		10.470	.000
	Were caregivers trained at this CBCC?	26.801	5.918	.481	4.529	.000

a. Dependent Variable: Receptive Language

Regressing Receptive Language as literacy outcome and caregivers training, coefficient of 26.801 for caregivers training with a p value of 0.000 implies significance at 1%. This means that caregivers training has a significant effect of increasing Receptive Language by 26.80 marks. The model summary indicates R Square of 0.232 which means that 23.3% change in the mark of Receptive Language of a child is caused by caregivers training.

Numeracy Skills

Numeracy skills has a p value of 0.027 and this means that there is significant difference between children from CBCCs where caregivers were trained and those that were not trained in Numeracy skills score.

Table 7: Numeracy skills Vs trained Caregivers

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.264[a]	.070	.056	22.721

a. Predictors: (Constant), Were caregivers trained at this CBCC?

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	55.872	3.638		15.357	.000
	Were caregivers trained at this CBCC?	12.322	5.467	.264	2.254	.027

a. Dependent Variable: Numeracy skills

Caregivers training has a coefficient of 12.322 with a p value of 0.027 implying significance at 5%. This means that caregivers training has a significant effect of increasing Numeracy skills by 12.32 marks. Model summary indicates R Square of 0.070 and this implies that 7% change in Numeracy skills of a child is influenced by caregivers training.

Correlations

		Expressive Language	Were caregivers trained at this CBCC?
Expressive Language	Pearson Correlation	1	.294*
	Sig. (2-tailed)		.014
	N	70	70
Were caregivers trained at this CBCC?	Pearson Correlation	.294*	1
	Sig. (2-tailed)	.014	
	N	70	70

*. Correlation is significant at the 0.05 level (2-tailed).

The correlation coefficient of 0.294 with a p value of 0.014 means that there is positive linear relationship between caregivers training and Expressive Language in CBCCs.

Table 8: Correlation of trained caregiver versus receptive and expressive language

		Receptive Language	Were caregivers trained at this CBCC?
Receptive Language	Pearson Correlation	1	.481**
	Sig. (2-tailed)		.000
	N	70	70
Were caregivers trained at this CBCC?	Pearson Correlation	.481**	1
	Sig. (2-tailed)	.000	
	N	70	70

Correlation is significant at the 0.01 level (2-tailed).

Correlation coefficient of 0.481 with a p value of 0.000 implies that there is significant positive linear relationship between caregivers training in CBCCs and Receptive Language score of children. To assess the effectiveness of trained caregivers in improving number sense, counting, and shapes in preschoolers

Correlations

		Numeracy skills	Were caregivers trained at this CBCC?
Numeracy skills	Pearson Correlation	1	.264*
	Sig. (2-tailed)		.027
	N	70	70
Were caregivers trained at this CBCC?	Pearson Correlation	.264*	1
	Sig. (2-tailed)	.027	
	N	70	70

*. Correlation is significant at the 0.05 level (2-tailed).

The positive correlation coefficient of 0.264 with a p value of 0.027 implies positive and significant linear relationship between caregivers training in CBCCs and Numeracy skills score among children.

4.4 Objective four (4) aimed at understanding strategies that are used by trained caregivers that promote literacy and numeracy learning outcomes in the five (5) year olds.

Various training programs aim to improve caregiver competency, however there is a need to better understand the specific strategies they employ to promote literacy and numeracy outcomes in preschool-aged children. The objective sought to explore the instructional techniques, interactive methods, and learning environments fostered by trained caregivers to support five-year-olds in acquiring literacy and numeracy skills. The strategies which came out frequently includes; storytelling, rhymes and songs, play, modelling, and guided practice, counting and individualized instruction.

4.4.1 Storytelling

Storytelling was a strategy mentioned by all the caregivers interviewed that they use to promote literacy and numeracy skills among young children. All caregivers alluded that, through interactive storytelling sessions, caregivers engaged children's imagination, enhance their vocabulary, and foster comprehension skills. Respondent CG1 highlighted that;

Mmm, when I tell them a story, I see their little eyes light up. They love when I ask, 'What do you think will happen next?' It helps them, you know, to think beyond the story, to imagine things, and that's important for learning. In some stories I include numbers so they learn the numbers even colors and many more. Stories have the power to connect new concepts with children's existing knowledge.

This quote illustrated how storytelling encourages children to think critically and engage in imaginative thinking, both of which are crucial for literacy development. The caregiver's also explained that stories promotes children's imagination, helping them build a connection between the story and real-world scenarios.

4.4.2 Rhymes and Songs

Rhymes and songs, were frequently used in both CBCCs with trained and untrained caregivers to support early literacy and numeracy skills. These activities according to caregivers improves language development and help children develop a strong foundation in reading and counting.. Some caregivers said that the repetitive nature of songs makes learning enjoyable and memorable for children. Trained CG2 said:

Ah, we sing songs about numbers, letters of the alphabet and other songs and oh, children love it! I see them clapping their hands, dancing, counting along when it's a number song, mmm, and sometimes they even sing them on their own during playtime. This shows that they acquire vocabulary and numeracy skills through songs.

Parents also buttressed that songs support learning in children because singing is fun and as children are singing they learn alphabet and numbers. Parent respondent P1said:

Children sing number and alphabet songs and aah, children love it! I see them at home as they are singing they count along when it's a number song, and sometimes they even sing them on their own during dramatic play. This shows that they acquire language and numeracy skills through songs.

This quotation showed how songs and singing make learning interactive and fun for children, encouraging them to participate actively while they acquire literacy and numeracy skills..

4.4.3 Play

Play-based learning is an essential strategy in CBCCs, mentioned by CBCCs with trained caregivers. However untrained caregivers only one mentioned about play based learning and it was observed that untrained caregivers did not provide opportunity to children to learn through pplay but rather it was rote learning about alphabet, numbers and calendar. Trained caregivers were observed fostering literacy and numeracy through games, exploration, and imaginative play. "This method allows children to grasp complex ideas in a natural and enjoyable way while fostering social and cognitive skills. This was concurred by the parents who explained that children play a lot at the CBCC " Said CG3 :

We turn counting into a game, like, we'll use blocks or toys, and they don't even realize they're learning while playing. They just have so much fun.

Parent 2 said:

We see children playing a lot. They do number games sometimes they play with flashcards and other letter charts mmm its very interesting on how their caregivers play with children and becaue of that I also started doing that at home.

The quotation showed the benefits of incorporating learning into play. By using toys or other manipulative, caregivers creates a hands-on learning experience where children practice counting or language skills in a relaxed environment, making learning feel less formal and more effective as observed during data collection especially in CBCCs with trained caregivers. However in CBCCs with untrained caregivers, caregivers mentioned that children learn literacy and numeracy through play but when asked on exactly what they do caregivers kept referring to singing. CG4

We always sing with children in class and mmm children learn letters and numbers as we sing

4.4.4 Modelling and Guided Practice

Modelling and guided practice were valuable strategies that help children learn by observing caregivers and then practicing the skill with support. This method was mentioned only in CBCCs with trained caregivers. The caregivers explained that this strategy builds children's confidence and allows them to gradually take more responsibility for their learning.

When I want them how to trace letters for example, I do it first, and they watch. Then, oh, they try on their own, and I guide them when needed. So as a caregiver aaa mm am involved in modelling,

This quote showed how caregivers scaffold children's learning by demonstrating first and then allowing them to practice with support. The gradual release of responsibility helped children become more independent and confident in their literacy and numeracy skills.

4.4.5 Counting

Caregivers both in CBCCS with trained and untrained caregivers mentioned counting activities to be vital in helping children to know number concepts. Caregivers explained that by using physical objects such as blocks, beads, or bottle tops, caregivers provided tangible experiences that promote counting numbers in children. Caregivers also explained that hands on activities such as use of beads and bottle tops helps children in problem-solving and numeracy skills. CG5 said:

We count with bottle tops, and they like touching and moving them. It's easier for them to understand numbers this way, rather than just saying the numbers. And also we use objects mmhu even children themselves to represent numbers so that they understand.

This quotation showed the importance of concrete learning experiences in teaching numeracy. By using manipulatives, children grasped abstract concepts like counting and number sense, helping them make the connection between numbers and physical objects.

Parents also explained that children at CBCCs count which they also do at home. The parents said that children sometimes request them to count along with them as they are counting. Respondent parent P3 said:

Mmhu.. you know, my child force me to count when he is home. He brings cups sometimes spoons or anything for counting.. because he says thus what they do with their teacher they count so I just do…

4.4.6 Individualized Instruction

Individualized instruction was mentioned only in CBCCs with trained caregivers. Caregivers explained that individualized instruction allows caregivers to meet the diverse learning needs of children in the classroom. Tailoring activities to each child's abilities ensured that every child receives the necessary support for literacy and numeracy development. CG1 explained that:

Some children, oh, they learn faster, and others need more time. I adjust the activities to make sure each child gets the help they need. I also have a child with hearing impairment, this child can hardly hear but rather she reads lips so I always do instructions for her separately. Mm after I have given the instruction to the class I repeat the instruction ensuring that I look at her closely so that she can lip read.

In this, caregivers recognized the varying paces at which children learn and adapt their teaching accordingly. Individualized instruction ensured that all children, regardless of their learning speed, are given the opportunity to succeed in literacy and numeracy development.

4.5.1 Factors that may influence the effectiveness of trained Caregivers in fostering literacy and numeracy

The effectiveness of trained caregivers in enhancing literacy and numeracy skills among preschoolers is influenced by several factors. Key among these is the Unavailability and accessibility of teaching and learning resources, supportive supervision and mentorship, quality and depth of the training provided. Caregiver motivation and attitude and Class room environment

4.5.2 Unavailability and Accessibility of teaching and learning resources

One of the factors influencing the effectiveness of caregiver training interventions which was mentioned by most caregivers is the unavailability and accessibility of teaching and learning resources. Trained caregivers often required sufficient teaching materials and play equipment to implement the learned strategies effectively. However, caregivers mentioned that they struggle to engage children in interactive learning activities, which limits the potential impact of their training knowledge. CG 2 said:

Mmm, we were trained to use so many materials, but sometimes, ah, it's hard to get them, you know? Oh, the books, the toys, they are not always there, and it's frustrating when you want to teach, but you don't have the right tools.

Trained caregivers mentioned that while they were equipped with valuable strategies during training, inadequate and lack of essential teaching aids hinders their ability to fully implement the techniques they know. Parents also explained that the CBCCs do not have enough play materials, they said that they use locally made which are good because are cheap but they are not durable.

Children play a lot but our CBCC do not have play materials, we support by making play materials especially the outdoor like swings and seesaw but they do not have enough toys, balls and even the teaching materials

4.5.3 Supportive Supervision and Mentorship

According to caregivers who were interviewed, most of them explained that supportive supervision and mentorship significantly influence the success of caregiver training interventions. Caregivers alluded that continuous guidance and feedback from more experienced educators or supervisors,

helps them refine their teaching practices. On the other hand, they said that follow-up and mentorship helped caregivers feel more confident in applying new strategies and encouraged professional growth. However, caregivers said that this does not happen frequently. CG 4 explained:

After the training, oh, it's not just done, no. Mmm, they come back and check, ask how we are doing, what challenges we have. It helps a lot, knowing someone is there to guide you, makes you feel confident.

Supervision and support provided caregivers with more infomation, where they can ask questions, seek advice, and receive constructive feedback. This process ensured that caregivers continue to improve and apply their training effectively in the classroom.

4.5.4 Depth of the Caregiver training provided

Caregivers expressed that the training is comprehensive enough but the duration is short considering the content and also there is a lot of information which makes it hard for the caregiver to understand, Further the caregivers expressed that they would have loved to have more practical than theory with a component on phonics introduced in the training curriculum. CG1 alludes:

…..eish the training is very relevant to us but the content is too much to be handled in two weeks, there is also less practical sessions but a lot of theory, I think the facilitators rush through the content to cover the curriculum, I also wish if they could have added a component on phonics.

4.5.5 Caregiver Motivation and Attitudes

The motivation and attitudes of caregivers had a significant role in the effectiveness of caregivers. Highly motivated caregivers are more likely to embrace recommended teaching methods and persist in overcoming challenges in the classroom. It was clear that the positive results of training can fuel caregiver motivation. When caregivers observed the benefits of their efforts, they become more enthusiastic about implementing their training knowledge, which enhances the overall success of the intervention. CG3 said:

Oh, when I saw how much the children improved, I felt even more motivated to keep going, to try new things. It's rewarding, you know, seeing them grow.

4.5.6 Classroom Environment

The physical and social environment of the classroom greatly influenced the effectiveness of caregivers. Most caregivers explained that a well-organised, stimulating environment provided opportunities for children to engage meaningfully in literacy and numeracy activities, while also making it easier for caregivers to implement their training skills.

CG1 Mmm, the space we have for the children to play and learn makes a big difference. If the environment is set up well, it's easier for us to put into practice what we learned during training.

Children are happy with the classroom full of print, we see them touching the walls while naming objects drawn even letters or numbers, they love to play with the indoor play materials that it is not easy to get them from free choice play to structured learning….

In this quotation, the study showed the impact of the classroom environment on the successful application of training. When the environment was conducive to learning, it supported the strategies caregivers were taught. This allowed them to create more effective and engaging lening experiences for the children.

The study observations conclusively showed that trained caregivers in evidence-based literacy and numeracy strategies significantly enhances preschoolers' learning outcomes. Caregivers who underwent structured training were more effective in fostering critical early skills such as letter recognition, phonemic awareness, counting, and pattern recognition. These improvements were reflected in both measurable test scores and observed child engagement in learning activities.

The classrooms for the CBCCs with trained caregivers had play materials arranged in play corners such as dramatic, imaginative, manipulative, nature, reading, music and blocks. The classrooms had wall charts of numbers, letters, animals, weather and some drawings.

The findings underscore the transformative potential of caregiver training in early childhood education. By equipping caregivers with the tools and techniques to create stimulating learning environments, foundational skills essential for academic success are effectively nurtured. This not

only benefits individual children but also has broader implications for closing achievement gaps in under-resourced communities.

In conclusion, the research affirms that investing in caregiver training is a cost-effective and scalable approach to improving early learning outcomes, advocating for its integration into policies and practices aimed at enhancing the quality of preschool education.

5.0 Chapter Summary

The chapter highlights key results from a comprehensive investigation into how caregiver training impact literacy and numeracy learning outcomes for children aged five years in CBCCs. The findings in the chapter was structured around the objectives of the study. The quatitative findings shows that trained caregivers has a positive effect on child's literacy and numeracy learning outcomes as children in CBCCs with trained caregivers scored more than those with untrained caregivers in all assessed items. The findings from qualitative results also shows that trained caregivers employed a variety of strategies that support literacy and numeracy learning outcomes, they are able to organize activities, organize classroom spaces into play areas with a variety of play materials. The findings underline the importance of caregiver training as effective in improving literacy and numeracy skills and impactful strategy to enhance learning outcomes.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0 Introduction

This chapter critically examines the findings of the research. It synthesizes the results in relation to the study's objectives, existing literature, and theoretical frameworks, providing a comprehensive understanding of the implications of caregiver training.

The discussion begins by contextualizing the findings within the objectives of the study, highlighting the pivotal role caregivers play in shaping foundational literacy and numeracy skills. It then evaluates how the observed improvements align with or diverge from prior research, offering insights into the unique contributions of this study. Key themes emerging from the data on strategies used by caregivers and the challenges of program implementation—are explored in depth.

Finally, the discussion positions the findings within practical and policy contexts, emphasizing how targeted caregiver training programs can bridge educational gaps and enhance early learning experiences. By integrating the research findings with theoretical and empirical perspectives, this chapter aims to provide a nuanced interpretation of the results and their broader significance.

5.1 The Effectiveness of Trained Caregivers in Improving Expressive, And Receptive Language Skills

The findings of this study revealed that trained caregivers play a significant role in enhancing both expressive and receptive language skills among young children. A key result was regression output between Expressive Language as literacy outcome and caregivers training. Coefficient of 11.899 for caregivers training with a p value of 0.014 implies that, caregivers training has a significant effect of increasing Expressive language by 11.89 marks.

Similarly from the model summary, R Square of 0.086 means that 8% change in the mark of Expressive Language of a child is caused by caregivers training. Furthermore, the study indicated that 91% of children could name friends and interact socially, demonstrating strong expressive language skills. This finding concurred with Hoff's (2006) research, which suggests that peer

interaction is a driver of language development. Hoff, (2019), found that children who engage in conversations with peers tend to exhibit better expressive language outcomes, as these interactions provide opportunities for children to practice language in real-life contexts. This idea was echoed by Dickinson and Tabors (2001), who found that children with more frequent peer interactions tend to develop a more sophisticated grasp of language, particularly in their ability to articulate thoughts and ideas. However, this study also found that most of children faced challenges in phonics, suggesting a need for targeted interventions for phonics in the training curriculum for caregivers in Malawi as it was revealed that caregivers are not trained in phonics. In contrast to these findings, Farran and Hofer (2019) found that in classrooms where instructional practices lacked structure, children exhibited less engagement and lower language gains, highlighting the importance of skilled caregiver guidance in fostering language development as it was observed in CBCCs with trained caregivers who had a daily program, and an activity plan unlike CBCCs with untrained caregivers.

This aligned with findings from Tomasello's (2003) research on language acquisition, which emphasized the importance of motivation and social interaction in the learning process. Tomasello argued that language development is inherently social, and motivation to communicate within meaningful contexts enhances children's engagement and facilitates both expressive and receptive language growth. Similarly, Snow's (2016) study underscored that children who are engaged and motivated are more likely to participate in conversations, listen attentively, and develop richer vocabulary. This is also highlighted by Albert Bandura's TET which alludes that teachers with efficacy are motivated to teach and engage children more. The current study's finding that a high percentage of children in CBCCs with trained caregivers exhibited these traits, reinforces the effectiveness of the caregivers' interactive teaching methods, such as storytelling and play-based learning, which are well-supported in literature as being conducive to language development (Wasik & Hindman, 2011).

The study also highlighted that 99% of children in CBCCs with trained caregivers understood instructions well, which is a strong indicator of receptive language skills. This concurs with the Teacher Efficacy Theory (TET) which states that teachers who are trained have confidence and are effective to support learning (Hattie,2009). This is also supported by Justice et al. (2018) findings, who demonstrated that caregivers' use of clear, structured instructions and active

engagement in children's learning significantly improved receptive language outcomes. However, about 26% of the children in this study faced difficulties understanding instructions, which suggests that training of caregivers also helps them to employ strategies that support children's understanding to instructions by being responsive and interacting more with children. This variability in receptive language aligned with findings from Bleses et al. (2018), who observed that differences in caregivers' responsiveness and interaction quality influenced children's language comprehension skills. While the majority of children in this study showed positive language development, the challenges faced by some children indicate the importance of continuous reflection and adjustment of caregiver strategies to meet diverse learning needs.

5.2 The Effectiveness of Trained Caregivers in Improving Number Sense, Counting, And Shapes

The study found that trained caregivers had a moderate effect on improving children's numeracy skills, particularly in areas such as counting and understanding shapes. This finding aligns with the conclusions drawn by Baker and Jones (2020), who found that teacher training modestly improved numeracy outcomes in preschool settings. The positive influence of training on numeracy skills is further supported by Starkey and Klein (2020), who noted that teachers trained in mathematical language and vocabulary help children build a solid foundation in numeracy concepts. However, the findings in this study indicates that caregivers often struggled with numeracy-related activities especially in CBCCs with untrained caregivers due to a lack of specific training in developing locally made learning and stimulating materials.

In terms of numeracy, caregivers training has a coefficient of 12.322 with a p value of 0.027 implying significance at 5%. This means that caregivers training has a significant effect of increasing numeracy skills by 12.32 marks. Model summary indicates R Square of 0.070 and this implies that 7% change in numeracy skills of a child is influenced by caregivers training. Numeracy is not the same as mathematics, nor is it alternative to mathematics. Numeracy encompasses the knowledge, skills, behavior, and dispositions that a learner need to use mathematics in a wide range of situations (Tout, et al, 2020).

Furthermore, trained caregivers showed better outcomes in numeracy instruction by initiating activities that are engaging and within a specific period of time. This is supported by the work of Johnson et al. (2021), who highlighted that confident and competent teachers, particularly those

who receive specialized training, tend to implement more effective teaching strategies. However, the variability in the study's findings regarding numeracy improvement reflects the conclusions of Baker and Jones (2020), who argued that more research is needed to identify specific components of teacher training that are most effective in improving numeracy skills.

In contrast to the findings of Clements and Sarama (2020), who emphasized the importance of fostering mathematical problem-solving skills in young learners, this study noted that caregivers often struggled with numeracy beyond basic counting and shapes. This limited their ability to be innovative on how they teach mathematical concepts. This suggests that the training provided to caregivers in Malawi may not sufficiently cover higher-order numeracy skills, highlighting a gap in both the content and depth of the training provided to caregivers. Further, it was observed that caregivers do not engage children with a variety of numeracy activities and there was few learning and stimulating materials for numeracy.

5.3 Specific Teaching Strategies Employed by Trained ECD Caregivers

The study also highlighted the importance of play-based learning in improving children's understanding of numeracy concepts, which concurred with Baroody et al. (2019), who emphasized the role of engaging, hands-on activities in enhancing children's motivation and conceptual understanding in numeracy. However, a significant gap identified in this study was the lack of sufficient play and instructional materials to facilitate these activities, a point also raised by Munthali et al. (2014), who found that most CBCCs in Malawi lacked the play materials necessary to support children's cognitive development. This suggested that the success of numeracy-focused training is closely linked to the availability of resources, as confirmed by Brown et al. (2022), who reported more significant gains in children's learning outcomes when numeracy and literacy instruction was integrated with appropriate resources.

The study revealed that storytelling, songs, and chants were some of the most effective strategies employed by trained caregivers to improve literacy and numeracy skills. This finding concurs with Powell et al. (2018), who noted that teachers' competencies significantly influence children's academic progress and school readiness, particularly when creative, engaging strategies are used. The use of storytelling as an effective tool aligns with research by Mashburn et al. (2018), who reported that interactive read-alouds and storytelling enhance children's vocabulary and comprehension skills. The integration of songs and rhymes into the curriculum also reflects best

practices as outlined by Neuman and Cunningham (2019), who found that incorporating creative approaches to learning, such as songs and chants, helps children develop foundational literacy skills.

However, the study also identified challenges related to the use of individualized instruction due to high caregiver to child ratios, which hampered the effectiveness of this strategy. This finding is inconsistent with Sénéchal et al. (2020), who found that individualized instruction has a significant positive impact on early literacy outcomes. The inability of caregivers to provide tailored instruction to children, as noted in this study, highlights the structural challenges faced by many CBCCs in Malawi, such as inadequate staffing, limited knowledge on inclusiveness and insufficient training in inclusive teaching.

Additionally, the study found that caregivers often lacked the time and resources to implement guided practice, another key strategy for improving literacy and numeracy skills. This finding contrasts with Johnson and Smith (2019), who reported that guided practice, when effectively implemented, can lead to significant improvements in children's reading and numeracy abilities. The gap between the intended use of guided practice and its actual implementation underscores the need for more comprehensive training programs that equip caregivers with both the skills and resources necessary to deliver high-quality instruction.

Furthermore, the emphasis on play-based learning in the study aligns with the findings of Baroody et al. (2019), who found that hands-on, playful experiences in numeracy instruction enhance children's motivation and understanding of mathematical concepts. However, as noted earlier, the lack of sufficient materials in many CBCCs limits the effectiveness of play-based learning, reinforcing the findings of Munthali et al. (2014), who argued that inadequate resources are a significant barrier to effective early childhood education in Malawi.

5.4 Factors That May Influence the Effectiveness of Caregivers' Training Interventions

The study highlighted several factors that influenced the effectiveness of caregiver training interventions, including socioeconomic status, caregiver qualifications, and the availability of resources. The findings concur with research by Sirin (2005), who found that children from higher socio-economic backgrounds tend to perform better in literacy and numeracy due to greater access to educational resources. Similarly, Reardon (2011) noted that children from low socioeconomic

households often face challenges in developing literacy and numeracy skills due to limited access to learning materials and supportive home environments. This is consistent with the study's finding that trained caregivers who were in CBCCs without play materials struggled to implement their training effectively.

The study also establish that caregivers' educational qualifications played a significant role in the effectiveness of the training interventions, with those possessing higher qualifications showing better outcomes. All CBCCs with trained caregivers their qualification was higher mostly with a Junior certificate and Malawi School Certificate of Education unlike in CBCCs with auntrained caregivers, the qualification was primary school leaving certificate and below. This finding aligns with Chalamanda et al. (2013) and Zulkarnaen, at al. 2021, who emphasized the importance of well-qualified caregivers in improving children's academic outcomes. However, the variability in caregiver qualifications in this study, with some caregivers having only primary-level education, raises concerns about the overall quality of the training provided. This is consistent with the findings of Munthali et al. (2007), who noted that many caregivers in Malawi lack the educational background necessary to fully benefit from the training programs.

Finally, the study found that community and parental involvement significantly influenced the effectiveness of training interventions. This resonates with the work of Mwanza-Kabaghe et al. (2022), who highlighted the importance of creating a literacy-rich environment at home to support children's literacy development. However, the study also identified challenges in engaging parents so that there is literacy and numeracy continuum of activities from CBCCs to home which limits the potential impact of these interventions. This highlights the need for more integrated approaches to early childhood education that involve caregivers, parents, and the wider community in supporting children's learning.

5.5 Chapter Summary

This chapter provided a comprehensive discussion of the findings. According to the first objective, the findings indicate that expressive language and receptive Language in CBCCs where caregivers were trained have relatively high mean score. However, there is slight difference on standard dexpressive language similarly, numeracy skills has significant difference between children from CBCCs where caregivers were trained and those that were not trained in Numeracy skills score.

Objective three has found out that there is a positive influence in terms of literacy and numeracy learning outcomes for children in CBCCs with trained caregivers and the fourth objective, revealed that caregivers employed storytelling, rhymes, songs, as effective strategies to develop children's vocabulary, expressive, and receptive language learning outcomes. The study also revealed that factors influencing the effectiveness of caregivers' training interventions includes availability and accessibility of resources, supportive supervision, mentorship, caregiver motivation, and a well-organized classroom environment.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

The chapter presents conclusions and recommendations based on the study's key findings. Based on summary of the key findings on the specific objectives. It also explains both theoretical and practical contributions on the effectiveness of caregiver training interventions and early childhood education practices in Malawi. Additionally, this chapter provides suggestions for further research, addressing the gaps identified in the current study.

6.1 Summary of the Key Findings

6.1.1 The Effectiveness of Trained Caregivers in Improving Expressive, And Receptive Language Skills

The study found that trained caregivers play a pivotal role in enhancing both expressive and receptive language skills in children. A high percentage of children demonstrated motivation, concentration, and social interaction, which are crucial for language acquisition. Notably, 91% of the children named friends and interacted socially, showing strong expressive language skills, while 79% followed instructions well, indicating strong receptive language skills. However, some children struggled with focus and understanding instructions, suggesting a need for more individualised support. These findings underscore the importance of caregiver training in using interactive methods like storytelling, play-based learning, and structured instructions to facilitate language development, although additional interventions may be needed for children with learning challenges.

6.1.2 The Effectiveness of Trained Caregivers in Improving Number Sense, Counting, And Shapes

The study demonstrated that trained caregivers were effective in enhancing children's early numeracy skills, particularly in number sense, counting, and basic arithmetic. 78% of the children were able to correctly identify three items, showcasing strong number sense, while 60% could solve simple arithmetic problems. However, performance dropped as tasks became more complex, with only 9% able to recall advanced number sequences, reflecting cognitive limitations typical of

their developmental stage. Spatial reasoning tasks, such as fitting puzzle pieces, also posed challenges, indicating that more activities targeting spatial skills could be beneficial. These findings highlight the positive impact of caregivers' numeracy-focused instruction but point to a need for more advanced numeracy interventions.

6.1.3 Specific Teaching Strategies Employed by Trained ECD Caregivers

The key findings from the study revealed that storytelling, rhymes, songs, and chants are essential teaching strategies employed by ECD caregivers to foster literacy and numeracy skills among children. Storytelling was found to stimulate children's critical thinking and imagination, while rhymes, songs, and chants made learning more interactive and engaging, helping children develop phonemic awareness and counting skills. Play-based learning was another prominent strategy, where children learned literacy and numeracy concepts through hands-on activities and exploration. This approach allowed children to grasp complex concepts while enjoying themselves, making learning a natural part of play. Additionally, caregivers used modelling and guided practice to scaffold children's learning, fostering independence and confidence in literacy and numeracy skills. Numeracy activities involving physical manipulatives like blocks and bottle tops were also widely used, enabling children to understand abstract mathematical concepts. Individualised instruction allowed caregivers to tailor teaching approaches to the needs of each child, ensuring that all learners progressed at their own pace.

6.1.4 Factors That May Influence the Effectiveness of Caregivers' Training Interventions

The findings indicate that several factors affect the effectiveness of caregiver training interventions in improving literacy and numeracy skills. First, resource availability emerged as a critical factor, with caregivers struggling to implement learned strategies effectively due to the lack of teaching materials such as books, toys, and other play equipment. Without these resources, the impact of the training was limited. Supportive supervision and mentorship were also identified as essential for the success of training interventions, providing caregivers with ongoing guidance, feedback, and professional development. Regular follow-ups allowed caregivers to refine their teaching methods and address any challenges. Lastly, caregiver motivation and attitudes played a significant role in the effectiveness of the training. Motivated caregivers were more likely to adopt new teaching practices and persevere in challenging situations, particularly when they observed

positive outcomes from their efforts. Classroom environments were also influential, with well-organised, stimulating spaces facilitating the effective implementation of training.

6.2 Contributions

6.2.1 Theoretical Contributions

This study contributes to the theoretical understanding of the impact of caregiver training on early childhood literacy and numeracy development, particularly within the context of developing countries like Malawi. It extends existing literature on the role of ECD interventions by demonstrating that training alone is insufficient without the necessary classroom resources and favorable child to caregiver ratios.

Additionally, the study provides empirical evidence supporting Teacher Efficacy Theory, focuses on the beliefs and perceptions teachers have about their ability to influence student learning and outcomes. The study conveys the understanding and the relationship between caregiver confidence, training quality, and teaching outcomes. Further, Teacher Efficacy Theory posts that teachers with high self-efficacy are more likely to adopt innovative teaching methods, set challenging goals, and persist in the face of obstacles (Tschannen-Moran & Woolfolk, 2019). They also adapt their instruction to meet the diverse needs of their students and teacher efficacy is linked to student motivation and achievement (Hattie, 2016).

The findings show that caregiver confidence plays a crucial role in implementing effective instructional strategies, aligning with Bandura's Teacher Efficacy Theory, which posits that self-efficacy influences learning behaviors. Hence trained caregivers, fostered language and numeracy skills through interactive teaching methods and innovations. This is adding to the literature on importance of professional development in early childhood education. This insight bridges gaps in existing research on how the quality and depth of caregiver training impact children's literacy and numeracy development, offering a nuanced understanding of early literacy and numeracy acquisition.

6.2.2 Practical Contributions

Practically, the study provides actionable insights for policymakers, educators, and early childhood education stakeholders in Malawi and similar contexts. One key contribution is the identification of critical gaps in caregiver training programs, particularly the need for more specialized training

in both language and numeracy instruction. The study's findings underscore the importance of providing caregivers with adequate resources and reducing class sizes, thus informing policy recommendations for the expansion of infrastructure and resources in CBCCs. These insights are directly applicable to the design and implementation of more effective caregiver training programs that focus on differentiated instruction and resource utilization.

The study also contributes to practice by highlighting successful teaching strategies such as storytelling, rhymes, and play-based learning, which can be scaled up and adequately given enough time in the caregiver training curricula. These strategies offer practical approaches to improving literacy and numeracy outcomes in early childhood settings.

Furthermore, the recommendation for a mentorship program for less experienced caregivers and those that have just been trained has the potential to foster professional growth and improve teaching effectiveness.

The study also calls for improved monitoring and evaluation of ECD programs to ensure that caregiver training interventions are yielding the desired outcomes, thus providing a framework for ongoing assessment and quality improvement in early childhood education systems with a robust monitoring and information management system in place.

This study explored the impact of caregivers' training on preschoolers' literacy and numeracy learning outcomes. The findings highlight a significant relationship between the trained caregivers' literacy and numeracy learning outcomes of children in CBCCs. Caregivers with training in early childhood development were more effective in implementing instructional strategies that promote foundational literacy and numeracy skills, compared to untrained caregivers. Trained caregivers also demonstrated enhanced abilities to create stimulating learning environments, apply age-appropriate play based learning method, and engage children in meaningful learning activities that promote literacy and numeracy skills in children.

Additionally, the study reveals that trained caregivers' development are more equipped to address the diverse learning needs of preschoolers. This is reflected in improved literacy outcomes, such as receptive language skills, vocabulary development, expressive language and early reading skills, as well as stronger numeracy outcomes, including basic number sense and problem-solving abilities.

Further the study divulges that trained caregivers use a variety of strategies in teaching literacy and numeracy including play based learning and child centered teaching that allows children to be more engaged and involved in the activities that makes leaning playful but engaging. On the other hand the same strategies used by untrained caregivers such as stories and songs were not engaging as such children in CBCCs with untrained caregivers did not acquire the same skills in literacy and numeracy despite applying some of the activities.

However, the study also identifies some challenges, including inconsistencies in the quality of training programs due to training delivery models, limited access to mentorship or refresher trainings, and inadequate resource support in early childhood centers including play materials, teaching and learning materials and instructional materials. These challenges highlight the need for more robust support systems to ensure that all caregivers are adequately prepared to foster preschoolers' literacy and numeracy development and also the need to invest more in the ECE sector.

6.3 Recommendations

Based on the findings of this study, the following recommendations are proposed to enhance the impact of caregivers' training on preschoolers' literacy and numeracy outcomes:

6.3.1 Standardization and Duration of Caregiver Training Programs:

National or regional standards should be established to ensure uniformity in the quality of training programs for early childhood caregivers in Malawi. These standards should focus on core competencies related to literacy and numeracy instruction among others. The standards should also include delivery of the training by those who train caregivers, period of training to be increased from two days to at least six months as most caregivers requested and the training should be institutionalized to have the minimum hours required covered.

6.3.2 Ongoing Professional Development:

Governments, NGOs, and educational institutions should provide continuous professional development opportunities for caregivers. Workshops, refresher training, and mentorship programs should be made available to keep caregivers updated on new teaching techniques, curriculum and pedagogical approaches. Improve and implement the mentor model to increase on

the understanding of the caregivers and advance on the skills acquired during training. There is also a need to train all caregivers as the study has revealed positive impact of the training.

6.3.3 Review of Caregiver Training Curriculum to Emphasize on Practical, Play Based Learning Approaches:

Training programs should prioritize practical, hands-on learning experiences for caregivers. These should include play based learning (PBL), strategies for integrating play-based learning, and problem-solving activities that align with children's developmental stages so that caregivers first understand PBL for them to foster a supportive environment, encourage participation in children, emphasize on the process over product and provide opportunities for reflection. This leads to enjoyable, engaging and effective learning experiences that support children's literacy and numeracy learning outcomes.

6.3.4 Improved Access to Resources and Materials:

Caregivers during the training should be exposed to a variety of teaching, play and stimulation materials and be engaged in producing the materials so that they understand and relate the use with how children learn and develop. CBCCs should also be equipped with enough teaching materials and resources that support literacy and numeracy development. This includes access to age-appropriate books, manipulative for literacy and numeracy learning, and digital tools where applicable.

6.3.5 Strengthening Monitoring and Evaluation Systems for Caregiver Training:

A comprehensive monitoring and evaluation framework should be developed to assess the effectiveness of caregiver training on preschoolers' learning outcomes. This can help identify areas for improvement and ensure that training programs are continuously evolving to meet the needs of both caregivers and children.

6.3.6 Collaboration between Stakeholders:

Collaboration between government, training institutions, preschools, and parents is essential to create a supportive ecosystem for caregivers. Partnerships can also facilitate knowledge sharing and resource mobilization to improve early childhood education quality through training of caregivers among others. Partners also should adhere to training requirements for caregivers.

By implementing these recommendations, policymakers and educators can strengthen the capacity of caregivers, thereby improving preschoolers' literacy and numeracy outcomes and setting a strong foundation for lifelong learning.

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APPENDIX: Data collection Tools

1. Parents Interview

Introduction and Informed Consent

My name is **Nellie Masamba**, a Masters student of Early Childhood Development Care and Education (ECDCE) at the University of Zambia. I am doing a research on "**Assessing the *Impact of Caregivers' Training in the Literacy and Numeracy Learning Outcomes for children"***. I therefore wish to request you to assist in participating in an interview so that I can gather information which will be helpful for the study. The information that will be obtained will be treated with total confidentiality and will only be used for study purposes. The interview will take us approximately 15 - 20 minutes to complete.

Are you willing to participate? Yes☐ No ☐

We sincerely appreciate your willingness to participate in this important interview, which aims to collect essential data about the socioeconomic status of households. Your valuable insights will contribute significantly to our understanding of the economic circumstances of your family so that we can relate to literacy and numeracy learning outcomes of children. Your participation in this survey is invaluable. May you sign this consent form?

Name _____

Signature_____

Section 1: Demographic Information

1.1. Please provide your contact information (optional):

Name: _____ Phone: _____

TA_____ Village_____

1.2. What is your relationship to the child? (Parent, uncle, grandparent, aunt etc.)_____

1.3. Child's Age: _____1.4. Child's Gender: [ ] Male [ ] Female

Section 2: Literacy and numeracy materials at home

2.1. Do you have children's number chart (s) for [NAME] at home?

☐ Yes ☐ No

2.2. Do you have children's letter/ phonics chart (s) for [NAME] at home?

☐ Yes ☐ No

2.3. How often do you read books to your child?

☐ Daily ☐ Several times a week ☐ Once a week ☐ Rarely ☐ Never

2.4. Do you provide educational toys, games, or activities for your child?

☐ Yes ☐ No

2.5 Do you have the following toys that your child play with?

1. ☐ Homemade toys such as dolls, cars, or other toys made at home
2. ☐ Toys from a shop or manufactured toys
3. ☐ Household objects such as bowls or pots or objects found outside
4. ☐ Objects within the child's environment such as sticks, rocks, animal shells or leaves
5. ☐ Never

2.6 How often do you engage in educational activities with your child (e.g., counting, letter recognition, puzzles)?

☐ Daily ☐ Several times a week ☐ Once a week ☐ Rarely ☐ Never

Section 5: Additional Comments

4.1. Please provide any additional comments or insights regarding your child's home environment and support for literacy and numeracy development

_____

_____

_____

Thank you for accepting to be interviewed. Your input is valuable to our research. Your participation is greatly appreciated.

Appendix 2: Semi structured Interview Questionnaire for CBCC Caregivers on Pedagogy and Teaching Strategies in Literacy and Numeracy.

My name is **Nellie Masamba**, a Masters student of Early Childhood Development Care and Education (ECDCE) at University of Zambia. I am doing a research to "**Assessing the *Impact of Caregivers' Training in the Literacy and Numeracy Learning Outcomes for children"***. I therefore wish to request you to assist in participating in an interview so that I can gather information which will be helpful for the study. The information that will be obtained will be treated with total confidentiality and will only be used for study purposes. The interview will take us approximately 20- 30 minutes to complete.

Section 1: Demographic Information

1.1. Please provide some basic demographic information:

- Name: _____ CBCC……. Tranined/ untrained
- TA_____ GVH_____Village_____

Section 2: Pedagogy in CBCC

2.1 What approaches do you use to foster numeracy development in preschool children? Can you provide examples of effective activities or strategies?

2.2. How do you create a literacy-rich environment in your classroom? Are there specific strategies or activities you use to promote early literacy skills?

2.3. How do you ensure that literacy and numeracy activities are developmentally appropriate for preschoolers?

2.4. How do you individualize literacy and numeracy instruction to accommodate the diverse needs and abilities of your children in CBCC?

2.5. Have you encountered challenges in teaching literacy and numeracy to preschoolers? If so, how have you addressed these challenges?

Section 25: Assessment and Reflection

5.1. How do you assess the progress of your students in literacy and numeracy? What tools or methods do you use?

Section3: Continuous Improvement

6.1. In your opinion, what are the key factors that contribute to a successful preschool program focused on literacy and numeracy development?

6.2. How can ECD caregivers continuously improve their pedagogy and teaching strategies for literacy and numeracy to better support early childhood development?

Section 7: Additional Comments

7.1. Is there anything else you would like to add or share about your experiences with teaching literacy and numeracy in CBCC?

Conclusion: Thank you for participating in this interview. Your insights are invaluable in advancing our understanding of preschool pedagogy and teaching practice. If you have any further comments or suggestions, please feel free to share them. Your contribution to this research is greatly appreciated.

Appendix 3: Measuring Early Learning Environments (MELE)

Classroom Observation

It is recommended that observations last at least two hours, ideally in mornings. The observation should begin when the CBCC's(or other centre) as daily program begins. If possible, the entire learning session should be observed.

CLASSROOM OBSERVATION

TO THE CAREGIVER: "You do not have to do anything special today because I am here; please just follow your planned activities for the day. While you are teaching, I will sit in a place that is out of the way so that I do not interfere with you or the children. I am not here to interact with the children, and will not participate in your lessons and activities. Before you start teaching, would you please introduce me to your children? You may say, 'A friend is joining us today to see what we do in our classroom. He/she will not be joining our activities. To start, he/she will count who is at school today.' "

A. Observation information		
0	**CBCC Name**	
1	**Date of Visit**	
2	**Data collec0r**	
4	**Class start time (Observed or teacher report)**	____:____ **[Use 24-hour time HH:MM]**

5	**<u>Emerging literacy (reading skills.</u>** Learning opportunities to support development of emerging literacy skills for example, letter identification, sounds/phonics and reading.	**1**	**2**	**3**	**4**
6	**<u>Expressive language development (conversations between the children and caregiver).</u>**Opportunities to develop and use language to discuss ideas, share opinions, communicate with others and build vocabulary.	**1**	**2**	**3**	**4**
7	**<u>Storybook reading and storytelling</u>.** Supporting children's listening, communication, comprehension and speaking skills**.**	**1**	**2**	**3**	**4**
8	**Learning opportunities that allow children to engage in <u>Music/Singing/Movement activities</u>** • Singing songs • Dancing • Acting and role-play • Group-songs/dances, all together or in turns • Nursery rhymes	**1**	**2**	**3**	**4**

Appendix 4: International Development and Early Learning Assessment (IDELA) Tool

Instructions: This packet will allow you to assess the development and early learning of young children (5 years). Please pay careful attention to the instructions, and read all questions to children exactly as they appear. You will see two forms of type:

Bold type indicates things you, the assessor, must say to the child out loud. Please read this type aloud to the child completely and exactly as it appears. This is important to ensure that the data will be collected in a standardized manner across all children.

Non bold or italic type indicates instructions for you. Do not read these instructions aloud to the child.

Before beginning any assessment, it is important to establish a relaxed and playful rapport with the child. Ask him/her a few questions about subjects of interest to them. Introduce your self- etc. As much as possible, help the child see the assessment as a game rather than a serious test. Throughout the assessment, offer neutral encouragement to the child. Say things like, *'You are working very hard - keep it up!'* Give encouragement in between questions, rather than in the middle of questions. Be patient! Do not give hints to questions or make facial expressions while the child is completing tasks.

Before you begin the assessment, ensure that the child has had their school provided meal or has been fed at home and is not hungry. Also, have clean drinking water available.

Observe how the child is doing and offer breaks as needed throughout. Technically there is no "time limit" to complete the assessment although some questions are timed to help move through the items at a regular pace.

My name is Nellie Masamba I am a Masters student with the University of Zambia in Early childhood Development, care and Education.

We are at your school to see how you play and learn. Are you willing to play with me?

Yes No

1. We will play together different games. I will also show you different play materials and ask you some questions regarding stories, pictures, letters and numbers. I will also ask you to show me how you draw, jump, dance and singing.

2. You might find some of the activities them simple while some requires your effort. Do not worry if you will not manage some activities.

3. If you need a break, tell me it is ok.

4. Do you understand? Any question? Are you ready to play?

Background questions

This information is to be completed before the assessment begins with the child. These questions should not be asked to the child. The specific items in this section can be decided on by each project team, but at minimum we recommend:

a) Assessor name	
b) Name of CBCC	
c) Child's full name	
d) Child sex	
e) Child's age	
f) Date of Assessment	
g) Time at start	
h) Time at end of the assessment	

ID**ELA items**

Item 1. Personal awareness

Materials: None

I am very happy to meet you …… *(Mention the name of the child)*. I want to know you more. May I request that you respond to those questions which you feel you will be able

to do. If you feel that there is a question which you cannot answer or an activity which you cannot do leave them

Ask the child the following questions one at a time.

Scoring

a) Can you tell me your first and surname?	Correct	Incorrect	No response
b) Can you tell me how old you are?	Correct	Incorrect	No response
c) Can you tell me the name of the village that you live in?	Correct	Incorrect	No response
d) Can you tell me the name of the country that you live in?	Correct	Incorrect	No response

Item 2. Comparison by Size and length (Emergent math)

Materials: Picture Cards with circles and sticks

I will show you different pictures and I will ask you questions. Look at these pictures. Show me the biggest circle.

Now, I would like to show you other pictures. I will ask you some see these pictures. Show me a big circle

*Wait for child to respond and then ask**:***

Can you show me the smallest circle?

*Then show the child the picture with the sticks and ask**:***

Now, look at this picture. Can you show me the longest stick?

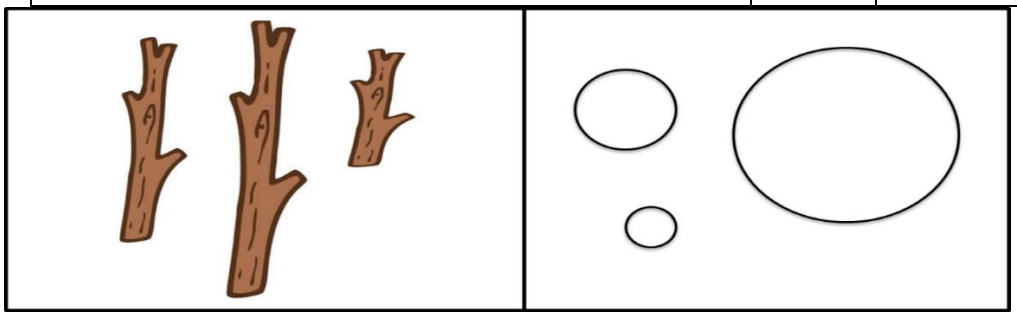
Wait for child to answer and ask:

Can you show me the shortest stick?

Scoring

a) Child identifies biggest circle	Correct	Incorrect	No response

b) Child identifies smallest circle	Correct	Incorrect	No response
c) Child identifies longest stick	Correct	Incorrect	No response
d) Child identifies shortest stick	Correct	Incorrect	No response



Item 3. Sorting and classification (Emergent mAth)

Materials: Picture cards of stars and circles (two red stars and one yellow star, two yellow circles and one red circle)

Place the picture cards in front of the child in a random order and say:

"**We will do matching activity**. **Please observe and put all similar things together**.

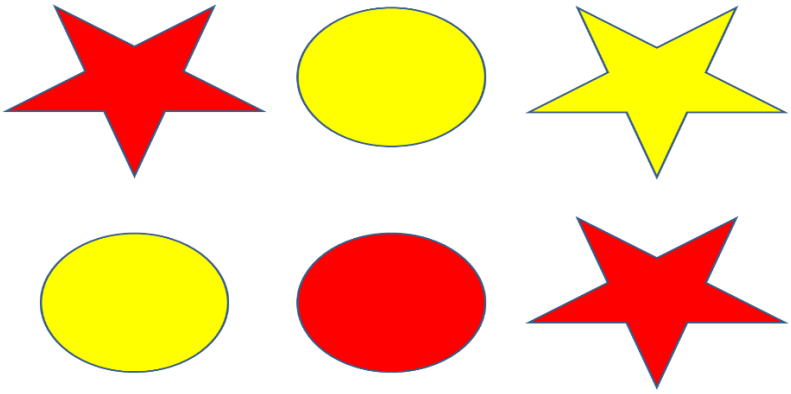
Once the child has completed sorting by one criterion say,

"Alright. Now, look at these pictures, find other ways of matching things

Be patient and wait as the child tries to examine how to arrange the cards.

Scoring

a) Child sorts cards by first criterion	Correct	Incorrect	No response
b) Child sorts cards by second criterion	Correct	Incorrect	No response



Item 4. Shape identification (Emergent math)

Materials: A laminated page with pictures of 6 shapes used in this test (4 shapes + 2 distractors)

Place the laminated page with shapes in front of the child and say:

"I have some pictures which I want to show you. They are shapes. See them and I will ask you to show me when I mention.

a) **Which one is a circle?**

Continue like this down the list:

b) **Which one is a rectangle?**

c) **Which one is a triangle?**

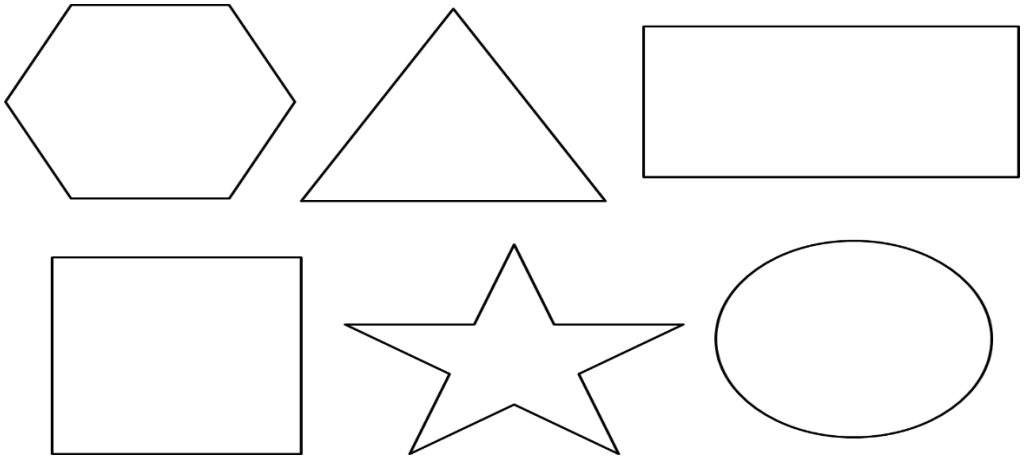
d) **Which one is square?**

e) **"Think and tell me a thing which looks like circle?"**

Scoring

a) Child identifies circle	Correct	Incorrect	No response
b) Child identifies rectangle	Correct	Incorrect	No response
c) Child identifies triangle	Correct	Incorrect	No response

d) Child identifies square	Correct	Incorrect	No response
e) Child identifies circle in the environment	Correct	Incorrect	No response



Item 5. Number Id (Emergent

Materials: Number chart of numbers from 1 to 20

Now let's see numbers. I will point at some of the numbers and I want you to mention them. If you do not know do not worry.

Show the child a copy of the numbers chart. Using another sheet of paper cover all rows of the table except Rows 1 so that it doesn't distract the children. Begin with the first number in the first row by pointing and asking the child

Alright, Let's start**. What number is this?**

If the child gets stuck for more than 5 seconds, mark as incorrect, point to the next number and encourage the child to continue.

Continue to show number by number, moving your finger across the row until you complete Rows 1 and 2. As the child identifies each number, mark with an X those identified incorrectly. Count all the numbers child identified correctly in Rows 1 and 2. If the child has only identified 3 or fewer numbers correctly, STOP and move on to the next item. If the child identifies 4 or more numbers correctly, move to Rows 3 and 4 saying,

Well done, Let us see some more numbers Mention the numbers which you know

Ask the child to continue identifying the numbers as done in Rows 1 and 2 and continue marking incorrect answers.

2	4	10	5	7
9	6	8	3	1
13	17	14	19	16
15	18	11	12	20

Item 6. Number sense- One-to-one correspondence (Emergent math)

Materials: 20 small items (e.g. stones, beans, sticks etc.)*Arrange the 20 objects randomly in front of the child.*

Let us now play with stones. We have lots of stones. Give me 3 stones.

Be patient while child arranges the objects. When child finishes, re-arrange the 20 objects randomly.

Thank you. Now give me there stones

Thank you. Give me 8 stones now.

Be patient while child arranges the objects. When child finishes, re-arrange the 20 objects randomly.

If the child cannot give you 3 or 8 objects, STOP and move on to the next item.

If they can give you 3 or 8 items, re-arrange the 20 objects randomly again and say

Well done. Now give me 10 and 5 stones.

While you administer this item observe how persistent /engaged the child is in trying to answer the questions, and score according to the scoring rubric.

Scoring

One to One correspondence			
a) Child identifies 3 items	Correct	Incorrect	No response
b) Child identifies 8 items	Correct	Incorrect	No response
c) Child identifies 15 items	Correct	Incorrect	No response
Persistence / Engagement			
a) Child stays concentrated on the task at hand; not easily distracted	Yes	No	No response
b) Child is motivated to complete task; does not want to stop the task.	Yes	No	No response

Item 7. addition and subtraction (Emergent m

Materials: Rocks/blocks used in previous item, Picture cards with bikes and apples

I have another game with blocks Here I have 3 blocks

Now we will play with blocks. I have 3 blocks.

My friend has given me 2.

*Lay these out near the first objects but leaving a little space between the two groups***.**

Now, how many blocks do i have together?

Wait for the child to count and score response. Then show the picture with the bikes and say

On this chart there are 2 bicycles 2if I can add 2 more bicycles, how many bicycles will be here all together?

Then if i remove 1 bicycle how many bicycles are remaining?

Record Child's Response

Scoring

a) Child adds 3 and 2	Correct	Incorrect	No response
b) Child adds 2 and 2	Correct	Incorrect	No response
c) Child subtracts 1 from 3	Correct	Incorrect	No response

Item 8. Puzzle completion (Emergent math)

Time Estimate: 2 minutes 

Materials: Two 4 piece jigsaw puzzles (laminated and standardized, cut appropriately). Include a picture of the puzzle for the child to see.

Show the picture of the first puzzle to child and say,

We will do another exiting game using pictures on cards. The picture which we want to make from these pictures on the cards is this one.

Show the child the puzzle pieces in a random order and say,

Let's put together the small pieces to make this big picture. We will be doing together.

Help the child to put the puzzle together. Put two pieces in the correct place and then hand the third piece to the child and ask him/her where he/she thinks it should go. If the child does not put it in the right place, do it for the child and then ask the child to put in the last piece.

Put the first puzzle away. Now show the picture of the second puzzle to the child and say

*Now I want you to make the picture***. Can you put these small picture cards together to make the big picture? Let me know when you finish.**

While you administer this item observe how persistent /engaged the child is in trying to answer the questions, and score according to the scoring rubric.

Scoring

Puzzle completion			
a) Number of puzzle pieces fit together (0, 2, 3, 4, 5)			No response
Persistence / Engagement			
a) Child stays concentrated on the task at hand; not easily distracted	Yes	No	No response
b) Child is motivated to complete task (solve the problem); does not want to stop the task.	Yes	No	No response

Item 9. Friends

Materials: Nothing

Can you mention your friend whom you play with?

You can prompt ONCE by saying,

Can you mention more friends?

Scoring

a) Number of friends named (0-10)		No response

Item 10. Working memory (ex. function)

Materials: Nothing

If the child makes an error, supply the correct answer on the practice items only.

Practice:

Now we will play another game. I will mention numbres and you should listen so that ypou also mention the numbers the way i mentioned. Now lets try.

Pause for one second in between each number in the sequence. For example « 5 » [pause] « 2 ». If the child makes an error on the practice, supply the correct answer.

5…2

6…1…3

Assessment:

Listen attentively now and mention the numbers exactly as I have mentioned.

If the child makes an error in this section, DO NOT supply the child with the correct answer.

Scoring

a) 1…6	Correct	Incorrect	No response
b) 5…2…9	Correct	Incorrect	No response
c) 8…3…1…4	Correct	Incorrect	No response
d) 1…2…4…7…3	Correct	Incorrect	No response

Item 11. Oral vocabulary (Emergent literacy)

Materials: No Material

Now let's play with words. Think of what you see when you are going to school (CBCC) from home?

Tell me more and i will be counting to know how many you have mentioned

Record the number of items the child lists until the child has listed 10 items. If the child is stuck at 2 or 3 items, you can PROMPT ONCE by saying,

Do you remember some more?

When the child cannot think of more items, move on to the next question and say:

Now I want to mention animals which you know. Mention the names of animals which you know. Animals which you have seen either at your home or in your village. Can you mention all the animals which you can remember and I will be counting to know how many you have mentioned.

You can PROMPT ONCE by saying

Do you know another animal?

When the child cannot think of more items, move on to the next item.

Scoring

a) Number of market items named (0-10)		No response
b) Number of animals named (0-10)		No response

Item 12. Print awareness (emergent literacy)

Materials for Item: Age appropriate book for 3-5 year olds

a) **Let us see this book now, I want you to help me. If you want to read this book, show me how you can open so that you read.**

b) *Turn to the first page of the story.*

c) Show me where you can start to read from.

Open on the next page and point to the first word on that page

d) If I start reading from here, on this word, which direction can I continue to read? Show me with your finger

Give the child a moment or two to look through the book if he/she wants before we move on to the next question.

Scoring

a) Child opens the book appropriately (turns book so words are no longer upside down)	Correct	Incorrect	No response
b) Child points to text on the page (can be the full sentence, the first word, the whole text)	Correct	Incorrect	No response
c) Child shows direction of text	Correct	Incorrect	No response

Item 13. FIRST LETTER SOUNDS (emergent literacy)

We will do a phonics game now. The word "Hat" starts with /h/ (say the sound of the letter h.

Listen to words which I will mention. Mention all the words which start with the same sound /h/ (say the sound not name of the letter) **Ham, ball, or Lamp?**

If the child gives an incorrect response, say: **Ham starts with /h/ as in hat**

<u>Assessment:</u>

We will continue playing. Are you ready?

*Repeat the list of words ONCE per question if needed and mark child's response***.**

a) **The word 'Star' starts with /S/. which words from the words that I will mention starts with /S/ Cow Doll Sand**

b) **Alright. Now "Tree starts with /T/. listen to the words I will mention and tell me which one starts with /T/ Game Toy Cat**

c) **Well done! Now door /D/. listen to the words and tell the word which starts with /D/ Dog Key Girl**

Scoring

a) Child identifies /s/ word pair	Correct	Incorrect	No response
b) Child identifies /t/ word pair	Correct	Incorrect	No response
c) Child identifies /d/ word pair	Correct	Incorrect	No response
a) **" How did the cattle got itd hat from the dog?"** (the dog returned it)	Correct	Incorrect	No response

b) **" What happened to the cattle and dog at the end of the story?"** (became friends/shared the hat/stopped chasing)	Correct	Incorrect	No response