COLLEGE OF EDUCATION AND BEHAVIORAL STUDIES

CENTRE FOR EARLY CHILDHOOD CARE AND EDUCATION

PRACTICE OF PLAY BASED LEARNING IN NUMERACY INSTRUCTION: A CASE STUDY IN LIBA PRESCHOOL IN LEGETAFO SUBCITY

BY:

CHALA GEREMA

June, 2024

Addis Ababa, Ethiopia

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Approval of Thesis

Signed by Examining Committee

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DECLARATION

I declare that the document titled "Practice of play-based learning in numeracy instruction: A case study in LIBA preschool in Legetafo subcity, Oromia Region, Ethiopia" is my own work. All the sources used in the preparation of this case study have been properly cited and included in the reference section. I confirm that this work is original and that I have not copied or used any external sources without proper acknowledgement. The findings, analysis, and recommendations presented in this case study are the result of my own research. I declare that practice of play based learning in numeracy instruction: a case study in LIBA preschool in Legetafo subcity, Oromia Region, Ethiopia, this work is my own work and that all the sources that I have cited have been indicated in the reference section.

Name of candidate Chala Gerema signature of the candidate ---------- Date---------

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Abstract

Preschoolers learn foundational mathematics concepts such as counting, patterns, shapes, and measurement through hands-on experiences such as playing with blocks, puzzles, and other materials. The purpose of this study was to investigate the practice of play-based learning in numeracy instruction in LIBA preschool in Legetafo subcity, Oromia region, Ethiopia. Specifically, the study tried to identify teachers' understanding of play-based learning, types of play in numeracy instruction implementation, and challenges faced by the teachers. Using a qualitative case study design, data was collected from four teachers through interviews and observation and analysis of data using a thematic approach. The result of the study was that two teachers create engaging learning environments by incorporating play-based activities into numeracy instruction. Both used varieties of play-based activities, such as number songs, physical play, and manipulative, to teach numeracy concepts. On the other hand, two teachers relied more on direct teaching methods and did not use play-based activities frequently. The challenges faced included limited resources and a lack of support from the administration. Based on these findings, the study recommends that the preschool should invest in high-quality professional development opportunities for its teaching staff and the preschool should ensure that teachers have access to the necessary materials, dedicated learning spaces, and sufficient time to plan and implement engaging, play-based numeracy activities.

Key Terms: Play-based Learning Numeracy Practices numeracy instruction

Abbreviations

ECCE Early childhood care and education

MOE Ministry of education

LIBA Legetafo International Boarding Academy

UN United Nation

CHAPTER ONE

1.1Background of the Study

Numeracy is a fundamental aspect of early childhood education, and play is considered a highly effective way to promote children's mathematical development (Yenpad, 2021). Play-based learning in numeracy instruction involves children engaging in games, activities, and tasks that involve numerical concepts and manipulative (Bisanz, 2011). In the pre-school settings, children have many opportunities to enjoy and learn numerical concept through Play (Evans, 2021).Preschool education lays the foundation for children's academic success in future learning endeavors. Preschoolers learn foundational mathematics concepts such as counting, patterns, shapes, and measurement through hands-on experiences such as playing with blocks, puzzles, and other materials (Whitebread, 2015). Play-based learning is an effective strategy for teaching numeracy concepts because it is fun, engaging, and promotes natural curiosity and exploration. The state recognizes the importance of play-based learning and has included it in the guidelines for quality preschool education programs (International Education, 2013).

Sarama and Clement (2018) compared two groups of preschoolers: one receiving play-based numeracy instruction and the other receiving teacher-centered instruction; the play-based group outperformed the teacher-centered group in measures of number sense, spatial reasoning, and problem-solving. So, as this study found, playful teaching can significantly improve early numeracy skills. According to Fuson and Moresco (2021), who investigated the use of manipulative in play-based learning for early numeracy development, children who explored number concepts with manipulative like blocks and counters demonstrated a deeper understanding of place value, addition, and subtraction compared to those who received instruction without manipulative. So, as this study found, playful exploration with manipulative can strengthen foundational numeracy concepts (Parks, 2015).

The teachers used various strategies to implement play-based learning in their numeracy instruction (Brady, 2008), first, they used open-ended questions to encourage children to think and communicate their ideas. Second, they provided a rich learning environment with materials that promoted exploration and experimentation. Third, they allowed children to work in small groups, which encouraged collaboration and social interaction. Fourth, they provided activities that were challenging but achievable, which promoted a sense of accomplishment and self-confidence in the children. In order to achieve these strategies preschool teachers using different

approach of play based learning. These are; Teacher-directed play, child-directed play/free activities and guided play (DeLuca, 2018). There are many forms of play based learning which teachers use in numeracy instruction and that support play based learning numeracy, such as; constructions play, exploratory play, role-play, pretend play/ dramatic, manipulative play, fantasy play and other type of play (Parks, 2015).

Globally, there are great variations in preschool teachers' understanding of play-based learning, practices, and challenges of play-based learning. Preschool teachers in developed countries such as Japan, the United States, Germany, Denmark, Australia, and Finland have a relatively better understanding of play-based learning and implementing play in the classroom and are stuck by little challenges regarding play-based learning (OECD, 2012).In several developing countries, such as some Asian and sub-Saharan African countries, including Malaysia, Kenya, Ghana, and Ethiopia, preschool teachers have an inadequate understanding of play-based learning and practice concerning play-based learning due to a lack of preschool teacher competence, school factors, and child-related factors (OECD, 2012).

In Ethiopia, preschool teachers are expected to have the adequate thoughtful of play based learning, practice and understanding of all aspects of child development including theories and approaches of teaching for the successful implementation of good early teaching in general and play based learning numeracy in particular. This helps to integrate new knowledge and skills with the current practice (MOE, 2010). But different studies show as, preschool teachers in Ethiopia where put high value on formal academic learning rather than play based learning (Gebreslassie, 2016).

In history of early childhood, educational theorists, including notable influential scholars such as Piaget, Vygotsky, Dewey, Froebel, and Rousseau have been discussing and debating the best approaches to learning, whilst the ideology of early childhood expended. When it comes to learning in early childhood, the overall agreement is children learn best through exploring their world through play (Brandice, 2021). Following the work of educational philosophers like Froebel, who championed the importance of play-based learning for preschoolers, there has been a global shift towards incorporating and practicing this approach in preschool settings (OECD, 2021).

According to (LEGO Foundation, 2019) several countries worldwide have adopted play-based learning in numeracy instruction as an effective approach to teaching numerical concepts. For

example, in Finland, a country that has consistently performed well in international assessments of numeracy, play-based learning is widely used in the instruction of numerical concepts. Finnish children participate in a variety of mathematical games, activities and tasks that encourage them to apply mathematical concepts in real-life situations (Rosli & Lin, 2018).

Similarly, in Australia, play-based learning is widely used in the instruction of numeracy. Early childhood centers in Australia often have numeracy learning centers that include math manipulative, such as blocks, geometric shapes, and counting materials. Children engage in math activities, such as sorting, classifying, measuring, and pattern building. Play-based learning in numeracy instruction is considered a critical foundation for future learning and is seen as an essential requirement of early childhood education (LEGO Foundation, 2019). In the United Kingdom, the government promotes play-based learning as part of the Early Years Foundation Stage (EYFS) curriculum. The EYFS framework identifies play as a fundamental aspect of children's learning and development. The curriculum places a significant emphasis on the use of play-based learning in numeracy instruction, with a focus on providing children with opportunities to explore numbers, patterns, and relationships (LEGO Foundation, 2019).

Nowadays, through use of loose parts is preparing the practice of play-based numeracy learning in many countries. The term "loose parts" is used by Nicolson to refer to a variety of materials that can be moved, carried, combined, redesigned and lined up, in various ways. Both alone and in combination with other materials, loose parts can be used. With all of these things, children enjoy playing, experimenting, learning, inventing, and having fun (UNICEF, 2019).

The practice of play-based learning in numeracy instruction in Ethiopia is still in its early stages, but there are some promising initiatives underway. For example, the Ethiopian government has recognized the importance of play-based learning and has included it in its Early Childhood Care and Education (ECCE) policy framework. In addition, there are several NGOs and international organizations working to promote play-based learning in Ethiopia, such as Save the Children and UNICEF (MoE, 2015).

One successful example of play-based learning in numeracy instruction is the "Number Games" program developed by Save the Children in Ethiopia. This program uses games and activities to help children develop their numeracy skills in a fun and engaging way (Save children, 2018). The program has been implemented in several schools in Ethiopia and has shown promising results in improving children's numeracy skills and attitudes towards learning. Another example

is the "Playful Learning" program developed by UNICEF, which uses play-based learning to promote literacy and numeracy skills among children in Ethiopia. The program provides training and support to teachers in implementing play-based learning activities in their classrooms, and has been shown to be effective in improving children's learning outcomes (UNICEF, 2018).

1.2 Statement of problem

In Ethiopian preschools, experience is often to teach children in the same way as primary education. This is a lot of chalk and talk methods of teaching and learning. This situation makes children bored and hates learning (Tilahun, 2020). Ethiopian Policy in Education details put the importance of ECCE. It requires that young children to be provided care opportunities and experiences that lead to their whole development- physical, mental, social, emotional, and school readiness. One of the ways children can experience all of these things is through play. Through play children can learn about themselves, and their environment, as well as academic skills, such as math, science, reading, writing and social studies. Based on these ideas, it is possible to recognize the need for this play-based learning (MoE, 2010).

Curriculum Framework for Ethiopian Education stated preschool education centers to use a child centered approach where children can learn through play in an informal environment at their own pace. Free play encourages the child to engage in learning voluntarily, experimenting, and making their own discoveries, both independently or with other children and teachers. This contributes to the formation of their identity and expression and social learning. Numeracy helps students develop the concepts of direction, space, quantity, size, and number. Children will be learning to sort and classify objects and identify common objects around them and to describe their geometric features and positions (MoE, 2010).

Play-based learning in numeracy instruction is effective in preschool in different countries as various studies show. For example in countries like Scotland, Japan and other countries that are working hard on preschool education, and they have strategies in which children learn numbers through play based (Al-Mansour M. , 2014). These strategies are through used loose parts play children manipulating and using open-ended materials as they play in numeracy classes. Integrating those materials into different types of play, such as simulation or construction, gives teachers and children plenty of ideas for creating open-ended play opportunities. These tools make it easier for children to learn numbers (Bowman, 2009).

Many studies recommend that full play materials in the classroom can help children understand numbers themselves and succeed in their math learning skills in their life. In particular, different researchers point out that numeracy and literacy are the foundation for the development of the country (Al-Mansour M. , 2014). The implementation of play based learning in preschools is now seen in developed countries. However, some evidence suggests that it is very rare and non-existent in developing countries. These are related to the reasons for the provision of play equipment, teacher awareness of the benefits of play, preschool teacher training and financial (OECD, 2022).

In practice, the preschool education delivery system in Ethiopia same as primary school, developmentally inappropriate and focused on academic skills (Amente, 2016). Despite the importance of play based learning and policy suggestions, evidence on its implementation in preschools is limited. This suggests that the problem is embedded in preschool teachers worldwide and in need of investigation. In Ethiopia, ECCE is a recently introduced field as this field receives little attention due to lack of knowledge, and practice about the importance of play and play based learning for children's overall development and learning (ESDPV, 2015).

Many international organizations such as UNICEF, UNESCO and others have been providing technical and supporter for the promotion of early childhood education and promoting learning through play is also one of the approaches of these international bodies. However, promoting learning through play in early childhood education comes with huge challenges in many developing countries (OECD, 2022). In Ethiopia where teachers put high value on formal academic learning, rather than play based learning. Various studies revealed that the international ECCE advocated policy reforms have not been put into effect in the situation of Ethiopian's ECCE and early childhood teachers were found to be not implementing learning through play in preschool (Kwot, 2021).

The Ethiopian national Policy Framework for ECCE expressed the importance of play based pedagogy as one of the appropriate methods to accelerate the learning practice in all children's developmental domains (MOE, 2010). However, many findings on early childhood Education in Ethiopia showed that most ECCE centers lack good quality and the absence of learning through play in preschool (Adane, 2020), the practice of learning through play in ECCE settings discovered that preschool teachers view play based learning as a fun and pleasurable. Despite the growing emphasis on play-based learning, several challenges hinder teachers' ability to

effectively implement it. These include limited training opportunities for educators, a shortage of appropriate play materials, insufficient time dedicated to play activities, a lack of administrative support, and high child-teacher ratios.

Play based learning has been recommended for children learning all globally (UNICEF, 2018). In Ethiopia, existing literature has enumerated the significance of play-based learning, a little are said about how teachers apply and integrate play-based learning activities in Ethiopian preschools classrooms. Even though numerous studies support play-based learning as a valuable method for early childhood education, research by Amente (2016) suggests that, in Ethiopian classrooms learning does take place, even though most teachers don't utilize play methods and essential learning aids. This study emphasized the practice of play-based learning in numeracy instruction. As far as the present knowledge of the researcher is concerned, no systematic study was reported on the practice of play-based learning in numeracy instruction. Therefore, the researcher would be motivated to explore the practice of play-based learning in numeracy instruction through the case study in LIBA Preschool in Legetafo subcity. In light of the above pressing and sensitive issues, the researcher was initiated to fill the gap and conduct an in-depth exploration of the practice of play-based learning in numeracy instruction in LIBA preschool.

1.3 Basic Research Question

1. How do numeracy teachers understand play-based learning?
2. What are the types of play implemented in numeracy instruction?
3. What are the challenges numeracy teacher's faces in implementing play-based learning in numeracy instruction?

1.4 Objectives

1.4.1 General objective

The main objective of this study was to assess the practice of play-based learning in numeracy instruction; a case study in LIBA preschool in Legetafo Subcity.

1.4.2 Specific Objectives

1. To explore teachers understanding on the play based learning.
2. To identify types of play based learning implemented in numeracy instruction.
3. To identify the challenges numeracy teachers face in implementing play-based learning in numeracy instruction

1.5 Significance of the Study

The study was appropriate to recognize the practice of play-based learning in numeracy instruction; a case study in LIBA preschool in Legetafo Subcity. The study will also create awareness about the practices of play-based learning in numeracy instruction for practitioners, civil society, caregivers, teachers, non-governmental agencies and government sectors. In addition, the findings of the study will have a broader application in to ECCE by displaying the findings for preschool teachers, directors, caregivers, government and nongovernmental centers. It may also provide some valuable suggestion and recommendations for concerned bodies. It helps to know what major challenges are encountered in the implementation of play-based learning in numeracy instruction; and the study was initiate other researchers to undertake in depth study on the problem. The audiences that was benefited from this study are parents, children attending preschools, teachers of preschools, care givers, directors of preschools, and administrative town's curriculum experts.

1.6 Delimitation of the Study

It's difficult to do all things at once due to money, time, knowledge, and experience. Thus, this study was limited geographically to the Oromia region, Legetafo SubCity in LIBA preschool. Conceptually, the study delineated the practice of play-based learning in numeracy instruction: a case study in LIBA preschool. Methodologically, it was a qualitative research method and case study research design based on the nature of the objective of this study. The participants of this study were limited to four numeracy teachers at LIBA preschool.

1.7 Limitations

This study has some limitations which should be considered when interpreting the results. The sample size was small, with only four teachers being assessed; therefore, the results may not be generalizable to other educational settings. Secondly, the study only focused on observation and interview methods, which could be subjective and prone to bias. Additionally, the study did not take into consideration the role of parents in supporting play-based learning at home.

CHAPTER TWO

REVIEW RELATED LITERATURE

2.1. Play Based Learning in Numeracy Instruction

The use of play-based learning in preschool education has gained increasing attention in recent years, as research has demonstrated its effectiveness in teaching young children a range of skills, including numeracy concepts (Elkind, 2007; Moyles, 2010). Play-based learning is an approach that emphasizes the importance of incorporating playful and engaging activities into the learning process, allowing children to actively explore, discover, and construct their own understanding of mathematical ideas (Fesseha & Pyle, 2016). Numerous studies have highlighted the benefits of play-based learning in numeracy instruction. Researchers have found that when young children are given the opportunity to engage in play-based activities, they develop a stronger understanding of mathematical concepts, improved problem-solving skills, and increased motivation and engagement in learning (Ginsburg, 2006; Saracho & Spodek, 20018). Play-based activities, such as number games, manipulative materials, and physical movement, can help children make connections between abstract mathematical ideas and concrete experiences, facilitating their learning and retention of numeracy skills (Clements & Sarama, 2014).

Furthermore, play-based learning aligns with the principles of child-centered, developmentally appropriate practice in early childhood education (NAEYC, 2009). This approach recognizes that young children learn best through active exploration, experimentation, and social interaction, rather than through passive, teacher-directed instruction (Bodrova & Leong, 2015). By incorporating play-based activities into numeracy instruction, teachers can create learning environments that are responsive to children's natural curiosity, interests, and cognitive abilities (Saracho, 2017).

2.2 Play based learning

Society and daily life are the resource banks for children's learning. The motivation for children's learning comes from playing. The goal of kindergarten education and teaching is to cultivate children's love of learning. Therefore, the content of children's learning cannot be separated from the context of play. The kindergarten curriculum should be closely linked with children's real-life experiences, as the learning process itself is an integral part of their lived reality. As Chudacoff (2007) suggests, the types of play-based learning experiences offered in preschool settings are

instrumental in fostering children's holistic development. By recognizing the centrality of play in children's learning, educators can design curricula and learning environments that seamlessly integrate play-based pedagogies, maximizing the benefits for young learners.

The use of play as an educational tool is the basis of play-based learning, which is a pedagogical approach commonly, used in early childhood settings. The concept of learning through play has been widely adopted in education and psychology to explain how children gain knowledge from their surroundings (Sharifah Nor Puteh and Aliza Ali, 2013). According to (Rosli, 2018), play-based learning is the most suitable curriculum for children as it aligns with their natural tendencies to enjoy playing. Therefore, teachers should take into account the interests and needs of their students and guide and support them during play activities. During this process, teachers observe children systematically, provide effective feedback, and ask purposeful questions to facilitate and extend their learning. Despite the increasing focus on academic development and school readiness, playful activities have received little attention. However, since play is the most developmentally appropriate way for young children to learn, play-based learning should be an essential aspect of early childhood learning environments (Danniels, E., & Pyle, A., 2022).

Throughout history, the method of play-based learning has been extensively discussed in early childhood education. As far back as 1896, German educational theorist Friedrich Froebel expressed his belief that play was the ultimate expression of human development in childhood (Monica Nilsson, 2018). Later on, in 1929, Piaget and Vygotsky shared their own perspectives on the relationship between play and learning. Piaget asserted that play was essential to the learning process for young children, while Vygotsky believed that play facilitated all aspects of childhood development (Monica Nilsson, 2018). These educational theorists, along with others like Dewey, Froebel, and Rousseau, emphasized the importance of young children learning through play and exploration (Kane, 2021). These principles of play-based learning in early childhood have stood the test of time and remain highly relevant today. In Ethiopia many studies on play-based learning have shown that children who learn by interacting with the world and materials demonstrate greater growth in social-emotional and academic domains compared to peers who only receive teacher-led direct instruction (Hailu Tamir, 2021).

2.3. Early numeracy

According to (French, 2013), define numeracy is the incorporated of the ability to use mathematical understanding and skills to solve problems and meet the demands of day-to-day

living in complex social settings. He argues that, have this ability, young children needs to be able to think and communicate quantitatively, to make sense of data, to have a spatial awareness, to understand patterns and sequences, and to recognize situations where mathematical reasoning can be applied to solve problems.

During the early childhood, the growth of mathematical ability consists of infants being exposed to mathematical language through playful activities such as play number rhymes (like "One, Two, Buckle My Shoe"), fitting "smaller" boxes into "larger" boxes, learning the concept of "sameness" and "difference," and encountering the experience of moving "faster" or "slower" (Jung, 2014).

(Goos . M, 2004), States the word numeracy as; the capacity to identify and utilize mathematical principles in all aspects of life. Simple tasks such as count, looking shapes, and play about size can aid in the early development of children's numerical and mathematical abilities. Engaging in playtime activities is an effective way to enhance children's numeracy and mathematical skills. Consider singing number songs and sorting toys together. Numeracy skills involve understanding numbers, counting, solving number problems, and measuring, estimating, sorting, noticing patterns, adding and subtracting numbers, and so on. Playing board games and other activities involving experiments with numbers can help children develop their numeracy skills. Materials such as blocks, puzzles, and shapes can also encourage the development of numeracy (Jung, 2014).

2.4 Play and Numeracy

Play and numeracy are two important components of early childhood education that have been extensively studied in the field of child development. The integration of play into numeracy activities can enhance children's mathematical skills while also promoting their cognitive and social development (Lee J., 2010). One of the early foundational studies on the relationship between play and numeracy was conducted by (Gallistel C. and Gelman R,2005) they proposed the theory of "core knowledge" which suggests that children have innate numeracy abilities that can be fostered through playful activities. This theory emphasizes the importance of hands-on experiences and exploration in developing children's understanding of mathematical concepts.

In recent years, researchers have focused on the benefits of integrating play-based activities into formal mathematics education. Hirsh and Pasek et al. (2009) conducted a meta-analysis of studies on play and early childhood mathematics learning. They found that play-based

approaches to teaching numeracy were more effective in promoting children's numeracy skills compared to direct instruction methods. Research by Ramani and Siegler (2008) investigated the relationship between children's symbolic play and their numeracy abilities. They observed that children who engaged in more symbolic play activities, such as pretending to be a store cashier or playing with number blocks, exhibited higher levels of numeracy skills compared to children who did not engage in such play activities.

Play-based learning environments have been shown to enhance children's motivation and engagement in mathematics. Pyle and Bigelow (2014) conducted a study on the impact of play-based math interventions in early childhood classrooms. They found that children who participated in playful math activities showed increased interest and confidence in learning mathematical concepts. Furthermore, play-based approaches to numeracy can also support the development of early spatial awareness and geometry skills in young children. Uttal et al. (2013) conducted a study on the effects of spatial play on children's spatial skills. The study found that engaging in spatial play activities, such as building with blocks or puzzles, helped children develop a better understanding of spatial relationships and geometric concepts.

Overall, different studies suggests that play and numeracy are closely interconnected in early childhood education. Playful activities provide children with opportunities to explore mathematical concepts in a hands-on and experiential manner, promoting their cognitive development and problem-solving skills.

2.5 Types of Play

In the world of education, integrating play into numeracy instruction has been recognized as a valuable approach to engage students, promote active learning, and enhance mathematical understanding. Various types of play have been identified and explored in the literature in the context of numeracy instruction (Smith, 2005).

2.5.1 Exploratory

Research by Mielonen and Paterson (2009) shows the significant role of exploratory play in fostering children's numeracy development in the classroom. This type of open-ended, hands-on play encourages children to actively engage with their environment, allowing them to discover new concepts and ideas (Mielonen & Paterson, 2009).

During exploratory play, children often encounter various objects, toys, or materials that can be counted. By interacting with these materials, children have the opportunity to practice counting

and develop number recognition skills (Mielonen & Paterson, 2009). They can also make connections between the quantity of objects and the corresponding numerical symbols, laying the foundation for numerical understanding.

Exploratory play also supports children's skills in sorting and classifying objects based on different attributes, such as size, shape, color, or quantity (Mielonen & Paterson, 2009). Through this process, children develop the ability to group objects and recognize patterns, which are essential numeracy concepts. These skills are crucial for children's mathematical development and problem-solving abilities.

2.5.2. Constructive Play

According to Awopetu (2016) the significant benefits of constructive play in supporting children's numeracy development. Constructive play refers to activities where children use materials to build, create, and assemble objects, and this form of play is not only enjoyable but also encompasses numerous educational advantages.

During constructive play, children engage in manipulating three-dimensional objects and understanding their spatial relationships (Bakar, 2017). Activities such as building with blocks, constructing puzzles, and creating structures require children to think about shapes, sizes, and spatial configurations. These experiences foster spatial reasoning skills, which are fundamental for understanding geometry and measurement concepts.

Furthermore, constructive play often involves manipulating and organizing materials, such as counting blocks, stacking toys, or sorting objects by attributes (Awopetu, 2016; Bakar, 2017). These activities provide opportunities for children to practice and reinforce their counting skills and develop an understanding of basic numeracy concepts like quantity, classification, and sorting.

2.5.3. Dramatic Play and Pretend play

Dramatic play and pretend play are imaginative forms of play where children engage in role-playing, acting out scenarios, and creating pretend worlds. While often associated with social and emotional development, these types of play also offer substantial advantages for children's numeracy learning (NAEY, 2009).

During dramatic play and pretend play, children often engage in activities that involve counting, such as setting up a pretend store, playing with pretend money, or counting objects in their pretend environment (Clements & Sarama, 2005). By assigning values to objects, exchanging

pretend money, or organizing items, children practice counting and develop a basic understanding of numerical concepts.

Moreover, through imaginative play scenarios, children can explore measurement and estimation (NAEY, 2009; Clements & Sarama, 2005). For example, they may pretend to bake in a kitchen and measure ingredients using pretend measuring cups or experiment with balancing objects on a make-believe scale. These activities help children understand weight and measurement concepts, laying the foundation for their mathematical understanding.

These researches suggest that dramatic play and pretend play provide valuable opportunities for children to engage with numeracy concepts in a meaningful and engaging way (NAEY, 2009; Clements & Sarama, 2005). By incorporating numerical elements into their imaginative scenarios, children can practice and reinforce their counting skills, develop an understanding of quantity and value, and explore measurement concepts, all within the context of their own creative narratives.

2.5.4. Story-Based Play

By incorporating stories or real-life contexts into math lessons, students can develop a deeper understanding of how mathematics is used in everyday situations (Wood, E., 2013). This approach helps to bridge the gap between abstract numerical information and its practical applications, allowing children to see the relevance and importance of numeracy skills in their lives.

Clements and Swaminathan's (2014) research suggests that story-based play can be a powerful tool in enhancing children's mathematical literacy. By embedding numeracy instruction within the context of relatable stories and real-world scenarios, children can develop a more holistic understanding of mathematics and its role in their daily lives. This approach not only supports their numeracy development but also fosters a positive attitude towards learning and applying mathematical skills.

2.5.5. Manipulative Play

In numeracy instruction, manipulative such as blocks, counters, or shapes are often used to help students visualize and solve mathematical problems (Wood, E., 2013). These tangible materials allow children to interact with numerical information in a hands-on and interactive way, which can be particularly beneficial for their learning and understanding.

Sarama and Clements (2008) found that the use of manipulative during play-based activities can significantly enhance children's grasp of mathematical concepts. By manipulating physical objects, children can develop a deeper understanding of quantities, shapes, patterns, and other numerical relationships. This tactile and visual approach to learning helps to bridge the gap between abstract mathematical ideas and concrete, real-world applications.

Furthermore, the researchers noted that manipulative play can foster problem-solving skills, as children engage in experimentation, exploration, and trial-and-error when working with the materials (Sarama & Clements, 2008). This process not only supports their numeracy development but also cultivates their critical thinking and reasoning abilities, which are essential for mathematical success.

2.6. Approach of Play Based Learning

Play-based learning numeracy is essential as it acts as a basis to young children in understanding higher mathematical concepts in the future. Different researchers recommend is how children acquire knowledge numeracy from their surroundings and the approach teachers used in preschool classroom. Teacher used different activities in numeracy instruction such as; singing, storytelling, Object Collections, Measuring Tools, Puzzles, blocks and through using different types of like as; Pretend Play, construction play, dramatic play, physical play are part of play activities in preschool where teachers can utilize for basic numerical skill development. Those activities apply in the classroom under some the following approach of play based learning numeracy;

2.6.1 Free Play approach

The Play-Based free Approach: is an approach that centers on play, with the belief that teachers should act as mere observers of children's play without interfering. Teachers should provide appropriate play materials and allow children to engage in self-guided play with minimal involvement. Teachers can increase time for child-directed free play that excludes adult participation, using these periods to assess play and observe the social-emotional development of their students. This will enable children to express and overcome anxieties and social problems and engage in physical activities that promote their physical health.

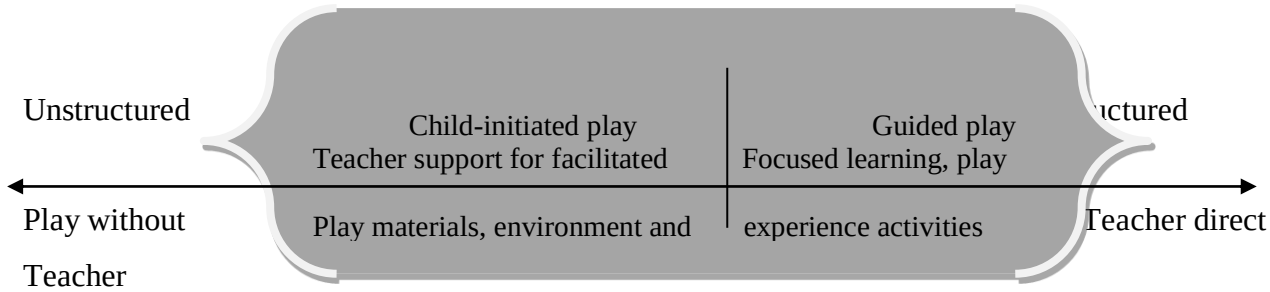
2.6.2 Guided Play

The Facilitate-Play/ Guided play approach: involves teachers as facilitators who create special environments and interact with children in purposeful ways. This approach emphasizes teacher-

child play interactions to enhance specific types of play. Research has shown that this approach can lead to broader developmental outcomes, such as language acquisition or mathematical reasoning. Teachers can interact with children to enhance specific types of play that support development, such as socio-dramatic play, games with rules, construction play, motor play, and games. Teachers should aim to promote play without ulterior motives for academic learning.

2.6. 3 Direct Instruction

This approach is based on the belief that teachers can intentionally promote one or more areas of learning by entering play activities without interrupting children's learning themes. The curriculum is designed to achieve specific academic learning goals through play, and the focus is on helping children learn a concept or skill. Teachers identify the right moments to ask questions, pose problems, or present new information in play, such as teaching through board games and puzzles. The present researcher suggests that preschool teachers should adopt the best elements from each approach, particularly those ideas that have been supported by research.



Adapt from (Pyle, A., & Danniels, E, 2017)

The above shows as what different researchers, educational experts recommended, in the out of shade box is unstructured play approach. Unstructured play children can do activities without teacher/adult plan such play strategy are occur out of the school. Too little teacher support can limit learning. In the structure play based learning approach is teacher direct doing activities and focused on academic areas. Too much tightly directed activity deprives children of the opportunity to engage actively with learning. Effective learning takes place in preschool when the time, space, and activities in the daily routine are organized to reflect the overall combination that best supports children's well-being and learning. The general preschool teacher's emphases

on combining child-initiated play with playful or guided approaches are best for the children's learning and development (Pyle, A., & Danniels, E, 2017).

2.7. Preschool Teachers' Knowledge about Play Based Learning

The importance of play in early childhood education has been well-established. Therefore, preschool teachers must have a comprehensive knowledge of play-based learning to design and implement activities that effectively promote the development of young children. Play is a natural activity for children as it allows them to explore the world, express themselves, and build social, emotional, physical, and cognitive skills. Thus, teachers must understand how to set up an environment that stimulates children's curiosity, creativity, and imagination to enhance their learning experiences (Rengel, 2013).

Preschool teachers need to have a deep understanding of what play is and how children engage in it. Play should be seen as a process, not a product, and as a means of communication, not just entertainment. Play-based learning provides children with opportunities to interact with their environment and learn about themselves, others, and their surroundings. Preschool teachers must understand that play-based learning supports children's holistic development and that fostering children's natural curiosity and engagement is essential to promote opportunities for exploration and learning (Nor Puteh S. & Ali A., 2013).

One of the critical aspects of play-based learning is the creation of safe and engaging environments that promote children's learning and development. The physical environment of the classroom must be responsive to children's developmental needs. It should be open, inviting, warm, and free from hazards. Teachers need to consider the layout of the room, the materials available, and the children's interests and preferences. Preschool teachers should consider the principles of universal design and ensure that all children have the same opportunities to engage in play-based learning experiences (Cekaite, A., & Evaldsson, A., 2017).

Teachers must also be knowledgeable about the different types of play and the varying roles that children take on in play (Dako M., 2011). Preschool children engage in various forms of play, including socio dramatic play, constructive play, and games with rules. Teachers should have a clear understanding of these types of play and consider how they can design engaging activities that foster children's development. Preschool teachers should also understand that play-based learning is not an isolated event that occurs separately from the rest of the curriculum. It is intertwined with all aspects of a child's learning, including literacy, numeracy, science, social

studies, and the arts. The integration of play-based learning with the curriculum helps children to develop functional skills that are essential for success in the future (Adbo, K., & Vidal Carulla, C., 2020).

Preschool teachers should be skilled in observing children at play and recognizing the opportunities for teach (Dako M., 2011). They should be aware of the children's interests and needs and use this information to develop a curriculum that promotes the development of skills that are important for their future success. The teacher should provide support and guidance as needed, rather than directing the play or imposing their personal goals for the children. Play-based learning provides children with opportunities to explore and learn in a self-directed manner, promoting independence, self-regulation, and resilience (Abang Ahmad, D., & Mohamed, S., 2021).

Preschool teachers should be knowledgeable about the benefits of play-based learning for the development of their students. Children who engage in play-based learning show improved social skills, enhanced language development, increased problem-solving skills, and expanded creativity. Play-based learning also fosters emotional regulation and helps children cope with stress, anxiety, and other challenges that they may face in their lives (Abang Ahmad, D., & Mohamed, S., 2021).

2.8. The practice of play based learning numeracy in preschool

Play-based learning numeracy instruction has gained significant attention among educators worldwide, as an effective way to promote children's learning and development. Many countries have integrated play-based learning numeracy instruction into their preschool curriculum. This approach to learning not only enhances children's mathematical knowledge but also their social and emotional skills (OECD, 2022).

Australia is one country that has prioritized play-based learning in its preschool education. In Australia, preschools follow the Early Years Learning Framework, which emphasizes play as the cornerstone of learning. The framework encourages educators to use play to promote children's literacy, numeracy, and other developmental skills. Teachers in Australia have reported positive outcomes concerning children's learning through the use of play-based learning numeracy instruction (OECD, 2022).

In Canada, play-based learning has been integrated into the national early learning program. The program emphasizes the importance of play-based learning in the development of numeracy and literacy skills. Teachers in Canada have reported a positive impact on children's learning, and play-based learning numeracy instruction has provided a solid foundation for learning (LEGO, 2019).

In the United States, play-based learning numeracy instruction has gained significant interest among educators in recent years. However, the implementation of play-based learning numeracy instruction in preschool curriculums varies across states, and many preschools still rely on traditional teaching methods. Despite this, play-based learning numeracy instruction has received increasing attention and support from education policymakers in the U.S. (LEGO, 2019).

2.9. The Importance of Play-Based Learning in Numeracy Instruction

Growing trend of incorporating play-based learning approaches in early childhood education, particularly in the domain of numeracy instruction (Goos, 2004; Geist, 2009; Sullivan, 2011). These studies suggest that play-based learning can have a significant impact on children's attitudes and development of numeracy skills.

Goos (2004) emphasize the importance of play-based learning in numeracy instruction, as it helps children develop a positive attitude towards mathematics. Mathematics is often perceived as a challenging subject, and direct instructional methods can be boring and repetitive, contributing to children's negative attitudes. In contrast, play-based learning is fun and engaging, which can promote children's interest and willingness to learn and participate in the learning process.

Geist's (2009) research further supports this notion, highlighting how interactive games and puzzles can help children see mathematics as an enjoyable and exciting subject. This approach allows children to engage with numeracy concepts through playful activities, such as counting, sorting, and measuring, which can lead to the development of numeracy skills.

Moreover, Sullivan's (2011) work suggests that the use of manipulative, interactive games, and puzzles in play-based learning can foster the development of problem-solving, critical thinking, and logical reasoning skills. These skills are essential for children's overall competence in mathematics, as they enable them to apply their numeracy knowledge in various problem-solving situations.

2.10. Overview of play in Ethiopia preschool education

Play based approach

The national policy framework for ECDE also focuses on play-based learning in preschool education. The policy recognizes that play is a vital component of young children's learning and development, and that play-based learning can promote children's cognitive, social, emotional, and physical development. This means that instructional methods and techniques should be designed to facilitate play and exploration, and should be flexible and responsive to children's interests and needs (MoE, 2022).

According to the Standard of pre-primary program (MoE, 2001) the pre-formal education program is effectively implemented using a play-based methodology. The rationale behind adopting this teaching approach lies in the fact that children in this age group perceive play as their primary activity. Engaging in play allows them to develop physically, enrich their cognitive abilities, and enhance their social and emotional values. Consequently, through various individual and group games, children's physical, mental, emotional, and social thinking skills are fostered, preparing them for mainstream education. Due to its immense significance, particular emphasis is placed on incorporating play within the educational framework.

Furthermore, the games provided to children in the pre-regular program should align with their mental and physical capabilities and make a substantial contribution to their future development. Consequently, this level does not constitute a formal education program, but rather focuses on developmental activities that serve as the foundation for children's growth. As a result, all activities necessitate the active involvement of both children and teachers. Therefore, any activities planned to be carried out individually or collectively should consider the physical, mental, emotional, and social conditions of the children.

Research indicates that children benefit from a diverse range of teaching methods to enhance their learning experience (MoE, 2001). The Ethiopian pre-primary program standard offers teachers various teaching methods that can be employed. Group games, individual games, role play, demonstrations, field visits accompanied by close supervision and subsequent discussions, oral presentations and descriptive activities involving active participation from children, among others.

Teachers in ECCE

The Ethiopian pre-primary program's standard states that, preschool education teachers are required to possess the essential expertise and competencies to address the diverse abilities and needs of the children under their care. This includes proficiency in the mother tongue and English languages, as well as a comprehensive understanding of the children they teach. Moreover, they are expected to effectively combine their knowledge and skills with appropriate professional ethics throughout their professional engagements and actively engage in the children's activity program. In fulfilling their role, these teachers should carefully devise and execute activities within the pre-school program, taking into consideration the physical, emotional, and social development of the children. By doing so, they create a conducive environment that nurtures holistic growth in the young learners (MoE, 2001).

Qualifications of teachers

The education level of teachers and staff varies depending on their roles and responsibilities. According to the Ethiopian standard teachers are required to have graduated with a diploma in the field of pre-formal education. Assistant teachers, on the other hand, should have completed 10th grade and obtained a certificate in Kindergarten Education. In addition to these criteria, teachers who will be working with children with special learning needs should have received short trainings in special education. For speech teachers, they are expected to have completed 10th grade and received training as a kindergarten teacher, holding a certificate in the field. (MoE, 2001).

2.11. Theoretical framework

Various theories of play provide different perspectives for understanding the role of play in learning and development (Frost, J., and Reifel, S. , 2005).While these theories generally agree on the importance of play, they differ in their underlying assumptions. To investigate the practice of play-based learning in numeracy instruction at the LIBA preschool, the constructivist theories of Piaget and Vygotsky were chosen as the theoretical frameworks.

The constructivist approach, which forms the basis of developmentally appropriate practices, views learning as an active process of constructing knowledge and meaning (Copple, C. & Bredekamp, S., 2009).In this view, children learn through engagement, exploration, and

interaction with their environment. The teacher's role is that of a facilitator, guiding children to draw their own conclusions and understandings rather than directly instructing them.

Piaget's and Vygotsky's constructivist theories were selected because they focus on the instructional methods and practices that shape children's learning experiences, with a particular emphasis on the role of play (Piaget, 1954; Vygotsky, 1978). These theories assume that learning occurs through the active construction of knowledge, as children engage in activities and explorations. The teacher's responsibility is to create an environment that supports and scaffolds this process of self-directed learning.

By using the theoretical framework of constructivist play theory, the study aims to better understand how preschool teachers perceive and implement play-based learning in their numeracy instruction. This theoretical perspective provides insights into the instructional practices and learning experiences that foster children's development of mathematical understanding and problem-solving skills.

Play-based learning aligns seamlessly with the principles of constructivism theory. By engaging in play, children are able to actively construct their knowledge and understanding of mathematical concepts based on their direct experiences with the environment (Heidemann, 2010). During play, children have the opportunity to experiment with numbers and shapes, count objects, sort and classify them, and explore the patterns and relationships between numerical and spatial elements.

This hands-on, exploratory approach to learning mathematics encourages children to think critically and creatively as they make sense of the mathematical properties and structures they encounter (Gronlund & Rendon, 2017). Rather than passively receiving information, children actively problem-solve, hypothesize, and draw their own conclusions about the mathematical ideas they are exploring.

The constructive nature of play-based learning aligns perfectly with the core tenets of constructivism, which emphasize the active role of the learner in building their own understanding. By engaging in play-based activities, children construct their knowledge of mathematics through first-hand experiences, interactions, and reflections. This process fosters the development of essential numeracy skills, including critical thinking, problem-solving, and the ability to apply mathematical concepts to novel situations (Bodrova, E., & Leong, D., 2010)

2.12. Challenges teacher's faces in implementing play-based learning

According to Bruce (2018), implementing play-based learning in numeracy classrooms is a beneficial approach to promoting children's mathematical skills and overall engagement in learning. However, there are various challenges that educators may encounter when integrating play into numeracy instruction. One of the significant challenges is lack of teacher training and professional development in play-based pedagogies can be a barrier to effectively integrating play into numeracy instruction. Studies by Broussard (2018) and Bergen (2019) emphasized the importance of providing educators with the necessary support and training to confidently facilitate play-based learning experiences in mathematics. Without adequate knowledge and skill development, teachers may struggle to effectively implement play-based approaches in the classroom.

Play-based learning requires teachers to have a deep understanding of the concept, activities, and resources required. When teachers lack sufficient training and resources, it may be challenging for them to implement this approach effectively (Baker, 2014). Play-based learning requires educators to have specific skills and knowledge to effectively plan and implement learning experiences for children. Teachers need to know how to create a conducive learning environment, select appropriate materials, and guide children's play to meet learning objectives (Lynch M. , 2015).

Another obstacle to implementing play-based learning in numeracy classrooms is the lack of resources and materials to support hands-on and experiential learning activities. Studies by Gaskins et al. (2017) and Lee and Kim (2020) highlighted how limited access to manipulative, educational games, and other play-based resources can impede educators' ability to effectively incorporate play into mathematics instruction. Investing in appropriate materials and resources is essential for creating a supportive environment for play-based learning in the classroom.

The perception of play as solely a leisure activity rather than a valuable educational tool can hinder the adoption of play-based learning in numeracy classrooms. Research by Fleer (2014) explored how societal attitudes towards play and the perceived dichotomy between play and academic achievement can influence educators' beliefs about the appropriateness of using play in mathematics instruction. One of the significant challenges is a lack of support from parents and communities who may not understand the effectiveness of play-based learning. Some parents

still believe that play is a waste of time and that children need to focus on academic subjects such as reading and writing (Kamau, 2016).

Moreover, challenges related to classroom management and organization can also impact the successful implementation of play-based learning in numeracy classrooms. Research by Kaur and Thakur (2016) and Leong et al. (2018) discussed how managing group dynamics, facilitating meaningful play experiences, and balancing structured and unstructured activities can pose challenges for teachers attempting to incorporate play into numeracy instruction.

Summary

By combining different perspectives of theories, educators can create a rich play-based learning environment that fosters numeracy development. Piaget's theory views play as a fundamental aspect of numeracy instruction for preschoolers. By providing concrete experiences, intrinsic motivation, and opportunities for assimilation and accommodation, play fosters cognitive development and lays the foundation for a lifelong love of learning math. Others theories suggested by incorporating play-based learning into preschool numeracy curriculum, the teachers can create a fun and engaging environment that fosters a love of math and sets children on the path to success in their mathematical journey. Studies have shown that play-based learning can improve numeracy skills in children of all ages, from preschoolers to older elementary school students. Play-based learning can be particularly effective for children who struggle with traditional math instruction. The benefits of play-based learning go beyond numeracy skills, also impacting social, emotional, and cognitive development.

Play-based learning (PBL) is a powerful approach for teaching numeracy skills in preschool. It allows children to explore and learn math concepts in a fun, engaging way. PBL fosters numeracy development, problem-solving, language skills, and social-emotional learning through play. Teachers can create playful activities using manipulative, games, and everyday materials that target specific numeracy concepts like counting, sorting, and recognizing shapes. Preschool teachers can face several hurdles when implementing play-based learning (PBL) for numeracy instruction due to; knowledge gap, misconceptions, limited training or resources and time concern.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The chapter focuses the methodology and procedures used in carrying out this study. Accordingly, the subsequent part of this study tries to describe; method and design employed the nature of the research setting, participants, data collection tools and procedures, and data analysis techniques in context and objectives of the research.

3.2. Research method and Design

To understand the practice of play-based learning in numeracy instruction in the study setting, the researcher employed a qualitative approach, specifically a case study design. This method involves in-depth investigation in a natural setting, allowing the researcher to analyze firsthand experiences and reports (Creswell, 2014). The researcher believes that, this qualitative approach is best explored through in-depth exploration rather than statistical measurement.

3.3. Research Setting

This study was conducted at LIBA preschool in Legetafo Subcity. LIBA is an abbreviation of Legetafo International Boarding Academy, which was established in 2004 E.C. It is a private school that offers grades from KG to 12. LIBA is the first preschool to open in the Legetafo area and is a preferred school in the Legetafo subcity, Addis Ababa, and its surrounding areas. Children from various parts of Addis Ababa City attend this school. As a result, the researcher decided to conduct the study at this preschool. The school is located in Legetafo LegeDadi (Oromo: Laga Xaafoo Laga Daadhii), which is in the Oromia region surrounding Finfinne. The Oromia Special Zone Surrounding Finfinne (Oromo: Godina Addaa naannawa Finfinnee) is a zone in the Oromia Region of Ethiopia. The study focused on this area to assess the practices of play-based learning in numeracy instruction through a case study at LIBA Preschool.

3.4. Population of the Study

This study focused on KG2 and KG3 because the curriculum of those stages contains more numeracy instruction. The target populations of this study were the teachers at LIBA preschools.

3.5 Sample and Sampling Techniques

Among 15 active teachers, the researcher was used 4 teachers by using purposive sampling technique. The reason for choosing purposive sampling technique is they are directly teaching

numeracy. Thus, the issue was more relevant to them more than any other teachers. Thus, 4 teachers were the participants of this study.

3.6. Data Collection tools

As it has been indicated, this study was going to employ qualitative case study in order to achieve the objectives. Therefore, it uses two data collection tools that are unstructured and observation will be used to enrich the data obtained through above instruments.

3.6.1. Interview

In line with research questions, the researcher was employed unstructured. Unstructured to enable the participants express themselves in depth on play based learning practices in numeracy instruction LIBA preschool. Unstructured, they allow for inducting the interviewees to talk intensively about the topic at hand (Jane and Lewis, 2003). Thus, interviews were providing the opportunity to have a deep understanding of the practice of play-based learning in numeracy instruction. Unstructured interview will employ to collect the desired data from preschool teachers. Merriam (2009) proposed that conducting interviews is necessary when the researcher aims to investigate the feelings or views of people that may not be directly observed. The interview questions would be discussed with the interviewee in Oromo Language to reduce communication barriers and to gain more information.

3.6.2. Observation

Observation is one of the basic and necessary methods for qualitative studies to gather data (Marshall, C., & Rossman, G., 2006), observation can be used to enhance the validity of the study. It may support the researcher to obtain an in-depth understanding of the context and phenomenon of the study. It is used as a research instrument to explore the answers to research questions and increase the reliability of the study (Merriam, 2009). Moreover, observation helps the researcher investigate the participants' reflections that they would not or could not express as much as they wished (Dewalt & Dewalt, 2002). In this study, this method would be use specifically to answer the research questions about "the practices of play based learning in numeracy instruction." Therefore, in this study, both interview and observation are first-hand data collection tools.

3.7. Data Collection Procedures

The researcher obtained an official letter from the Center of Early Childhood Care and Education, addressed to the school director of the LIBA preschool. With this letter, the

researcher received official permission from the school director to conduct the study at the LIBA preschool. This step ensured the legalization of the research process and allowed the researcher to receive informed consent from the participating teachers. The four preschool teachers selected to participate in the study were chosen based on the subject they were teaching (numeracy) at the LIBA preschool. The researcher introduced himself and the purpose of the study to the four participating teachers. This step helped to establish rapport and trust with the teachers prior to the data collection process. The researcher conducted individual interview with each of the four preschool teachers. The interviews focused on understanding the teachers' perspectives on play-based learning, the specific types of play-based activities they utilize in their numeracy instruction, and the challenges they encounter in implementing these approach. In addition to the interview, the researcher carried out classroom observation to directly observe the teachers' use of play-based learning strategies in their numeracy lessons.

3.8. Data Analysis Techniques

This study is design as a qualitative case study. An interpretative philosophy is typically the foundation of qualitative data analysis. The study would be in-depth investigate the practice of play based learning in numeracy instruction in LIBA preschool in Legetafo Sub city. Therefore, the data that would be collected through interview and observation were analyzed by applying thematic analysis technique. As suggested by (Virgina Braun and Victoria Clark, 2008), thematic analysis is a good approach to research where the researcher is trying to find out something about people view's opinions, knowledge's experience or values from the set of qualitative data. Having this, each specific objective of this study was categorized as a theme and the interview and observation results were analyzed.

3.9. Ethical consideration

This study was conducted to explore the practice of play-based learning in numeracy instruction; a case study in LIBA preschool in Legetafo subcity. Participation of respondent was strictly in voluntary basis. The researcher will highly respect different, ethical issues including considering human dignity, and right the information that gain from respondents keep confidentiality and secret to third person. All information, collected from the research participant's use only for the purpose of the present study.

CHAPTER FOUR

Major Findings and Discussions

This part deals with the analysis of the collected data through observation and interviews. It starts with the presentation of background data, followed by analysis of the data, identification of major findings, and discussion in context.

4.1 Demographic Characteristics of Participants

Table 1: Summary of Demographic Characteristics of Participants

Codes	Gender	Academic level	Teaching experience	Teaching KG
T1	F	BA	5	KG2 U
T2	F	BA	3	KG3 U
T3	F	BA	13	KG2 L
T4	F	BA	4	KG3 L

Table 1 presents data on the background of the four participant numeracy teachers denoted as T1, T2, T3, and T4.

T1 has 5 years of teaching experience. She studied psychology and has knowledge of child development and behavior. She is able to apply this knowledge in the classroom to create developmentally appropriate activities and strategies that support each child's social, emotional, and cognitive growth. T1 has an early childhood education certificate and worked in another preschool for two years before joining the staff at LIBA preschool, where she currently teaches KG2 U.

T2 has 3 years of teaching experience. She studied chemistry and does not have an early childhood education certificate. However, she makes up for this through her extensive experience and knowledge obtained from working with children. T2 currently teaches KG3 U at the LIBA preschool.

T3 has 13 years of teaching experience. She studied biology and has an early childhood education certificate. Her extensive 13 years of preschool teaching experience have given her a

deep understanding of teaching preschool children. T3 currently teaches KG2 L at the LIBA preschool, but she worked in another preschool for six years before joining LIBA.

T4 has 4 years of teaching experience. She studied computer science and does not have an early childhood education certificate. Like T2, T4 relies on her extensive experience and knowledge gained from working with children to carry out her role. She currently teaches KG3 L at the LIBA preschool.

As researcher summarized background of the participants;

All four participant numeracy teachers are female, aged between 24 and 34 years old. T1 and T3 have a 6-month Early Childhood Care and Education (ECCE) certificate in addition to their extensive teaching experience. T3 has the most teaching experience at 13 years, while T1, T2, and T4 have less than 10 years of teaching experience. While none of the teachers have attained a full ECCE degree, they have studied various fields - psychology, chemistry, biology, and computer science. T2 and T4 do not have preschool education certificates, but they rely on their years of experience working with young children to teach in the KG classes. The four teachers have different educational and experiential backgrounds, but they all work to apply their knowledge and skills to support the early learning and development of the preschool students they teach.

4.2 Finding results

4.2.1 Interview result

The data obtained from participants via interview and observation was analyzed by categorizing each specific objective into teams. In doing so, each of the participants in this study was interviewed. Additionally, they were observed by the researcher when they were doing play-based learning in the numeracy classroom. Overall, the results of the data are as follows:

Table: 2 themes of analysis

Themes emerged from Objectives		
Understanding of play	**Types of play implemented in numeracy classroom**	**Challenges for implementing play based learning in numeracy instruction**

Theme 1:

Understanding of play

T1 stated, "Play is not just fun, it is a powerful tool for learning, not just for children but for everyone. Even babies begin exploring the world through play, and this innate desire continues throughout life. Recognizing this, I strive to incorporate play-based learning into my classroom." T1 further elaborated, "In my experience, children are able to grasp numeracy concepts more readily when they are presented in a playful and engaging manner. For instance, counting becomes a fun activity when integrated into play. Overall, I believe play is essential for human development, especially in children's formative years. Therefore, I actively seek ways to make learning enjoyable through play." (T1 personal communication, May 3, 2023)

T2's stance is that she views play as merely a form of entertainment for children, rather than a valuable learning tool. It's a natural way for them to explore the outdoor environment and experience joy." T2 shared that she enjoys seeing the children's happiness during outdoor play activities such as maharabee, agaartani, jumping rope, hiding, and wrestling. (T2 personal communication, May 3, 2023)

T2 agreed that, while she has not yet studied play-based learning methods in depth, she is interested in learning more about this approach in the future. This would allow her to create even richer learning experiences for the children in her care.

However, T2 does not currently apply play-based learning methods in her numeracy classroom. She said "The time I have is not enough for play;" I use the limited time for classwork and have to finish the textbook units before the semester is ended." T2 stated that she does not use play-based learning with her KG3 children, as she believes that these children should be practicing lessons aimed towards first grade.

T3 succinctly stated, "Play is learning." Elaborating on this perspective, T3 explained, "Children play in different corners of the classroom during doing activities. This is how they learn; they count numbers, learn the shapes, sound out the names of things. They have conversations, discuss their actions, and ask questions."

T3 further emphasized the role of play in learning and development, stating, "Play is fun and gives children enjoyment. Play, for me, is learning, and it should be fun; it helps children learn and makes them happy. I want them to enjoy being in the classroom and enjoying themselves sometimes;

whatever they are doing, they are playing, so I teach children through play, according to the subject's content." (Personal communication, T3, May 4, 2023)

T4 acknowledged that she has not formally studied play-based learning, but she recognizes "the power of play itself." In T4's view, play is "just entertainment; it's a stress relief, and enjoyment with play activities in the outdoor environment."

T4 noted that she hasn't been able to fully integrate play-based learning strategies in her classroom, though. "I don't think I've implemented play because there wasn't enough time or material." I'm not sure whether play is being implemented in my classroom." Despite these challenges, T4 shared that when she does incorporate play, she takes the children "outdoors during break time, and there they will start running."

Theme 2:

Types of play implemented in numeracy instruction

T1 *listed the different play types she used in numeracy instruction and explained them.*

I believe that numeracy skills are the foundation of all education for children. Because numeracy education plays a major role in subjects like physics and even in other fields of study, it is necessary to make the children understand these numeracy concepts well. Therefore, children cannot understand numbers unless they learn them in a playful way.

T1 *Added "I have often made them understand the number skills as much as I can in the form of play. Some of the examples of play-based learning in the numeracy lessons that I have used are:" Counting numbers in song: Example:(Tokkeen Tokkituma) the One is the One,(Laman mucha re'ee) two teats goat, (Saden Susumani) three Gulcha, (Afran mucha sawwaa)four teats cow,…… and children counts up to a hundred numbers through this song.*

She added "I believe that children will develop not only numbers but also language skills from this song." Another song is "what do we count in numbers?" or "Lakkoofsaan maal lakkoofna." by Afaan Oromo, for example:

I have five beautiful bananas if eat one. There are four left

I have four beautiful bananas; if I eat one, there are three left.

I have three beautiful bananas; if I eat one, there are two left.

I have two beautiful bananas; if I eat one, there I one left.

I have one beautiful banana. If I eat one,

I have nothing left to eat x3.

*T2 stated that she uses concrete objects like corks, sticks, and sand to help her students grasp concepts related to count and addition**.** Learning extends beyond the classroom walls with colorful games that explore both numbers and colors. Inside, I might spread a large sheet of paper with different colored sections. Students then take turns standing next to a color, while others call out color names. The student touches the correct color if it's named."*

Other she gives example, "Pictures and shapes are also part of my toolbox, turning math concepts into engaging activities. In my experience, such types of play make learning fun and effective."(T1 personal communication, May 5, 2023).

***T3** explained some types of play she used in numeracy classroom" I use as many play types as I can in the classroom, including number songs, weekly songs, and monthly songs." Example;*

Teacher	*Can you count our numbers?*
Students	*Yes we can 1,2,3,4,5,6,7,8,9,10,……..*
Teacher	*Can you say months of the year?*
Students	*Yes, we can; January, February, March, April, May…….*

She added I used Active Play: Lining up students to practice ordinal numbers ("first, second, third"). Example: Having students line up shortest to tallest.

She also added I used sometimes storytelling: This involves using stories to introduce numerical concepts like counting, addition, and subtraction. Example: Reading a story about sharing banana and then asking children how many bananas are left after some are eaten (T3 personal communication, May 4, 2023).

T2 and T4 mentioned that they do not always utilize play-based learning in their numeracy classrooms for KG3 children. This is because they believe these older preschool students need to focus more on practicing first-grade level lessons.

T2 and T4 further described their classroom approach as one of direct instruction. Direct instruction involves the teacher presenting information in a structured and systematic manner, ensuring that students receive clear and explicit explanations of numeracy concepts. This approach allows for a focused and efficient delivery of the curriculum (T2 and T4, personal communication, May 3, 2023).

Theme 3

Challenges to Implement Play based learning in numeracy instruction

T1 pointed out that some teachers equate play solely with recess time and lack clear guidelines for effectively integrating play in the classroom. To address this, she advocated for more comprehensive training programs that educate teachers on the value and implementation of play-based learning.

Additionally, T1 shared her own experiences with the limitations of available resources. She explained that despite the lack of commercial play materials in the preschool, she found creative solutions. T1 utilized readily available, everyday items from the surroundings, such as cork, leaves, small stones, various shapes, and pictures. While these local materials offered a sense of resourcefulness, they had certain limitations. They may not always be age-appropriate, and sometimes T1 needed to borrow materials from older grades to create engaging activities.

Building on T1's points, T3 identified additional challenges to implementing play-based numeracy instruction. One such challenge was misconceptions among parents about the value of play in learning. T3 explained that parents often have high expectations for a more direct, academic teaching approach in the classroom, rather than prioritizing play-based pedagogies.

T3 further elaborated on the administrative support. She stated, "The administration hasn't provided instructors with the resources they need to improve the use of play-based learning strategies. I use what I've studied on my own to see, watch, study, and do in order to put the teaching practices into effect."

T2 also stated the lack of professional development opportunities as a significant barrier to implementing play-based learning. She stated, "The school did not provide any professional development due to this most teachers do not receive professional development training in play-based learning." T2 further elaborated that "the absence of training in play-based learning was a common issue faced by most teachers."

Building on this, T4 identified limited time as another key obstacle to implementing play-based learning. T4 explained that this challenge is due to the pressure to cover a vast amount of content area instruction mandated by the administration. The need to adhere to a packed curriculum leaves little room for teachers to devote time to integrating play-based approaches.

4.2.2 Classroom Observations results

The researcher analyzed data from the observed teaching and learning sessions in the study setting. The researcher conducted observations for two weeks, with each observation session lasting approximately 30 minutes.

During an observation of the T1 classroom, the researcher was able to observe aspects of play-based learning in numeracy instruction, even though the physical layout of the classroom was not conducive to play-based learning. On the day of the observation, the researcher witnessed the practice of play-based learning in numeracy taking place.

As the researcher observed, T1 used most of the play-based learning approaches mentioned during the interview. When the researcher observed the T1 classroom, the following activities were visible: the use of pictures, number songs, and other activities related to the situation. As we can see from the picture 1 below T1, implementing play-based learning in numeracy through the use of such type of in numeracy classroom.

During the observation, the researcher witnessed children learning numeracy concepts through the use of songs. The researcher noted the specific numeracy songs that were used in the classroom. Overall, the observation of the T1 classroom revealed the implementation of play-based learning approaches in numeracy instruction, despite the physical limitations of the classroom environment.

Classroom observations revealed that T3 actively practices play-based learning in her numeracy instruction. She utilizes a variety of manipulative activities, number songs, and other engaging methods to teach numeracy concepts.

For instance, on the first day of observation, the researcher witnessed T3 giving nine corks to a child, and then adding one more cork, asking the child, "If you have nine corks and I add one cork for you, how many do you have now?" This question posed by T3 assessed and confirmed the child's understanding of addition reasoning through a hands-on, interactive approach.

On another day of observation, T3 lined up four sticks in front of a child, then took one stick away, and asked the child to count how many were left. This activity allowed T3 to gauge the child's ability to perform subtraction by physically manipulating the objects.

Overall, the researcher observed T3 employing hands-on, interactive methods to engage the children in learning numeracy concepts through play-based approaches. By using manipulative,

songs, and other interactive activities, T3 was able to foster the children's understanding of mathematical ideas in a fun and engaging manner.

Classroom observations revealed that T2 and T4 do not consistently practice play-based learning in their numeracy instruction. Over the course of three days of observation in T2's classroom, no play-based learning activities were observed. Similarly, the researcher did not witness any play-based learning approaches being implemented in T4's numeracy lessons.

Instead, the classroom observations showed that T4 relies on direct instruction and the use of workbooks to teach numeracy concepts. While T2 and T4 acknowledged the potential benefits of play-based learning, such as increased engagement and motivation among students, they did not consistently apply such activities in their actual classroom teaching. During the observed lessons, the focus was on the use of workbooks and direct teaching methods, rather than the integration of play-based numeracy activities.

4.3 DISCUSSION

This study was intended to investigate the practice of play-based learning in numeracy instruction at the LIBA preschool in Legetafo Subcity. Play-based learning is a teaching philosophy that recognizes the importance of play in young children's learning and development. With its emphasis on hands-on activities, exploration, creativity, and imagination, play-based learning has become increasingly popular in preschool settings around the world. In this section, the researcher made an attempt to discuss the findings in light of the existing literature on play-based learning in numeracy instruction. The study aimed to explore how the participating teachers were implementing play-based approaches in their numeracy lessons, and to identify any challenges or best practices that emerged.

By examining the classroom observations and interview data, the researcher sought to gain insights into the extent to which play-based learning was being utilized, as well as the perspectives of the teachers themselves on the efficacy and feasibility of this approach. The findings were then contextualized within the broader scholarly discourse on the role of play in early childhood numeracy.

Understanding of play

The results revealed that two of the teachers recognized the educational value of play-based learning and its potential to support children's numeracy development. They understood that play-based activities can foster problem-solving skills, conceptual understanding, and overall engagement with mathematical concepts. This aligns with research that suggests teachers who have a deeper grasp of play-based learning are more likely to effectively implement it in their teaching (Ginsburg & Golbeck, 2004). On the other hand, the other two teachers viewed play more as a form of entertainment or fun, rather than a powerful learning tool. This suggests they had a more limited perspective on the role of play in numeracy instruction. As the research by Hendricks (2017) indicates, teachers who have a stronger understanding of play-based learning are more inclined to utilize this approach in their teaching practices.

The existing research paints a nuanced picture regarding teachers' perspectives on play-based learning. On one hand, many teachers are reported to have a positive attitude towards the approach and recognize its importance in promoting children's learning (Bentley & Schiller, 2010; Hendricks, 2017). This suggests a general appreciation for the value of play-based learning among educators. However, the literature also indicates that a significant number of teachers lack the necessary knowledge and skills to effectively implement play-based learning in their classrooms (Moyles, 2010; Siraj-Blatchford et al., 2002). This gap in practical understanding and implementation strategies may hinder the widespread adoption and successful integration of play-based learning in educational settings.

Furthermore, the research suggests that preschool teachers often define play as a means for children to learn and develop new skills (Fesseha & Pyle, 2016; Martlew et al., 2011). This perspective may lead to a more structured, teacher-directed approach to play-based activities, rather than a fully child-centered approach. This distinction is crucial, as the latter is considered more aligned with the principles of effective play-based learning, which emphasize the importance of child agency and self-directed exploration. Additionally, the literature indicates that preschool teachers' understanding of the relationship between play and learning can vary significantly (Bodrova & Leong, 2015; Wood, 2010). Some teachers may view play and learning as separate entities, while others see them as a continuum, with play-based activities seamlessly supporting academic skill development. This diversity in perspectives can significantly impact how teachers design and implement play-based learning experiences in their classrooms.

The study identified a dichotomy in the participants' understanding of the significance of play-based learning. Two teachers exhibited a relatively limited appreciation for the educational advantages of incorporating play into their numeracy teaching. These teachers did not fully recognize the critical role of play in children's development and learning. In contrast, the study also found that two other participants demonstrated a strong grasp of play-based learning and actively incorporated it into their numeracy teaching practices. These teachers were able to effectively integrate play-based activities to support children's acquisition of numeracy skills and conceptual understanding.

This variation in perspectives aligns with the research by Bergen (2018), which suggests that educators and researchers often hold diverse definitions and understandings of play, leading to varied experiences in terms of time, adult direction, and available materials.

The findings of this study further highlight the diverse understandings and approaches that preschool teachers have when it comes to the implementation of play-based learning methods in numeracy instruction. This diversity can be attributed to the differing backgrounds and experiences of the participants. Importantly, these findings corroborate the conclusions of a previous study by Lyons (2022), which indicated that many teachers lack the necessary knowledge and abilities to successfully implement play-based learning approaches in their classrooms. Lyons attributed this challenge to the teachers' educational and professional backgrounds, which may not have adequately prepared them to effectively utilize play-based pedagogies.

Types of play implemented in numeracy instruction

According to the findings presented in Chapter 4, the participants in this study held diverse perspectives on the types of play-based activities they incorporated into their numeracy instruction. The data gathered through observations and interviews revealed that two of the teachers, T1 and T3, utilized a variety of play-based approaches in their numeracy lessons. These included number songs, cork counting, leaf counting, storytelling, sensory play or hands-on activities, color play, and physical play or movement-based activities, such as counting while children were jumping. This aligns with the findings of numerous researchers, who have highlighted the benefits of incorporating different types of play into numeracy instruction. For instance, studies by Bodrova and Leong (2015) and Martlew et al. (2011) suggest that integrating imaginary or dramatic play can enhance children's understanding of mathematical concepts.

Studies have found that the use of physical manipulative, such as blocks, counters, and number lines, can effectively support the development of numeracy skills through play-based learning (Clements & Sarama, 2007; Seo & Ginsburg, 2004).

Additionally, research has shown that storytelling activities can be an effective and engaging way to teach children numeracy skills (Moyles, 2010). Teachers can create stories that involve numeracy concepts, such as counting or measuring, that children can relate to and apply in their everyday lives. Well-known children's stories, like "The Three Little Pigs" or "Goldilocks and the Three Bears," can also be used to introduce and reinforce numeracy skills (Jung, 2014). Furthermore, physical play that involves social interaction and physical movement has been found to support the development of numerical skills. For example, through activities like jumping, children can develop the ability to count numbers and learn about distance and time measurements (Awopetu, 2016).

Bakar's (2017) research also emphasizes the importance of actively involving children in the learning process. Educators can leverage manipulative materials, such as puzzles, blocks, and play dough, to provide hands-on activities that build numeracy skills. This approach has been shown to have significant benefits for children's learning and contribute to the development of their future mathematical abilities.

The study findings revealed that two of the participants, T2 and T4, exhibited a limited understanding of the different types of play and their applications in numeracy instruction. The data gathered through interviews and classroom observations indicated that these teachers did not incorporate a variety of play-based approaches into their teaching methods to support children's learning in mathematics. This study aligns with the research conducted by the National Association for the Education of Young Children (NAEYC, 2010), which found that many teachers struggle to integrate play effectively into their teaching and learning activities, even though they acknowledge that children enjoy playing. Several factors contribute to this challenge, including: Time allocation, materials management, and control over students, inappropriate space, teacher’s skill, and poor support from administrators.

Challenges teacher’s faces in implementing play-based learning in numeracy instruction

The findings of this study highlight the significant challenges that preschool teachers face when attempting to implement play-based learning in their numeracy instruction. These challenges are

consistent with the existing literature on the barriers to effective implementation of play-based pedagogies. One of the primary challenges identified in the study is the lack of knowledge and skills among teachers regarding the integration of play-based learning strategies in the numeracy classroom. As noted by Bruce (2018), teachers require specialized knowledge and skills to create a supportive learning environment and effectively guide children's engagement in learning through play. However, the results of this study suggest that many teachers, particularly T2 and T4, lacked the necessary understanding and expertise to fully embrace and implement play-based learning approaches in their numeracy teaching.

Another significant challenge is the inadequate availability of resources, both in terms of relevant playing materials and the time required to plan and facilitate play-based learning activities. As described by the participants, the lack of appropriate numeracy-focused play materials and the limited time allocated for such activities posed significant barriers to the successful implementation of play-based learning. This agree with research has found that the availability and accessibility of appropriate play-based learning materials, such as manipulative and educational toys, can be limited in some educational settings (Farran, 2006), the absence of these resources can make it difficult for teachers to design and implement engaging, play-based numeracy activities.

Furthermore, the study findings reveal that perceptions and attitudes of parents and the broader community can hinder the implementation of play-based learning in numeracy instruction. As highlighted by Kamau (2016), some parents still hold the belief that plays is a waste of time and that children should focus solely on traditional academic subjects, such as reading and writing. This lack of parental and community support can create challenges for teachers in advocating for and implementing play-based learning approaches in the preschool setting.

Additionally, the study identified curriculum requirements and the lack of institutional support as additional obstacles to the effective implementation of play-based learning in numeracy instruction. These findings are consistent with the existing literature, which suggests that the rigidity of curriculum structures and the lack of support from preschool administrators and policymakers can significantly impede the adoption of play-based learning approaches (Bruce, 2018). Other studies found that a lack of administrative support and policies that prioritize or mandate play-based learning can pose significant barriers to its implementation (Sheridan et al., 2009; Stipek, 2006).

UNIT FIVE

Summary, Conclusion, Recommendation

5.1 Summary

The use of play-based learning in preschool education has gained increasing attention in recent years, as research has demonstrated its effectiveness in teaching young children numeracy concepts. This case study explores the practice of play-based learning in numeracy instruction among four preschool teachers from the LIBA preschool.

The primary objectives of this study are to:

1. Understand how the participating teachers conceptualize play-based learning.
2. Identify the different types of play-based activities they incorporate into their numeracy instruction.
3. Explore the challenges they face in implementing play-based learning approaches in the preschool numeracy classroom.

To gather the necessary data, the researchers conducted individual interviews with the four preschool teachers selected from the LIBA preschool. The teachers were chosen based on their subject they were teaching to participate in the study. The interviews focused on understanding the teachers' perspectives on play-based learning, the specific types of play-based activities they utilize in their numeracy instruction, and the challenges they encounter in implementing these approaches. In addition to the interviews, the researchers also carried out classroom observations to directly observe the teachers' use of play-based learning strategies in their numeracy lessons. This multi-method approach, combining interviews and observations, allowed the researchers to gain a comprehensive understanding of the teachers' practices, perceptions, and the realities they face in integrating play-based learning into preschool numeracy instruction.

The findings of this case study reveal distinct differences in the extent to which the four participating teachers incorporated play-based learning into their numeracy instruction. Two of the teachers, T1 and T3, were more inclined to utilize play-based approaches in their numeracy lessons. These teachers demonstrated a deeper understanding of play-based learning and recognized its benefits in engaging children and enhancing their comprehension of numeracy concepts. T1 and T3 employed a variety of play-based activities, such as number songs, physical play, and the use of manipulative materials, to teach numeracy skills and ideas. In contrast, T2

and T4 relied more heavily on direct teaching methods and did not integrate play-based activities as frequently into their numeracy instruction. These teachers had a more limited understanding of play-based learning and its potential advantages for young children's development and learning.

The study also identified several key challenges faced by the teachers in implementing play-based learning in their numeracy lessons. These included a lack of resources, such as play materials specifically designed for numeracy instruction, as well as a shortage of time to effectively plan and implement play-based activities.

5.2 Conclusion

This case study provides valuable insights into the practice of play-based learning in preschool numeracy instruction. The findings reveal distinct differences in the extent to which the participating teachers incorporated play-based approaches into their teaching. Two teachers (T1 and T3) demonstrated a deeper understanding and more frequent use of play-based activities, such as number songs, physical play, and manipulative materials, to engage children and enhance their comprehension of numeracy concepts. In contrast, the other two teachers (T2 and T4) relied more heavily on direct teaching methods.

5.3 Recommendations

Based on the findings of this case study, the researcher recommends the following key practices to enhance the implementation of play-based learning in numeracy instruction at the LIBA preschool:

1. Provide comprehensive professional development opportunities: Offer in-service training and workshops to help preschool teachers develop a deeper understanding of play-based learning and its benefits for young children's numeracy development. This will empower teachers to confidently incorporate these approaches into their teaching practices.
2. Develop and disseminate play-based numeracy resources: Create and distribute a wide range of play-based learning materials specifically designed for preschool numeracy instruction. These resources should include lesson plans, activity ideas, and manipulative materials that teachers can easily integrate into their classrooms.
3. Allocate dedicated planning time: Ensure that preschool teachers have sufficient time during their workday to plan and prepare play-based numeracy activities. This will allow them to thoughtfully integrate these approaches into their lesson plans and provide high-quality, engaging learning experiences for their students.

4. Foster a collaborative learning environment: Encourage preschool teachers to share their experiences, successes, and challenges in implementing play-based learning. Establish professional learning communities or peer-to-peer mentoring programs to facilitate the exchange of ideas and best practices, enabling teachers to learn from one another and continuously improve their play-based numeracy instruction.
5. Conduct further research: Expand the scope of this case study by exploring play-based learning in numeracy instruction across a larger sample of preschools. This will provide a more comprehensive understanding of the challenges and enablers for successful implementation, ultimately informing policy and practice decisions to better support preschool teachers in delivering high-quality, play-based numeracy education.

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Appendix

COLLEGE OF EDUCATION AND BEHAVIORAL STUDIES

CENTRE FOR EARLY CHILDHOOD CARE AND EDUCATION

APPENDIX A

Interview Guides for Preschool Teachers

Dear teachers of LIBA preschool, First of all, I would like to ask you a language question. I kindly ask you to allow me. The purpose of this question is to provide information on the practice of play-based learning in numeracy instruction. Without sparing your thoughts and experiences on the subject, if you contribute, the results of this research will be high.

Name of preschool_____ Date_____

KG _____ Code of teacher_____

1. What is play for you?
2. What are the types of play you practiced during teaching numeracy?
3. Do you use play as a means of method in the numeracy class? Give examples
4. How do you use play in numeracy instruction? Can you give me some examples?
5. How do you think play is important? For what?
6. How frequent do you use such types of play in numeracy instruction?
7. Do you think these types of play help children to learning numeracy skill better?
8. What are the challenges of play-based instruction in your school? (Policy, time table, structure of textbook content, resource availability, etc.)

APPENDIX 'B'

Observation Guide

This observation is being conducted as part of the study that seeks to investigate the practice of play-based learning in numeracy instruction in your LIBA preschool. What is noticed will be recorded to ensure an accurate record of the preschool.

Observation form in this study

Name of teacher **KG** **Date**	
Observation activities	**Comment**
Environment	
Materials: Are there a variety of open-ended materials available (blocks, balls, counting toys, puzzles, etc.)?	
Space: Is there dedicated space for active play and exploration?	
Organization**:** Are materials easily accessible and organized in a way that encourages exploration and play?	
Activities	
Integration of Numeracy Concepts: Do the play activities naturally integrate numeracy concepts (counting, sorting, comparing, estimating, etc.)?	
Which types of play do the teachers use in numeracy instruction? constructions play, exploratory play, role-play, pretend play/ dramatic, manipulative play, Fantasy play and other type of play	
How does a teacher implement play-based learning in numeracy instruction? Through; Create Play-Based Learning Centers, Use manipulative, Play Games, Using block and construction materials	
Teacher guide and support children by intentionally planning invitations for play and asking open- ended questions in numeracy class.	
Availability of materials such as blocks, puzzles shapes and others materials which encourage the development of numeracy.	
Numeracy skills such as; counting, measuring, estimating, adding and subtracting numbers, and so on are practice through play?	
Face difficulties in implementing play based learning in numeracy instruction	

YUUNIVARSIITII ADDIS ABABAA
KOLEEJII BARNOOTAA FI SAAYINSII AMALA
MUUMMEE KUNUNSA FI BARNOOTA IJOOLLEE

Dabalee A

Qajeelfama Af-gaaffii

Kabajamtoota barsiisota mana barumsaa LIBA, duraan dursee gaaffii marii amma isiniif dhiyeessuuf akka naaf eeyyamtan kabajaan isin gaafadha. Kaayyoon gaaffii kanaa dhimma barumsa tapha irratti hundaa'en akkataa ijoolleen barnoota lakkoofsaa itti baraatan, walqabate irratti odeeffannoo sassaabachuu waan ta"eef, yaadaafi muuxannoo dhimma kanarratti qabdan osoo hinqusatin yoo gumaachitan bu"aan qorannoo kanaa olaanaa ta'a.

Maqaa barsiisa/ttu _____ Guyyaa_____

KG _____

Gaaffileewwan af-gaaffii

1. Tapha jechuun maal jechudhu? Akka yaada kettiti
2. Gosoonni tapha yeroo lakkofsa barsiistu itti fayyadamtu maal fa'i?
3. Kutaa lakkoofsaa keessatti tapha akka mala barsiisutti fayyadamtaa? Fakkeenyota kenni
4. Barnoota lakkoofsaa keessatti tapha akkamitti fayyadamta? Fakkeenya tokko tokko naaf kennuu dandeessaa?
5. Taphaan akkamitti barbaachisaadha jettanii yaaddu? Maaliif?
6. Barnoota lakkoofsaa keessatti gosoota tapha akkasii yeroo meeqa fayyadamta?
7. Gosoonni tapha kanaa ijoolleen ogummaa lakkoofsaa akka gaariitti akka baratan ni gargaaru jettanii yaaddu?
8. Qormaanni barnoota tapha irratti hundaa'e kana hojjii irra olmaa dhorku mana barumsaa keessan keessatti maal fa'a? (Imaammata, yeroo, caasaa qabiyyee kitaaba barataa, hanqina meeshalee barnoota fi kkf)