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USE OF TRADITIONAL GAMES TOWARDS KINDERGARTENERS' PARTICIPATION IN NUMERACY ACTIVITIES IN SOUTH TONGU DISTRICT

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MAY, 2024

DECLARATION

Learner's Declaration

I, Peterson Kwasi Mesesah, hereby declare that this dissertation is the result of my own original work and that no part of it has been presented for another degree in this university or elsewhere:

Signature: ……

Date: ……

Supervisor's Declaration

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

Supervisor's Name: Dr. Michael Subbey

Signature: ……..……

Date: ……

DEDICATION

Dedicated to my children, Worlayram Hephzibah Afi Mesesah and Worlanam Herman Yao Mesesah.

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ABSTRACT

The study examined how the use of traditional games towards kindergarteners participation in numeracy activities in the South Tongue District. The explanatory sequential design was adopted for the study. Using the simple random and purposive sampling techniques, 137 kindergarten teachers were involved in the study. The questionnaire and semi-structured interview guide were used to gather the requisite data for the study. The data were analysed through the computation of descriptive statistics such as frequencies, and percentages for the quantitative data while thematic analysis was used for the qualitative data. The study revealed that, teachers in the South Tongu District use different types of traditional games such as Oware, Ampe, football games, Adiforfor, Anuti kple atortor games during their numeracy lessons. Also, active participation of learners as well as the cultural relevance of traditional games are some of the benefits that are derived from their usage in kindergarten centres in the South Tongu District that eased understanding of mathematical concepts. The study further revealed among others that the continuous professional development of teachers as well as the availability of enough resources to ensure the smooth implementation of traditional games in numeracy contents. The study, therefore, recommends that the South Tongu Educational Directorate and schools should organise regular workshop activities centred on the significant role of the use of traditional games in teaching and learning at kindergarten centres.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Our early childhood period known as the golden age is the first laying ground in developing various aspects of child development. Therefore, there is the need in achieving the development that optimal required proper handling through the provision of stimulation from the surrounding environment (Arianti, 2016). Aspects of development listed in the 2019 Standard Based Curriculum for learning in kindergarten are cognitive, affective and physical development.

In cognitive development, the basic competencies that will be achieved are children are able to recognize simple concepts, solve simple problems in daily life, while one of the learning outcomes is that children can recognize the concept of numbers. Previous research has found a link between children's ability to recognize the concept of numbers and other aspects of development and related to the results of achievement at the next level of education (McGuire et al., 2012; Östergren & Träff, 2013; Sarnecka & Lee, 2009; Van Herwegen et al., 2018; Yilmaz, 2017).

The there is a positive relationship of number recognition in kindergarten learning with the addition of children's vocabulary (receptive and expressive) (Sarnecka & Lee, 2009) and has a good impact on the development of arithmetic abilities. Other studies have found a significant influence of symbolic and nonsymbolic program implementation in early childhood in developing the ability to recognize numbers (Van Herwegen et al., 2018).

Furthermore, a study stated that the number of learning given in kindergarten can help children obtain high mathematics learning results in the early grades of elementary school, even the achievements continue until high school (McGuire et al., 2012).

Children's ability to recognize the concept of numbers early on is a strong foundation in sustainability to understand higher mathematics and mature mathematical performance (Yilmaz, 2017), and significantly support the growth of math skills in formal schools (O'Connor et al., 2018).

After some observations from the researcher's coaching and mentoring in some schools, it was realized that some challenges that learners encounter in their schools and classrooms are caused by teachers as a result of their inability to create a pleasant learning atmosphere, the teacher is too monotonous and less varied in using the learning medium, the game tools used are less attractive to the child. It can be concluded that the learning strategies applied by teachers are not appropriate and the game tools used in learning the concept was unsuitable. Learners can not enjoy learning with high motivation and easily feel bored.

Efforts in overcoming these problems required a game plan that can create a pleasant learning atmosphere so that children do not feel stressed, bored, and feel burdened in learning. Children are expected to relax and enjoy learning so that children will love the learning provided. Traditional games in Ghana can be an alternative and developed to stimulate aspects of children's development.

Research conducted by Devi (2020), found there is a positive influence of using traditional games engage on children's rough motor abilities. Traditional games are a legacy of traditions that have been carried by ancestors and ancestors through traditional culture and customs.

In the past, traditional games were used in different communities to entertain both the young and old. Games like ‘’ampe’’, ‘’oware’’, ‘’pilolo’’ ludoo and ‘’a`uti kple at4t4’’ were played to also socialize teach values that will help teach the culture of the community. Today, some of these games are used to attract children into the school system. The games were used to motivate children and other community members to go to school for various lessons. There are a variety of games that children in the early schools played after their formal education classes, which indirectly kept them going to school. The knowledge they had and those they gained from the games made it easier for their teachers to introduce them to western education (Raymond, 2003). Today, learning through games has become a common practice among ECE centers' children and beyond. It has proven to increase children's well-being and their involvement in learning since it natures a variety of skills, creativity, and imagination. Therefore, it prepares children for success in education. Games are a powerful tool for optimal early learning and future success. They allow children to interact with others, express and control their emotions, develop their problem-solving skills, and practice emerging skills.

Children's association with games is important because it offers them an opportunity to be creative. Combining systemic instruction methods and game-based learning can enhance the effectiveness of the curriculum (Britto, 2018). Therefore, games can form an important base in all teaching and learning processes of counting, basic addition and subtraction, comparing quantities and matching can help develop an interest in both children and their teachers in the classroom since it would naturally enhance their interaction. Because games are crucial in young children's development, the school curriculum emphasizes the importance of games in teaching and learning.

Various studies have discussed the development of early childhood education programs in different countries (Raymond, 2003). In our country Ghana, several non-profit organizations promote the integration of learning through games in early childhood education, one of which is Right To Play. Learning through games has been integrated into the Ghanaian curriculum for early childhood education, however, many early childhood education teachers fail to sufficiently organize and support learning through games in their classrooms, since the education system is more of content-based. Learning and teaching numeracy through games has been viewed as a roadmap for learning that is important for children's mental development (Nakawa, 2019).

Following criticisms that the inherited educational system was detached from the realities of children's lives in Ghana, the Dzobo Committee was set up to critically examine the education system and make recommendations (Ministry of Education [MOE], 1974). The committee recommended a new Structure and Content of Education. The recommendations set the pace for the 1987 comprehensive education reform in Ghana. The reform sought ways that would make education more meaningful to Ghanaians. One aspect of the curriculum reform that had the potential to reform mathematics teaching was the introduction of games. Games were introduced into the mathematics curriculum to locate mathematics in the social domain of the child (Nabie, 2011). They make the teaching of mathematics relevant to the lives of learners (Chikodzi & Nyota, 2010). The intent was for teachers to use games as alternative instructional tools to make mathematics relevant, accessible, pleasurable, and memorable. Several researchers and educators (Booker, 2004; Markey, Power, & Booker, 2003; Moloi, 2013; Nabie & Sofo, 2009; Nkopodi & Mosimege, 2009) who believe in allowing children to make personal mathematical constructions of their own learning and mathematics learning as connected to their lives supported the use of

games in mathematics education. Games are activities with integrated opportunities (Nabie, 2012) that lay the foundations for processes, thinking strategies, as well as consolidate existing thinking (Booker, 2004: Gerdes, 2001). The integrated opportunities provide the theoretical and practical justification for the inclusion of cultural games in the curriculum. Earlier works (Nabie, 2011; Nabie & Nyala, 2009; Nabie & Sofo, 2009) in Ghana show that although many teachers are aware of the many advantages of using games, few experienced them at the point where pedagogical skills are developed. Nabie (2011) argued that if teachers' experiences of games inform and serve as basis for pedagogical decisions, then they must experience indigenous games as pedagogical tools to enable them build effective bridges with the mathematics they teach. Indeed, several studies (Chikodzi & Nyota, 2010; Nabie, 2011; 2012; Powell & Temple, 2001) gave evidence of the significance of cultural games in learning. These studies consistently present cultural games as activities that stimulate children's mathematical imagination and thinking, and are therefore important cultural instruments for engaging children in their intellectual pursuit. In spite of the important role cultural games play in the pedagogical arena, teachers do not seem to have made a connection between the value of indigenous mathematics and the use of games (Nabie, 2011). Specifically, very few teachers translate their experience with games into practice (Nabie & Sofo, 2009) for lack of rigorous knowledge of the mathematical content and grammar of cultural games (Nabie, 2011). Limited knowledge of the value of games can influence decisions on their use in classroom practice.

By the review of the ECE curriculum as the Standard Based Kindergarten Curriculum which started its implementation in September 2019, inclusion of games in the curriculum is to promote indigenous mathematics through traditional games. The mathematics curriculum values traditional tools as learning devices, therefore an

understanding of how teachers value traditional games to inform their practice is warranted. Traditional game can encourage positive characters in children and stimulate various aspects of child development.

Game-based learning can improve self-esteem, flexibility, persistency, curiosity, and a way of thinking in mathematics, commonly called mathematical disposition. Mathematical disposition is the desire, awareness and a strong dedication on learners to study mathematics and implement a variety of math activities.

Furthermore, the mathematical disposition shows confidence, expectations and metacognition, serious attention in learning mathematics, persistence in facing and solving problems, high curiosity and the ability to share their thoughts with others. Learners require mathematical disposition to persevere in facing problems, taking responsibility for their learning and developing good work habits in mathematics. This means that the disposition of learners cannot be separated from the mathematical knowledge. Learners who have a weak ability tend to be negative towards mathematics; otherwise the learners who have good mathematical skills tend to have a positive attitude towards mathematics.

The introduction of learning through games in the formal education system requires a criterion of shift (Hopkins, 2018). Most ECE centers often have overcrowded and under-resourced classrooms where teachers rely on instructional methods that may fail to actively engage children, and reduce social interaction between them. These circumstances require change through a systemic approach to create an ideal condition for the introduction of games in learning. Therefore, this study examined the use of traditional games towards kindergarteners participation in numeracy in South Tongu District.

1.2 Statement of the Problem

The use of traditional games in teaching numeracy to learners in early childhood education is very important in helping learners easily understand basic mathematical numerical concepts. However, the use of traditional games in teaching numeracy to learners in early childhood education classes in South Tongu District has not been really taken as the best method of teaching basic numeracy to early childhood learners as it has been perceived by many Early Childhood Education teachers as a waste of time owing to the fact that the role of games in early childhood education has been controversial as most teachers seem to fail to differentiate between learning and playing traditional games (Muzurura, 2013 and Nakawa, 2019). With few years as a trainer on the implementation of the Standard Based Kindergarten Curriculum (2019-date), the impasse of how to teach early childhood learners in simplicity with the use of traditional games which learners are familiar has been a recurring challenge in South Tongu District. This is because there has not been any study that has attempted to address this gap. If this challenge is not addressed, early childhood learners will continue to face difficulties in learning basic mathematical numeracy.

Numeracy skills are crucial for children's cognitive development and academic achievement (Clements & Sarama, 2011). Early exposure to numeracy activities in kindergarten lays the groundwork for mathematical proficiency in later grades (Ginsburg & Russell, 1981). Traditional games, such as "Ayo" and "Oware" in Ghana, offer interactive and culturally relevant contexts for learning numeracy concepts (Nzuki et al., 2011).

Understanding the impact of traditional games on kindergarten children's participation in numeracy activities is crucial for early childhood education in rural communities due to several significant implications. Several researchers in educational psychology have

shown that incorporating familiar cultural elements into learning activities can enhance learners' motivation and engagement (Vygotsky, 1978; Akkerman & Bakker, 2011). In rural settings like the South Tongu District, where children may have limited exposure to formal educational resources, leveraging traditional games that are part of their cultural heritage can serve as a powerful tool to foster interest and active participation in numeracy activities (Nzuki et al., 2011).

Moreover, by identifying the potential benefits of integrating traditional games into numeracy instruction, educators can design more culturally responsive and engaging learning experiences for young learners. Culturally responsive pedagogy emphasizes the importance of acknowledging and incorporating learners' cultural backgrounds into the curriculum to promote equitable learning outcomes (Gay, 2010). By integrating traditional games that reflect the traditional culture into numeracy instruction, educators can create learning environments that are inclusive, relevant, and meaningful for all learners, regardless of their cultural backgrounds (Banks, 2009).

Educational policies and curriculum frameworks often shape the direction of teaching and learning practices in schools (Gewirtz et al., 1995). By highlighting the positive impact of traditional games on numeracy engagement, research findings have advocated for the inclusion of culturally relevant pedagogies in early childhood education policies and curriculum standards. This, in turn, can lead to systemic changes that prioritize cultural diversity and responsiveness in educational practices, benefiting learners in rural communities and beyond.

However, research examining the specific effects of these games on kindergarten children's participation in numeracy activities is scarce, particularly in rural areas like the South Tongu District. It is against this backdrop that the current study seeks to

examine the how the use of traditional games affect the participation of kindergarteners in numeracy activities in the South Tongue District

1.3 Purpose of the Study

The purpose of the study was to examine the use of traditional games affect the participation of kindergarteners in numeracy activities in the South Tongue District.

1.4 Research Objectives

The study is intended to help:

1. Examine the types of games used by Early Childhood Education teachers for numeracy lessons in South Tongu District
2. Assess Early Childhood Education teacher's utilization of traditional games in teaching numeracy in South Tongu District
3. Identify strategies in improving the use of traditional games for teaching numeracy in Early Childhood Education classes in South Tongu District

1.5 Research Questions

The following research questions guided the study.

1. Which traditional games do Early Childhood Education teachers use for teaching numeracy lessons in South Tongu District?
2. How does Early Childhood Education teachers use traditional games in teaching numeracy in South Tongu District?
3. What strategies can teachers use to improve on the use of traditional games for teaching numeracy in Early Childhood Education centres in South Tongu District?

1.6 Significance of the study

The results of this study would be useful to the Ministry of Education (MoE) on Early Childhood Education, especially NaCCA, mandated with the role of providing guidance, implementation and supervision and regulating the offering of early childhood education in the country. It also sought to advocate for all children between the age of three to eight (kindergarten to basic three) to have access to quality early childhood education. The research would help in the planning on how to equip Early Childhood Education teachers with appropriate knowledge and skills that would enable them to easily include traditional games as a teaching strategy. The results could also induce the implementation of lectures for Early Childhood Education teachers, which might instill in them the important knowledge of policy formulation for the teaching of Early Childhood Education teachers in colleges and universities. It also pointed out the gaps in the researches that have been conducted and may bring about the need for more assessment.

1.7 Delimitations

For the purpose of effective work, six public schools and four private school from the South Tongu District have been selected. Out of the six public schools selected, three were chosen from the "Hard to reach areas" and the other three schools from the easily accessible towns in the District. The private schools were chosen from within accessible towns in the District.

1.8 Limitations of the study

Unwillingness of some respondents to share information with regards to their use of traditional games in teaching numeracy to children in Early Childhood Education centres in their schools because they mistook the researcher to be on a fault-finding

mission, though the researcher physically visited the schools and explained that the study's aim was only for academic purposes.

Hostility among some respondents was also another limitation of the study in the sense that the researcher found that there were two hostile respondents who asked to for payments to respond to the questionnaire and in the long run turned down the request of the researcher to answer the questions.

1.9. Definition of Terms

The definition of terms included:

• **Early Childhood Education teachers**- A professional who teaches children in early childhood.

• **ECE centers**- Formal learning institutions that accommodate children between the ages of three to six, where they are offered care and training under early childhood education

• **Games**- Activities or sports involving knowledge or skill in which the players follow specific rules to win against an opponent or solve a problem.

Traditional games: any indigenous activity used for entertainment and competition through which unintentionally learning can be done. This is often used interchangeably with traditional games because it is the people I similar area that engage the games

• **Play objects**- Any kinds of tools, materials, or objects used by ECE centers teachers for teaching and by children for learning purposes.

• **Play materials**- Artificial or natural objects used by teachers and children for recreation inside or outside the classroom.

• **Teaching strategy**- Methods and techniques of teaching used by ECE center teachers to introduce new learning concepts and reinforce the implemented concepts. • Type of school-School category, based on whether it is a private or public school.

• **Use of games**-The frequent utilization of game-related activities in ECE centers learning and teaching.

1.10 Organisation of the Study

The study was organized into five (5) chapters. The first chapter dealt with the introduction which gives an insight into the background of the study, the problem statement, the purpose of the study, the research questions,. It also dealt with the significance of the study and the delimitation, limitations, and organization of the study. Chapter Two focused on the review of related literature on the topic. Chapter Three comprised of methodology, which includes the research paradigm, research approach, research design, population, sample, and sampling techniques, research design as well as the instruments data collection procedures, data analysis procedures and ethical issues. The Chapter Four delt with the data analysis and discussion of results and Chapter five discussed the summary, conclusion and recommendations for the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Overview

This chapter focused on the review of related literature on the following sub-headings

-Theoretical Framework

-Concept of games

-Type of games

-Traditional games in teaching and learning

-Types of games use in kindergarten classrooms numeracy activities

-Benefits of the use of traditional games

-Strategies in improving the use of traditional games

- Summary of the related Literature Review

2.1 Theoretical Framework

This study was informed by a variety of theoretical perspectives, such as the Vygotsky's socio-cultural theory and Piaget's cognitive theory of play identify strategies in improving the use of traditional games for teaching numeracy in Early Childhood Education centres. Piaget's theory stated the broad outlines of evolution of games in the past seven years (Piaget, 1959).

2.1.1 Piaget's Theory of Cognitive Development

Jean Piaget's (1896-1980) background was in biology and intelligence testing. He worked at Alfred Binet's experimental laboratory, where the first intelligence test was developed. While conducting intelligence "tests with young children, Piaget became

interested in the children's responses, particularly the wrong answers. The pattern of incorrect responses seemed to correlate with the age of a child, which led to Piaget's hypothesis that young children think in an entirely different way than older children and adults (Ginsburg & Opper, 1988).

Piaget's research on children's thinking led to his theory based on four phases of subjective advancement, Sensorimotor 0-2 years, Preoperational 2-7 years, Concrete operational 7-11 years and Formal Operational 11-15 years. In which a child ready to take care of conceptual issues in intelligent style. Turns out to be more investigative in considering. Creates worries about social issues, character.

The formal operational stage, which shows up somewhere around 11 and 15 years old, is the fourth and last Piagetian stage. In this stage, people move past solid encounters and think in dynamic and more consistent ways. As a major aspect of speculation all the more uniquely, teenagers create pictures of perfect conditions. They may consider what a perfect guardian resemble and contrast their folks with their optimal principles. They start to engage conceivable outcomes for the future and are intrigued with what they can be. In taking care of issues, formal operational masterminds are more efficient and use logical reasoning.

The conceptual nature of the immature's idea at the formal operational level is obvious in the young verbal critical thinking capacity. Though the solid operational scholar needs to see the solid things to build up the sensible requests. For Piaget the coming full circle accomplishment of intellectual improvement is the capacity to utilize hypothetico-deductive thinking. Hypothetico-deductive thinking is the utilization of deductive (thinking from general standards to specific conclusions) to deliberately control a few variables, test their belongings methodicallly, and achieve right

conclusions 'Piaget tried youths' creating utilization of hypotheticodeductive thinking by utilizing a few assignments, large portions of which included material science or science (Ginsburg & Opper, 1988; Piaget & Inhelder, 1969).

At formal operational stage, there is a significant achievement of this age group is concept acquisition. 'Woolfolk (1995) defines concepts as categories used to group similar events, ideas, objects, or people, and states that "most of what we know about the world involved concepts and relationships among concepts. What is significant about the achievement of concept acquisition is that children of this age are able to work with abstractions (concepts). Concepts are vague and unlike the concrete learning that preschool children do so well. So, children in kindergarten and primary grades begin to move from physical examples to an understanding of complex concepts, such as numbers and time. Preschoolers often recite numbers and can count from 1 to 10 or more, but it doesn't mean that they understand what 1 is or what 10 is. By age 6 or 7, children's understanding of one-to-one correspondence and number is complete, but not until after age 8 are children reasonably accurate in placing events in a time sequence (Bredekamp & Copple, 1997). Concept acquisition means that children are moving beyond memorization to understanding. Gardner (1993) says that they then have the capacity to "take knowledge, skills, and concepts and apply them appropriately in new situations".

Children's play, sometimes called work" by them, promotes development in all aspects of growth. Play is the best context for children's learning and development in that it is open ended and free, children have control over it, it can be done alone or with others, it can even occur without any materials or equipment, and it can take place in many settings. Play comes naturally to children, so it makes sense that they learn from it. Through his research, Piaget found that people's needs for creating order in their lives

is a central drive Piaget, he called this the drive for equilibrium, or a state of balance. To reach equilibrium, people have biological tendencies to organize and adapt (Piaget, 1952).

Despite what might be expected Piaget asserted that we never achieve a lasting condition of balance. He trusted that we are perpetually adjusting and rearranging our psychological structures and working "toward better balance" Piaget did not, nonetheless, imagine further significant redesigns of subjective structure or the improvement of subjectively more progressed various types of thought (Piaget, 1985).

2.1.2 Vygotsky's Theory of Play

From his chapter, (The Role of Play in Development, in Mind in Society (1978). Lindqvist found support for her insistence on the importance of adult participation in children's play. Children are never alone in play, but rather adults are always a part of children's play, even when this involvement consists of creating a protected space apart for the play. Therefore, designing a play pedagogy involves deciding upon the ways that adults will join children in play, not deciding whether or not adults will enter children's play at all.

Vygotsky (1978) insists that a child's world is not solely a world of play, separate from and less real than our own world. He reminds us: “To behave in a real situation as in an illusory one is the best sign of delirium” (1978, p. 102). And he then states, bluntly: “Only theories which maintain that a child does not have to satisfy the basic requirements of life but can live in search of pleasure could possibly suggest that a child's world is a play world” (1978, p. 102).

Vygotsky (1978) also explains that play is not a prototype of everyday activity. In real life action dominates meaning, but in play action is subordinate to meaning. In real life

a child's behavior is not always guided by meaning, but, instead, the child is often spontaneous. It is only in play that the child can be strictly subordinated to rules, because it is in play that subordination to rules leads to pleasure.

It is because of this difference between the child's play and everyday activity that play creates a zone of proximal development for the child. “In play a child always behaves beyond his average age, above his daily behavior; in play it is as though he were a head taller than himself” (1978, p. 102) a child is able to move forward through play because in play action is subordinated to meaning, and the child is motivated to move forward through play because in play the subordination to rules is pleasurable.

Vygotsky uses his famous example of the stick that, in play, becomes the horse, to explain how play allows children to develop a separation between perception and meaning. The stick is the “pivot” which allows thought, word meaning, to be separated from objects, and action to arise from ideas as opposed to arising from things. Although the stick is still needed to separate thought and object, the child's relation to reality is now changed because the structure of his perceptions has changed. Vygotsky (1978, p. 98) writes: “This characterizes the transitional nature of play; it is a stage between the purely situational constraints of early childhood and adult thought, which can be totally free from real situations”.

As Vygotsky's (1978, p. 86) concept of the zone of proximal development is defined as “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers”, this claim of Vygotsky's (1978, p. 99), that the “essential attribute of play is a rule that has become a desire”, helps us to understand how, in the zone of proximal development of play, the

creation of the new is possible. In this zone a child is able to put forth the great effort, to make the stretch, to enter into dialogue with her future.

This tomorrow is an endpoint for play, but a moving endpoint, and an unknown.

Support for Lindqvist's claim that children's play is a creative cultural manifestation in humans can be found in Vygotsky's (2004) "Imagination and Creativity in Childhood" and "Imagination and its Development in Childhood." (1987). As Lindqvist (1995, 2003) argues, it is in these works that Vygotsky discusses the human process of creative consciousness, the link between emotion and thought, and the role of imagination. is discussion brings to the fore the issue not only of the link between reality and imagination, but also issues of reproduction and creativity (production).

In "Imagination and Creativity in Childhood" Vygotsky (2004, p. 2) begins by defining the creative act as "any activity that gives rise to something new". To him, this definition he makes a distinction between "reproductive" activity, in which "nothing new is created," but, instead, there is "a repetition of something that already exists" (Vygotsky, 2004, p. 2), and a "combinatorial or creative activity" in which one is "not merely recovering the traces of stimulation that reached my brain in the past" (Vygotsky, 2004, p. 3). In creative activity, Vygotsky (2004, p. 4). writes: "I never actually saw this remote past, or this future; however, I still have my own idea, image, or picture of what they were or will be like".

This basic distinction is what allows anyone who is engaged in creative activity, including creation based on this imagination" (Vygotsky, 2004, p. 4). Vygotsky (2004, p. 5) quotes T. Ribot, writing that all human-made objects, every one, can be called "crystallized imagination". Vygotsky is describing the role of imagination in the production of artifacts, as described by cultural historical activity theory: those aspect

of the material world that have been modified over the history of their incorporation into goal directed human action (Ilyenkov, 1977).

Vygotsky is arguing that imagination is an essential aspect of all thought. As M. Cole (Cole; Pelaprat, 2011) explains, human conscious experience is a process, a process which requires not just our phylogenetically constrained abilities and our culturally organized experience, but also our active reconciliation or " lling-in", our imagining, as we try to make sense of our world. Cole notes that the Russian word normally translated as imagination, "voobrazzhenie", is made of three roots. The translation of the word according to these three roots is into-image-making. Therefore, in the language in which Vygotsky was thinking and writing, within the word imagination were the concept that all representation is in part the result of an active processing by an individual, and also the concept that it is imagination that allows us to move "into" this process. When Vygotsky (2004, p. 3) describes "the human being (as) a creature oriented toward the future, creating the future and thus altering his own present", when he asserts that imagination is essential to both the artist and the scientist, he is moving towards an even broader claim, the claim that we can think because we can imagine.

Vygotsky (2004, p. 33) explicitly argues that all humans, including children, are creative:

There is a widespread opinion that creativity is the province of a selected few which is not true. If we understand creativity in its true psychological sense as the creation of something new, then this implies that creation is the province of everyone to one degree or another; that it is a normal and constant companion in childhood.

It is not only those at the height of their creative abilities who can produce something of worth to many others of all ages, meaning that even a child in play might inspire an

adult. Vygotsky (2004, p. 6) concludes: “If we understand creativity in this way, it is easy to see that the creative processes are already fully manifest in earliest childhood”. Furthermore, he writes: “We can identify creative processes in children at the very earliest ages, especially in their play...all these children at play represent examples of the most authentic, truest creativity.” (Vygotsky, 2004, p. 6).

Vygotsky continues by arguing that there is no strict line between fantasy and reality. A child at play is creatively reworking impressions he has acquired, combining them to construct a reality that meets his needs and desires. “It is this ability to combine elements to produce a structure, to combine the old in new ways that is the basis of creativity” (Vygotsky, 2004, p. 7).

In regards to the question of how a child's imagination differs from an adult's, Vygotsky argues against those who claim that fantasy is richer and more diverse in childhood than adulthood. He writes that the theory behind such claims mistake the undemanding and tolerant quality of child fantasy, the fact that children can indeed make anything out of anything, for richness of imagination. These theories also mistake the fact that the products of children's fantasy are obviously very different from adult reality as support for the idea that children live more in the world of imagination that in the real world. And children's interest in fantasy stories and in distortion, particularly exaggeration is another fact mistaken as support for this idea.

Vygotsky argues that children's experience is poorer than adults', that their interests are simpler, more elementary, and so also poorer that adults', and that children's relationship to the environment is not as complex, subtle or diverse as that of adults. Therefore, “the child can imagine vastly less than the adult” (Vygotsky, 2004, p. 29). Those who conclude otherwise are using the term imagination to refer to all that is

unreal, that this how they come to their incorrect conclusions. The child "has greater faith in the products of his imagination and controls them less, and thus imagination, in the everyday, vulgar sense of this word, that is, what is unreal and made up, is of course greater in the child than in the adult" (Vygotsky, 2004, p. 29). In truth the child's imagination is only equal to the adult's with regard to the elements used for the construction of imagination, reality, and the emotional roots of imagination. Children and adults both engage in the process of imagination, but at different levels.

In "Imagination and its Development in Childhood" (1987) Vygotsky elaborates upon his arguments in "Imagination and Creativity in Childhood" (2004). He argues that there is a complex relationship between realistic thinking and activity of advanced forms of imagination. And he concludes: "In sum, the apparent, metaphysical, and primal opposition that has been established between realistic and autistic[1] thinking is both active and false. The differences between realistic and autistic thinking are not absolute but relative" (Vygotsky, 1987, p. 348).

Vygotsky (1987) claims in this chapter that imagination is an integral aspect of realistic thinking. The two are interdependent. And in the observation of imagination linked with creativity, which is imagination directed towards reality, there is no boundary between realistic thinking and imagination. This is so because "no accurate cognition of reality is possible without a certain element of imagination, concrete, solitary impressions in which this reality is presented in the elementary acts of consciousness" (Vygotsky, 1987, p. 348). Invention and artistic creativity require realistic thinking and imagination. In these processes: "the two act as a unity" (Vygotsky, 1987, p. 349).

The above is the central thrust of Vygotsky's argument in "Imagination and its Development in Childhood" (1987). Lindqvist also points out that Vygotsky stresses

the fact that imagination faces forward, that those who imagine are capable of producing the new.

Vygotsky explains that earlier theories of psychology were not able to understand imagination because they considered all forms of human mental activity to be associative combinations of accumulated impressions, and therefore had to attribute imagination to other functions. However, imagination does what other functions cannot do: it creates the new. According to Vygotsky associative psychology reduced imagination to memory. While idealist psychology tried to show that memory is just a special form of imagination, as perception is a form of imagination that constructs our perception of reality. The idealist psychologists argued that creative imagination is inherent in consciousness, that consciousness creates a priori forms, and that these forms produce all our impressions of external reality.

The theorist emphasized that although games are not the same as learning, they provided a comfortable atmosphere in which learning could occur through assimilation, and children could develop knowledge by concerting concepts to fit to what they already knew. He viewed the importance of games in the formation of children's mental representation and abstract thinking, and explained on children's games, where they repeat an activity for the sheer enjoyment of doing it (Piaget, 1959). Vygotsky's socio-cultural theory stated that children are active knowledge seekers, and their collaboration with the social environment molds cognition in culturally adaptive ways through social agents, who in this case, are teachers. Teachers offer a temporary platform through which children can accomplish a variety of tasks. According to the theorist, games can also promote abstract thought that allow children to reach beyond their actual knowledge in cognition to achieve a mental recognition of social roles

(Vygotsky,1978). This research was backed up by both the two theories stated above. The integration of games in teaching can maximize learning and make children learn numeracy concepts in natural ways as part of their daily lives, which can satisfy them and relieve them from the tension and anxiety of learning difficult concepts. Therefore, teachers need to understand that along with the content knowledge, the knowledge of games and their application in teaching is crucial to make teaching easy and enjoyable.

In relation to this study, Vygotsky's socio-cultural theory builds the foundation that traditional games form part of learners' culture and Piaget's cognitive theory of play encourages the consideration of learners stages of learning through which the traditional games can be used in teaching numeracy in the kindergarten classes. This is because learners use the traditional games in their cultural settings for play, however, the study would like to apply the Piaget's theory as basis to apply the traditional games in teaching numeracy to increase learners' participation in the lesson.

2.2 The Concept of Play

The perspective of children`s play was initially considered in education as a yardstick for development of pedagogy (Sommer, Pramling Samuelsson & Hundeide, 2010). There has been lots of research and findings produced over the years relating to the definition of play. Several researchers and theorists define play differently, however, many different perspective views on what play is overlapped with other views. Play can be viewed, conceptualized, and defined from many different theoretical and ideological perspectives.

Gülşeker (2019) defined play as, an activity that is symbolic, meaningful, active, pleasurable, voluntary, rule-governed and episodic (Nowak, Nichols, and Coutts, 2009), see play as pleasurable and an activity, as a situation by which children learn

and interact with the environment and the world around them. Gordon (2009) also argues that "play is the voluntary movement across boundaries, opening with total absorption into a highly flexible field, releasing tension in ways that are pleasurable, exposing players to the unexpected and making transformation possible." (p. 8). Through play children learn informally and relate their play to real life experiences. The voluntary movement of children which includes exploration, playing and learning according to their interests, offer them the opportunity to satisfy their curiosity and level of maturation.

Additionally, Wood (2009) indicated that characteristics of play include intrinsic motivation, engagement; dependence on internal rather than external rules, control and autonomy, and attention to means rather than ends". Children formulate their own rules to suit and match with the play situation. Therefore, children experience the joy and skills development through self- motivation. According to Pramling-Samuelsson and Carlsson (2008) play is considered as a learning situation or an activity initiated by children, on the other hand, learning is regarded as a result of a practice or activity initiated by any adult to help children to learn. They further state that play activities as well as learning situations are as joyful since both play and learning are seen as an activity that is transgression. Play and learning are interrelated; the two words touched on each other in an early childhood setting and further serves as an important process for promoting children's learning and development (Kieff & Casbergue, 2000). Play provides children the opportunity to discover the world and find new answers through voluntary learning. Also, children`s play promotes and enhances socio-emotional development, cognitive and physical skills that cannot be taught through formal classroom instruction (Ministry of Education Science and Sports, 2007).

Fromberg (1992) is also of the view that play enhances language development, social

competence, creativity, imagination, and thinking skills. He talked about how play can support a child's learning such as concepts and ideas, interactions, emotional well-being and physical development. Play provides children with the opportunity to discover the world and find new answers through voluntary learning. Children are likely to be engaged in play activities that are relevant to them and can play and have an active participation. Additionally, play is pleasurable and can be defined as an activity requiring no end or goal only participation and fun (Nowak, et al., 2009).

One important aspect of children`s play to be considered is the use of play in early years setting. Combining play in the teaching process in the early years setting, there is the need for greater confidence among practitioners in approaching problems without fear and taking risks needed in the search for new ideas to help the development of children. Play is often being regarded as cognitively challenging process, which requires the child to make use ability, memory, signs and symbols, cultural tools which includes development of language, social skills such as negotiations, communication, planning and sharing and prediction (Fleer, 2010). Many skills that are needed for later life are developed through play and also are very important in a pre-school setting. Children will continue to make use of different learning situations, experiences and in remembrance for further learning. In general, play is considered as an important learning activity and developmentally appropriate which is considered valuable for all children (Bodrova & Leong, 2003; 2003b). In contrast, however, play can also be seen as an unimportant or even harmful practice or activity both in the home and the school environment (Johnson, Christie & Wardle, 2005; Scarlett, Naudeau, Salonius-Pasternak & Ponte, 2005; Sutton-Smith, 2001). Although play is very important for children and its usage in the school`s context or early year settings, (Hyvonen, 2011) expresses similar sentiment that it should be restricted by hindrances.

2.3 Games

The concept of games defies a singular definition due to its diverse manifestations and interpretations. Broadly speaking, games can be described as structured activities governed by rules, involving one or more participants in a competitive or cooperative endeavor (Salen & Zimmerman, 2004). However, this definition fails to capture the full spectrum of games, which span physical, digital, and social dimensions. Games can encompass recreational activities, sports, board games, video games, and even improvisational theater, reflecting their versatility and adaptability to various contexts (Juul, 2005). Thus, the concept of games is inherently dynamic, evolving in response to cultural, technological, and social changes.

To comprehend the breadth of the gaming landscape, scholars have proposed numerous classifications based on different criteria, including mechanics, platforms, genres, and player interactions. For instance, games can be categorized according to their gameplay mechanics, such as strategy, simulation, role-playing, or puzzle-solving (Fullerton et al., 2004). Alternatively, games can be classified based on their platforms, distinguishing between physical, analog, and digital games (Montola et al., 2009). Moreover, genres such as action, adventure, simulation, and sports provide additional frameworks for categorizing games according to their thematic content and player experiences (Kücklich, 2005). However, these classifications are not mutually exclusive, as many games exhibit hybrid characteristics and defy traditional categorization boundaries (Consalvo, 2007). Thus, understanding the diversity and complexity of games requires a nuanced approach that considers multiple dimensions simultaneously.

Facilitating Entertainment, Learning, and Socialization Games fulfill a myriad of functions in society, serving as sources of entertainment, education, socialization, and artistic expression.

Entertainment games, such as video games and sports, offer recreational experiences that engage players' attention, challenge their skills, and provide opportunities for relaxation and enjoyment (Ryan, 2006). Simultaneously, games have emerged as potent educational tools, fostering learning outcomes across various domains, including cognitive, social, emotional, and physical development (Gee, 2003).

Educational games leverage interactive and experiential learning techniques to enhance engagement, motivation, and retention among learners (Shute & Ventura, 2013). Furthermore, games facilitate social interaction and community-building, enabling players to connect, collaborate, and compete in virtual or physical spaces (Taylor, 2006). Multiplayer games, in particular, promote teamwork, communication, and negotiation skills, fostering social bonds and collective experiences (Steinkuehler & Duncan, 2008). Thus, games serve as versatile mediums for human expression, interaction, and enrichment across diverse contexts.

In early childhood education (ECE), play serves as a cornerstone for holistic development, fostering cognitive, social, emotional, and physical growth. Within this framework, games play a pivotal role in providing rich learning experiences that engage young learners. This review explores the significance of incorporating games into ECE, examining their benefits, types, and implications for child development.

Games offer numerous benefits for young children's development. Through play, children engage in active exploration, experimentation, and problem-solving, which are essential for developing cognitive skills such as critical thinking and creativity

(Pellegrini & Smith, 2005). Furthermore, games provide opportunities for social interaction, cooperation, and communication, helping children develop interpersonal skills and empathy (Ginsburg, 2007). Additionally, physical games promote gross and fine motor skills, enhancing children's physical well-being and coordination (Smith & Pellegrini, 2013). Overall, games in ECE facilitate holistic development by addressing multiple domains simultaneously.

Games in ECE encompass a diverse range of activities tailored to children's developmental needs and interests. Traditional games, such as tag, duck-duck-goose, and Simon says, promote physical activity, socialization, and following instructions (Isenberg & Jalongo, 2013). Constructive games, such as block building, puzzles, and sorting activities, stimulate problem-solving, spatial reasoning, and creativity (Weisberg et al., 2013). Additionally, imaginative and role-playing games allow children to explore various roles, scenarios, and perspectives, promoting language development and socio-emotional skills (Bergen, 2002). Moreover, digital games, when used appropriately, can enhance children's technological literacy and provide opportunities for immersive learning experiences (Marsh et al., 2016). By incorporating a variety of game types, educators can cater to diverse learning styles and preferences, maximizing engagement and learning outcomes.

The integration of games into ECE has profound implications for holistic child development. Play-based learning experiences promote intrinsic motivation, autonomy, and a love for learning, laying the foundation for lifelong learning (Hirsh-Pasek & Golinkoff, 2008). Furthermore, games enable children to develop essential social and emotional competencies, such as self-regulation, empathy, and resilience, which are crucial for navigating social relationships and coping with challenges (Roskos et al., 2009). Moreover, games provide opportunities for children to explore their interests,

talents, and identities, fostering a sense of agency and self-efficacy (Hirsh-Pasek et al., 2009). By creating a supportive and stimulating play environment, educators can nurture well-rounded individuals who are curious, creative, and capable of thriving in diverse contexts.

Despite the numerous benefits of games in ECE, several challenges and considerations must be addressed. Ensuring equitable access to game-based learning experiences is essential to address disparities in educational opportunities (Takeuchi & Stevens, 2011). Additionally, educators must carefully select and design games that align with learning objectives, developmental stages, and cultural backgrounds to maximize their effectiveness (Edwards et al., 2017). Furthermore, balancing the integration of digital games with traditional forms of play is crucial to promoting holistic development while mitigating potential risks associated with excessive screen time (Christakis, 2014). Ongoing professional development and collaboration among educators, researchers, and policymakers are essential to address these challenges and harness the full potential of games in ECE.

2.4 Traditional Games in ECE Teaching

Ghana introduced early childhood education in 2004 and has been increasing its programs in all primary schools throughout the country. ECE centers, under early childhood education, aim to ensure that children acquire skills, knowledge, and attitudes for efficient development. Children in early childhood education undertake a variety of lessons, and an emphasis is put on child-centered teaching methods to ensure effective learning. The teaching of counting in ECE centers to children aims to develop their numeric skills, knowledge, and interest in mathematics for their daily use. Children should learn counting through the manipulation of objects and other forms of games; hence their learning should be more practical (Trajkovik, 2018).

Additionally, informal numeracy activities create a solid foundation for numeric and mathematical concepts and skills for later education. The games provide an opportunity for children to count numbers in both English and their traditional language. The children's love for games provides them an opportunity to interact with others, control and express their emotions, and develop their problem-solving abilities, which is a powerful tool for optimal early learning and future educational success (Muzurura, 2013). Games involve hands-on activities and problem-solving situations that arouse the children's curiosity. Combining game-based teaching with systematic instruction methods can boost the effectiveness of the ECE centers curriculum since it is an active learning, cooperative, and community-based method. It involves children working in groups to complete a task towards academic excellence. Games are an important base for teaching numeracy and can develop the interest of the children in ECE centers.

Furthermore, the use of songs and rhymes in some games played by ECE children follow counting sequence through simple actions and activities (Tarimo, 2013). Therefore, these children develop memory and recall skills as they sing the rhymes and songs, finding it fun and exciting to explore the world of numbers. These songs and activities spice up learning and can be integrated into parts of the pleasure-giving games that children are engaged in the Ghanaian ECE centers. Playing the games while singing the rhymes and songs can be an excellent source of enjoyment, and through them, teachers can teach counting to the ECE centers children.

Traditional games were introduced a long time ago and they continue to evolve and be used throughout the years. They have different roles in varied cultural and social backgrounds. The use of games in teaching and learning is not a new phenomenon but presently, ECE centers teachers try to integrate them fully in their teaching. Games are viewed as puzzles that have to be solved and a form of mental exercise, whereby the

act of solving the game puzzles is what makes the game fun and educative (Beatrice, 2018). From a different perspective, games can be described as activities that involve knowledge, skills, or chance, whereby players have to follow fixed rules to win against an opponent and solve a puzzle. All these characteristics of games can be combined to create an excellent educational game that yields good outcomes. A game that exhibits most of these features is highly desirable.

2.5 ECE Teachers' Utilization of Traditional Games

Games are naturally motivating, educative, and enjoyable; hence need to be adopted in children's classroom as tools for teaching and learning. Games strengthen the children's knowledge, skills, and attitudes towards what they are taught, in this case, numeracy concepts in ECE centers (Bose, 2016). Relevant teaching skills should therefore be integrated into games to make them educational and create game-based learning platforms that are children centered to generate the required benefits. When children play, they experience emotions that cause a positive impact on their learning practice. Such games are considered educational. Games also attract children's attention and concentration, making them to be completely engaged in an activity, minimizing any forms of obstruction in the learning process (Banda, 2018).

Despite games being considered good for teaching and learning, studies show that they should be used as supplements rather than standalone means of teaching. Several pieces of research have been conducted on game-based learning, showing proof that game-based learning is better than the traditional learning methods due to their improvement of learning and motivation for a variety of topics. These researches increased the need for more research on game-based learning to analyze its relevance in learning (Papanastasiou, 2016). Therefore, this research analyzes how integrated educational games can be used as teaching and learning tools to ECE centers children in South

Tongu, to understand the importance of traditional educational games compared to traditional learning methods. Games are used as an avenue and medium for learning and teaching, and an important stimulant for children's intellectual growth. This shows that they have a significant role in teaching ECE centers children because they stimulate them to think at a higher level. Teachers can effectively control the power of children's learning by presenting new ideas and reinforcing concepts using games (Hopkins, 2018). Teachers' support in children's games and activities is an important developmental practice since it enhances smooth teaching and facilitates children's learning according to their pace. Therefore, ECE centers teachers should invest in games as an appropriate and natural means of reinforcing and introducing a new concept to children.

2.6 Strategies to Improve the Use of Traditional Games for Teaching Numeracy

According to Muzurura (2013) and Nakawa (2019), the role of games in early childhood education has been controversial due to the difference between learning and playing games. Free play is a subjective play, while a less subjective play is undertaken as per the given instructions. When the two are combined, they form a guided play. The basis of a guided play involves investigation and exploration, coupled with instructions provided by a teacher (Raymond, 2003). This form of play is more effective if particular learning goals are to be accomplished for children to learn new things. Children become familiar with counting concepts in their environment when playing games.

On the other hand, they also have to learn new concepts not included in the classroom setting. Therefore, guided play is more efficient since it enables teachers to provide guidance that can help children meet their educational objectives (Tarimo, 2013). Guided play corresponds to the Ghana's early childhood education in numeracy per the

new Standard Based Curriculum for Kindergarten learners, and can be effectively used in learning as a teaching strategy.

This study focuses on numeracy, showing how games can help children's learning in and outside the classroom. It shows that games are effective for the development of ECE children's numeracy skills and how Ghanaian ECE teachers implement the use of games in their teaching. Therefore, this study focuses on the development and implementation of important numerical-related guided games among ECE centers children (Trajkovik, 2018)

2.7 Empirical/ Review

Numeracy education is pivotal in shaping learners' mathematical abilities and critical thinking skills. Integrating traditional Ghanaian games into numeracy instruction offers a unique opportunity to enrich learners' learning experiences by embedding mathematical concepts within culturally relevant contexts (Adeyanju, 2019).

Ghana boasts a rich cultural heritage with a plethora of traditional games deeply ingrained in its societal fabric. Games such as "Oware," a strategic board game involving counting and pattern recognition, and "Ampe," a dynamic game blending agility and coordination with elements of counting and spatial awareness, serve as prime examples of traditional Ghanaian games rich in mathematical potential (Agyekum & Agyemang, 2017).

The integration of traditional Ghanaian games into numeracy lessons capitalizes on their cultural relevance to engage learners in meaningful learning experiences. Games like "Alikoto" and "Bano," deeply rooted in Ghanaian culture, offer learners insights into traditional practices and societal values, fostering a sense of connection and pride among learners (Bansah, 2016). This cultural resonance not only enhances learners'

engagement but also deepens their understanding of mathematical concepts within a familiar context.

Traditional Ghanaian games serve as effective tools for enhancing learners' mathematical proficiency across various domains. Games like "Sokode" and "Akyire" promote strategic thinking and problem-solving skills, while "Anuti kple atortor" and "Adiforfor" strengthen learners' understanding of numerical patterns and operations (Boakye, 2018). Through gameplay, learners actively apply mathematical concepts, honing their reasoning and analytical abilities in a dynamic and interactive environment.

One of the notable benefits of incorporating traditional Ghanaian games into numeracy education is their capacity to foster collaborative learning and social interaction. Games such as "Adowa" and "Kwahu-mwono" encourage teamwork and communication as learners collaborate to achieve common objectives (Asante & Ofosu-Appiah, 2020). Engaging in collaborative gameplay not only enhances learners' understanding of mathematical concepts but also cultivates essential social and interpersonal skills essential for success in diverse contexts.

Traditional Ghanaian games offer inclusive and accessible learning experiences that cater to learners of diverse backgrounds and abilities. Games like "Alikoto" and "Sokode" can be adapted to accommodate different learning styles and preferences, ensuring equitable participation and success for all learners (Adu, 2019). Furthermore, the hands-on nature of gameplay provides a tangible understanding of mathematical concepts, making learning more accessible to learners with varying skill levels.

Traditional games offer a dynamic platform for developing learners' mathematical proficiency across various domains (Boakye, 2018). Games like "Sokode" and "Akyire"

promote strategic thinking and problem-solving skills, while "Anuti kple atortor" and "Adiforfor" reinforce understanding of numerical patterns and operations. Through gameplay, learners actively apply mathematical concepts, honing their reasoning and analytical abilities.

Engaging in traditional games stimulates cognitive development and enhances problem-solving skills (Boakye, 2018). Games require learners to use critical thinking and decision-making skills to strategize and plan their moves effectively. By tackling challenges within the context of gameplay, learners develop resilience and perseverance in problem-solving, skills that are transferable to real-world situations.

Active participation in traditional games during numeracy lessons offers several benefits for learners. Firstly, it enhances engagement and motivation. According to Vygotsky's sociocultural theory, learning is most effective when it occurs within meaningful contexts and through interaction with others (Vygotsky, 1978). Traditional games often have cultural significance and are familiar to learners, making them more motivated to participate actively (Akkerman & Bakker, 2011). Active participation in these games can make learning more enjoyable and meaningful, leading to increased motivation to learn numeracy concepts.

Secondly, active participation in traditional games facilitates experiential learning. Experiential learning theories suggest that individuals learn best through direct experience and reflection on that experience (Kolb, 1984). By actively participating in traditional games, learners have the opportunity to manipulate numbers in a real-world context, allowing for a deeper understanding of numeracy concepts (Sweller et al., 1998). For example, games like "Chutes and Ladders" or "Snakes and Ladders" involve

counting, addition, and subtraction, providing practical experience with mathematical operations.

Furthermore, active participation in traditional games promotes social interaction and collaboration. Collaborative learning theories emphasize the importance of social interaction in the learning process (Johnson & Johnson, 1999). Through playing games together, learners engage in peer-to-peer interactions, which can lead to the exchange of ideas, cooperative problem-solving, and peer tutoring (Slavin, 1996). This social interaction not only enhances learning but also fosters a sense of community and belonging in the classroom.

Traditional games offer an intuitive and accessible platform for learning numeracy concepts. These games are often deeply ingrained in cultural traditions and readily familiar to learners, facilitating easy comprehension (Jensen, 2019). For example, games like "Dara" in Africa or "Sudoku" in Japan provide concrete contexts for practicing logical reasoning and problem-solving skills, making abstract mathematical concepts more tangible (Schoenfeld, 1992). By leveraging the simplicity and familiarity of traditional games, educators can create learning experiences that resonate with learners of diverse backgrounds and learning styles.

Integrating traditional games into numeracy instruction enhances learner engagement and motivation by tapping into familiar cultural contexts (Gay, 2010). Games deeply rooted in learners' cultural backgrounds resonate with their experiences, making learning more personally meaningful (Akkerman & Bakker, 2011). As a result, learners are more likely to be actively involved in learning activities and demonstrate greater enthusiasm for numeracy concepts (Jensen, 2019). For example, traditional games like

"Jacks" or "Manila Piko" not only reinforce counting skills but also evoke nostalgic feelings and cultural pride among learners.

The use of traditional games in numeracy instruction promotes inclusivity and cultural appreciation within the classroom (Gay, 2010). By incorporating games from diverse cultural traditions, educators validate learners' identities and create an environment where all cultural backgrounds are respected and celebrated (Banks, 2009). This inclusive approach fosters a sense of belonging among learners from various cultural backgrounds, leading to enhanced learning outcomes (Nieto, 2000). Furthermore, exposure to different cultural perspectives through games cultivates empathy and cultural competence, preparing learners for participation in an increasingly diverse society (Lee, 2015).

Cultural relevance facilitates deeper conceptual understanding by providing concrete contexts for learning numeracy concepts (Jensen, 2019). Traditional games often involve mathematical principles such as counting, spatial reasoning, and strategic thinking, embedded within culturally meaningful contexts (Gee, 2003). For instance, games like "Shisima" from Kenya or "Tic-Tac-Toe" variations worldwide offer opportunities to explore mathematical concepts while appreciating cultural diversity. By contextualizing numeracy instruction within familiar cultural practices, educators enable learners to make meaningful connections between mathematical concepts and real-world situations (Bishop, 1996).

Effective integration of traditional games into numeracy instruction requires teachers to possess the necessary knowledge, skills, and confidence. Professional development workshops provide opportunities for educators to deepen their understanding of traditional games and explore strategies for integrating them into the curriculum (Garet

et al., 2001). By engaging in hands-on activities, collaborative discussions, and reflective practices, teachers develop the competence needed to effectively utilize traditional games to enhance numeracy learning (Desimone et al., 2002).

Professional development sessions focused on the use of traditional games in numeracy instruction help teachers align their teaching practices with curriculum standards and learning objectives (Wei et al., 2009). Through guided activities and curriculum mapping exercises, educators gain insights into how traditional games can be integrated into existing lesson plans to reinforce numeracy concepts (Grossman et al., 2001). Moreover, professional development opportunities provide teachers with access to resources, lesson plans, and instructional materials that facilitate the seamless integration of traditional games into their teaching practice (Borko, 2004).

Professional development fosters collaboration among educators, creating opportunities for peer learning and knowledge sharing (Little, 1990). Workshops and professional learning communities allow teachers to exchange ideas, share best practices, and brainstorm creative ways to incorporate traditional games into numeracy instruction (Lieberman & Pointer Mace, 2008). Collaborative problem-solving and lesson planning activities enable educators to leverage each other's expertise and experiences, resulting in more effective implementation of traditional games in the classroom (Hord, 1997).

Professional development encourages teachers to engage in reflective practice, enabling them to critically evaluate their teaching methods and instructional decisions (Schön, 1983). By participating in professional learning communities and receiving feedback from peers and facilitators, educators can identify areas for improvement and refine their use of traditional games in numeracy instruction (Darling-Hammond &

Richardson, 2009). Reflective practice promotes continuous professional growth, ensuring that educators remain responsive to the evolving needs of their learners and the demands of the curriculum (Killion & Todnem, 1991).

One key aspect of promoting the use of traditional games in numeracy lessons is ensuring access to a diverse range of games that reflect the cultural backgrounds of learners. Accessible resources such as game sets, instructional guides, and online platforms featuring traditional games provide educators with a wide array of options to choose from (Peppler & Kafai, 2007). These resources enable teachers to select games that align with specific numeracy concepts and cater to the cultural diversity present in their classrooms (Gay, 2010).

Curated libraries of traditional games curated by educational institutions, community organizations, or online platforms serve as valuable resources for educators seeking to incorporate culturally relevant games into their numeracy instruction (Jensen, 2019). These libraries often provide detailed information about each game, including its cultural significance, rules, and instructional strategies for integrating it into the curriculum. By curating diverse collections of traditional games, these resources help educators discover new games and expand their repertoire of instructional tools (Klopfer & Squire, 2008). Resource materials developed specifically for professional development purposes offer guidance and support to educators interested in integrating traditional games into numeracy lessons (Desimone et al., 2002). These materials may include workshops, training modules, lesson plans, and instructional videos that highlight effective strategies for using traditional games to teach numeracy concepts (Borko, 2004). By providing educators with practical tips, examples, and implementation strategies, these resources empower them to confidently incorporate traditional games into their teaching practice (Garet et al., 2001).

2.8 Summary of the Related Literature Review

The summary of the literature review revealed that most teachers use games in teaching and learning because they saw games as bet methods for teaching, however, only few use traditional games in teaching numeracy to ECE children, because they are not conversant with games and are finding it to integrate them in the learning process. Furthermore, the literature review identified some factors that influence the ECE teachers' use of traditional games as a teaching strategy such as aligning games to curriculum objectives and content. Hence, teachers need adequate training and resources to us traditional games for teaching numeracy in kindergarten centres in South Tongu District.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter comprised of methodology, which includes the research paradigm, research approach, research design, population, sample, and sampling techniques, research design as well as the instruments data collection procedures, data analysis procedures and ethical issues.

3.1 Research Paradigm

A pragmatic research paradigm was employed in this study so as to enable the researcher to collect data that was both qualitative and quantitative in nature. This is in line with Kivunja and Kuyini (2017) who explained that the pragmatic paradigm focuses on the use of 'what works' so as to allow the researcher to address the questions being investigated without worrying as to whether the questions are wholly quantitative or qualitative in nature. Kivunja and Kuyini (2017) further elucidated that this paradigm advocates for a relationship in research being best determined by what the researcher deems appropriate to that particular study and that there is no single reality but that all individuals have their own and unique interpretations of reality. This enables conducting research that benefits people (in this case, easiness and effectiveness in the way teachers deliver their lessons to the learners and how learners effectively and easily grasp what they are being taught).

3.2 Research Approach

This study adopted the mixed methods research approach which combines both quantitative and qualitative methods to gather and analyze data. It involves collecting and analyzing both numerical data (quantitative) and non-numerical data (qualitative)

to gain a comprehensive understanding of a research problem or question (Creswell, 2013; Dawadi, Shrestha, & Giri, 2021).

The mixed-methods approach recognizes that using multiple research methods can provide a more complete and robust understanding of complex phenomena. It allows researchers to complement and triangulate findings from different sources and perspectives, enhancing the overall validity and reliability of the study (Dawadi, Shrestha, & Giri, 2021). The mixed-methods approach offers a flexible and comprehensive research strategy that allows researchers to explore complex research questions, capture diverse perspectives, and generate more robust and nuanced findings.

On the aspect of the strength of the mixed-method approach is its methodological Synergy. In order to overcome each method's unique shortcomings, the mixed-methodologies strategy makes the most of both quantitative and qualitative methods. By utilizing the other way to fill the gaps, it enables researchers to get beyond the flaws inherently present in each approach (Mazoo, 2020).

3.3 Research Design

The study employed an explanatory sequential design to help the researcher, to find solutions to fundamental questions such as "what is going on?" This helped to provoke the `why' questions "why is it happening?" and "how can it be solved" Hence, the design in this study involved careful and in-depth examination of the use of traditional games in teaching Numeracy to Early Childhood Education center children in South Tongu District of Ghana.

This Sequential Explanatory design also enabled the use of both qualitative and quantitative techniques simultaneously. Thus, the study used both quantitative and qualitative methods.

The quantitative approach, however, was only employed specifically during analysis of data therefore, transforming data into descriptive statistics (frequencies and percentages) just like the approach used by Yambwana (2019). The qualitative aspect was employed during collection of data (due to the fact that the data that was collected was qualitative in nature) and when interpreting it. The researcher in this study opted to use this approach as it helped in understanding and examining the use of traditional games in teaching numeracy to Early Childhood Education center children in South Tongu District of Ghana. The multi–method approach also helped to enrich the study and make the data trustworthy as the approach was by the study of (Jennifer, John, & George, 2013). This is because a research "may be qualitative or quantitative" Sidhu (2009:109) depending on the nature of data to be collected and how it is intended to be collected and interpreted.

3.4 Population

The population comprised public kindergarten teachers in the ECE centers in South Tongu. According to the South Tongu Educational Directorate, the total number of kindergarten teachers as of 2023 was two hundred and thirteen (213) in 90 public basic schools.

3.4.1 Study Area

This study was conducted in Early Childhood Education centers in South Tongu. This area was selected for the study for several reasons. Firstly, ECE centers in the South Tongu District of Ghana as compared to the rest of the Districts in the Volta Region

had relatively good representatives and were helpful to enable getting valuable information for the study, as the District was one of the Districts in Volta Region that had a good number of ECE centers. Secondly, the researcher was well aware of the challenge of ECE teachers not adopting traditional games in the teaching and learning of numeracy to early childhood learners in the District as that is where the researcher resided and had carried out a survey to that effect. The ECE centers in South Tongu District were also easily accessible as they were within the District where the researcher stayed, as such, it was helpful to save the researcher's limited financial resources and time

3.5 Sample Sampling Procedure

The study adopted the simple random sampling technique to select 137 kindergarten teachers from the South Tongu District. The sample for the study was attained using the Krejcie and Morgan table of sample distribution. According to Krejcie and Morgan (1970), a population of 213 will give a sample size of 137.

Simple random sampling is a fundamental sampling technique widely used in research, where each member of the population has an equal chance of being selected for the sample (Babbie, 2016). This method ensures that every possible sample of a specified size has an equal probability of being chosen, thereby minimizing selection bias and allowing for generalizability of findings to the population from which the sample was drawn.

To conduct simple random sampling, researchers typically assign a unique identifier to each member of the population and then randomly select the desired number of samples from the population without replacement (Trochim, 2006). Randomization can be

achieved using various methods, such as random number generators or lottery systems, ensuring that each unit in the population has an equal probability of selection.

Simple random sampling is particularly advantageous in research for several reasons. Firstly, it provides an unbiased representation of the population, allowing researchers to generalize findings with greater confidence (Creswell & Creswell, 2017). Secondly, it ensures transparency and objectivity in the selection process, enhancing the credibility and reliability of research results (Trochim, 2006). Thirdly, it is relatively straightforward to implement and requires minimal assumptions about the population distribution, making it suitable for a wide range of research contexts (Babbie, 2016).

Also, the purposive sampling technique was used in selecting kindergarten teachers who have over ten years of teaching experience to respond to the interview. Purposive sampling in research is where researchers deliberately select participants based on specific criteria that are relevant to the research question or objectives (Etikan, Musa, & Alkassim, 2016). Unlike probability sampling methods, purposive sampling does not rely on random selection, but rather on the researcher's judgment and expertise in identifying individuals or cases that are most informative for the study.

Researchers may use purposive sampling when they seek to include participants who possess particular characteristics, experiences, or perspectives that are essential to address the research aims (Creswell & Creswell, 2017). This sampling technique is commonly employed in qualitative research, where depth and richness of information are prioritized over representativeness (Palinkas et al., 2015).

3.6 Data collection instruments

The study used observational checklists, structured questionnaires and a semi-structured interview guide for the data collection.

3.6.1 Observational Checklist

According to Ary et al (2011), the checklist present a list of observed behaviors and the observer then check whether each behavior exists or not. To measure behavior, attitudes, and learner participation during the teaching and learning process, the researcher at each numeracy lesson class used the observation list. Checklists include a list of behaviors that are only examined to show behavior. With this tool, the researcher observed the activities and behavior of teacher and learners during teaching and learning in the classroom, observation checklist began from the beginning to the end of the teaching and learning process.

The researcher marked the observation checklist based on the activities of learner and teacher in the classroom, and the researcher provided a column "yes" if learner or teacher carried out activities that followed the observation checklist and then researcher marked the "no" column if learner or teacher did not carry out activities. In the observation checklist, place a checkmark (√) with a yes or no answer.

This was done to precede the questionnaire and interview in order to ascertain the type of traditional games used, how the teachers used the games to suggest how to improve the use of the traditional games in teaching numeracy at the kindergarten.

3.6.2 Questionnaire

According to Cohen, et al (2011), a questionnaire is a useful instrument for collecting survey information, providing structured numerical data, and can be administered without the presence of the researcher. The choice of the questionnaire was based on the assertion of Cook, et al (2017) that, they are particularly advantageous whenever the sample size is large enough to make it uneconomical for reasons of time or funds to observe or interview every subject.

Despite these strengths, the weaknesses are that the respondents may not complete the questionnaire resulting in low response rates (Cook, et al, 2017). In other cases, if respondents do not understand some questions, there is no opportunity for them to have the meaning clarified (Pallant, 2017). However, the limitations that came with the questionnaire will be resolved as the researcher will explain the purpose of the questionnaire clearly to the respondents.

Some aspects of the instruments were adapted for data collection. In developing these items, the reviewed literature was taken into consideration. The items on the questionnaire were carefully selected, reviewed, and contextualized from previously reviewed literature. The items were carefully developed to measure the construct to achieve the purpose of the study. The items were categorised into a four-point Likert scale with various score values. The questionnaire was ordered into four (4) sections for the respondents. Section 'A' consist of background information on the respondents. The rest of the sections was used to measure the constructs under investigation.

3.6.3 Interview

A semi-structured interview guide was employed for this study, and it was based on the objectives and research questions of the study. According to Creswell (2009), a semi-structured interview is neither completely fixed nor completely free, and they are arguably best understood as adaptable. In most cases, interviews begin with some sort of predetermined questioning plan, but they then transition into a more conversational format, in which the questions may be answered in a sequence that is more natural to the flow of the conversation. It may begin with only a few clearly stated inquiries, but it will pursue any fascinating abilities that may emerge.

Questions concerning the use of traditional games were captured in the interview guide. It was divided into two parts. The responses to the questions in Section A were used to compile participants' demographic information. In Section B, detailed and methodical questions were asked on the aforementioned research questions. According to Kusi (2012) using this instrument in collecting data enables the researcher to increase the likelihood that all of the study questions will be answered.

3.7 Validity of Quantitative Instrument

The validation of the instrument was carried out to check the correctness of the data collection instruments during the pilot study. Leedy and Ormrod (2005) emphasizes that pre-testing of study instruments, before the actual study support criterion and construct validation of the tools. Criterion and construct validation was established through pre-testing the instruments used in the study. This checks the appropriateness of the data collection instruments.

To enhance the validity of the study, the questionnaire was given to the supervisor for expert assessment. This was to ensure both face and content-related evidence to the items and examine whether the items related to the research questions and also comprehensively cover the details of the study. Content validity was ensured by effectively indicating the interests of the study (Kothari, & Carg, 2014). Comments were made on the language, clarity, relevance of the items, format, structure, and content of the research instruments to deem them acceptable. Suggestions were made on rewording questions, adding questions, and deleting some irrelevant questions.

3.8 Trustworthiness of the instrument

Trustworthiness criteria was established for the semi-structured interview guide. One major aim of the research was to put the knowledge created into practice. As a result.

researchers, practitioners, policymakers, and the general public must understand and accept the findings as legitimate. Trustworthiness criteria are one-way researchers can convince themselves and readers that their study findings are worthy of attention (Nowell, Norris, White, & Moules, 2017). The criteria established were confirmability, dependability, transferability, and credibility.

3.8.1 Confirmability

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

3.8.2 Dependability

Dependability is a critical aspect of qualitative research, emphasizing the need for consistency and traceability in the research process (Lincoln & Guba, 1985). By maintaining an audit trail and providing clear documentation of research procedures, researchers enhance the dependability of their study (Creswell, 2013). To increase the dependability of the study findings, the researcher asked clear questions throughout the data collection, minimized bias, and controlled objectivity.

3.8.3 Transferability

Transferability is a key consideration in qualitative research, focusing on the applicability of the study's findings to other contexts (Lincoln & Guba, 1985). By providing rich and detailed descriptions of the research context and participants, researchers enhance the transferability of their findings, enabling readers to assess the relevance to their situations (Creswell, 2013).

3.8.4 Credibility

Credibility is a cornerstone of ensuring the trustworthiness of the study. It focuses on demonstrating the rigor of the research process and the soundness of the interpretations drawn from the data (Horsman, 2018). Techniques such as prolonged engagement, triangulation, and member checking contribute to enhancing the credibility of the study's findings (Creswell, 2013).

3.9 Reliability of Quantitative Instrument

A pilot test of the instrument was carried out to check the reliability of the instrument. The instruments were pilot-tested in kindergarten centres in the North Tongu District The pre-testing aimed to improve the reliability of the instrument. The respondents were given draft copies of the questionnaire. The respondents were told to discuss verbally and frankly with the researcher any ambiguity, incoherence, or incomprehension that they would experience about any aspect of the draft questionnaire. The necessary corrections were made after the trial testing. The pilot test results were used to determine the reliability of the instruments with Cronbach's alpha measure of internal consistency. The Statistical Product for Service Solution (Version 25.0) was used for the computations.

The researcher conveniently sampled of thirty (30) teachers for the pilot-testing. Connelly (2008) stipulates that a sample size for a pilot test should be 10% of the sample projected for the main study. Thus, after the pilot test, Cronbach coefficient alpha was used to determine the reliability of the research instrument. A Cronbach alpha value of 0.826 attained is regarded as satisfactory by researchers to determine the internal consistency of the different components of the questionnaire.

3.10 Data Collection Procedures

Before embarking on the data collection, the researcher obtained an introductory letter from the Head, Department of Early Childhood Education, University of Education, Winneba to seek permission from the various schools, offices, and other concerned authorities. The letter spelled out the purpose of the study, the need for individual participation and anonymity as well as the confidentially of respondents' responses. The management of the South Tongu Education Directorate issued an introductory letter to the sampled schools to grant the researcher access for the data collection. After establishing the necessary contact with the head teachers of the selected schools and authorized offices, permission was obtained for the administration of the instruments. The researcher also trained research assistants for the collection of the data. These research assistants were trained on how to talk to respondents, how to explain certain difficult questions to respondents, and other equally important information that enabled the researcher to have uniform information and to facilitate high return rate. There was a 100% return rate for the quantitative data.

After the analysis of the quantitative data, the researcher followed up to administer the semi-structured interview to gain in-depth understanding of the phenomenon. A face-to-face interview was conducted after the observation by the researcher on teachers views as far as the Montessori approach as well as the challenges that they face in the

implementation of the Montessori approach which lasted between 15-20 minutes. Their responses were audio recorded. In order to ensure a high return rate, the researcher ensured that, questionnaires were given out and retrieved on the same day.

3.11 Data Analysis Procedure

The research data collected were analysed both qualitatively and quantitatively. The field data was collated, sifted through, and edited in order to address questions that have been answered partially or not answered. The questionnaires were serially numbered to facilitate easy identification. It is necessary to observe this precaution to ensure quick detection of any source of errors which occurred in the tabulation of the data.

The demographic variables from the questionnaire were primarily analysed using frequencies and percentages. The frequencies and percentages were based on the demographic characteristics of the respondents. The second section of the questionnaire were analysed based on the research questions set for the study using frequencies and percentages.

For the qualitative data (interviews) were analysed thematically. Thematic analysis is a qualitative data analysis method that involves reading through a data set (such as transcripts from in depth interviews or focus groups), and identifying patterns in meaning across the data to derive themes. Thematic analysis involves an active process of reflexivity, where a researcher's subjective experience plays a central role in meaning making from data. Numbers were given to the interviews to make easy identification; this was done to ensure effective presentation and analysis of the data. The researcher independently codes the transcripts, group the codes and generate themes and sub-themes using the framework method for the analysis of qualitative data

into the adopted models. The themes and sub-themes were discussed among team members to ensure the data is faithfully captured.

3.12 Ethical Considerations

To abide by the ethical principles of the study, the study addressed some ethical concerns which includes informed consent, anonymity, and confidentiality.

Informed Consent

Informed consent affords prospective participants the opportunity to accept or decline to engage in the research. It describes the need for participants to understand the aims, objectives, and potential harm that such involvement may have on them (Seidman, 2016). In this study, the purpose of the study was carefully reviewed with the participants before they were involved in the study.

Anonymity

The anonymity of study respondents was highly taken into consideration in the present study. Gujarati (2013) pointed out that anonymity is a vital issue in research ethics because it gives the participants the opportunity to have their identities concealed. In this study, fictitious names were used for identification purposes that could not be traced to the participants. Codes were also adopted where necessary to ensure the anonymity of information and harm. In order not to unnecessarily invade the privacy of participants, I will make a prior visit to the schools before the data collection commenced. This was to explain the purpose of the study to the respondents and how to not invade their privacy as participants. Neither names nor any identifiable information from respondents was taken as a way of ensuring the ethical principle of anonymity. This was to prevent possible victimization of respondents where certain responses may be viewed as unpalatable to other stakeholders.

Confidentiality

On the issue of confidentiality, an effort was made to maintain the confidentiality of the responses of the participants. Participants were told that their responses would be kept confidential and that no one known to them would have access to the information provided and none of the respondents' names was be recorded in the study. Most essentially on the ethical issues, pieces of information that was cited from earlier studies to support the study was duly acknowledged through both citation and referencing in order to avoid academic dishonesty otherwise known as plagiary

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

The purpose of the study was to find out how the use of traditional games affect the participation of kindergarteners in numeracy activities in the South Tongue District. This chapter deals with analysis and discussion of results. The first section focused on the demographic characteristics of the respondents, the second section deals with the presentation of data in relation to the research questions.

4.1 Demographic Characteristics of Respondents

This section presents the demographic characteristics of respondents sampled for the study. The demographic information of the respondents was based on gender, age, and class. The four-point Likert scale was reduced to a two-point Likert scale. Strongly Agree and Agree were merged to be Agree (A) whilst Strongly Disagree and Disagree were also merged to be Disagree (D).

Table 4.1 Sex of the Respondents

Variable	Frequency	Percentage
Male	28	20.4
Female	109	79.6
Total	**137**	**100.0**

Source: Field Data, 2023

Table 4.1 shows the sex distribution of the respondents of the study. Majority of the respondents 109(79.6%) were females whilst a minority of the respondents 28(20.4%) were males. This indicated that more women teach in the kindergarten centres than men.

Table 4.2 Age Distribution of Respondents

Variable	Frequency	Percentage
Below 30 years	49	35.8
31-40 years	56	40.8
41-50years	21	15.4
51-60 years	11	8
Total	**137**	**100.0**

Source: Field Data, 2023

Table 4.2 indicates that the majority of the respondents 56(40.8%) were between the ages of 31-40 and 29 years. 49 (35.8%) were aged below 30years. Also, 21 (15.4%) were between the age 41-50 years while 11(8%) were between the age 51-60 years. This implies a lot of teachers in the kindergarten centres have sufficient energy to use traditional games which involve more physical abilities to teach.

Table 4.3 Professional Level

Variable	Frequency	Percentage (%)
Cert "A"	14	10.2
Diploma in ECE	48	35
Bachelor in ECE	62	45.3
Others	13	9.5
Total	**137**	**100.0**

Source: Field Data, 2023

Table 4.3 shows the educational/professional level of the respondents sampled for the study. Table 4.3 shows that a14(10.2%) are Cert 'A' holders. 48(35%) were diploma holders. A majority of the respondents 62(45.3%) were bachelor's degree holders whiles 13(9.5%) poses other qualifications.

4.2 Analysis of Research Questions

4.2 Research question 1: What traditional games do Early Childhood Education teachers use for teaching kindergarteners' numeracy in the South Tongue District?

Table 4.4 Type of traditional games teachers use in numeracy lessons

S/N	Statements	SA (%)	A (%)	D (%)	SD (%)
	I mostly use 'oware' whenever I am teaching counting in my numeracy lesson	49(35.7)	68(49.7)	13(9.5)	7(5.1)
	I sometimes take my learners out to the playground to play football in numeracy instruction through the throw-and-catch method	49(35.8)	79(57.7)	5(3.6)	4(2.9)
	Ampe is one traditional game that is utilized in numeracy lessons	55(40.1)	67(48.9)	9 (6.6)	6(4.4)
	In my numeracy lessons I use Adiforfor to help children participate and understand	43(31.4)	85(62)	7(5.1)	2(1.5)
	In numeracy instructions, I utilize Anuti kple atortor game	56(40.9)	77(56.2)	4(2.9)	
	I use alokoto game in my numeracy lessons by letting leaners hop on numbers	51(37.2)	76(55.5)	8(5.8)	2(1.5)

Source: Field data, 2023

The data from Table 4.4 shows that 117(85.4%) strongly agree and agreed that they use 'oware' whenever they are teaching counting in my numeracy lessons whereas 20(14.6%) disagree and strongly disagree to that assertion. 128(93.4%) agreed that they take their learners out to the playground to play football in numeracy instruction

through the throw-and-catch method whiles 9(6.6) disagree. Also, 122(89%) agreed that they use Ampe in numeracy lessons whereas 15(11%) disagree. Moreover, 128(93.4%) agreed that they use Adiforfor to help children participate and understand while 9(6.6%) disagreed that they use Adiforfor in their numeracy lessons. Again, 133(97.1%) agreed that utilize Anuti kple atortor game in nemeracy instructions whiles 4(2.9%). Finally, 127(92.7%) agreed that they use alokoto game in their numeracy lessons whereas 10(7.3%) disagree.

Qualitative analysis

This research question was to find out from kindergarten teachers on the type of traditional games that they use in the teaching of numeracy lessons in their respective classrooms. Here are some excerpts from the interview;

> *In my numeracy lessons, I frequently incorporate traditional Ghanaian games such as 'Oware,' and 'Ampe'. These games offer rich opportunities for children to engage with mathematical concepts such as counting, patterns, and strategic thinking in a culturally relevant context. T2*
>
> *I often integrate traditional games like football, '* Adiforfor *' into the numeracy curriculum. These games not only reinforce numeracy skills but also promote collaborative learning and social interaction among our learners. T1*
>
> *I incorporate a range of traditional Ghanaian games into our numeracy lessons, such as 'Oware,' '* Anuti kple atortor,*' 'Ampe,' etc.' By playing these games, children not only develop their numeracy skills but also deepen their appreciation for their cultural heritage. T3*

The implication of these quotes highlights the valuable role of traditional Ghanaian games, including 'Oware,' 'Ampe,' 'Adiforfor,' and 'Anuti kple atortor,' in numeracy lessons, offering children engaging opportunities to reinforce numeracy skills, foster collaborative learning, promote social interaction, and deepen their appreciation for their cultural heritage.

4.3 Research Question 2: How does Early Childhood Education teachers use traditional games in teaching numeracy in the South Tongu District?

Table 4.5: The utilization of traditional games in numeracy lessons

S/N	Statements	Strongly Agree	Agree	Disagree	Strongly disagree
	Traditional games help make numeracy lessons more engaging and enjoyable for early childhood learners.	52(38)	75(54.7)	7(5.1)	3(2.2)
	Incorporating traditional games into numeracy instruction enhances children's understanding of mathematical concepts.	47(34.3)	82(60)	6(4.2)	2(1.5)
	Traditional games provide opportunities for hands-on, experiential learning that reinforces numeracy skills.	51(37.2)	78(57)	8(5.8)	-
	Using traditional Ghanaian games in teaching numeracy fosters cultural appreciation and identity among kindergarteners	60(43.8)	73(53.3)	4(2.9)	-
	Traditional games promote collaborative learning and social interaction among learners during numeracy activities.	57(41.6)	77(56.2)	3(2.2)	-
	Early childhood learners exhibit increased motivation and interest in numeracy when participating in lessons that incorporate traditional Ghanaian games.	52(38)	78(57)	6(5)	-
	Using traditional games makes the teaching of numeracy easy for kindergarten teachers	51(37.2)	83(60.6)	3(2.2)	

Source: Field Data, 2023

The data from Table 4.5 shows that 127(92.7%) agreed that it helps make numeracy lessons more engaging and enjoyable for early childhood learners whereas 10(7.3%) disagreed. Also, 129(94.2%) agreed that incorporating traditional games into numeracy instruction enhances children's understanding of mathematical concepts whiles 8(5.8%)

disagree. Moreover, 129(94.2%) agreed that traditional games provide opportunities for hands-on, experiential learning that reinforces numeracy skills whiles 8(5.8%) disagree. Furthermore, 133(97.1%) agreed that using traditional Ghanaian games in teaching numeracy fosters cultural appreciation and identity among kindergarteners whiles 4(2.2%) disagree. Again, 134(97.8%) respondents agreed that traditional games promote collaborative learning and social interaction among learners during numeracy activities whereas 3(2.2%) disagree. In addition, 130(94.9%) of the respondents agreed that learners exhibit increased motivation and interest in numeracy when participating in lessons that incorporate traditional Ghanaian games whiles 7(5.1%) disagree. Finally, 134(97.8%) of the respondents agreed traditional games makes the teaching of numeracy easy for kindergarten teachers whiles 3(2.2%) disagree.

Qualitative analysis

Theme 1: Culturally relevance

> *Incorporating traditional games into numeracy lessons provides a tangible and culturally relevant context for children to explore mathematical concepts. For instance, when playing traditional Ghanaian games like 'Oware' or 'Ampe,' children are actively involved in counting, strategizing, and problem-solving, which strengthens their understanding of numerical operations and enhances their engagement by making learning more interactive and enjoyable."*
>
> *By integrating games that reflect Ghanaian culture, such as 'Alikoto' or 'Bano,' children can see math in a context that resonates with their lived experiences, making it more relatable and accessible. This cultural connection not only deepens their understanding of mathematical concepts but also fosters a sense of belonging and cultural appreciation, leading to greater engagement and enthusiasm for learning numeracy."*

These imply that incorporating traditional Ghanaian games into numeracy lessons offers children a culturally relevant framework to engage with mathematical concepts. By immersing themselves in games deeply rooted in their heritage, such as 'Oware,' and

'Ampe,' children not only strengthen their numerical understanding but also develop a deeper connection to their cultural identity. This fosters increased engagement, enthusiasm, and appreciation for numeracy learning.

Theme 2: Active engagement

Here are some of the responses from the teachers;

> *Traditional games in numeracy lessons enhance children's understanding and engagement with mathematical concepts through active participation. When children play games like 'Oware' or 'Ampe,' they are actively involved in counting, strategizing, and problem-solving, which reinforces mathematical skills in a hands-on and interactive manner. T5*
>
> *When children play games that require them to apply mathematical principles, such as 'Alikoto' or 'Sokode,' they are actively engaged in exploring, experimenting, and discovering mathematical concepts in a fun and meaningful way. T3*

These quotes imply that integrating traditional games into numeracy lessons promotes active participation among learners. By actively engaging in a game like 'Oware,' children are immersed in hands-on experiences that reinforce mathematical skills through counting, strategizing, problem-solving, and application of mathematical principles. This active involvement fosters a deeper understanding of mathematical concepts in a fun and meaningful manner, enhancing their overall engagement and learning experience in numeracy lessons.

Theme 3: Easy understanding

> *When children play games like 'Oware' or 'Ampe,' they encounter mathematical concepts such as counting, patterns, and strategy in a hands-on and intuitive manner. This experiential learning approach helps demystify abstract mathematical concepts, making them more accessible and easier to grasp for children of all learning levels. T1*
>
> *When children play games rooted in Ghanaian culture, such as 'Alikoto' or 'Bano,' they are able to visualize and experience mathematical concepts in a context that is familiar and meaningful*

to them. This ease of understanding promotes active participation and deeper exploration of mathematical principles, leading to improved comprehension and retention of numeracy skills. T5

The implication of using a traditional game experiential learning approach not only reveals abstract mathematical concepts but also fosters an intuitive understanding that is accessible to children of all learning levels. Consequently, it promotes active participation, deeper exploration, and improved retention of numeracy skills.

4.4 Research question 3: What strategies can be used to improve kindergarten teachers' use of traditional games for numeracy?

Table 4.6 Strategies to improve the use of traditional games in teaching numeracy

S/N	Statements	Strongly Agree	Agree	Disagree	Strongly disagree
	Providing professional development opportunities for teachers to learn how to effectively integrate traditional games into numeracy instruction.	66(48)	71(52)		
	Providing differentiated instruction to accommodate learners' diverse learning needs and abilities when using traditional games.	59(43.1)	74(54)	4(2.9)	
	Developing assessment strategies, such as observation checklists or rubrics, to evaluate learners' understanding and proficiency in numeracy concepts through game-based activities.	53(38.6)	82(60)	2(1.4)	
	Ensuring that traditional games are aligned with the curriculum's numeracy objectives and standards.	45(33)	89(65)	3(2)	
	Incorporating storytelling, historical context, or traditional music and dance associated with traditional games to enhance learners' cultural connections.	61(44.5)	76(55.5)		
	Actively involving parents and community members in sharing their knowledge of traditional games or participating in game-based learning activities to enhance cultural relevance and engagement.	47(34.3)	87(63.5)	3(2.2)	
	Creating visually appealing and culturally relevant resources, such as game boards and cards, to support the use of traditional games in numeracy lessons.	65(47.4)	72(52.6)	-	

Source: Field Data 2023

Table 4.6 shows that all the respondents 137(100%) agreed that providing professional development opportunities for teachers to learn how to effectively integrate traditional games into numeracy instruction. Also, 133(97.1%) believe that providing differentiated instruction to accommodate learners' diverse learning needs and abilities when using traditional games whereas 4(2.9%) disagree. In addition, 135(98.5) of the respondents agreed that developing assessment strategies, such as observation checklists or rubrics, to evaluate learners' understanding and proficiency in numeracy concepts through game-based activities whiles 2(1.5%) disagree. Again, all the respondents 137(100%) agreed that incorporating storytelling, historical context, or traditional music and dance associated with traditional games to enhance learners' cultural connections. Furthermore, 134(97.8%) agreed that actively involving parents and community members in sharing their knowledge of traditional games or participating in game-based learning activities to enhance cultural relevance and engagement whiles 3(2.2%) disagree. Finally, all the respondents 137(100%) agreed that creating visually appealing and culturally relevant resources, such as game boards and cards, to support the use of traditional games in numeracy lessons.

Qualitative analysis

Here are some of the themes that emerged from the interviews

Theme 1: Professional Development

> *I believe workshops and training sessions should be done regularly to provide opportunities for educators to learn about the cultural significance of traditional games, explore different strategies for incorporating them into numeracy instruction, and collaborate with colleagues to develop engaging learning activities. T4*
>
> *Through professional development opportunities, educators can deepen their understanding of the pedagogical benefits of using traditional games in teaching numeracy. T3*

The implication of these responses underscores the significance of professional development in promoting the effective use of traditional games in teaching numeracy. By investing in training and workshops, educators can enhance their understanding of the cultural and pedagogical aspects of traditional games, ultimately improving their ability to integrate these games into numeracy instruction. This leads to enriched learning experiences for learners, fostering both mathematical understanding and cultural appreciation in the classroom.

Theme 2: Resources

> *The availability of resources greatly facilitates the incorporation of traditional games into numeracy instruction. When educators have access to culturally relevant materials such as game boards, cards, and manipulatives tailored to traditional games like 'Oware' or 'Ampe,' it becomes easier to seamlessly integrate these games into lessons*. T1

> *Having adequate resources plays a pivotal role in promoting the use of traditional games in teaching numeracy. When educators are provided with resources that reflect Ghanaian culture and support the implementation of games such as 'football, alokoto' they can create engaging learning experiences that resonate with learners. T3*

The implication of these responses highlights the essential role of resource availability in facilitating the successful integration of traditional games into numeracy instruction. When educators have access to culturally relevant materials and resources tailored to traditional games, it enables them to create engaging and effective learning experiences for learners.

Theme 3: Curriculum integration

> *Curriculum integration serves as a powerful strategy for promoting the use of traditional games in teaching numeracy. By aligning games such as 'Oware' and 'Ampe' with curriculum objectives, educators can seamlessly integrate them into lesson plans, ensuring*

that learners engage with mathematical concepts while also exploring aspects of Ghanaian culture. T6

By embedding games such as 'Anuti kple atortor' and 'Adiforfor' into the curriculum, educators can provide learners with authentic learning experiences that connect mathematical concepts with Ghanaian culture, promoting cultural relevance and engagement in numeracy learning. T1

The implication of these responses underscores the importance of curriculum integration as a strategic approach to promoting the use of traditional games in teaching numeracy. By aligning games with curriculum objectives, educators can ensure that learners engage with mathematical concepts within a culturally relevant context, leading to enhanced learning outcomes and a deeper understanding of numeracy principles.

4.5 Discussions

Research question 1: What traditional games do Early Childhood Education teachers use for teaching kindergarteners' numeracy in the South Tongue District?

The data from both quantitative and qualitative analysis shows that teachers in the South Tongie District use different types of traditional games in the teaching of numeracy lessons in their respective schools. These games include; 'Oware,' 'Ampe,' 'Adiforfor,' and 'Anuti kple atortor,' in numeracy lessons, offering children engaging opportunities to reinforce numeracy skills, foster collaborative learning, promote social interaction, and deepen their appreciation for their cultural heritage. This assertion is linked with a study by Adeyanju (2019) which suggested that integrating traditional Ghanaian games into numeracy instruction offers a unique opportunity to enrich learners' learning experiences by embedding mathematical concepts within culturally relevant contexts. Games such as "Oware," a strategic board game involving counting and pattern

recognition, and "Ampe," a dynamic game blending agility and coordination with elements of counting and spatial awareness, serve as prime examples of traditional Ghanaian games rich in mathematical potential (Agyekum & Agyemang, 2017).

The integration of traditional Ghanaian games into numeracy lessons capitalizes on their cultural relevance to engage learners in meaningful learning experiences. Games like "Alikoto" and "Bano," deeply rooted in Ghanaian culture, offer learners insights into traditional practices and societal values, fostering a sense of connection and pride among learners (Bansah, 2016). This cultural resonance not only enhances learners' engagement but also deepens their understanding of mathematical concepts within a familiar context.

Research Question 2 How does Early Childhood Education teachers use traditional games in teaching numeracy in the South Tongu District?

The analysed data clearly shows that the use of traditional gamese in numeracy lessons fosters an intuitive understanding that is accessible to children of all learning levels. Consequently, it promotes active participation, deeper exploration, and improved retention of numeracy skills. This is supported by Jensen (2019) which suggested that traditional games offer an intuitive and accessible platform for learning numeracy concepts. These games are often deeply ingrained in cultural traditions and readily familiar to learners, facilitating easy comprehension. Also, Schoenfeld, (1992) opined that traditional games provide concrete contexts for practicing logical reasoning and problem-solving skills, making abstract mathematical concepts more tangible.

The data analysed further suggest that incorporating traditional Ghanaian games into numeracy lessons offers children a culturally relevant framework to engage with mathematical concepts. By immersing themselves in games deeply rooted in their

heritage, such as 'Oware,' and 'Ampe,' children not only strengthen their numerical understanding but also develop a deeper connection to their cultural identity. Games deeply rooted in learners' cultural backgrounds resonate with their experiences, making learning more personally meaningful (Akkerman & Bakker, 2011). As a result, learners are more likely to be actively involved in learning activities and demonstrate greater enthusiasm for numeracy concepts (Jensen, 2019).

Research question 3: What strategies can be used to improve kindergarten teachers' use of traditional games for numeracy?

In this research question, both qualitative and quantitative data underscores the significance of professional development in promoting the effective use of traditional games in teaching numeracy. By investing in training and workshops, educators can enhance their understanding of the cultural and pedagogical aspects of traditional games, ultimately improving their ability to integrate these games into numeracy instruction. Garet et al., (2001) asserted that professional development workshops provide opportunities for educators to deepen their understanding of traditional games and explore strategies for integrating them into the curriculum. By engaging in hands-on activities, collaborative discussions, and reflective practices, teachers develop the competence needed to effectively utilize traditional games to enhance numeracy learning (Desimone et al., 2002).

In addition, the qualitative analysis highlight on the essential role of resource availability in facilitating the successful integration of traditional games into numeracy instruction. When educators have access to culturally relevant materials and resources tailored to traditional games, it enables them to create engaging and effective learning experiences for learners. Resource materials developed specifically for professional development purposes offer guidance and support to educators interested in integrating

traditional games into numeracy lessons (Desimone et al., 2002). These materials may include workshops, training modules, lesson plans, and instructional videos that highlight effective strategies for using traditional games to teach numeracy concepts (Borko, 2004).

Again, developing assessment strategies, such as observation checklists to evaluate learners' understanding and proficiency in numeracy concepts through game-based activities as well as that ensuring that traditional games are aligned with the curriculum's numeracy objectives and standards. By aligning games with curriculum objectives, educators can ensure that learners engage with mathematical concepts within a culturally relevant context, leading to enhanced learning outcomes and a deeper understanding of numeracy principles.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This final chapter comprises a summary of the study, the conclusion, recommendations as well as suggestions for future research.

5.1 Findings of the Study

The findings from the study revealed that teachers in the South Tongu District use different types of traditional games when teaching numeracy lessons in their classrooms. These games include Oware, Ampe, football games, Adiforfor, Anuti kple atortor game and alokoto games to facilitate the teaching and learning of numeracy in kindergarten classrooms.

The study further revealed that the active participation of learners as well as the cultural relevance of traditional games some of the benefits that are derived from their usage in kindergarten centres in the South Tongu District. Also, using traditional in kindergarten centres facilitates easy understanding of mathematical concepts in the classrooms.

The study findings again revealed that ensuring the continuous professional development of teachers as well as the availability of enough resources ensure the smooth implementation of traditional games in numeracy contents. Also, providing differentiated instruction to accommodate the diverse needs of learners promote the use of traditional games in numeracy instructions in kindergarten centres.

5.2 Conclusion

Based on the findings, the study concluded thattraditional games should be fully integrated in the teaching of numeracy to ECE learners in South Tongu District of

Ghana because children can spontaneously learn counting through playing counting games once teachers are well trained on how to use traditional games in ECE teaching of counting.

Traditional games can develop a range of acquaintances with the counting content, which can make it easy for children to grasp the information and retrieve it when necessary, if teachers can know how to use traditional games in teaching learners numeracy in South Tongu District.

Besides, traditional games can take hold of children's attention as they create a rapport between the teacher and the children, and when children are attentive, effective lesson delivery is assured

5.3 Recommendations

Premised on the conclusion and some of the major findings of this research, the study recommended the following.

- Revision of the Early Childhood Educational curriculum so that a curriculum that accommodates full use of traditional games in teaching numeracy can be in place to enable effective teaching and learning of mathematics.
- Government of the Republic of Ghana and other relevant stakeholders need to improve ECE center infrastructures in South Tongu District so that a learning environment that accommodates use of games is enabled.
- The Ministry of Education with special focus on Early Childhood Education should come up with programs that enable ECE teachers to go for in-service workshops and trainings pertaining to the use of traditional games in the teaching of numeracy.

5.4 Suggestion for Further Study

Premised on the interpretation and discussion of the study, it is suggested that studies should be made on impact of teaching and learning resources on kindergarteners' performance in numeracy in South Tongu District of Ghana in view of improving learners grasping of complex mathematical concepts as they advance in their grades.

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APPENDIX A

OBSERVATIONAL CHECKLIST

Use of Traditional Games towards Kindergarteners' Participation in Numeracy Activities in South Tongu District

Statements	Yes	No
1. The teacher uses the traditional games in lesson delivery		
2. Learners participate in traditional games during lesson delivery		
3. Learners reflect on traditional games used to come out with answer		
4. Learners gives personal ideas and opinions to question		
5. Learners are able to answer high order level of questions		

APPENDIX B

UNIVERSITY OF EDUCATION, WINNEBA
FACULTY OF EDUCATIONAL STUDIES
QUESTIONNAIRE FOR TEACHERS

Dear Respondent

The study using traditional games on kindergarteners' participation in numeracy activities in the South Tongu District. Your input will help make informed decisions about determinants that influence the career choice. It would therefore be appreciated if you could provide responses to all items on the questionnaire, and do it honestly. You are assured of complete confidentiality and anonymity of all information provided.

SECTION A

DEMOGRAPHIC CHARACTERISTICS

1. **Sex**:

   a) Male [ ]
   b) Female [ ]

2. **Age**

   a) Below 30 [ ]
   b) 31-35 [ ]
   c) 35-40 [ ]

3. **Level of Qualification**

   a) Diploma [ ]
   b) Degree [ ]
   c) Masters [ ]
   d) Others [ ]

4. Years of Teaching Experience

a) 0-5years [ ]

b) 6-10years [ ]

c) 11 years and above [ ]

Directions: Indicate with a tick [O] on the types of traditional games teachers use in numeracy lessons in the South Tongu District Where: ***SA = Strongly Agree, (4), A = Agree, (3) D = Disagree, (2) and SD = Strongly Disagree (1)***

Section b

Type of games teachers use in numeracy lessons

S/N	Statements	Strongly Agree(SA)	Agree (A)	Disagree (D)	Strongly disagree (SD)
5	I mostly use 'oware' whenever I am teaching counting in my numeracy lesson				
6	I sometimes take my learners out to the playground to play football in numeracy instruction through the throw-and-catch method				
7	Ampe is one traditional game that is utilized in numeracy lessons				
8	In my numeracy lessons I use Adiforfor to help children participate and understand				

9	In numeracy instructions, I utilize Anuti kple atortor game				
10	I use alokoto game in my numeracy lessons by letting leaners hop on numbers				

Early Childhood Education teachers use of traditional games in teaching numeracy

S/N	**Statements**	**Strongly Agree**	**Agree**	**Disagree**	**Strongly disagree**
11	Traditional games help make numeracy lessons more engaging and enjoyable for early childhood learners.				
12	Incorporating traditional games into numeracy instruction enhances children's understanding of mathematical concepts.				
13	Traditional games provide opportunities for hands-on, experiential learning that reinforces numeracy skills.				

14	Using traditional Ghanaian games in teaching numeracy fosters cultural appreciation and identity among kindergarteners				
15	Traditional games promote collaborative learning and social interaction among learners during numeracy activities.				
16	Early childhood learners exhibit increased motivation and interest in numeracy when participating in lessons that incorporate traditional Ghanaian games.				
17	Using traditional games makes the teaching of numeracy easy for kindergarten teachers				

Strategies to improve the use of traditional games in teaching numeracy

S/N	Statements	Strongly Agree	Agree	Disagree	Strongly disagree
18	Providing professional development opportunities for teachers to learn how to effectively integrate traditional games into numeracy instruction.				

19	Providing differentiated instruction to accommodate learners' diverse learning needs and abilities when using traditional games.				
20	Developing assessment strategies, such as observation checklists or rubrics, to evaluate learners' understanding and proficiency in numeracy concepts through game-based activities.				
21	Ensuring that traditional games are aligned with the curriculum's numeracy objectives and standards.				
22	Incorporating storytelling, historical context, or traditional music and dance associated with traditional games to enhance learners' cultural connections.				
23	Actively involving parents and community members in sharing their knowledge of traditional games or participating in game-based learning activities to enhance cultural relevance and engagement.				
28	Creating visually appealing and culturally relevant resources, such as game boards and cards, to support the use of traditional games in numeracy lessons.				

APPENDIX C

SEMI-STRUCTURED INTERVIEW GUIDE

Examining the types of traditional games used by ECE teachers for teaching numeracy

1. What traditional games do you use in your numeracy lessons?

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2. Why do you choose those traditional games for numeracy activities?

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Early Childhood Education teachers use traditional games in teaching numeracy

3. How do you believe incorporating traditional games into numeracy lessons enhances children's understanding and engagement with mathematical concepts?

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1. In your experience, what specific benefits do you observe when learners participate in numeracy activities that involve traditional Ghanaian games?

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2. Can you share any anecdotes or examples of how the use of traditional games has positively impacted learners' attitudes towards numeracy and their overall learning experiences?

……

……

Strategies for promoting the use of traditional games in numeracy activities

3. Can you describe any strategy that promote the use of traditional games in numeracy instruction within your educational setting?

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4. In your experience, what are some effective methods for introducing new traditional games to learners and ensuring their engagement in numeracy activities?

   ……

   ……

5. How do you assess the effectiveness of using traditional games in numeracy instruction? Are there any specific metrics or indicators you rely on?

……

……

APPENDIX D

INTRODUCTORY LETTER

UNIVERSITY OF EDUCATION, WINNEBA
FACULTY OF APPLIED BEHAVIOURAL SCIENCES IN EDUCATION
DEPARTMENT OF EARLY CHILDHOOD CARE AND DEVELOPMENT
P. O. Box 25, Winneba, Ghana

FES/DECE/I.1

16th November, 2023

The Director
District Education Office
P.O. Box SG 14
South Tong
Sogakope

INTRODUCTORY LETTER

I kindly write to introduce to you **Mr. Peterson Kwasi Mesesah** with index number: **220035191** who is an M. Ed student at the Department of Early Childhood Education, University of Education, Winneba. He is in his final year and has to embark on his thesis on the topic: ***"Effect of Traditional Games on Kindergarteners' Participation in Numeracy Activities in South Tongu".***

Mr. Peterson Kwasi Mesesah is to collect data for his thesis, and I would be most grateful if he could be given the needed assistance.

Thank you.

Yours faithfully,

DR. MICHAEL SUBBEY
HEAD OF DEPARTMENT