

An Assessment of Preparation and Utilization of Instructional Materials in Numeracy Instruction: The Case of Selected Pre- schools in Wukro Town, Tigray

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**COLLAGE OF EDUCATION AND BEHAVIORAL STUDIES
CENTER OF EARLY CHILDHOOD CARE AND EDUCATION**

**An Assessment of Preparation and Utilization of Instructional
Materials in Numeracy Instruction: The Case of Selected Pre-
schools in Wukro Town, Tigray**

By

Haregu Feseha

Advisor: Dr. Abraha Asfaw

Submitted to: The Center for Early Childhood Care and Education

**Thesis Submitted for the Partial Fulfillment of Requirements for
Degree of Master of Arts in ECCE**

July 2024

Addis Ababa

Ethiopia

ADDIS ABABA UNIVERSITY

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Declaration

I, the undersigned, declare that this thesis entitled "*An Assessment of Preparation and Utilization of Instructional Materials in Numeracy Instruction: The Case of Selected Preschools in Wukro Town, Tigray*" is my novel effort and has not been presented for any other prize, and that all sources of materials used in this thesis are appropriately acknowledged. This thesis was approved out under the supervision of my major advisor Dr. Abraha Asfaw Department of Early Childhood Care and Education in Addis Ababa University in 2023/2024 academic year.

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Thesis Approval

The thesis titled “*An Assessment of Preparation and Utilization of Instructional Materials in Numeracy Instruction: The Case of Selected Preschools in Wukro Town, Tigray*” by Mrs. Haregu Feseha is approved for the degree of Master of Arts in Early Childhood Care and Education.

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Addis Ababa

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Acronyms and Abbreviations

<i>WTWEO</i>	Wukro Town <i>Woreda</i> Education Office
MOE	Ministry of Education
UNESCO	United Nation Educational, Social and Cultural Organization
WETB	<i>Woreda</i> Education Training Board
PTA.	Parent and Teacher Association

Abstract

Education is considered as the key for advancement intended at fulfilling the desires and interests of a society. Particularly, preschool teaching gives the foundations for child overall development and affects future achievements and livelihood developments. Consequently, this study assessed the current practices, problems of preparation and utilization of numeracy instructional materials in selected pre- Schools of Wukro Town, Tigray national regional state in 2022/23. The objective of research was mainly focused to documenting current status of the situation to influence policy and practice. . It is also vital to the Woreda and school principals to initiate them to be conscious and responsible for the children's mental and physical development. The study is exploratory and descriptive in its nature due to limited research in the area. The study employed both simple random sampling and purposive sampling techniques in selecting participants. Quantitative data was analyzed using descriptive techniques such as mean; the qualitative data was analyzed qualitatively using thematic approach. The major findings of the study indicated that the current practices of preparation and utilization of the instructional materials of numeracy in the preschools is very low due to many hindering factors like teachers attitude and motivation problems, administration problems, shortage of tools /infrastructures/ lack of attention to the children and others. Finally, motivating and training the teachers, supplying enough tools for the preparation of the materials, solving the administration obstacles, funding enough budget to the preschool as the normal students giving more attention to the preschool children's mental and physical development because of their future generation owners are among the recommendations suggested based on the findings of the study.

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Education is regarded as the center of every civilization, and it is a best instrument for economic, social, and cultural development aimed at fulfilling the needs and aspiration of the society including skill development and their livelihood (UNESCO, 2010). Besides, UNESCO (2002) also indicated that, education is the basis for development. This means it gives chances the individual student to become a thinker, make powerful and accountable dweller. On the other side, education cannot play this role if not it is of highest quality and applicable to the development goals. To be flourishing in the anticipated eminence, suitable use of fabric, human, financial, time, and information resources play a useful role.

The concept of Early Childhood Care and Education, dates back to the 17th century by the Ethiopian philosophers like Zer'aYa'aqob and Waldahaywat (Summar, 1986 in UNESCO 2010). Others connected its advancement to religious education provided to children at the age of four in which children learn alphabet in place of worship services in the medieval Ethiopia. Regarding the time where the stages of formal education began in the church during the medieval period, male children began attending church services at around age four (Birhanu and Demeke, 1995). Formal preschool education, however, remained limited in scope, to the urban areas and operated by private investors. It was following the establishment of the 2010 Early Childhood National Framework that different modalities were introduced including the O – classes, annexed to formal schools that give service to six-year age children in preparation to grade 1.

The government of Ethiopia introduced “O” class and child -to- child programs as preprimary modalities about a decade ago (MOE, 2011). According to the MOE 2011, the government of Ethiopia at that time also involved in developing curriculum, training teachers, supporting availability of instructional materials and providing supervisory support. The registration of pre-school education is increasing every year though under reporting remains a persistent issue in the

kindergarten program of the pre-school education the annual abstract of education statistics of Ministry of Education (MOE, 2011).

The definitive objectives of the 'O' classes is supporting child overall development and school willingness, i.e. making children socially, physically, mentally and emotionally fit for schooling in primary grades MoE (2005). These include variety of objects such as real, representative model sand charts prepared in the form of flashcards, pictures, calendars, toothbrushes, real objects, coins, fruits, balls, video, videotape, soap, musical instruments example drums, sticks, flute, whistles, papers and others to be used during teaching-learning process. In this effort, accessibility and deployment of instructional materials is crucial for instructional efficiency of the children. In this view, the policy document states that, "In order to promote the quality, relevance and expansion of education, due attention should be given to the supply, distribution and utilization of educational materials, education technology and facilities" (MOE, 2011). It has long been recognized that early mathematics competency is not only helpful to later learning in the same subject but also facilitates learning other subjects like chemistry, biology, and physics (Tsegay, Abreha, and Tsge, 2023). In other words, preschool is the basis for unlocking the foundations of learning and has carryover effect in learning in upper grades and beyond.

Unfortunately, in low-income countries like Ethiopia, instructional materials are scare in schools, and mathematics instruction is hardly supported by local materials for better understanding and skill development (Loh, 2002). Though hands on experiences facilitate learning and manipulation of concrete materials make mathematics learning clear and easy to understand, availability and utilization of such materials in classroom instruction is not yet well developed.

Students need to develop the ability to select appropriate instructional materials, electronic tools and computational tasks to investigate mathematical ideas and to solve problems (Loh, 2002). By means of such manipulative to put up demonstrations help learners to distinguish measures and interaction, construct associations between the concrete and the conceptual, examination, modify and corroborate their calculation and this facilitates students make sure the result, and bear in mind how they have worked out a trouble and correspond their way of thinking to others. As to Loh, 2002, instructional materials make concepts concrete, represents abstract ideas with tangible and visible objects, and initiates children to explore their environment, and leaner better.

Doing mathematical perception by means of manipulative make classrooms energetic and it cheers collaboration with a vigorous partaking of all the members of the collection (Loh, 2002). Different studies decided that mathematics accomplishment is increased through the long-term use of concrete instructional materials and that students' attitudes towards mathematics are improved when they have instruction using concrete materials provided by teachers knowledgeable about their exercise (Loh, 2002). Calculating materials can facilitate students recognize mathematical thoughts and procedures, amplify learners' liveness of thoughts, be used imaginatively as apparatus to answer innovative mathematical troubles, and decrease students' nervousness while doing mathematics. Manipulatives are also valuable aids to teachers. By analyzing students' concrete representations of mathematical concepts and listening to their reasoning, teachers can gain useful insights into students thinking and providing support to help enhance their thinking (Loh, 2002). As to him mathematics teachers have intended to use mathematical tools which support mathematical activities such materials as algebra models, kites, dies, geo boards and other locally made teaching aids are essential for advancing the teaching methods.

According to Tsegay, Abreha, and Tsge (2023), instructional materials are specific materials with relevant and up-to-date equipment known as instructional material manipulative, designated for the teaching and learning of mathematics. This means instructional materials be capable of supply to the learning of the subject in the following sense: make available an prospect to students to comprehend and internalize the indispensable mathematical concepts through existing bits and pieces and circumstances, permit students to authenticate or find out more than a few geometrical material goods and facts using models or paper cutting and folding methods, help students to construct concentration and confidence in learning the subject, provide an opportunity to show signs of the relatedness of mathematical concepts with everyday life, afford better capacity for individual participation in the progression of learning and becoming independent learners, supply scope for higher participation of both the mind and the hand which smooth the progress of cognition, allow and encourage the students to think, discuss with each other and the teacher and assimilate the concepts in a more effective manner and enables the teacher to demonstrate, explain and reinforce abstract mathematical ideas by using concrete objects, models, charts, graphs, pictures, posters T. Abreha, T. and Tsge, B. (2023). Thus, this research topic is selected by the researcher because there were complains which were heard from teachers and non-teaching staff

regarding preparation and utilization of instructional materials in mathematical or numeracy instruction.

1.2 Statement of the Problem

Studies in low-income countries show that status of learning is low, and preprimary is the best stage for intervention. Efforts are also on move to restructure education systems to ensure responsiveness to cultural contexts and thereby improve learning (HICKLING-HUDSON, 2006; SHIZHA, 2006; WOOLMAN, 2001). One of the intervention areas in this regard is enhancing use of local materials in classroom instruction.

Instructional materials, with a limited help from the teacher, have lots of contributions for the development of students' active learning by facilitating practical, independent and interactive learning MOE (2013). Students can learn and be engaged in the learning tasks with a minimum help from the teacher (Teheranian et. al., 1997; Reddy, 1996). According to MOE (2013), instructional materials are learning resources used by the teacher or learners or both in classroom teaching to enhance understanding. They therefore assist to formulate teaching and learning more valuable. As to MOE (2013), using appropriate instructional materials will go a long way to help learners understand abstractions and help improve their attitude toward learning. This indicates that the significance of using instructional materials in the teaching and learning of mathematics can by no means be above highlighted. Rather, it can both augment sympathetic of mathematical impressions and also arouse students' attention in mathematical learning.

Instructional materials that are used during teaching learning process in pre-schools have victorious outcome on escalating children's academic performance before amalgamation to the formal education MOE (2013). Thus, knowledge of how these instructional equipment are correctly organized and utilized in the education system will be incredibly significant. In support of this idea, Montessori (1897) developed educational theory, early life in Italy. She believed that the learning environment was just as imperative as the learning itself. The most favorable circumstances in the order of children allocate for and hold up their true natural development. Enrollments have to be arranged with meticulous series of scientifically developed materials, the equipment that are consistently organized by subject, degree difficulty & complexity (Montessori, 1897). All materials are displayed on open shelving and freely available for use, and to stimulate

natural instincts and interests of children in the classroom (Montessori, 1897). Montessori also believes education ought to be developmentally oriented and each child should develop in self-discipline and self-direction. Montessori trained a number of teachers how to guide children's learning. The teachers' role is to observe children engaged in activities, to make children ready for a new challenge and enhance independent learning. She also explains that children make mistakes; However, there is no need to raise teacher's voice; instead, the teacher should calmly recognize the mistakes. This means there is no need to blatantly point out child's mistake; there is a way to make them realize it. From her application about humanizing kids, we can appreciate that, the students gain knowledge of through practices that engage investigation, manipulations, instructions, duplication, obstruction, and communication.

A teacher has to encourage children to use their senses to explore and manipulate materials in their immediate environment (Antoni & Heineck, 2012; U. S Department of Education, 2008). As to them teacher's foremost what they have to do is to observe over the environment, and this takes measures over all the rest. However, research on preparation and utilization of instructional materials in general and in numeracy classes in particular in Ethiopia is scarce. Evidence also shows that preschool education as a subsystem was left for private investors, and it remained to be a phenomenon of urban than rural areas. It is only recently that the administration is increasing 'O' classes, reasonably priced one year school willingness program, aimed at enhancing the holistic development of children. The researcher, therefore, planned to study the availability and use of instructional materials in this newly introduced model which is called 'O' class in government subsidize surroundings and schools. Even though numeracy is introductory ability; numerous children realized low in it and are professed as hard subject. Numeracy learning situates a foundation for human capability development, learning in other subjects and in upper grades (Antoni & Heineck, 2012; U. S Department of Education, 2008). Thus, numeracy education is a key for excellence improvement and wants appropriate instructional support for successful responsiveness. It was in this sympathetic that this investigation was initiated with center in accessibility and employment of instructional materials in chosen preschools in numeracy situations.

Preschool mathematical applications referred in this paper are practices that take place before opening formal teaching in the well-known apprenticeship situation exclusive of the formal

composite. These social, cultural, and historical conditions that subsist in the students' surroundings characterize and figure students and their mathematical related experiences. Conditions that can affect the classroom teaching and learning in a formal class extensively investigated in the past few decades in many countries of the world (BISHOP, 1997; ZHANG, 2010). Unfortunately, evidence on preprimary school mathematics instructional material preparation and utilization in Ethiopia is scarce, and evidence on how teachers organize, and children learning is thin and calls for more studies to inform practice, policy and even research in the area. Cherinet (2008) provides supportive findings that the low achievement and dislike of the subject mathematics in most Ethiopian schools is due to the lack of relevance of the mathematics instruction in schools.

To this end, with the purpose of accessing the preparation and utilization of mathematical instructional materials in relation to their preschool mathematical activities, the researcher investigated this study. The researcher as an employee in the study area and working as an expert also felt as there is scarcity of instructional materials in the preschools specifically in numeracy classes. Though preparation of materials from local resources for counting, comparison of length, shapes etc. are relatively simpler, anecdotal data shows still scarcity in classroom uses. Therefore, this study was intended to investigate into the status of preparation and utilization of instructional materials in numeracy instruction in the selected preschools of Wukro town.

1.3 Research Questions

Based on the concerns of the research to understand the level of preparation and utilization of numeracy instructional materials in preschool setting, this study was guided by the following basic questions:

1. What is the current practice of preparation and utilization of instructional materials in numeracy instruction in governmental pre- Schools of Wukro Town?
2. Are there functional materials on the preparation and utilization of instructional materials in numeracy classes of the preschools?
3. What are the major factors that hinder the preparation and utilization of instructional materials in numeracy instruction in the study area?

1.4 Objectives of the Study

1.3.1 General objective

The general objective of this study was to investigate the current practices and problems of preparation and utilization of instructional materials in numeracy instruction in the selected governmental pre- Schools of *Wukro* Town, *Tigray* national regional state and forwarded suggestions for the solutions.

1.3.2 Specific objectives

The specific objectives of this research are:

1. To assess the current practice of preparation and utilization of instructional materials in numeracy instruction in the selected governmental pre- Schools.
2. To examine the present functional materials for preparation and utilization of instructional materials in numeracy instruction in the governmental pre- Schools.
3. To identify the major factors that hinder the preparation and utilization of instructional materials in numeracy instruction in the selected governmental pre- Schools.

1.5 Significance of the Study

The findings of the study may possibly afford information for regional and zonal educational officials, policy makers about the existing condition of the available and effectual preparation and utilization of instructional materials in numeracy instructions, and help them to play their role to get better preparation and utilization of instructional materials in numeracy instruction in the selected governmental pre- Schools of *Wukro* Town, *Tigray* national regional state. It may possibly also provide applicable and appropriate information to school principals how preparation and utilization of instructional materials in numeracy instruction is being approved out in the selected pre- Schools. Besides, the study is painstaking to create consciousness among members of *Woreda* Education and Training Board (WETB) and Parent Teachers Association (PTA) of the existing problems and to take common responsibility for the proper preparation and utilization of instructional materials in numeracy instruction. Moreover, it may show them (PTAs and WETB) the better solutions of preparation and utilization of instructional materials in

numeracy instruction that will be used by students, teachers and staff members who are supporters of pre-school in *Wukro* Town. Ultimately, the study may serve as a starting point for other researchers who are interested to do their research in this and other areas more detailed and broaden.

1.5 Delimitation of the Study

To make the study more manageable and feasible, out of sixteen governmental and nongovernmental pre- schools in *Wukro* Town, *Tigray* national regional state the study delimited to five governmental pre-schools. These are *Debrenihigo, Millenium, ksanet, Selam, and Zikre Semaetat* Pre-schools. The study mainly covered the study time of 2023/24. This helped the researcher to get relevant information on the status of preparation and utilization of instructional materials in numeracy instruction that enriches the study.

1.6 Operational Definitions of Key concepts

Instructional materials: are defined as a variety of material in any format which influence the student's learning and teacher's teaching and used to ease, encourage, improved and promote teaching and learning activities. It may include real objects, models, charts, and pictures, improvised or commercially produced.

Numeracy: the ability to reason and apply numerical concept to our daily lives. It also integrates problem solving, decision-making, logical thinking, and understanding of credentials.

Preparation: do something of preparing, getting ready, planning, training or studying with an objective in mind.

Pre-school: an early childhood program in which children mingle learning with play in a course run by professionally qualified adults.

Utilization: The process of using instructional materials successfully.

1.7 Organization of the Study

The study was organized into five chapters. The first chapter deals with the background of the study, statement of problem, objective of the study, significance of the study, scope and delimitation of the study. The second chapter provides review of related literature. Chapter three contains research design and methodology. The fourth chapter also deals about presentation, analysis and interpretation of the collected data. Finally, the last but not the least chapter presents about summary, conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 The Concept of Instructional Materials

Various studies have been done concerning pre-primary education and the utilization of instructional materials UNICEF, (1979). Most of these studies have involved surveys in different pre-primary schools in different areas which are owned by different people, institutions and the government. Instructional materials are any kind of aids that assist in the teaching and learning activities, which include reference books, counting equipment like blocks, stones or beads, natural displays models, charts, pictures, play materials, games, audio visual equipment UNICEF, (1979).

Bruner (1973) says that the teacher's work as communicator, model and identification figure can be supported by a wise use of variety of devices that expand experience, clarify it and give it personal significance. Similarly, Obanya, (1989) viewed instructional materials as didactic materials-things which are supposed to make learning and teaching possible while according to Johnson (1989) instructional materials are the collections and selection of resources (mechanical, otherwise) from available resources which are applied and integrated into a systematic process of teaching and learning to make learning effective. Ikerionwu (2000) defines instructional materials as objects or devices, which help the teacher to make a lesson more understandable to the learner.

Learners be inclined to understand easily diverse concepts if instructional materials are used. Instructional materials therefore are concrete or physical objects which make available sound, visual or both to the sense organs during teaching whereby many students tend to contribute practically to the teaching and learning process.

Azikiwe (1998) as cited in Doublegist (2013), define instructional materials to be all the devices that affect the five sense organs (sight, learning, hearing, touch, smell and taste) while presenting his/her lesson and are very important in teaching pre-primary school because they facilitate the direct association between concept and their symbols and also words and the objects they represent. Ayuackgbuo (2000) defines instructional materials are those materials or resources employed by the teacher to make teaching and learning process effective and productive.

According to Obemeata (1999) instructional materials are those things that promote the effectiveness of instruction during teaching and learning process. The use of teaching materials according to him makes teaching real and concrete and is one of the significant developments in the field of teaching. Ezeja (2000) as cited in Doublegist (2013), on his own view on the use of instructional materials asserts that “it helps the teachers to achieve effectively and makes teaching easy for the learner to understand the lesson very practical and lively page”. This means that instructional materials enhance operative teaching and learning. Instructional materials when properly used are very helpful to make ideas and concepts clear. They can move up learning from articulation to true indulgent and also make learning more concentrated.

Ogwa (2002) observed that “a teacher that uses teaching aid to deliver his or her lesson will cover more facts at short intervals than one who uses only oral speeches for lesson delivery.” So, when instructional materials are used, students can distinguish and conceptualize what is being trained much easier than nothing is used of when teaching materials are not used.

According to Abdullahi (1982), instructional materials are materials or tools locally made or imported that could make tremendous enhancement of lesson impact if intelligently used. As to Abdullahi (1982), in most cases many learners have the complicatedness in understanding assured concepts as a result of their level of cognitive operation. It is against this background that Jean Piaget postulated human beings to be classified along sensory-motor, pre-operational, tangible and conceptual cognitive levels, (Abdullahi 1982).

2.2 Teachers' Differences on the Utilization of Instructional Materials

Teachers have many differences in using instructional materials in their classroom situations. For example, Results or much research indicated that less qualified and less experienced teachers tend to utilize instructional materials more than the teachers with a higher qualification and a longer teaching experience. Moreover, except TTI qualified teachers, all non-government schoolteachers utilized instructional materials more than the teachers in government schools. Lack of training, time constraints, large class size, administrative problems and lack of instructional materials were reported as the main obstacles to use instructional materials in government sponsored schools.

2.3 Importance of instructional materials for pre-school children

Instructional materials which are developmentally suitable, adequate and environmentally relevant in the socio-cultural spheres of a child are central to constructive and productive learning for cognitive, affective and psychomotor domains development (Santrock, 2004). Instructional materials play substantial roles in the teaching and learning process. Agwu, (2005) as cited in Doublegist (2013) stated that instructional materials management is a crucial component of the entire classroom control and management. This is because the excitement is usually generated by the introduction of instructional materials can generate a lot of noise, undue movement of pupils, chairs and tables but make the student participate in the lesson. The instructional materials and aid are used to supplement and complement the teacher verbal effort. Ogwa (2002) also viewed that a teacher who uses teaching to deliver his/her lesson will convey more facts to the students at short intervals. According to Azikiwe (1998), as cited in Doublegist (2013) "Appropriate instructional materials have been found to be a very important tool for every teacher must use in teaching learning process". He further outlined various importance of instructional materials that: they supply a concrete basis for conceptual thinking and reduce meaningless words, responses of pupils, they have a high degree of interest for pupils, they make learning more paramount, they offer a reality or experience which stimulates self-activity on the art of pupil, they develop a continuity of thought and this is especially true of motion pictures, they provide experience not easily obtained.

According to Wilkinson (1971), instructional materials help the teacher to manipulate the instructional activities, whereby the teacher may illustrate ideas in a concrete way. Cartledge and Milburn, (1986) explained that instructional materials employed by the teacher during instructional process act as a vehicle for teaching. So, it is important that pre-primary schools are well supplied with appropriate and sufficient instructional materials to facilitate constructive and productive learning in children. With the consideration that public preprimary school enroll most of the children from low-income families therefore the school should provide the children with better opportunities to grow healthy both mentally, physically and socially. Brown (1997) as cited in Doublegist (2013) also outlines the importance of instructional materials as follows: to get and hold the learner's attention, to provide for a direct interaction of students with realities of social and physical environment, to re-enforce verbal message, to promote greater acquisition and longer retentions of factual knowledge, to provide opportunities for independent and individual learning.

Instructional materials are used to aid and facilitate teaching process for better understanding of concepts (chepkemoi, 2012). In his study suggested some importance of instructional materials which are: to stimulate learner interest and attention in pupils throughout the lesson to make learning real and enjoyable for children when they manipulates the learning materials, to play with the materials, it helps in the development of body muscles as children manipulate teaching materials, it helps in class control that children can be kept busy in handling materials even in the absence of the teacher it help children engaging in their learning activities by observing materials displayed on walls while others observe pictures of different kinds which make children to be more creative and imaginative.

Dale (1996) has also cited the following as importance of instructional materials: they supply a concrete basis of conceptual thinking and hence reduce meaningless words in responses of students, they make learning more permanent, they often provide a reality of experience, which stimulates self-activity on the part of the students.

From the literatures above, it can be noted that appropriate use or application of instructional materials play a very important role in helping students' understanding of the lesson and over all development of the learners in general.

According to Enuokoha and Umoren (2004) the usefulness of instructional materials in the teaching-learning process is highlighted as: facilitate the learning of abstract concepts and ideas, keep the learners busy and active thus, and increase their participation in the lesson, save teachers' energy and time in helping children through verbal talk, illustrate the concepts clearer and better, help to overcome the limitations of the classroom by making concepts concrete and appropriate to the experiences of the children, discourage rote learning and stimulates further learning

2.4 Preparation of Instructional Materials from Locally Available Resources

There is evidence from the extensive international literature that difference in student learning Outcomes are generally attributed to several child, school and household characteristics (e.g., Glewwe et al., 2017; Hungi et al., 2017; Iyer et al., 2020). Evidence shows inequality in learning

due to nutritional status, parental education, hours spent studying and doing homework (Iyer et al., 2020). However, there is a dearth of empirical evidence in the context of pre-primary school education in Ethiopia on factors associated with differential learning progress among students within an academic year. Particularly, national studies on preprimary learning outcomes that investigate child, home and school factors are limited. The same is true that good preparation of instructional materials from locally available resources can accelerate students' learning. As a result, instructional materials of numeracy like number flash cards, if possible enough sets for each group counters, like bottle tops, matching games, mathematics bingos, mathematics dominoes etc. can easily prepare from locally available resources such as wood, stones, sticks, metal, soil and other resources.

Early grade education is basic and necessary for preparing students for their future education and life. Therefore, paying attention for early grade mathematics education has a multidirectional contribution to the quality of education in a country. To make learning successful, using instructional materials is fundamental and essential. Such instructional materials can be prepared from locally available resources like wood, stone, plastics, glasses, metal and others according to the environment surrounding the children's preschool. Bishop (1997) defines mathematics as culture driven symbolic technology that relates man to its environment. Mathematics is important in everyday life, home, workplace, play/game, science and technology, medicine, economy, education and so on. This importance can be a good reason for teaching mathematics in schools
BISHOP, A. J., 1997.

2.5 Utilization of Locally Prepared Instructional Materials

As described above, proper utilization of instructional materials helps both teachers and students. For teachers, it helps them to ease their classroom burden and achieve their learning objectives more systematically through the involvement of children in relevant experiential learning schemes. Azikiwe (1998) as cited in Doublegist (2013) suggests four parameters of using instructional materials effectively: (a) be related to the topic of the lesson, (b) be within the age and maturational level of the learners-bold and colorful areas at pre-school level, preview by the teacher before the actual lesson to ascertain that everything is in order, and (d) be accurate in content and acceptable

in other places for the same lesson. Ughamandu, (1992) had also of the same view and had outlined six ways by which instructional materials should be utilized: preview the material, plan; previewing will enable the teacher to plan effectively the method of using the selected media, arrange the materials, prepare the class, presentation and follow-up activities.

Instructional materials when properly used, can supply concrete basis for conceptual thinking and reduce meaningless word responses of pupils making learning more permanent, have a high degree of interest for the pupils, develop a continuity of learning like in motion pictures, contributing to meaning of words and hence to vocabulary development, provide experiences not easily obtained by other materials and they contribute to the effectively, depth and variety of learning.

2.6 Classification of Instructional Materials

Instructional materials have been named differently by different authors. The naming shifted from instructional aids to curriculum materials and then to learning resources over time. Ughamadu (1992) indicated that instructional materials can be in different forms”:

- (a) printed material (examples: textbooks, journals, posters) and projected materials such as chalkboard, flannel boards, models and projectors.
- (b) audio or aural, visual or audio-visual. While audio instructional materials refer to those devices that make use of the sense of hearing only, like the television, radio, audio tape recording, etc, visual instructional materials are those devices that appeal to the sense of sight only such as the chalkboard, chart, slide, filmstrip, etc. An audio-visual instructional material therefore is a combination of devices which appeal to the senses of both hearing and seeing such as television, motion picture and the computer.

This does not mean that these are the only ways of classifying instructional materials. The classification may vary in time, place or objective of instruction. In any case, materials that make the learning process concrete, direct, involving, stimulating, and personal fall under the category of instructional materials irrespective of their physical forms or representations.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Research approach and design

A descriptive research approach was employed in this study. This approach was selected for the reason to enable the researcher to obtain current information about the preparation and utilization of instructional materials in numeracy instruction. In addition, since this study made use of both qualitative and quantitative data, a mixed research design was employed to triangulate findings of the research obtained from different data collection tools. According to Jonson and Onwuegbuzie (2004) mixed research design is the type of research design where, the researcher mixes or combines quantitative and qualitative research techniques, methods approaches, concepts or language to draw valid conclusions.

3.2 Sources of Data

The sources of data for this study included classroom instructions, teachers and directors and vice directors; secondary sources were relevant documents in the area. Accordingly, observation, questionnaire and interviews were used to obtain primary data from classroom instruction, teachers and principals, and schools' supervisor and the *Woreda* education office expert respectively. Questionnaire and interview formats were used to capture the perceptions of the relevant data sources regarding what types and how instructional materials are prepared and used based on their experiences. Moreover, documents in the pedagogical centers on preparation and borrowing instructional materials were used as additional sources of data for the study.

3.3 Sampling Technique and Sample Size

The study has been conducted at governmental preschools in *Wukro* Town, *Tigray* national regional state. As per the data obtained from *Wukro* town education office, there were 16 functional private and governmental preschools at the academic year when data collection was held. The researcher selected five (31%, about one-third of the total) using simple random sampling technique. Accordingly, *Debrenihigo, Millenium, Ksanet, Selam, Zkresemaetat* Preschools are the sample preschools for this investigation. Within these preschools, there are 186 teachers, 5 principals and 10 vice principals, two *Woreda* Education Office expert and one cluster supervisor. While teachers (35) were selected randomly using simple random sampling technique, the available Principals and vice principals, has been included by using purposive sampling technique. The cluster supervisor and *Woreda* education office expertise also were included purposely by using convenience sampling to triangulate the data from the preschools.

The study area comprised a total of 204 population and from these population, the researcher selected 35 (18.8%) of the teachers, 5 (100%) of the principals, 10 (100%) vice principals and the available cluster supervisor and the *Woreda* education office expertise for the study. Generally, the sample respondents in this study were summarized in the table below.

Table 1 Sample size of the study

<u>NO</u>	Sampled preschool	Total no of teachers	Sample teachers	Principals and vice principals	<i>Woreda</i> experts and supervisors
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		M	F	T	M	F	T	M	F	T	M	F	T
1	<i>Debrenihigo,</i>	13	18	31	3	4	7	2	1	3	2	1	3
2	<i>Millenium</i>	19	20	39	2	4	6	3	0	3			
3	<i>Ksanet</i>	22	26	48	4	5	9	2	1	3			
4	<i>Selam</i>	20	23	43	2	4	6	2	1	3			
5	<i>Zkresemaetat</i>	10	15	25	3	4	7	3	0	3			
Sub total		84	102	186	14	21	35	12	3	15	2	1	3
Total											28	25	53

3.4 Data Collection Instruments

To assure the validity of instruments for data collection, expertise opinion was solicited from different scholars regarding developing questionnaires. The pilot study was on teachers, principals and vice principals which were found in conducted at *kisanet* governmental preschool of *Wukro* town who were believed to be in a position to provide relevant inputs regarding preparation and utilization of instructional materials in numeracy instruction. The investigator also used different dimensions to cross-check different data collection mechanisms via questionnaires interview and observation.

3.4.1 Questionnaire

Questionnaire has been used as the main source of data gathering tool from selected teachers for collecting the data related with the issue under study as it enables to reach and succeed the stated objectives and the dispersedly located sample preschools to collect relevant data. Mutually open and close ended items were set and administered for the sample appraises and appraisers. The respondents indicated the extent of their attitude to a particular behavior or practice by choosing one of the five options, degree of agreement or disagreement, through a five-point Likert scale. In order to establish content validity care was taken while designing the questionnaire and framing of each question to maximize opportunity for complete and accurate communication of ideas with the respondents was made. To make the questions more understandable, attempt was made to provide clear directions on the questionnaire concerning mode of reaction. The researcher used questionnaire as a major instrument to collect information from the data source of the study. It

was prepared in order to collect data from selected teachers because of its relevance to answer the earlier stated basic research questions. Questionnaire has been prepared with closed and open-ended types of questions. The required data for this study has been collected by distributing open-ended questionnaire to the selected samples which enable the researcher to get the relevant information. As a result, the sample teachers at the selected schools and the directors and vice directors of the schools were supplied with questionnaires.

3.4.2 Interview

The other tool that the researcher applied to collect relevant data from the sample respondents was an interview. These instruments were supplied to the *WEO* supervisor and the *WEO* expertise which were selected purposefully. Checklists were prepared to be asked for the respondents by the researcher to be an initial idea for the triangulation of the data collected using other instruments.

3.4.3 Observation

A checklist was prepared to observe and check the available data for preparation and utilization of instructional materials in numeracy instruction in the selected preschools. The checklist was used to identify the nature of instructional materials prepared (counting materials like locally known as *gebeta*, geometric shapes and other materials) that helped to run on the numeracy teaching learning process of the preschool children.

3.5 Data Analysis Techniques

Reliable data collected through questionnaire, observation, document analysis and interview has been analyzed using both quantitative and qualitative methods of data analysis. The data gathered through questionnaire from teachers and head teachers has been organized, tabulated and described quantitatively, using frequency and percentages and the mean. The data obtained through close ended questions has organized and presented in tables and figures whereas the data collected through observation and interview has been analyzed in narration under each category in a descriptive way through triangulating the quantitative data.

CHAPTER FOUR

DATA ANALYSIS, DISCUSSION AND INTERPRETATION

4.1 General Profile of the Respondents

The sample respondents in the research were 53 of which 35 were teachers, 5 principals, 10 vice principals of the schools one cluster supervisor and two from the *Woreda* education office expertise. Of these participants 28 are male and 25 are females. The lowest and the highest age groups of the respondent teachers and principals are 18-25 years and 26-33 years and 50-57 and 42-49 years respectively. The educational status of the teacher respondents ranged from diploma holders to degree holders whereas educational status of the school principals was all in degree holders. The supervisor and the expert from the *Woreda* education office were also included in the column of principals in the table 2 below. The work experience of the respondents in the study ranges from 6-10 years of lowest work experiences to 16-20years of the highest work experiences to both the teachers and the principals. Large percentages of principals are in the highest work experiences than the teachers as table below indicated. Generally, the sex, age, educational status and work experience of the respondents are presented in table one below.

Table 2 The General profile of the respondents in the study

Sex composition						
No	Teachers			Principals		
	Sex	F	%		F	%
1	Male	14	40.0	Male	13	73.3
2	Female	21	60.0	Female	4	26.7
	Total	35	100.0	Total	17	100.0
Age						
No	Teachers			Principals		
	Age Group	F	%	Age Group	F	%
1	18-25	1	2.9	< 26	-	-
2	26-33	6	17.1	26-33	2	13.3
3	34-41	18	51.4	34-41	11	63.3
4	42-49	7	20.0	42-49	4	26.7
5	50-57	3	8.6	> 49	-	-
	Total	35	100.0	Total	17	100.0
Educational Status						
No	Teachers			Principals		
	Education	F	%	Education	F	%
	Below Certificate	-	-	Below Certificate	-	-
	Certificate	-	-	Certificate	-	-
	Diploma	32	91.4	Diploma	-	-
	degree	03	8.6	degree	17	100.0
	Above Degree	-	-	Above Degree	-	-
Work Experiences						
No	Teachers			Principals		
	Years	F	%	Years	F	%
1	6-10	7	20.0	6-10	2	13.3
2	11-15	21	60.0	11-15	9	60.0
3	16-20	7	20.0	16-20	6	26.7
	Total	35	100.0	Total	17	100.0

• **F = Frequency**

• **% = Percent**

4.2 Practices of Preparation and Utilization of Instructional Materials in Numeracy

4.2.1 Preparation of Instructional Materials in Numeracy

The preschools in *Wukro* town have extreme shortage of sufficient instructional materials to teach numeracy for the preschool children as the majority (about 86%) of the respondents replayed no sufficient instructional materials in the preschools to teach numeracy. The data from the observation also indicates that there are no sufficient instructional materials to teach numeracy in the preschools' pedagogical centers or the classes of the preschool children. Bering in mind this the teachers in the preschools are not preparing instructional materials to teach numeracy too as most of them (80%) replayed in their questionnaire negatively to their preparation. The reason for their poor preparation as most (above 57%) replayed is it needs finance for preparation. Significant number of teachers (35%) also replayed to this problem as they do not have skills for the preparation of the teaching aids of numeracy for their preschool children

Table 3 Teachers' Response on the preparation and utilization of instructional materials of numeracy for their preschool children

No	Items	1 = Strongly Disagree 2 =Disagree 3 = Undecided 4 = Agree 5 = Strongly Agree F = Frequency										Mean
		1		2		3		4		5		
		F	%	F	%	F	%	F	%	F	%	
1	I prepare instructional materials of numeracy to use children in their daily life.	5	14.3	18	51.4	3	8.6	4	11.4	5	14.3	2.6
2	I prepare and choose instructional materials of numeracy as to serve the purposes of my lesson carefully.	5	14.3	4	11.4	9	25.7	8	22.9	9	25.7	3.34
3	The Instructional materials I utilize in my class are relevant to the lessons I used to illustrate	2	5.7	1	2.9	7	20	7	20	18	51.4	4.08

4	Instructional materials of numeracy prepared for use help to both the fast and slow learners	6	17.1	6	17.1	9	25.7	5	14.3	9	25.7	3.14
5	There are a lot of local instructional to teach numbers in our pre-school.	10	28.6	19	54.3	1	2.9	2	5.7	3	8.6	2.11
3	Instructional materials of numeracy are always presented properly at the appropriate time in my teaching preschool class.	1	2.9	10	28.6	9	25.7	9	25.7	6	17.1	3.25

The preparation of instructional materials to use children in their daily life is low that more than 74% of the teacher respondents replayed negatively to their preparations. The mean score for this response is 2.6. This means that the response of the respondents is in the lower values. Similarly, the data from the interview of the principals also indicate the preparation of instructional materials for the preschool children is almost none. This indicates as the focus given to the development of the children in the schools is low. The teachers' response to their preparation of instructional materials to use the children in their daily life is indicated also as follows.

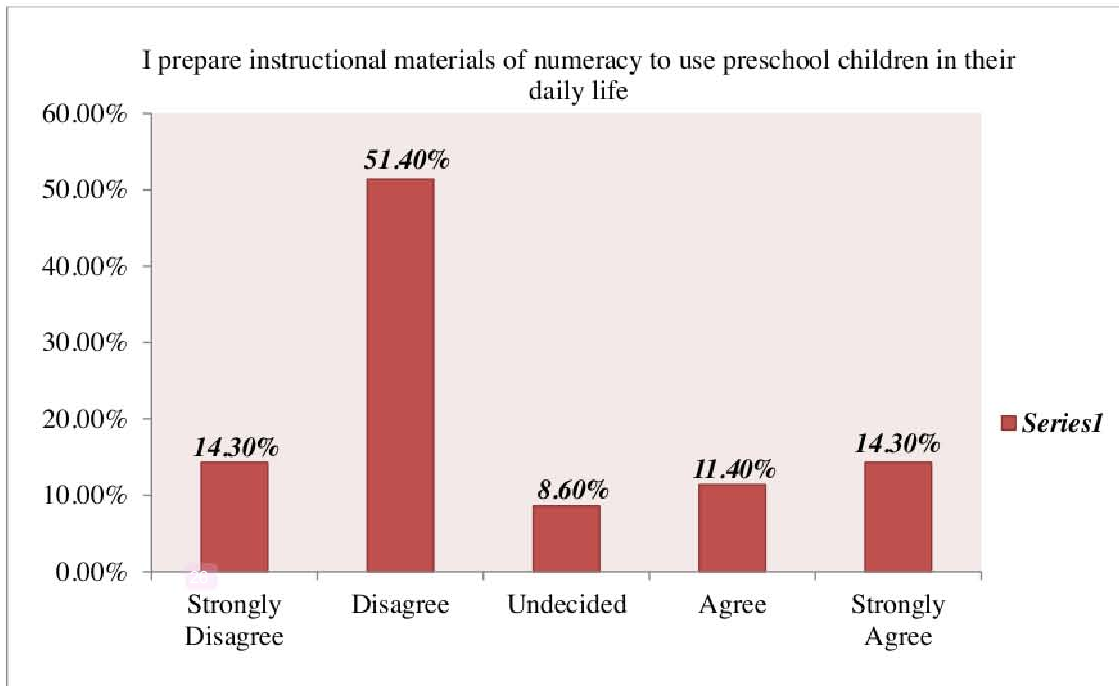


Figure 1 teachers' response to their preparation of instructional materials of numeracy to use the children in their daily life

The preparation and availability of instructional materials for teaching numeracy in the preschools is very limited as indicated in the above (table2). The table indicates that about 86% of the respondent teachers replayed as there are no local instructional materials to teach numbers in the pre-schools.

The utilization and preparation of instructional materials of numeracy to the preschool children is also less to serve the purposes of the daily lesson carefully as the mean value of the teachers' response is 3.34 and more than half of their responses are negatively. In this regard the data from the researcher's observation indicates that the teachers are too late to succeed the purpose of the lesson in utilizing the instructional materials of numeracy in their classes. Most of the teachers are careless to know the children's knowledge about their daily lesson.

Teachers in the preschools utilize their instructional materials of numeracy in a relevant way to the lessons they used to illustrate as more than half (60%) of them responded positively. But the data from the classroom observation of the researcher indicates that there was no instructional material aid to teach numeracy. The classes for the preschool children were almost empty of instructional materials of numeracy. As a result, utilizing instructional materials of numeracy in a relevant way to the lessons they used to illustrate is impossible with the absence of the instructional materials of numeracy.

More than 60% of the teacher respondents replayed negatively as the instructional materials of numeracy prepared for use do not help to cater for individual differences among the preschool children. They are simply for the principals' visualization not to punish the teachers and not intentionally prepared for the children's mental development. But about 40% of them replayed yes off course the instructional material of numeracy prepared for use help to both the fast and slow learners.

Principals of the schools replayed as the teachers do not often use instructional materials of numeracy in their teaching. They simply went let them to play in the field with their peers. The other data from the observation and interview also indicates similar with the principals' responses.

For more illustration, the schools' principals' responses on this issue are displayed in the following chart.

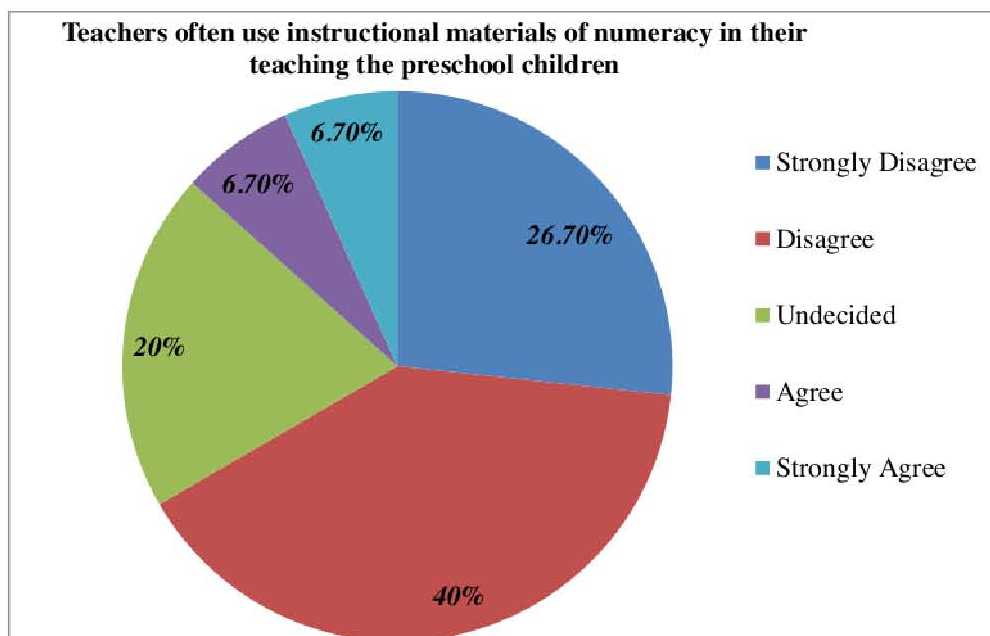


Figure 2 Principals response on teachers teaching by using instructional materials of numeracy

Instructional materials of numeracy in the schools are not prepared to develop in the children's desirable habits and attitudes like habit of hard work, self-reliance, concentration and discovery as 80% of the principals replied negatively with the mean score of 2.8 on this issue. The data from the observation and interview also indicated similar to the above data. In this case since there are no deliberately prepared instructional materials of numeracy for the preschool children in the schools, it is difficult to evaluate them to their preparation to develop the children's desirable habits.

Instructional materials of numeracy are not practically presented properly at the appropriate time in the preschool class as more than 57% of the teacher respondents replied negatively. Another data from the observation and interview also replayed complementary ideas to this. Even there are no more instructional materials of numeracy in the schools. As a result, because of their absence and other factors there is no appropriate use of the materials in the preschool classrooms.

4.2.2 Preparation and utilization of instructional materials in numeracy instruction

The Teachers' Knowledge and awareness about the presence and effectiveness of instructional materials of numeracy towards preschool teaching of numeracy is very limited as the majority (about 86%) of the respondent teachers replied negatively on the positions of strongly disagree, disagree and undecided for the questionnaire asked if they read and know more about the preparation and utilization of numeracy materials prepared towards the preschool teaching in numeracy. But the data from the interview of the *Woreda* Education Office Expertise and the supervisor responses are different from the teachers' response in the questionnaires that they responded as they know well and read it deliberately. In this regard majority (60%) of the principals of the schools also responded as they did it. But significant numbers of principals (40%) do not know and read about the preparation and utilization of materials towards teaching numeracy in preschools. The main problem here is indicated from teachers or may be from the principals and the *Woreda* office to aware the teachers about the preparation and utilization of such materials. But the data from the document observation indicated that there are some materials of teaching in preschools in general but not specifically for teaching numeracy. This indicated that the practice, preparation and effective utilization of such materials in preschool classes is lagged behind starting from the teachers up to the principals.

Table 4 Teachers' response on their knowledge and awareness on the guidelines of teaching instructional materials of numeracy

No	Items	1 = Strongly Disagree 2 =Disagree 3 = Undecided 4 = Agree 5 = Strongly Agree F = Frequency										Mean
		1		2		3		4		5		
		F	%	F	%	F	%	F	%	F	%	
1	I read and know about the preparation and utilization of numeracy towards pre-school children in teaching numeracy	9	25.7	20	57.1	1	2.9	4	11.4	1	2.9	2.08
2	The instructional materials available in our pre-school help the children to place great emphasis on	9	25.7	13	37.1	7	20	3	8.6	3	8.6	2.37

	the meaning and build capacities on mathematics for the future.											
3	The instructional materials of numeracy prepared are appropriate with the preschool real environment	2	5.7	3	8.57	24	68.5	4	11.2	2	5.7	2.77
4	The instructional materials of numeracy prepared are considered the overall personalities of the children/ age socio economic and developmental stages	9	25.7	11	31.4	4	11.4	7	20	4	11.4	2.6

There are no instructional materials of numeracy in the preschools to help the children give great emphasis on mathematics for the future. As indicated in the above (table 3) about 83% of the respondent teachers replied as they have no confidence on the instructional materials of numeracy available in the pre-schools help the children to place great emphasis on the meaning and build capacities on mathematics for the future. Similar data are received from the interview that the instructional materials of numeracy are not that much help full to help the children build and give great emphasis on mathematics for their future.

The instructional materials of numeracy prepared for the preschool children are not with the consideration of the children's real environment as the majority (above 73%) of the principals replied. The response of majority (above 68%) of teachers for this is also in the position of undecided because they don't know the materials as explained earlier. The other data from the observation of the assessment of prevalence of instructional materials of numeracy in the preschools indicates that the materials are scarce and almost none to fit with the children's real environment. There were also no additional suggestions that give direction to teachers to redirect the materials to their real environment.

As indicated in the above (table 3) the instructional materials of numeracy were not prepared in consideration to the overall personalities of the children/ age, socio economic and developmental stages. In this issue more than 68% of the respondent teachers and about 80% of principals argue that the instructional materials of numeracy in preschool teaching were more complex and vaguer to understand and to implement on the preschool children in specific classes.

4.2.3 Major Factors those Hinder the Preparation and Utilization of Instructional Materials in Numeracy Instruction

Table 5 Teachers response on the major hindering factors in the preparation and utilization of instructional materials of numeracy instruction

No	Item	<i>1 = Strongly Disagree 2 = Disagree 3 = Undecided 4 = Agree 5 = Strongly Agree F = Frequency</i>										Mean
		1		2		3		4		5		
		F	%	F	%	F	%	F	%	F	%	
1	The school administration is interested to purchase instructional materials of numeracy for our pre-school teaching.	9	25.7	12	34.3	2	5.7	5	14.3	7	20	2.68
2	The school community equally focuses for the instructional materials of numeracy for the normal students and pre-school materials.	9	25.7	11	31.4	2	5.7	6	17.1	7	20	2.74
3	Teachers' attitude towards mathematics significantly affects the preparation of instructional materials in numeracy.	2	5.7	4	11.4	9	25.7	9	25.7	11	31.4	3.65
4	There are enough basic materials of numeracy that are used as tools for preparation of instructional materials in our school.	4	11.4	17	48.6	3	8.6	8	22.9	3	8.6	2.68
5	The instructional materials of numeracy we prepare are clearly visible to the preschool children.	3	8.6	18	51.4	7	20	3	8.6	4	11.4	

Among the major factors that hinder the proper utilization of instructional materials of numeracy is their absence. There are not enough teaching aid materials of numeracy for the preschool children as the data from the observation indicated. It is also indicated above as the teachers do not employ the materials properly in the preschool classes.

As the above (table 5) shows, the school communities do not equally focus for the instructional materials of numeracy of the pre-school teaching with regular students teaching. In this case about 63% of the teacher respondents replied as the community is unsympathetic about the preschool teaching.

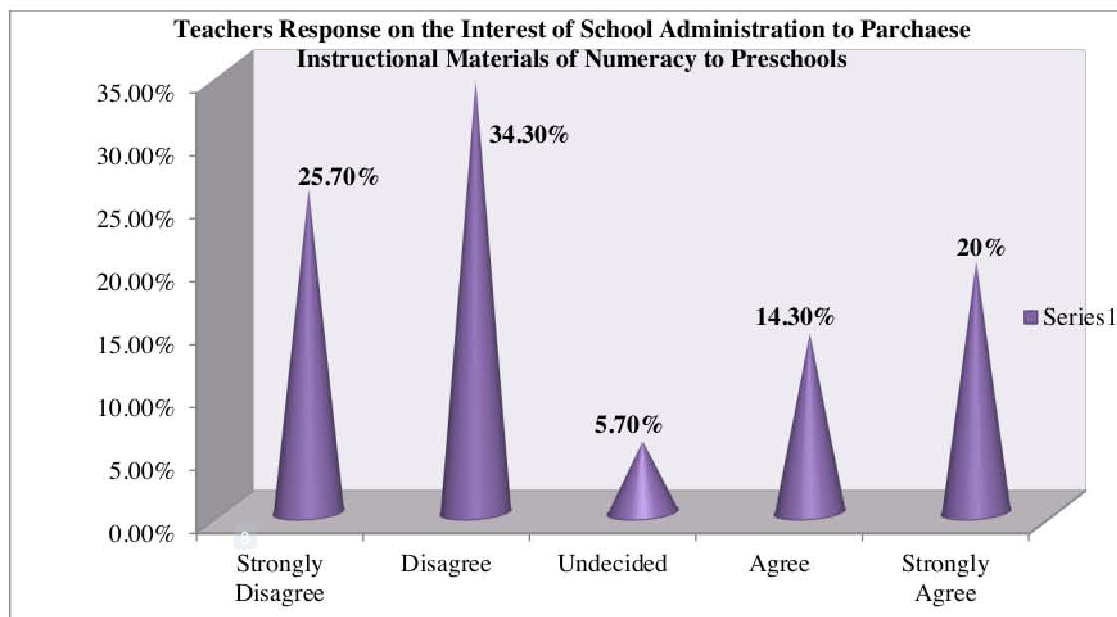


Figure 3 Teachers Response on the interest of school administration to purchase instructional materials of numeracy to the preschools

As indicated in the above figure, the school administration is not that much interested to purchase instructional materials for the pre-school teaching. The data from the interview also indicates that the school administration is more interested to the regular teaching but less interested to the preschool teaching. About 66% of the teacher respondents responded as the school administration is less interested to invest budget for the preschool children to buy teaching aid materials of numeracy.

The respondents reviewed that teachers' attitudes towards mathematics significantly affect for the preparation of instructional materials in numeracy. According to the teachers, the attitudes of teachers are one hindering factor that affects the preparation of instructional materials in numeracy for the preschool children. More than 57% of the respondent teachers agreed that teachers' attitude towards mathematics affects to the preparation of the materials (table 4). As the respondents indicated, there is a shortage of basic instructional materials that are used as tools for the preparation of instructional materials of numeracy in the schools. As the majority (about 69%) of the teachers replayed there are not enough basic materials used as tools for the preparation of instructional materials. Similar data are also received from principals to the shortage of tools for

the preparation of instructional materials of numeracy. The other data from observation also assures this problem. As a result, shortage of tools is another hindering factor for the preparation and utilization of instructional materials for the preschool teaching.

The instructional materials of numeracy prepared in the schools are not clearly visible to the preschool children as 80% of the respondents replayed. The data from the observation also indicates the classes for the preschool children are not comfortable as well as the very few prepared teaching materials are not clearly visible to the preschool children. The available instructional materials in the pre-schools are not accurate to develop essential skills of numeracy for the preschool children. As indicated from the observation checklists there are very few instructional materials for preschool children. But the materials are not significant to develop the children's essential skills of numeracy. The data from the principals' response also supports this idea.

The presence of instructional materials of numeracy for preschool children is too limited. This means there is not enough instructional materials as the data from the observation and the principals' questionnaire indicated. This absence of such basic materials is also another hindering factor for teaching numeracy in the preschools. As the majority (more than 89%) of the respondents whispered instructional materials of numeracy are helpful in making the lesson interesting and motivating. But practically in the schools, the presence of such materials is almost none and even their utilization is not proper.

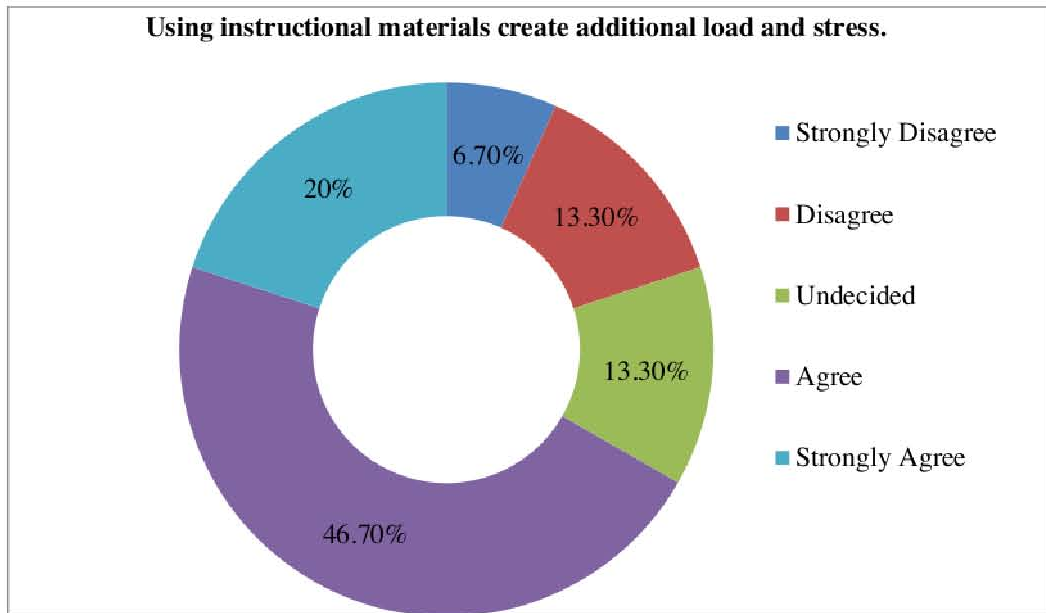


Figure 4 Principals response on using instructional materials of numeracy in creating additional load and stress.

As indicated in figure 4 above the principals believe preparing and using instructional materials of numeracy is encouraging in creating additional load and stress to the teachers of the preschool. This indicates that the attitude of the principals is negative towards preparing and using instructional materials of numeracy to the preschools. As indicated in the figure 4 above more than 66% of the principals replied similar to this idea. This indicates that the attitude of the principals of the schools is also negative to the preparation and utilization of instructional materials of numeracy in addition to the preparedness and attitude of the teachers of the preschool children.

UNITFIVE

SAMMARY CONCLUSION AND RECOMMENDATIONS

5.1 Summary

Data are gathered to assess the preparation and utilization of instructional materials of numeracy and assess the availability of the materials for teaching numeracy in the preschools of *Wukro* town. As the data obtained from diverse sources, the preparation and utilization of instructional materials of numeracy is investigated as abridged. This makes many reasons as the low level of availability of the materials in the classrooms as well as in the pedagogical centers of the schools.

The teachers are not preparing the materials due to shortage of budget, lack of skills and other reasons. As a result, using the materials to apply the children in their daily life is too low. The focus of preparing the materials to the development of the children is also investigated as limited. Even the preparation of local instructional materials of numeracy is negligible. The preparation and use of instructional materials of numeracy in the preschools is less to serve the purposes of the daily lesson. The ability of instructional materials of numeracy to cater the individual differences of the children is also indicated as low. The attitude of the schools' principals on the teachers' use of the materials in their class is low and the practice or using instructional materials of numeracy in the schools are not targeted to develop the children's desirable skills. The data indicated as the proper utilization of instructional materials of numeracy is also insignificant.

The teachers' knowledge about the presence of basic designed curriculum materials and guidelines of numeracy is too limited. Even though the school principals (directors, vice directors, supervisors and the *Woreda* Education Office Expertise know well to the presence of the guidelines, the teachers on the other hand do not know them. The implementation of the instructional materials of numeracy to give the children great emphasis on mathematics for the future is indicated as low and the prepared guidelines for the preschool children with the consideration of the children's authentic environment is also low and do not give directions to accommodate the teachers to interpret to their real environment. The absence of the instructional materials of numeracy for the preschool children is among the major factors that hinder the preparation of the instructional materials of numeracy.

5.2 Conclusion

The availability, preparation and utilization of the instructional materials of numeracy with consideration to the children's mental development are indicated as too low in the governmental preschools of *Wukro* town. Using the materials to stimulate with their daily life is also too low. The value of teaching instructional materials of numeracy to build capacities on mathematics for the future is low. The preparation and prevalence of the preschool curriculum materials and guidelines to the teachers is also another problem. Even though there are guidelines prepared to the preschool teaching most of the teachers know less than the principals and the supervisors as well as the *Woreda* Education Office expertise. As a result, there is a need to investigate solutions for such problems since the development of children is an indispensable program. Many factors are indicated as the factors hindering the practical and accurate preparation and utilization of instructional materials of numeracy in the classes of preschools. Such hindering factors are the absence of the materials in the schools, budget deficiency, lack of skills of the teachers, low attitude of the community towards preschool teaching, low value of the schools' administration, low teachers' attitude towards the role of teaching the preschool children using instructional materials of numeracy to the children's mental development on mathematics for their future life, shortage of tools for the preparation of instructional materials of numeracy. As a result, there is a need to find out imperative solutions to solve such critical problems for the comprehensive development of the preschool children.

5.3 Recommendations

The researcher would like to suggest the following recommendations to address the problems in line with the major findings drawn.

- ✦ Teachers should prepare and use instructional materials of numeracy directly from the environment giving it more emphasis as they are essential for the teaching learning process. There are many materials available in the immediate environment which may be either used as such or in a modified form to generate low-cost or no-cost teaching materials. Whenever possible, local materials should be used in making them to reduce their cost and to be easily understood by the pre-school children.
- ✦ The teachers should be motivated and trained to prepare local instructional materials adequately in each preschool class. Because it is the training, experience, foresight and creativity of teachers which will help the children innovate, redesign or develop new types of local instructional materials for use in their own classrooms. As a result, these activities are too necessary for the preschool teachers.
- ✦ The school community at large should motivate the teachers of pre-school children financially and morally because a well-motivated teacher to a large extent will be able to motivate his/her learners. Because negative attitude towards mathematics and lack of motivation are among the factors given in the findings as being responsible for poor performance preparing instructional materials of numeracy in the study area.
- ✦ There is a great need to motivate teachers towards learning numeracy. Motivation will serve as inner forces that propel teachers' interest towards using instructional materials of numeracy during their teaching learning.
- ✦ Teachers should have to select the content and instructional materials of numeracy for teaching appropriately. So that the children will be able to make use of their learning of mathematics in their daily life. Instructional materials of numeracy should be prepared to enable the students to solve mathematical problems of daily life.
- ✦ The school administration should tolerably supply basic materials that can be used as tools to prepare instructional materials of numeracy. Such tools include like cardboards, rulers, colored

pencils, letter stencils, blade, gum, knife, scissors, ink, nail, and plank or play wood, and other technologically advanced materials. Because the type of instructional materials of numeracy to be prepared will determine the specific type of numeracy materials to use.

- ✦ The *woreda* education office, the schools' administration and other stake holders should invest adequate budget and knowledge in the preparation and utilization of instructional materials of numeracy to develop in the child rational and scientific attitude towards life.
- ✦ The school community, school administration, teachers and other concerned bodies should supervise the use of instructional materials of numeracy as a matter of necessity in their teaching at the pre-school levels as the normal school children. Because using such instructional materials of numeracy are viable to develop in the child rational and scientific attitude towards life and to develop thinking and reasoning power of the children for their future development.
- ✦ The school administration should be interested and should put adequate budget to purchase vital instructional materials of numeracy in the preschools. Because the use of games and mathematical recreations that can help to sparkle interest and bring about a lively atmosphere in a mathematics classroom is vital for the mental development of the children and these materials are from probably market.
- ✦ The teachers, school administration and the *Woreda* education office should work collaboratively in choosing appropriate teaching materials of numeracy for the preschool children since instructional materials must be chosen and prepared carefully to serve the purposes for which they are engaged.
- ✦ The regional Education *Bureau*, the *Woreda* Education office and other concerned bodies should address the curriculum materials and other guidelines to the preschools at appropriate time; so that the teachers can apply them in the real classrooms of the preschool children.
- ✦ Further investigations should be carried out on this issue which will consist of large number of samples of schools and teachers at pre-schools levels; hence, it could help to re-assure the reliability and validity of this research paper.

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Appendixes

Addis Ababa University
School of Graduate Studies
College of Education and Behavioral Studies

7. If your answer for question number 2 is no, please would you explain why?

i. I have no skill III. I have no interest

ii. It needs money IV. It is impossible v. Other

8. Does the pre-school teaching numeracy have its own instructional material designed form teachers?

1. Yes 2. No 3. I don't know 4. I have no information

9. Are you highly interested to prepare instructional materials in numeracy in your pre-school teaching by yourself? Yes No

10. Do you feel comfort when you teach numbers without instructional of numeracy materials? Yes No

If your answer is no, please would you explain why? _____

Questionnaire to be filled by Teachers

The purpose of this study is to investigate the utilization and preparation of instructional materials in teaching numeracy in the preschools of Wukro town. Thus, this questionnaire is prepared to collect relevant data on this topic at your school. I would like to assure you that your response will be kept confidential and will be used only for academic purpose. Your genuine contribution will be greatly essential for the success of the study. Thus, you are requested to fill the questionnaire carefully and genuinely.

Direction for respondents

1. Do not write your name because writing your name doesn't have any significance to this study.
2. Please follow the instruction carefully when you answer the questions.
3. Write the answer for the open-ended questions on the space provided.

Thank you in advance for your cooperation.

A. Background information

Instruction: please mark “√” in the boxes that correspond to your background or write on space provided.

11. Name of school _____

12. 2. Sex:-- Male Female

3. Age _____ year

13. 4. Level of education _____

Instruction: please show the degree of your agreement or disagreement by putting “√” in the space provided under the rating scales that closely represents your opinion. Strongly agree (5), agree (4), undecided (3), disagree (2), strongly disagree (1).

No	Items for teachers	1	2	3	4	5	Remark
1	I prepare instructional materials of numeracy to use children in their daily life.						
2	I prepare and know the instructional materials of numeracy towards pre-school children						
3	Instructional materials of numeracy are always presented properly at the appropriate time in my teaching preschool class.						
4	I prepare and choose instructional materials of numeracy to serve the purposes of my lesson carefully.						
5	The Instructional materials of numeracy I utilize in my class are relevant to the lessons I used to illustrate						
6	The instructional materials of numeracy are prepared for use help to both the fast and slow learners (cater for individual differences)						
7	The instructional materials of numeracy available in our pre-school help the children to place great emphasis on the meaning and build capacities on mathematics for the future.						
8	There are a lot of local instructional to teach numbers in our pre-school.						

9	The instructional materials of numeracy prepared are appropriate with the preschool real environment						
10	The instructional materials of numeracy prepared are considered the overall personalities of the children/ age socio economic and developmental stages/						
11	The school administration is interested to aware and motivate teachers to prepare and use instructional materials of numeracy for our pre-school teaching.						
12	The school community equally focuses for the instructional materials of the normal students and pre-school materials.						
13	Teachers' attitudes towards mathematics significantly affect for the preparation of instructional materials in numeracy.						
14	There are enough instructional materials of numeracy that are used as tools for preparation of instructional materials in our school.						
15	The instructional materials of numeracy we prepare are clearly visible to the preschool children.						

Questionnaire to be filled by school Principals

14. Are there sufficient instructional materials to teach numeracy in the school?

Yes No

15. Does the pre-school teaching have its own teaching material of numeracy designed form teachers?

Yes No

Instruction: please show the degree of your agreement or disagreement by putting “√” in the space provided under the rating scales that closely represents your opinion. Strongly agree (5), agree (4), undecided (3), disagree (2), strongly disagree (1).

No	Items for school principals	1	2	3	4	5	Remark
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1	Teachers often use instructional materials in their teaching.						
2	Instructional materials in our school are prepared to develop in the children's' desirable habits and attitudes like habit of hard work, self-reliance, concentration and discovery.						
3	There are clearly prepared instructional materials for the pre-school children.						
4	There are enough instructional materials that are used as tools for preparation of instructional materials in numeracy our school.						
5	I read and know about the preparation and utilization towards pre-school children						
6	The available instructional materials of numeracy in our pre-school are important to develop essential skills in mathematics						
7	There are enough instructional materials to teach numbers in our pre-school						
8	There are a lot of local instructional materials to teach numbers in our pre-school						
9	The instructional materials available in our pre-school help the children to place great emphasis on the meaning and build capacities on mathematics for the future.						
10	Instructional materials are helpful in making the lesson interesting and motivating.						
11	Using instructional materials of numeracy create additional load and stress on teachers and the learners.						

Issues to be raised in the interview with the administration of the schools

16. Does the pre-school teaching have its own instructional material designed to teach numeracy?

17. Are there some instructional materials of numeracy prepared by the teachers themselves?
18. What roles have you played to develop the children's numerical development?
19. What are the advantages of teaching numbers with instructional materials?
20. Are the preschool children getting equal focus with the normal students? If no, why?
21. What solutions do you suggest in the utilization of supplementary instructional materials in teaching numbers?
22. Are there factors that hinder the preparation and utilization of instructional materials in numeracy instruction in your pre- schools' classes? What are they? List the major hindering factors if present.
23. What facilities do you provide for the preparation of instructional materials of numeracy?
24. What constraints are there in using instructional materials of numeracy?
25. Is budget allocated for the preparation of instructional materials of numeracy in your school?

Observation Checklist

1. The availability of instructional materials to teach numeracy /numbers/ in the pedagogical centers of the pre-schools. KG classes

2. Visibility of the instructional materials of numeracy to the children while teaching learning process.
3. Relevance of the instructional materials of numeracy with the content that the teachers cover.
4. The ability of using instructional materials of numeracy to succeed the purpose of the lesson.
5. Proper utilization of instructional materials of numeracy at the appropriate time in teaching preschool class.
6. The ability/delivery/ of the instructional materials of numeracy to use children in their daily life.