THE EFFECT OF ENTRY AGE ON PUPIL'S PERFORMANCE IN NUMERACY AND LITERACY TEST IN THYOLO DISTRICT

MASTER OF EDUCATION IN POLICY, PLANNING AND LEADERSHIP THESIS

By

CHRISTOPHER FRANCIS NAMAGOWA

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Submitted to the Faculty of Education in partial fulfillment of the requirements for a degree of Master of Education in Policy, Planning and Leadership

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AUGUST, 2015

DECLARATION

I, the under signed hereby declare that this thesis is my own original work, which has not been submitted to any other institution for similar purposes. Where other people's work has been used acknowledgements have been made.

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CERTIFICATE OF APPROVAL

The undersigned certify that they have read and recommend to the Postgraduate Studies and Research Committee & the Senate for acceptance of this thesis entitled: **THE EFFECT OF ENTRY AGE ON PUPIL'S PERFORMANCE IN NUMERACY AND LITERACY TEST IN THYOLO DISTRICT**

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DEDICATION

To my wife Dalitso

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ABSTRACT

Malawi uses an 8-4-4 education system and the official entry to primary school is six years. However data from EMIS shows that the ages of new entrants to Standard One ranges from 4 years to 11 years. Standard One efficiency indicators for primary education show that the promotion rate is at 62.7%; repetition rate is at 24.5%; and dropout rate is at 12.8% (EMIS, 2010). These are the worst indicators in as far as the efficiency indicators of the primary system are concerned. In addition to this, health indicators show that 47% of the children are stunted, 13% are underweight and 4% are wasted (NSO, 2011, p. 133). Hence, it is necessary to find out whether pupil's who enter Standard One have the same physical development levels and whether the age at which a pupil starts Standard One has an effect on the pupil's performance in literacy and numeracy test. The study used a cross-sectional design in which an MDAT, Mathematics, English, Chichewa and EGRA tests were administered to 137 new entrants to Standard One in Thyolo district. The results of the study showed that older pupils are most developed and successively perform better in numeracy and literacy test than normal aged and under aged pupils. However under aged pupils are the least developed and poor performers in numeracy and literacy test. Based on the findings it was concluded that enrolling pupils in Standard One at the official entry age of 6 improves their performance in numeracy and literacy test scores.

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LIST OF ACRONYMS AND ABBREVIATIONS

ANOVA	Analysis of Variance
DEM	District Education Manager
DEP	District Education Plan
df	degrees of freedom
DHS	Demographic Health Survey
ECD	Early Childhood Development
ECLS-K	Early Childhood Learning School - Kindergarten
EDF	Education Foundation
EGRA	Early Grade Reading Assessment
EMIS	Education Management and Information Systems
FPE	Free Primary Education
GoM	Government of Malawi
ID	Identity
LEA	Local Education Authority
M	Means
MDAT	Malawi Development and Assessment Tools
MDHS	Malawi Demographic and Health Survey
MDHS	Malawi Demographic and Health Survey
MIE	Malawi Institute of Education
MoEST	Ministry of Education, Science and Technology

MoGWCS	Ministry of Gender, Women and Child Services
MoGYCS	Ministry of Gender, Youth and Children Services
MS	Means of Squares
n	Number
NSO	National Statistical Office
OECD	Organization for Economic Co-operation and Development
PCAR	Primary Curriculum and Assessment Reform
PEA	Primary Education Advisor
PISA	Program for International Students Assessment
PSLCE	Primary School Leaving Certificate of Education
SACMEQ	Southern Africa Consortium for Monitoring Education Quality
SD	Standard Deviation
SES	Social Economic Status
SFP	School Feeding Program
SHED	Shire Highlands Education Division
SPSS	Statistical Package for Social Science
SS	Sum of Squares
TDC	Teachers Development Centre
UK	United Kingdom
USA	United States of America

CHAPTER ONE

INTRODUCTION

1.1 Background

Malawi uses an 8-4-4 education system where 8 years is spent at primary school, 4 years is spent at secondary school and an average of 4 years is spent at college/university level (MoEST, 2008). Primary education is divided into infant (Standard 1 - 2), junior (Standard 3 - 5), and Senior (Standard 6 – 8) classes (Milner et al, 2001). Malawi declared Free Primary Education (FPE) in 1994, which resulted in the soaring of enrolment from just less than 2 million to about 3.2 million within a year, yielding a gross rate of 108% (Avenstrup, Liang, & Nellemann, 2004). This rapid increase in enrolment resulted in:

- Low levels of material provision and overall low levels of pupil achievement (Chimombo 2005)
- The shortage of qualified teachers and the shortage of classroom blocks (Kunje et al 2009).
- Repetition rates in the primary schools increased to 20 percent between 1999 and 2006 (World Bank, 2010)

- An estimated MK1.97 billion is used annually to deliver primary education services to repeaters who are very high between Standard 1 and 4 (World Bank, 2010).

The aftermath of the declaration of FPE was summarized by Kunje, Meke and Ogawa (2009, p.11) as "the quality of education plummeted and increased access seemed to be the only gain".

In an effort to contain the problems that arose because of the declaration of FPE, the Government of Malawi (GoM) through the Ministry of Education, Science and Technology (MoEST) and other education partners introduced several programs which included:

- The development of educational policies that were deliberately designed to deal with problems that arose due to the declaration of FPE and these includes Policy and Investment Framework (PIF): 1995 – 2002 & 2005 - 2012, Education Sector Implementation Plan (ESIP): 2009– 2013, and National Education Sector Plan (NESP): 2008 – 2017.
- Direct financial support to primary schools to replace the collected tuition at school level starting from 2008 up to date. (World Bank, 2010)
- The introduction of School Feeding Program (SFP) to rural primary school to supplement pupil's breakfast
- The introduction of Malawi Integrated In-service Teacher Training Program (MIITEP) program where temporary teachers were recruited and

training under an intensive program that involved three months of residential training at Teacher College, self study distance education, and school based supervision (Milner et al, 2001).

1.1.1 Primary school entry age policy in Malawi

The official admission age to Malawian primary school is 6 years (MoEST, 2010). Prior to the declaration of FPE in 1994, the entry criterion to primary school was done in two folds but administered simultaneously. Firstly all citizen of Malawi were holders of Malawi Congress Party (MCP) membership cards and the membership cards were used as age verification tool. The second method was done by asking the children to reach over the head with their right arm to see whether they can seize their left earlobe. When the children manage to seize the ear, they were considered mature enough for school. This is called the 'Philippians' measure method. (Fertig & Kluve, 2005).

The abolition of tuition fees in 1994 meant an increase in the demand for primary school and to absorb that pressure PIF accommodated the change of entry age policy to a minimum of 6 years and a maximum of 12 years (GoM, 2000, p. 15). This change was meant to accommodate all over-aged children who have never attended school as well as children who were of the right age but never started school because of lack of tuition fees and school uniform.

However, despite the major reason of varying the entry age was to accommodate children who were affected by the abolished policies, current enrollment trends of new entrants to primary school shows that entry age ranges from 4 years to 8 years and above.

Table 1: The new entrants to Standard 1 in Malawi from 2007 up to 2009

Academic year	4 years old	5 years old	6 years old	7 years old	8 years old
2007	1, 308	6, 646	189, 478	111, 357	62, 315
2008	2, 079	12, 535	377, 752	232, 643	129, 652
2009	2. 228	15, 846	388, 834	311, 739	125, 768

Adapted from EMIS 2008, 2009 & 2010

The variance in enrolment age to primary school could be attributed to parents or guardians who hold the right to decide when to send a child to start schooling. Using this discretion parents or guardians send their children to school whether the child is of eligible or ineligible age by among other factors looking at the physical growth of the child. In other words, parents make a decision on whether their ward/child is ready for school or not. For example, results from the Malawi's 2008 Integrated Household Survey (IHS) conducted by the National Statistical Office (NSO) shows that 24.8% of children aged 6-7 were not in school because their parents felt that the children were too young to start school (NSO, 2008, p. 13). This means that in spite of the official entry age to primary school is 6 years of age and that entry to the school is free some parents favours physical development. On the other hand, World Bank (2010, p. 12) reported that access rates in Standard One show a high multi cohort phenomenon due to a large proportion of

over age new entrants. This can be attributed to unknown ages and double counts of new entrants, with some pupils dropping and attending the same standards for at least two consecutive years.

It should be noted that when a parent has taken a bold decision of enrolling his/her ward for Standard One, there is a discussion of the parent and the teacher on the eligibility of the child. Apart from age of entry rule, there is no any other clearly stated policy or guideline that is available for teachers to use when admitting pupils to start Standard One. And as a result of this many Standard One teachers use experience on readiness for schooling to determine the eligibility of the child to start formal schooling. The use of experience on the child development is also practiced in USA as Heaviside (1993 cited by Walker, 2005, p.4) reported that "public school kindergarten teachers said that the most important quality for kindergarten readiness is for a child to be physically healthy, rested, and well-nourished". This is also complemented by Stipek (2002) who reported that in a national study that asked kindergarten teachers which factors are important for a child to be ready for kindergarten, teachers rated highest the following:

- The child should be physically healthy, rested, and well-nourished
- The child should communicate needs, wants, and thoughts verbally in child's primary language
- The child should be enthusiastic and curious in approaching new activities, respectively

From this discussion, it can be deduced that for a child to be ready for schooling physical well being is favoured by both empirical evidence and parents. Further to that, it can be concluded that the entry age policy to start Standard One is arbitrary because apart from stating the age, it does not give substantive details as to how this policy is to be implemented. In other words, it does not give the boundaries of the entry as in mimimum and maximum entry age.

1.1.2 Pupils physical development

Child development theorist affirms that children of the same age differ in the rate of physical growth (Berk, 2009) and that is why in United States of America (USA), under the National Goals Panel 2000, considers the following physical wellbeing: motor, social, and language development as important in determining when a child is ready to start schooling. (Kagan, Moore, & Bredekamp, 1995)

Physical wellbeing of a child can be classified into gross and fine motor skills which involves the development of muscles. Gross motor skills involve the larger muscles including the arms and legs. Actions requiring gross motor skills include walking, running, balance and coordination while fine motor skills involve the smaller muscles in the fingers, toes, eyes and other areas. The actions that require fine motor skills tend to be more intricate, such as drawing, writing, grasping objects, throwing, waving and catching (Santrock, 2008). Cherry (2012) pointed out that physical wellbeing introduces movement, joy and success into the learning process by building the physical learning skills most conducive to cognitive, behavioral, and academic abilities. PCAR (2004, p. 1)

states that when a child has developed muscle co-ordination, he controls his movement and writing tools, a critical skill required for Literacy, Numeracy and Life Skills. This observation is also shared by Papalis (1995, p. 210) who said that with their small muscles under control, children are able to tend to their own personal needs. This imparts a sense of competence and independence hence learning takes place effectively. Thus when the children are well developed physically, they complete the tasks given to them on equal terms with peers in the same class.

Conversely, malnutrition hinders the physical development of children and leads to stunted growth, wasting and under weight (MoH, 2010). Stunted growth results in slow growth in gross motor, fine motor and language skills development and this may lead to failure in proper use of small and large muscles which will make learning not to take place effectively. In Malawi during the Malawi Demographic Health Survey (MDHS) 2010 it was found that 47% of the children are stunted, 13% are underweight and 4% are wasted (NSO, 2011, p. 133). Following this report, the results can be interpreted to that most of the children of the same age in Malawi could have different levels of physical development because of malnutrition and this could lead to delayed entry to primary school by some children of eligible age.

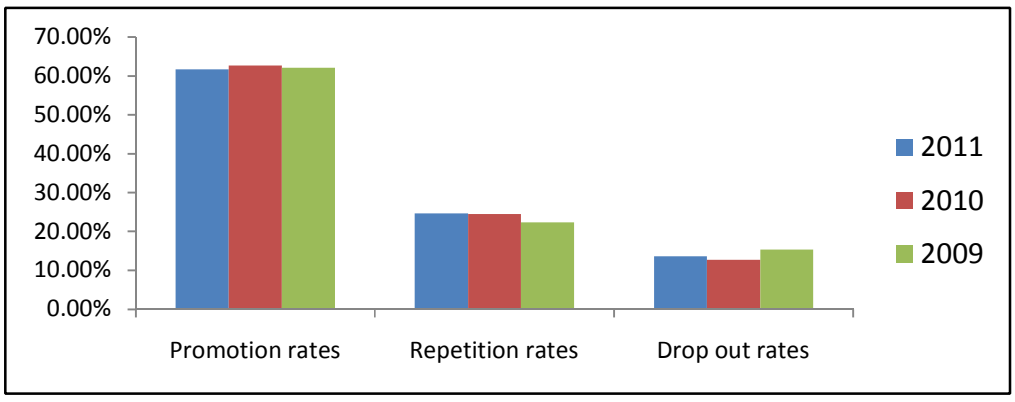
Hendrix et al (2004, p. 1) observed that in Malawi most children come to school for the first time without previous exposure to preschool experiences. This result in great difficulties being experienced by many pupil's in the first year of formal schooling. In order to curtail this problem, Term One of Standard One has been dedicated to what is

known as *"Introduction to School Life and Development"* where learners are offered an opportunity and assistance in their holistic development in preparation for formal learning. This will in turn develop readiness for formal learning in pupils (MIE, 2007, p. ix).

1.2 Statement of the problem

Education authorities and stakeholders are looking for ways and means of making the primary education system efficient and effective in its operations. Amongst which is the emphasis on school accountability based primarily on students' performance on achievement tests (Stipek, 2002) and this has enhanced researcher's interest by mainly focusing on the factors that affect performance of pupils in class. Most commentators on the quality of education in Malawi have reported that quality of education quality in Malawi is poor as indicated by the performance of pupil's in both national and school based examinations. Education efficiency indicators of promotion, repetition and dropout rate in the 8 years primary education cycle are persistently poor especially in Standard 1.

Table 2: The efficiency indicators for Standard 1 from 2009 up to 2011.



Evidence form EMIS, shows that age of new entrants to primary school varies from 4 years to 12 years as it has been the practice in the year after 1994 when entry age policy was amended to accommodate all pupils who were left behind because of the tuition fees policy. What is not clear is whether the age at which children start formal schooling has an effect on their performance in class.

Further to that, it has been shown through empirical evidence that physical development affects readiness for learning which also affects the time when a child can be allowed by guardians/ parents to start formal schooling. Basing on the point above, it is necessary to find out whether age predicts physical development bearing in mind that most of the Malawian children are stunted, underweight and wasted.

1.3 Purpose of the study

The purpose of the study was to find out the effect of entry age on pupil's performance in test scores. In an attempt to find the effect the research was guided by the following research questions:

- **i.** Is age a significant predictor of pupil's development and pupil's performance in numeracy and literacy test?
- **ii.** What is the relationship between entry age and pupils development status?
- **iii.** What is the relationship between entry age and pupils performance in numeracy and literacy test?

1.4 Significance of the study

The study was worthwhile taking since the findings from it would help to improve the efficiency of the primary school education specifically in Standard One where quality of education indicators are at an alarming level. It is envisaged that when an optimal age at which pupils performs much better is found, the efficiency indicators will improve in Standard One.

In addition to that, the findings of the study will contribute to an understanding of the effect of entry age on performance thereby advising policy makers on how the policy should be adhered to when enrolling pupils to start Standard One.

Further to that, there has been little if any, research that has been carried out to find the effect of children's entry age on their test score achievement in Standard One. Most of the studies that were done to find the effect of age on performance were done by Kunje, Meke & Ogawa in 2009 and Southern Africa Consortium for Monitoring the Educational Quality (SACMEQ) but at Standard Six. Hence, its results will stimulate and contribute to the debate on factors that affect the performance of pupil's in numeracy and literacy test.

Finally, most of the studies that have been conducted on the effect of age on pupil's performance have been done in USA by Lin, Freeman & Lee Chu (2009), in UK by Crawford, Dearden & Meghir (2007), and in Hungary by Hamori (2008). Presently, there are few studies if any, which have been done to find the local context of the effect of

entry age on class performance. Therefore this paper contributes to the available literature on the subject and this will in turn, help the policy makers and other education stakeholders to come up with the best policies in as far as entry to primary school and performance of pupil's is concerned.

1.5 Theoretical framework

This research was guided by the cognitive development theory as advocated by the French psychologist, Jean Piaget (1920 – 1980). Cognitive development refers to how a person perceives, thinks, and gains an understanding of his or her world through the interaction and influence of genetic and learned factors (Plotnik & Kouyoumdjian, 2011, p. 388). Piaget who was both a biologist and psychologists studied how children solve problems in their natural settings. Piaget believed that from an early, a child acts like a tiny scientist who is actively involved in making guesses and hypotheses about how the world works.

1.5.1 Piaget's stages of cognitive development

Piaget is best known for describing the changes or different stages that occur between infancy and adulthood (Bjorklund, 2005). Piaget cognitive stages refer to four different stages: Sensorimotor, Preoperational, Concrete operational and Formal operations. Each of the stages is more advanced than the preceding stage because it involves new reasoning and thinking abilities.

1.5.1.1 Sensorimotor (From birth to 2 years)

It is the first of Piaget's cognitive stages. During this stage, infants interact with and learn about their environments by relating their sensory experiences (such as hearing and seeing) to their motor actions (mouthing and grasping).

1.5.1.2 Preoperational (from about 2 years to 7 years)

It is the second of Piaget's cognitive stages. During this stage, children learn to use symbols, such as words or mental images, to solve simple problems and to think or talk about things that are not present. Children at this stage of reasoning cannot understand such logical operations as the reversibility of mental representations.

1.5.1.3 Concrete (From about 7 to 11 years)

It is the third of Piaget's cognitive stages. During this stage, children can perform a number of logical mental operations on concrete objects (ones that are physically present).

1.5.1.4 Formal (From about 12 years old through adulthood)

This is the fourth cognitive stage. During this stage, adolescents and adults develop the ability to think about and solve abstract problems in a logical manner.

1.5.1 Application of the cognitive development theory to the study

Piaget's theory of cognitive development was applied to the study in the context that the new entrants to Standard One in Malawi falls within all the four categories of cognitive

development as developed by the Frenchman. As the study aimed at finding out the effect of entry age on performance of pupil's, it would be very interesting to see whether pupils who started Standard One at different levels of cognitive development in Piaget's ladder would perform in numeracy and literacy test.

1.6 Limitation of the study

The major limitation of the study was on ascertaining the ages of the pupils to be involved in this research. It is a fact that most of Malawians do not have birth certificates and that most parents do not know the age of their children. This coupled with the likelihood of finding the registered ages for pupils in Standard One to be ranging from 6 years and above because that's the minimum official entry age to primary school. This in turn, made it hard for the researcher to find the real age of the learner. The researcher was aware of the fact that most teachers do register all under aged children as 6 years old for fear of reprisal from their bosses. In an effort to ensure that the right research participant was selected, the researcher followed the participants to their homes where the researcher asked for Health Passports of the pupils. These passports helped in cross checking the right age of the learners as most of these passports are given to the children immediately after their birth. The two birth dates were compared and in few circumstances where they were different much preference was given to the age on the Health Passport.

The second limitation of the study was sampling. The researcher selected the sample from on 2 zones out of the 9 education zones that were in the Thyolo district. Lack of resources restricted the researcher not to draw the sample of the study beyond the two

educational zones. As a result of this the total number of research participants was 137 pupils against a total of about 10, 000 pupils who were new entrants to Standard One in 2009. Due to this limitation, the results of the study may not be generalized beyond its locality. Further to that the researcher calculated “effect size” instead of “Significance level” as this is the practice in quantitative research when a small sample has been used.

1.8 Definition of terms

Under aged: A child whose chronological age is 5 years or below at the time of entry to primary school in Malawi and/or children who are below the official entry age to primary school in any country.

Normal aged: A child whose chronological age is 6 years at the time of entry to primary school in Malawi and/or children who are of the eligible age to enter primary school in any country.

Over aged: A child whose chronological age is 7 years or above at the time of entry to primary school and/or children who are one year older than the eligible age to enter primary school in any country.

Physical development: A child growth measured in gross motor, fine motor and language skills.

CHAPTER TWO

LITERATURE REVIEW

The literature reviewed in this section includes the different criterions that are used when allowing new entrants to Standard/ Grade One, the performance of under aged and over aged pupil's, the effect of children health status on entry age, and the financial implication of repetition on the government of Malawi's public resources.

2.1 Entry criterions to formal schools

There are three levels of education system namely: primary, secondary and tertiary. The entry point to the formal school system is primary level and for a long time education administrators, parents and researchers have been pressed with a need to determine the best time at which a child should be admitted to standard one. This has resulted in the differences in entry criterions to primary school and some of them are:

2.1.1 Apple or Coin test

Meiers (2002 cited by Fertig & Kluve 2005, p.2) said that in the *"apple or coin test"* a child who is not yet enrolled in school is given the choice between an apple and a coin. If the child chooses the apple, s/he has to remain in maternal custody. If the child chooses

the coin instead, s/he is considered *"worthy of instruction in knightly arts"* i.e. s/he is considered mature enough to engage in formal education.

2.1.2 Philippinian measure

The "Philippinian Measure" is used to determine a particular child's maturity. The child has to reach over the head with her right arm to see whether she can seize her left earlobe. If so, then the child is considered mature enough for school. (Fertig & Kluve, 2005, p. 2).

2.1.3 Age of the learner

For a long period of time in many countries, entrance to primary school has been based on the chronological age of the pupil at the time of enrolment. The enrolment age varies across countries and ranges from 4 to 8 years. Out of the 189 countries in the world, 23 countries use age 5 as the official entrance age, 119 countries use age 6, 45 countries use age 7 while Mongolia and Ireland use age 8 and 4 as the official entrance age respectively (Primary School Starting Age, 2010). Most of the developed countries established an entry age cut off where it is expected that children born before a prescribed date are to start school in that particular year. However, the variation among countries has sparkled wide debate as to what optimal age should a child be enrolled for primary school. Rungo (2008, p. 8) defined the optimal entrance age as the age of children that maximizes the net benefit of schooling which includes academic performance, social performance, future earnings, just to mention but a few.

2.1.4 Admission through readiness test

An exception to the age entry rule is the admission through readiness test. In this situation a parent whose child falls outside the entry age cut off may ask for the waiver of the rule so that their child can be admitted to primary school. This practice is very common in USA where schools provide for an early entrance waiver based on developmental test or readiness test. These readiness skills include focused attention, persistence, and ability to work independently (Perry, 2010).

2.2 Effects of entrance age on pupil's performance

Chronological age has been the most common and widely used method in admitting children in primary school world over. Despite having different entry age, in a class cohort there could be three categories of pupil's namely normal aged, under aged and over aged pupil's. In most cases, the ages of the new entrants fall in the different development levels as proposed by Piaget in his theory of development. The debate as regards the optimal age at which a child should be admitted to primary school has been a contentious issue since early 1900's. To contribute on this debate, researchers started looking at the effect of entry age on future outcome like test scores performance, behavior (Rungo, 2008; Uphoff & Gilmore, 1985), future earning (Angrist & Krueger, 1992) and school achievement.

2.2.1 Performance of under aged pupil's

Lincoln (1929) conducted a survey on the under aged pupils who were admitted to school on the basis of mental age. The findings of this research on the later performance of these

under-aged children show that children admitted on the basis of mental age are able to maintain their scholastic accomplishment on equal terms with their classmates and are decidedly superior in some phases of work. After these findings, parents were enrolling their children to primary schools at a younger age than the official entry age.

A contradicting research finding was unearthed by Bigelow (1934 cited by Lin, Freeman, & Chu, 2009) who reported that children enrolled in the first grade before the age of six had little chance of success in school. Uphoff & Gilmore (1985, p. 88) also found the same as they reported that

> Pupils who were very bright but very young at the time of school entrance did not realize their potential. They tended to be physically immature or emotionally unable or they would cry easily. And socially, they seldom showed leadership from Junior High School, and 50% of them only earned “C” grades.

Similarly, Demeis & Stearns (1992) conducted a research to determine if a student's chronological age is related to his or her academic and social performance in school. It was hypothesized that if younger kindergarten students experience more academic or social difficulty, a disproportionate number of them should be referred for psycho-educational evaluation. The study found that younger children did not experience academic and social difficulties. In addition, proportionally similar numbers of younger entrants qualified for a gifted education placement in spite of the significantly larger number of older entrants referred for psycho-educational evaluation.

Contrary to the findings by Lincoln (1929) and Demeis & Stearns (1992) where under aged pupil's are performing better, Wils & Sylla (2009) found the under aged pupils performs poorly than over aged. In their survey that used Demographic and Health Survey (DHS) data set in 35 countries in Sub-Sahara region, they found that test scores of younger pupil's are persistently lower than older pupils and they attributed this to parents who are sending their immature children to start Standard/Grade One and that most parents sent children to school early as a substitute for early childhood development classes. Hence these under aged children are not able to compete with their peers on equal terms due to their immature state of development.

From the studies above, it has been discovered that most of the studies used a longitudinal studies where data was collected over a long period of time and the data was analyzed by comparing age at entry and the test scores. This implies that to find the effect of entry age on test scores and comparison between entry age and test scores needs to be computed. Further to that, the discussion above has shown that researchers have not agreed on the effect of underage entry to primary school on test scores achieved by pupils.

2.2.2 Performance of over aged pupil's

Fertig & Kluve (2005) conducted a research using a data set capturing children who entered school in the late 1960s through the late 1970s, a time when delaying enrolment was common, and investigated the effect of age at school entry on educational attainment for West and East Germany. It was found that holding children back one year does not

seem to secure a better schooling performance for this group and if anything, then some of the deferred seem to fare worse.

However, Sprietsma (2006) conducted a research to estimate the effect of pupil's relative age within the first grade of primary school on math, reading, and science test scores at age 15 in 16 OECD countries using PISA 2003 data. It was found that older pupils have about 20% SD higher test scores than the relatively youngest. Sprietsma (2006) concluded that, most of the effect of relative age comes from grade repetition, for instance, relatively younger pupils are more likely to repeat a grade, and grade repetition has a significant negative impact on test scores. Another researcher who found similar results was Lin, Freeman & Lee Chu (2009) who wanted to find out whether enrolment age to kindergarten has got any effect on reading and mathematics scores of pupils from kindergarten to fifth grade in USA. Using data from the ECLS-K, it was discovered that older children did better than younger ones from kindergarten up to the fifth grade. The researchers also emphasized that the impact of enrolment age on test scores remained strong up to fifth grade and that the younger children did not catch up.

From the discussion above, it seemed that the effect of late entry into primary school is inconclusive because of the conflicting results that have been found by the renowned authors. This therefore merits the need for this research to be done so as to contribute to this debate on the effect of over aged entry into primary school.

2.2.3 The time at which the effect of entry age is measured

In an effort to find the effect of entry age on performance, most of the researchers have been finding this effect at different points in the course of a pupil's school life. Billari & Pellizzari (2008) who estimated relative age effects in academic performance at Bocconi University found that the youngest students performed better compared to their oldest peers, particularly in the most technical subjects. The youngest students in the cohort performed slightly better in cognitive tests and also appeared to have less active social lives: they were less likely to do sports, go to discos and have love relationships.

Other notable researchers like Kunje, Meke & Ogawa (2009) found the effect of age at Standard Seven where normal aged pupils (pupils aged 13 years) performed better than over aged pupil's. Further to that SACMEQ I, II, and III reported on the age levels of Standard 6 pupils. However in these researches no attempt was made to find the effect of entry age in the test scores. The researcher believes there is a need of finding the effect right at entry level because of the concept of "Garbage in, garbage out". This means that if wrong pupils are taken into the system, there is high likelihood that the student will face problems throughout the school life. This position is also noted by MoGWCS (2008, P. 7) who stated that

> It is during the early years of life that development of intelligence, affectivity and social relation occurs rapidly. As a result any irregularity in child development at this stage will substantially reduce future potential.

It is on this basis therefore there is a need to find out the amount of variance in performance that could be attributed to entry age.

2.2.4 The effect of children health on entry age

Alderman et al. (2006), using longitudinal data from rural Zimbabwe, show that improved health (measured as height-for-age) during early childhood results in increased height as young adult, higher educational attainment, and an earlier age of school entrance. Therefore, healthy and rich children begin the educational process before compulsory schooling, whereas poor and unhealthy children tend to postpone education.

Conquering with the same observation is Rungo (2008) who stated that unfavourable health/nutritional status may delay intellectual child development and hence, a child's capacity to respond to educational stimuli. When unfavourable health status results in delayed cognitive development, parents might rationally postpone school entrance of children in order to increase the probability of academic success.

Fredriksen (2004) noted that while rates of malnutrition in young children have been documented in Malawi, less is known about the national prevalence of malnutrition in school-age children. For example from the DHS 2000, it is apparent that many children are entering Standard 1 either short or underweight for their age: 57.4 percent of children 4–5 years of age are stunted and an alarming 28 percent are severely stunted. These high levels of malnutrition reflect cumulative nutritional insult and a dire nutritional situation, most of which occurs before 3 years of age. (Fredriksen, 2004)

So from the two studies it could be argued that children physical development is a critical factor in determining when a child should start formal school. That is the reason why this study measures pupil's level of physical development by entry age to ascertain whether there is any difference in physical development level differences by the entrants

2.2.5 The financial implication of repetition in Malawi

When a child has failed to reach the minimum performance level to be promoted to the next class, the child is asked to repeat the class/grade. In extreme cases the child may drop out from school while other children might opt to change school and proceed to the new class pretending as if they passed. However what is generally understood as the normal trend is that the child is asked to repeat the academic year.

The costs for grade repetition are estimated by adding the direct and opportunity costs (OECD, 2010). The direct costs consist of the costs for education systems to provide on additional year of education. The opportunity costs consist of the costs of delaying students' entrance to the labour market by one additional year.

From a purely economic point of view, the practice of repetition is extremely inefficient. Where repetition rates are significant, it means that additional teachers and classrooms are needed to cater not only for the regular cohort of children, but also for those who repeat and spend longer time in the system. Furthermore, for each additional year that a child repeats, the public purse must pay what it would not normally have to in a more

efficient system. In the longer term, each extra year a child spends in school through repetition is one year less they will spend in the labour market in the future.

In Malawi, 60% of public resources were wasted in 2000 at primary level meaning that the government was financing 20 school years to generate every graduate from primary school, when it should have been financing only an eight-year cycle if there were no repetition or dropout. In financial terms, the same study estimated that with a total primary enrolment of 3 million children, a repetition rate of 25% and a unit cost of MK 1,000 (around US$10) spent each year on a child's primary education, an additional MK 750 million would be required to achieve the same child–teacher ratio as in a situation without repetition. This led the study to conclude that a reduction of one percentage point in the repetition rate would lead to annual savings of approximately MK 30 million (around US$ 300,000) in Malawi (World Bank, 2004).

The amount public resources spent on repeaters is the highest percentage of resources being allocated for repeaters in the whole Anglophone countries because Ethiopia 17%, Lesotho 30%, Swaziland 40% (Ndaruhutse, 2008). In summary, repetition which comes about because of poor performance can be avoided if the factors that affect performance are uncovered and given the due attention that they deserve.

2.3 Conclusion

The literature reviewed in this study showed that the effect of entry age on performance is inconclusive and researchers have tried so hard to understand this research area. However, all researchers seem to agree on the fact that the best way to find the effect of entry age on students/ pupils performance is to compare the age of the learners at the time of entry with their test scores. This has justified the studies comparison of the age of the learner and their performance in test scores.

Further to that, most of the researchers conducted longitudinal studies except for Wils & Sylla (2009), SACMEQ I, SACMEQ II, and SACMEQ III just to mention a few. This has informed the researcher on the methodology of using a cross-sectional study because it has been shown that it is very possible and within the realms of research to do a cross-sectional research design on the effect of entry age on performance and find credible results.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Research paradigm

The research paradigm taken by this thesis is the positivism which takes the view that the aim of research is to uncover an existing reality (Cohen, Manion, & Morrison, 2000). This requires the researcher to be as detached from the research as possible, and use methods that maximize objectivity and minimize the involvement of the researcher in the research. The positivism approach is applicable to this research since it will help in finding whether age is a significant predictor of performance, whether there is relationship between entry age and pupil's physical development, and whether age affects the test scores a student get in literacy and numeracy test. Further to that, Muijs (2004) noted that the positivism believes that the world works according to fixed laws of cause and effect. As a result scientific thinking is used to test theories about these laws, thereby rejecting or provisionally accepting them. In this way, researchers finally get to understand the truth about how the world works. Thus, this research conforms to what the positivism believes in hence this research is grounded in the positivism paradigm.

3.2 Research approach

The approach taken by this thesis is the quantitative approach which aims at explaining phenomena by collecting numerical data that are analyzed using statistics (Muijs, 2004). Implying that, the researcher aims to explain the developmental levels of pupils in gross motor, fine motor and language skills and their enrolment age in relationship to the pupil's achievement in numeracy and literacy test. Further to that, the data collected was in form of figures as it was in numeracy and literacy test, physical development level score, the enrolment age of the learners and the Social Economic Status (SES) of the learner. All these numerical data were analyzed using statistics. So all in all, what was done fits perfectly in the quantitative research approach.

Table 3: Summary of quantitative research approach through steps and functions

Step	**Function**
Purpose	To study relationships, cause and effect
Design	Developed prior to study
Approach	Deductive, test theory
Tools	Uses preselected instruments
Samples	Uses large sample
Analysis	Statistical analysis of numeric data

Ary, Lucy, & Sorensen (2006, p. 25)

From the **Table 3** it can be seen that all the functions explained in each specific step are in tandem with what this research did hence the rationale of choosing the quantitative approach. Over and above that, the research paradigm for this paper is positivism which advocates for the use of scientific method in uncovering the reality.

3.3 Research design

Research design is basically the general plan for carrying out a study and this involves all the processes that are going to be followed from defining your problem, formulation of hypothesis, method of data collection and analysis. It simply means the core of the whole research process. The design is important because it determines the study's internal validity, which is the ability to reach valid conclusions about the variables being researched on. Ary, Lucy & Sorensen (2006) states that designs differ in their efficiency and their demands in terms of time and resources, but the major difference is in how effectively they rule out threats to internal validity. It is on this basis therefore, that the research design for this thesis was cross section design.

Cross section design is a type of survey research which Muijs (2004, p. 32) described as "well suited to when researchers want to look at relationships between variables occurring in particular real-life contexts". Sharing the same position is Bryman (2008) who defined cross sectional design as the collection of data on more than one case (usually quite more than one) and at a single point in time in order to collect a body of quantitative or quantifiable data in connection with the two or more variables (usually many more than two) which are then examined to detect patterns of association

The definitions by Bryman (2008) and Muijs (2004) presented above fits perfectly in how the data for this research was collected. Data on the background characteristics and the physical development levels if the pupil's was collected once at the beginning of the 2011- 2012 primary school academic year. In addition to that literacy and numeracy test was administered at the end of the 2011/12 academic year. Data for each variable was collected at one point, although data on the age of the pupil's was collected twice just to cross check that the researcher had the right/ correct age for the participants. This helped to improve the reliability of the data.

3.4 Population and sampling

Ary, Lucy & Sorensen (2006) defines population as the entire groups of individuals to whom the findings of a study apply while Muijs (2004) defines population as the group you want to generalize your findings to. Therefore the population of the research is Standard 1 pupils who entered it in 2011 and they are totaling 29,870 of which 14542 are boys and 15328 are girls.

Table 4: The distribution of the ages in Standard 1

	Under aged pupils	**Normal aged pupils**	**Over aged pupils**
Boys	213	7, 625	3, 290
Girls	244	8, 690	3, 373

A sample is a portion or a subset of a population (Dawson, 2002). Sampling is indispensable to the researcher. Usually, the time, money, and effort involved do not

permit a researcher to study all possible members of a population. In determining the sample the researcher randomly picked 2 education zones from 9 zones that are in Thyolo district. From the each zone, 2 schools were randomly selected (i.e. the researcher picked the first and last schools when they were alphabetically ordered). The idea of sampling was inspired by Ary, Lucy & Sorensen (2006) who said that sampling comes to the aid of the researcher by enabling the researcher to study a portion of the population rather than the entire population.

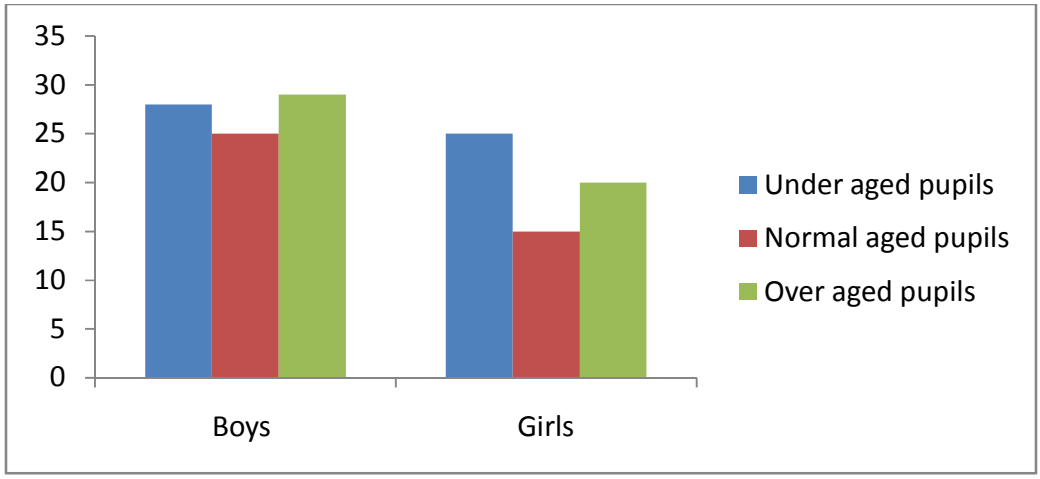
Because the purpose of drawing a sample from a population is to obtain information concerning that population, it is extremely important that the individuals included in a sample constitute a representative cross section of individuals in the population hence stratified random sampling was chosen. Stratified random sampling involved putting participants into strata's of under aged, normal aged and over aged.

Table 5: The distribution of the research participants according to SES and age.

	Under aged pupils	**Normal aged pupils**	**Over aged pupils**
Lowest SES	14	18	11
Low SES	17	12	17
Middle SES	17	10	21

According to Bryman (2008) it is allowed that a researcher can use more than one stratifying criterion therefore the researcher used another strata of gender against the entry age.

Table 6: The distribution of the research participants by gender and age.



This enabled the research to have a good representation of all the SES and gender strata's that was checked against the three age groups of the participants in this research. Bryman (2008) stated that the major advantage of stratified random sampling is that it ensures that the resulting sample will be distributed in the same way as the population is in terms of the stratifying criterions.

3.5 Instrumentation

Instrumentation refers to strategies used to collect data for the research. In this research paper, six instruments were used namely: a questionnaire, Malawi Development and Assessment Tools (MDAT), Mathematics test, Chichewa test, English test and Early

Grade Reading Assessment (EGRA) test. Throughout the research paper mathematics test has been referred to as numeracy test while an average score of Chichewa test, English test and EGRA test is referred to as literacy test. The data collection instruments are discussed in details below.

3.5.1 Questionnaire

The questionnaire was used to get data on the following variables: age, gender, SES, ECD attendance, highest level of father's education, highest level of mother's education. Of all the variables, SES status had to adopt the criterion used by the National Statistical Office (NSO) for its MDHS 2010 where all the variables that are used to determine the income quintile were used. Basically, it was an extract from the MDHS 2010 questionnaire, with consent from NSO, was used to determine the SES of the participant's parent. Another unique thing about the instrument was that it rounded the age of the participant to the nearest whole number at the time of enrolment i.e. children aged 5 years 0 months to 5 years 11 months were considered to be 5 years old (under aged), those aged 6 years 0 months to 6 years 11 months were considered 6 years old (normal aged), and finally those aged 7 years 0 months to 7 years 11 months were considered 7 years old (over aged).

Peer review and research supervisor input was sought to help in fine tuning the questionnaire. This according to Ary, Lucy & Sorensen (2006) improves the validity and reliability of the instrument. This exercise helped in the clarification and elimination of ambiguous and unclear questions.

3.5.2 MDAT

MDAT is an ordered sequence of activities that children are able to perform relative/corresponding to their age from 0 months to 7 years of age. All the activities were on a 34 item test score. The instrument was developed by the World Bank team in 2010 and permission was sought (See Appendix Q). MDAT measured pupil's level of development in gross motor, fine motor, language skills and social skills development. However for the purpose of this research social skills development was left out.

3.5.3 Numeracy and literacy test

As it has been discussed before numeracy test is what is known as mathematics test, while literacy test had three compositions namely English test, Chichewa test and EGRA test. Chichewa and English test are the conventional standard measure of literacy. Possibly EGRA is the latest addition to the measure of literacy. The researcher in consultation with the 7 primary school teachers added the EGRA because it is a newly introduced subject that aims at improving reading and writing skills of pupils. Gove & Wetterberg (2011, p. 1) writes

> Teaching young children to read is the cornerstone of improving educational outcomes and has far-reaching implications. Unless they learn to read at an early age, children cannot absorb more advanced skills and content that relies on reading. Children who do not learn to read in the early grades risk falling further and further behind in later years, as they cannot absorb printed information, follow written instructions, or communicate well in writing.

Sim & Wright (2008, p. 72) states that “pilot study is used to identify the problems with the tool, such as ambiguity, poor wording, missing items, inappropriate response option and unclear instructions”. Following this observation, all the six data collecting instrument were piloted in one school in Thyolo district but was not sampled as a school participating in this research. The response from the pilot study directed the changes that were made in the questionnaire only because the rest of the data collection instruments were faultless. However the results of the pilot study are not used in this final write up.

3.6 Data collection techniques

This section presents how data was collected using the six instruments that were used to collect data for this research paper. The data used in this research was collected by six people who included the researcher himself and 5 research assistants. Then the members were divided into two groups of three members per group. The research assistants were trained for three days and pilot tested the instruments to a group of 5 boys and 5 girls each for the research assistants to master the skills and to standardize the data collection strategies.

The first of the six instruments to be administered was the questionnaire which was administered to the parents of the children that fall in the category of under aged, normal aged and over aged. The identification exercise was done by checking the birth date in the class register and immediately after the pupils to be used as research participants were identified, researchers had to go to the parents/guardian to administer the questionnaire. This questionnaire was administered at the beginning of second term in the 2011/12

academic year. This strategy helped in the selection of participants that fitted in the strata's of age-SES and age-gender to whom the MDAT test was also administered to. The questionnaire and MDAT was administered to a total of 127 participants. The main advantage of directly administering questionnaires is the high response rate, which typically is close to 100 percent and this was achieved in this study. Other advantages are the low cost and the fact that the researcher is present to provide assistance or answer questions (Ary, Lucy, & Sorensen, 2006).

At the end of the 2011/12 academic year specifically in June, Mathematics, English, Chichewa and EGRA test were administered to the pupils that participated in MDAT test. The tests were administered by respective schools class teachers because the researcher believed that he is likely to get the true results from participants if the test is administered in their natural environment. It is on this basis therefore, that all the respective schools teachers administered the test to all the pupils in their classes and the researcher only got the grades for the pupils that were part of the research. This was done so as not to change the natural examination setting of the pupils thereby improving on the validity of the research.

3.7 Data analysis techniques

Data analysis technique involves making decision on how the data should be analyzed taking into consideration the research question and the type of data collected. The first step in this data analysis was to find a score that should represent literacy score and this was done by finding the average of English, Chichewa and EGRA tests. MDAT score

were also given numerical values by counting the number of activities a participant was able to do and rated out of 34. The summarizing of data also included the coming up of 5 economic quintiles of lowest, low, middle, high and highest SES for the pupils as well as rounding off of their ages.

Since this research takes the quantitative approach and that the type of data one collects influences the type of statistical analysis required, inferential statistics was used because according to Nachmias & Nachmias (1996 cited by Chikuni, 2012) is used to determine whether an expected pattern designated by the theory and hypotheses is actually found in the observation. Heiman (1999 cited by Mitambo, 2012) defined inferential statistics are the mathematical procedures for deciding whether a sample relationship represents a relationship that actually exist in the population. There are two basic types of inference techniques that researchers use: parametric techniques make various kinds of assumptions about the nature of the population from which the samples involved in the research study are drawn. Non-parametric techniques make few (if any) assumptions about the nature of the population from which the samples are taken. So in this study, the research chose to use parametric techniques because of its robustness and because all the assumption for carrying out parametric techniques was not violated.

An advantage of parametric is that they are generally more powerful than non parametric techniques and hence much more likely to reveal true difference or relationships if one really exists (Fraenkel & Wallen, 2000, p. 258). So the diagram below helped and guided the researcher in the choice of the statistics that would be used in this research paper.

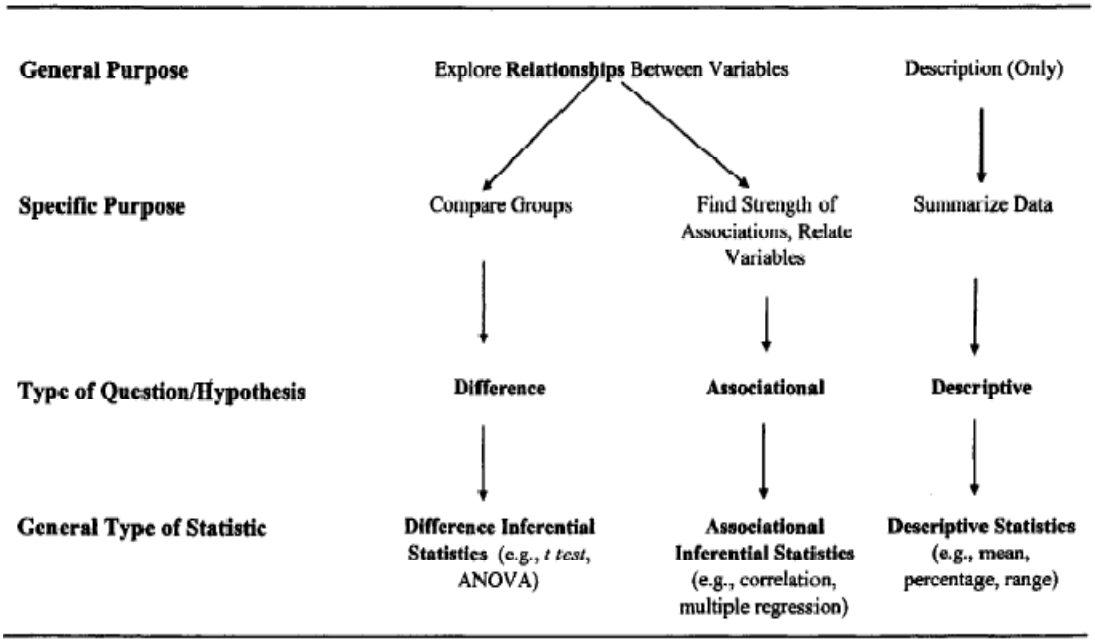


Figure 1: A schematic diagram showing how the purpose and type of research question correspond to the general type of statistics to be used in a study (Morgan, Leech, Gloeckener, & Barrett, 2004, p. 5).

3.7.1 Analysis of Variance (ANOVA)

It is a hypothesis testing procedure used to determine if mean differences exist for two or more samples or treatments. The purpose of ANOVA is to decide whether the differences between the samples is simply due to chance (sampling error) or whether there are systematic treatment effects that have caused scores in one group to be different from scores in other groups (Burns, 2000, p. 294). ANOVA was used when the researcher wanted to compare the means of gross motor, fine motor and language skills against independent variables of entry age because it has got three variables.

3.7.2 Multiple regressions

Multiple regressions is a technique that enables researchers to determine a correlation between a criterion variable and the best linear combination of two or more predictor variables (Fraenkel & Wallen, 2000, p. 363). This statistical application was used when the researcher wanted to find the variables that significantly predict the pupil's physical development level and his/her performance in numeracy and literacy test.

3.8 Validity and reliability of the study

Validity revolves around the defensibility of the inferences the researcher makes from the data collected through the use of an instrument (Fraenkel & Wallen, 2000, p. 18). The main types of validity are content, construct, concurrent and predictive validity. Some researchers distinguish between internal and external validity (Burns, 2000, p. 360). Content-related evidence of validity refers to the content and format of the instrument. The content and format must be consistent with the definition of the variable and the sample of subjects to be measured (Fraenkel & Wallen, 2000, p. 18). In order to comply with those requirements the following things were done:

- The questionnaire had to take content of questions used by the NSO when they are determining the SES of Malawians during their survey

- The MDAT is a widely used and approved instrument used to measure development levels for Malawian children from month one to seven years in gross motor, fine motor, language skills and social skills.

- The Mathematics, English, Chichewa and EGRA tests were formed by a group of four subject matter experts with 7 years of teaching experience in Standard One and took the format of the test administered for Standard 1 pupils.

The aforementioned steps taken comprehensively answer the questions that Fraenkel & Wallen (2000, p. 18) emphasized that they would help in determining content validity, thereby making the study valid.

Fraenkel & Wallen (2000, p. 18) defines reliability as "the stability, accuracy and dependability of data". Further to that reliability is concerned with how consistently you are measuring whatever you are measuring. It is not concerned with the meaning and interpretation of the scores, which is the validity question. The questionnaire was used to ascertain the socioeconomic status of the research participants and the researcher used a cutoff from a NSO questionnaire that measure wealth of individuals during their survey. This instrument is reliable since it is the one that is used to define the economic quartiles in Malawi.

Finally, the four tests that were constructed for the purpose of this study, a reliability analysis was run on SPSS 16 to get the values of Cronbach's alpha coefficient (r) for each test because it is the most commonly used reliable way of measuring reliability of an instrument (Burns & Grove, 2011).

Table 7: The Cronbach's Alpha coefficients for data collection instrument.

Instrument	R
Chichewa	.631
EGRA	.774
English	.825
Mathematics	.876

From the reliability scores, Chichewa has a score of .631 which is typically below the minimum acceptable standard of 0.7. When researchers are faced with this problem, Burns & Grove (2011) stated that the researcher must decide whether to analyze the data collected with the instrument. The researcher, therefore decided to analyze the data collected from Chichewa test because the unit of analysis in this research was Literacy which comprised of Chichewa test, EGRA test and English test of which Chichewa test contributed 25%. It is the opinion of the researcher that the effect of unreliability of Chichewa can be absorbed by the other two papers. Further to that it was also observed that the average Cronbach's Alpha coefficient literacy score (Chichewa test, EGRA test and English test) is .743 which slightly above the minimum acceptable value of .7 (Waltz, Strickland & Lenz, 2005 cited by Burns & Grove, 2010).

3.9 Ethical consideration

Ethical consideration is one of the most important elements that every researcher has to observe. Research using children as participants present some special issues for researchers. The children are more vulnerable in some respects, have fewer legal rights, and may not understand the language of the informed concert. Permission for the pupils

to be used in the research was sought from Thyolo District Education Manager and from the Head teachers of the schools where pupils learn. This conforms to what Fraenkel & Wallen (2000, p. 48) said

> Informed consent of the parents or those legally designed as caretakers is required for the participants defined as minors. Signers must be provided all necessary information in appropriate language and must have the opportunity to refuse.

Informed consent requires that the participants must understand the nature and purpose of the research and must consent to participate without coercion (Burns, 2000), therefore consent was sought from the school and then later on from parents of the children before the questionnaire was being administered to them. Further to that before anything was done, the parents were informed of the intention of the research and the researcher faced no resistance.

Confidentiality and privacy involves a clear understanding between researcher and participant concerning the use to be made of the data provided. It is extremely important to ensure that responses to personal questions, score on tests, etc. are confidential and anonymous so that the reader of the research would be unable to deduce the identity of the individual (Burns, 2000).

However in all the data collection instruments, names were used so as to match information on the questionnaire with MDAT and test scores. As the data collection span over a period of 6 months, it would have been difficult to use ID's only. Another

justification is that because the test in mathematics, Chichewa, English and EGRA were administered like a normal test to all the pupils in their respective schools, pupil's used their names so that they were easily matched at the end of the day during data analysis. The writing of names on top of an exam paper is a tradition in primary schools during examination writing hence the participants were placed in their natural setting. But in order to live within the parameters of an ethical research, the papers that contained personally identifiable information were burnt immediately after the data was entered in SPSS 16.0. In addition to that, data in the SPSS 16.0 was entered using ID numbers ranging from 1 to 137 corresponding to each research participant.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

This chapter presents the data analysis and its interpretation by looking at the various SPSS 16.0 output that were given out after running several statistical analysis. The chapter starts by giving the descriptive analysis on the pupil's development by age, and pupil's scores in literacy and numeracy by entry age. The chapter further gives regression analysis on the significant predictors of pupil's development and pupil's performance in literacy and numeracy. The last part of the chapter presents the findings and discussion on the relationship between entry age and pupil's development and pupils performance respectively.

4.1 Location of the study

The research was carried out in Thyolo district which is situated within the Shire Highlands, 47 kilometers from Blantyre and boarders internationally with Mozambique to the south (DEP, 2010). It is one of the four districts in the Shire Highlands Educational Division (SHED). It has a total land area of 1,715 square kilometers and has three distinct land regions namely: Rift Valley scarp, hilly zones and plains. The population density is 342 persons per square Kilometers, which is 2.5 times above the national average.

Ninety three percent of the population is living on subsistence farming and 22% of the total land is under the estate farming mainly with tea cultivation. The average land holding of smallholder farmers is 0.6 hectare, which is lower than the national average. This small land holding results in households not producing enough for the year hence during dry seasons learners are compelled to drop out of school for employment in order to be able to buy food. The poverty index for Thyolo is at 55% meaning that more than half of the population lives below the poverty line.

Thyolo has 16 PEA's each heading a zone with a total 190 primary schools of which 180 are public primary schools, 6 are tea estates schools and 4 are private schools (charge school fees). The maximum number of schools per zone ranges from 7-16 depending on the topography of the area and how easily the schools access the Teacher Development Centre (TDC), 107 of the public schools are Local Education Authority (LEA) schools and the rest are owned by a number of Christian organization. The total enrolment is 172,193 with 50.1% being girls.

Table 8: The basic indicators for Standard 1 in Thyolo district from 2008 to 2011.

	Promotion rate		**Repetition rate**		**Dropout rate**	
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**
2011	59(61.2)	60(62.1)	29(24.87)	29(24.01)	13(14.21)	11(13.70)
2010	61.3(63.2)	58.5(62.2)	28.71(25.05)	28.98(24.01)	9.96(11.71)	12.51(13.73)
2009	60.19(61.2)	57.42(63.2)	26.40(22.74)	27.19(21.9)	13.41(15.64)	15.40(15.06)
2008	63.04(63.12)	61.05(62.05)	30.65(26.0)	29.27(24.75)	6.31(10.88)	9.68(13.2)

Adapted from EMIS 2008, 2009, 2010 & 2011

Table 8 above shows the comparison of efficiency indicators for Thyolo district and national average (in brackets) for a period of 4 years from 2008 up to 2011. Promotion rates shows that the national average is greater than Thyolo district promotion rate for the whole period of 4 years. And further to that repetition rate for Thyolo district is higher than the national average repetition rate which is an indication than the system is not doing very well. However, on a positive note, the dropout rate for Thyolo district is less than the national average dropout rate and this means that despite the education indicators not being so good, more children are remaining in the system.

4.2 DESCRIPTIVE STATISTICS

4.2.1 Pupils physical development level by entry age

Pupils entering Standard One are aged five years, six years and seven years (for the purposes of this study). Descriptive statistics shows that in terms of language skills and fine motor, seven years old students are more development than their peers. However six years old pupils are more developed in gross motor than the rest of the pupil's.

Table 9: The means and SD of language skills, fine motor and gross motor development by age.

		Gross motor		**Fine motor**		**Language skills**	
	N	**M**	**SD**	**M**	**SD**	**M**	**SD**
5 years old	48	30.48	2.212	30.75	1.828	28.65	4.329
6 years old	41	32.24	1.786	32.00	1.225	31.37	1.785
7 years old	48	31.10	2.845	32.23	1.653	31.58	2.268

It is surprising that six years old pupils are more developed than seven years old, however a rational explanation would be that the children aged seven years have growth retardation as it has been observation that most children who have malnutrition and health related problem start schooling at later years (Rungo, 2008).

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4.2.2 Pupils performance in numeracy by entry age

A numeracy test that was administered to Standard One pupils to determine which age group performed better than the other is summarized in **Table 10** which gives means and SD.

Table 10: Means and SD for pupils score in numeracy test.

	5 years	**6 years**	**7 years**
Mean	49.40	62.83	64.46
Standard Deviation	29.15	28.80	23.78
Number	48	41	48

Table 10 shows that pupils who enter Standard 1 at the age of 7 years have a successively higher mean over pupils that enter Standard 1 at the age of 6 and 5 years respectively. Similarly, pupils who enter Standard 1 at the age of 5 years have a lower mean than all the three entry age groups. This means that in a class cohort younger pupils are likely to fail numeracy test because their average score is below the minimum pass rate of 50%. The findings from this study support the assertion that Sprietsma (2006) and Freeman, Lin & Chu (2009) who found that over aged children performs much better than under aged children.

4.2.3 Pupils performance in literacy by entry age

On pupils' performance in literacy, mean scores show that all the three entry age group performed very well.

Table11: Means and SD of pupils score in literacy test by age.

	5 years	**6 years**	**7 years**
Mean	58.08	68.85	70.81
Standard Deviation	25.73	23.86	19.55
Number	48	41	48

It can be seen from **Table 11** that pupils who enter Standard one at the age of seven years have a successively higher mean over pupils that enter Standard one at the age of six and five years respectively. Similarly, pupils who enter Standard 1 at the age of five years have a lower mean than all the three entry groups however the score of the under aged pupil is above the minimum mark required for one to be granted a pass. This finding confirms what Stipek (2002) noted that teachers defined children readiness in that the child should communicate needs, wants, and thoughts verbally in child's primary language. In other words, teachers in these schools allowed under aged children to start schooling on the understanding that they can be able to communicate effectively hence they have done well in language skills.

4.3 INFERENTIAL STATISTICS

4.3.1 Significant predictors of pupil's development and pupil's performance in numeracy and literacy test

Most literature show that age, gender and socioeconomic status affects performance of pupil's and pupil's development. Given the data collected in this study, the researcher wanted to find out how each of these factors affects pupils development and pupil's performance. A statistical application called regression analysis was run to find the significant predictor of pupils development and pupils performance respectively. Sykes (2010, p. 1) defined regression is "a statistical tool for the investigation of relationships between variables which seeks to ascertain the causal effect of one variable upon another".

4.3.1.1 Factors that predict pupil's development

The researcher wanted to find out the amount of effect that age, socioeconomic status and gender have on pupil's level of development. Below is the general formula that was going to guide the analysis

$$\mathbf{MDAT = b_0 + b_1 age + b_2 SES + b_3 gender + Error}$$

Where

b_0 = the regression constant

b_1 = the regression coefficient for age

b_2 = the regression coefficient for SES

b_3 = the regression coefficient for gender

Table 12: A Model summary from regression analysis.

Mode 1	R	R Squared	Adjusted R Squared	Std. Error of the Estimate
1	.394[a]	.155	.136	4.983

Predictors: (Constant), age, SES, gender

Dependent variable: MDAT

The Model Summary table shows that the multiple correlation coefficient *(R)*, using all the predictors simultaneously, is .394 which according to Field (2009) is a medium positive effect of age, SES and gender on the development of a pupil. It can also be reported from the model that the combination of the predictor account for 16% because R^2 is .155, meaning that 16% of the variance in pupil's development can be predicted from the combination *of age, SES and gender*

According to Field (2009) ANOVA is used to test the overall fit of the regression model to a set of observed data. It was found that $F\ (3, 133) = 8.155$, $p < .000$, $f^2 = 0.18$ and this indicates that the combination of the predictors significantly (when combined together) predict pupils development because the effect size is greater than a medium effect of $f^2 = 0.15$ (Allen & Bennett, 2010).

Table 13: Simultaneous Multiple Regression Analysis Summary for age, SES and gender.

Variable	**B**	**SEB**	**β**	**t**	**P**
Constant	79.276	3.573		22.188	.000
Age	2.490	.512	.390	4.863	.000
SES	-.148	.529	-.023	-.281	.616
Gender	-.436	.868	-.040	-.502	.779

Dependent variable: MDAT

Using the beta values from **Table 13** above the following is the regression equation:

MDAT = **79.276 + 2.490 age - 0.148SES - 0.436 gender**

But when all the three predictors are included in the regression equation, it is only age that makes a medium statistically significant contribution (effect) in predicting the pupil's development and as a result the model has to be re-estimated using age as the only predictor.

Predicting pupil's development by age

MDAT = b_0 + $b_1$age + Error

Where

b_0 = the regression constant

b_1 = the regression coefficient for age

Table14: Model summary from regression analysis

Mode 1	R	R Squared	Adjusted R Squared	Std. Error of the Estimate
1	.392[a]	.153	.147	4.952

Predictors: (Constant), Age

Dependent variable: MDAT

The Model Summary table shows that the correlation coefficient *(R)*, using age as the predictor is .392 which is a medium positive effect (Field, 2009, p. 173). This means that from the variance in pupil's development 15% could be attributed from the effect of age. It is also interesting to note that a SES and gender made a combined effect of 2%.

The ANOVA revealed a statistically significant predictor of age on pupil's development, $F\ (1,\ 135)\ =24.472$, p<.000 with f^2= 0.18. Finally, below is a regression analysis summary which shows the values that are used in a regression equation.

Table15: Simple Regression Analysis Summary for Age

Variable	B	SEB	β	t	p
Constant	78.285	3.062		25.570	.000
Age	2.500	.505	.392	4.947	.000

Dependent variable: MDAT

From the regression summary above, the equation for predicting pupils development is as follows:

MDAT = 78.285 + 2.5age

The findings from the regression analysis that age has an effect on pupils development in gross motor, fine motor and language skills development is in total agreement with assertion by cognitive development psychologists who argued that development is in stages with those in lower level not being able to perform some tasks as vindicated by the results from this study.

4.3.1.2 Factors that predict pupil's performance in literacy

Following research question number one of this study, the researcher wanted to find out the amount of effect that age, socioeconomic status and gender have on pupil's performance in literacy test. The following is the model equation that guided the analysis.

Literacy= b_0 + $b_1$age + b_2SES + $b_3$gender + Error

Where

b_0 = the regression constant

b_1 = the regression coefficient for age

b_2 = the regression coefficient for SES

b3 = the regression coefficient for gender

Table 16: A model summary from regression analysis.

Mode 1	R	R Squared	Adjusted R Squared	Std. Error of the Estimate
1	.266[a]	.066	.044	23.158

Predictors: (Constant), age, SES, gender

Dependent variable: Literacy test

The Model Summary table shows that the multiple correlation coefficient *(R),* using all the predictors simultaneously, is .256 which Field (2009) noted that it is a relatively small positive effect of age, SEs and gender on the performance of a pupil in literacy test. It can also be put on record that the combination of the predictor account for 7% because R^2 is .066, meaning that 7% of the variance in pupil's performance in literacy can be predicted from the combination *of age, SES and gender*

ANOVA output shows that there is a statistically significant effect of age, SES and gender on the performance of pupils in literacy with $F\ (3, 133) = 31.09$, p= .029 and f^2= 0.07. The results shows that the effect size is between small effect and medium effect because Allen and Bennett (2010) defined an f 2= 0.1 as small effect while an f 2= 0.15 as a medium effect. Hence a prediction of pupil's performance in literacy can be made from a combination of age, SES and gender.

Table 17: Simultaneous Multiple Regression Analysis Summary for Age, SES and gender.

Variable	**B**	**SEB**	**β**	**t**	**p**
Constant	18.292	16.605		1.102	.273
Age	6.203	2.379	.220	2.607	.010
SES	3.394	2.458	.117	1.381	.565
Gender	2.326	4.034	.049	.577	.170

Dependent variable: Literacy test

Using the beta values from Table above the following is the regression equation:

Literacy= 18.292 + 6.203 age + 3.394 SES + 2.326 gender

From **Table 17** above, it has been observed that of all the three predictors, it is only age that makes a statistically significant contribution (effect) in predicting the pupil's performance in literacy test and on that basis therefore the model has to be re-estimated using age as the only predictor.

Predicting pupil's performance in literacy test using age

Literacy test = b_0 + $b_1$age + Error

Where

b_0 = the regression constant

b_1 = the regression coefficient for age

Table18: A model summary from regression analysis

Mode 1	R	R Squared	Adjusted R Squared	Std. Error of the Estimate
1	.226[a]	.051	.044	23.164

Predictors: (Constant), Age

Dependent variable: Literacy test

The Model Summary table shows that the correlation coefficient *(R)*, using age as the predictors is .226 which is a relatively small positive effect (Field, 2009). Further to that, Field (2009) noted that ANOVA is used to test the overall fit of the regression model to a set of observed data. It was found that *F (1, 135) =7.247,* statistically significant with p=.008 and f^2= 0.05. This indicates that age can moderately predict pupils performance in literacy test.

Table19: A simple regression analysis summary for age

Variable	B	SEB	β	t	P
Constant	27.579	14.322		1.926	.056
Age	6.365	2.364	.226	2.692	.008

Dependent variable: Literacy test

From the regression summary above, the equation for predicting pupils development is as follows:

Literacy = 27.579 + 6.365 age

4.3.1.3 Factors that predict pupil's performance in numeracy

This section aims at finding the amount of effect that age, socioeconomic status and gender have on pupil's performance in numeracy test. Below is the model equation that is being used in this section.

Numeracy= b_0 + $b_1$age + b_2SES + $b_3$gender + Error

Where

b_0 = the regression constant

b_1 = the regression coefficient for age

b_2 = the regression coefficient for SES

b_3 = the regression coefficient for gender

Table20: A model summary from regression analysis

Mode 1	R	R Squared	Adjusted R Squared	Std. Error of the Estimate
1	.231[a]	.052	.032	27.486

Predictors: (Constant), age, SES, gender

Dependent variable: Numeracy test

The model summary table shows that the multiple correlation coefficient *(R),* using all the predictors simultaneously, is .231 which according to Field (2009) is a relatively small positive effect of age, SEs and gender on the performance of a pupil in literacy test. It can also be reported from the model that the combination of the predictor account for 5% because R^2 is .052, meaning that 5% of the variance in pupil's performance in numeracy can be predicted from the combination *of age, SES and gender*.

Gravetter & Wallnan (2013) reported that in regression analysis, ANOVA output is used to test the overall fit of the regression model to a set of observed data. The results from ANOVA showed that $F\ (3, 133) = 24.96$, p= .063 and f^2= 0.05. This means that the combination of the three predictors make a slightly greater than a small effect on predicting pupil's performance in numeracy. However, a regression summary model shows how each variable in the model is affecting the performance of pupil's in numeracy as shown in Table 21.

Table21: Simultaneous multiple regression analysis summary for age, SES and gender.

Variable	**B**	**SEB**	**β**	**t**	**p**
Constant	8.932	19.709		.453	.651
Age	7.655	2.824	.230	2.711	.008
SES	.093	2.917	.003	.032	.974
Gender	2.531	4.788	.045	.529	.598

Dependent variable: Numeracy test

Using the beta values from Table above the following is the regression equation:

Numeracy= 8.932 + 7.655age + .093SES + 2.531gender

Despite the fact that a combination of the three variables is statistically not significant, simultaneous multiple regression summary shows that age that makes a statistically significant effect in predicting the pupil's performance in numeracy test. It is on this basis therefore that the model has to be re-estimated using age as the only predictor.

Predicting pupil's performance in numeracy test using age

Numeracy test = b_0 + $b_1$age + Error

Where

b_0 = the regression constant

b_1 = the regression coefficient for age

Table22: A model summary from regression analysis

Mode 1	R	R Squared	Adjusted R Squared	Std. Error of the Estimate
1	.227[a]	.051	.044	27.511

Predictors: (Constant), Age

Dependent variable: Numeracy test

The Model Summary table shows that the correlation coefficient *(R),* using age as the predictors is .227 which Allen & Bennett (2010) described as a relatively small positive effect. Further to that, it can be observed from the model that 5% of the variance in pupil's performance in numeracy test can be predicted from *age.*

ANOVA output showed that there is a statistically significant effect on age on the regression model with $F\ (1, 135) = 7.300$, $p < .01$, $f^2 = 0.05$. The f^2 value shows that age has a slightly lower than a medium effect in predicting pupils performance in numeracy test.

Table23: Simple regression analysis for age

Variable	**B**	**SEB**	**β**	**t**	**p**
Constant	13.506	16.886		.800	.425
Age	7.531	2.787	.227	2.702	.008

Dependent variable: Numeracy test

From the regression summary above, the equation for predicting pupils development is as follows:

Numeracy = 13.506 + 7.531age

4.3.2 The relationship between pupil's entry age and pupil's development in gross motor, fine motor and language skills

In the section of descriptive statistics above, it was found that the three age entry groups have different development levels in gross motor, fine motor and language skills. This section wanted to find out whether the difference in the means is statistically significant across the three groups. It should also be put on record here that age has been proved using regression analysis that age is a significant predictor of pupils development in gross motor, fine motor and language skills.

Using the hypothesis presented below, one way ANOVA was used to find out whether under aged, normal aged and over aged pupils differences in gross motor, fine motor and language skills development is statistically significant.

Gross motor development hypothesis:

H_o = there is no difference in gross motor development among under aged, normal aged and over aged pupil's

H_1 = there is a difference in gross motor development among under aged, normal aged and over aged pupil's

Fine motor development hypothesis:

H_o = there is no difference in fine motor development among under aged, normal aged and over aged pupil's

H_1 = there is a difference in fine motor development among under aged, normal aged and over aged pupil's

Language skills development hypothesis:

H_o = there is no difference in language skills development among under aged, normal aged and over aged pupil's

H_1 = there is a difference in language skills development among under aged, normal aged and over aged pupil's

Table24: The one way ANOVA summary showing the development of pupils in gross motor, fine motor and language skills

Source	**df**	**SS**	**MS**	**F**	**p**
Gross motor					
Between groups	2	69.966	34.983	6.352	.002
Within groups	134	738.019	5.508		
Total	136	807.985			
Fine motor					
Between groups	2	59.995	29.998	11.635	.000
Within groups	134	345.479	2.578		
Total	136	405.474			
Language skills					
Between groups	2	252.078	126.038	13.510	.000
Within groups	134	1250.158	9.330		
Total	136	1502.234			

The F value in the three measures of pupil's development shows that the difference in development is statistically significant. However, it is not known as to between where is the difference amongst the three age groups hence, a Post hoc analysis has to be done.

ANOVA results show that gross motor F (2, 134) = 8.357, p= .000, ω^2= 0.07; fine motor F (2, 134) = 4.196, p =.017, ω^2= 0.13 and language skills F (2, 134), = 7.35, p= .001, ω^2= 0.15. The results from ANOVA shows that age has a large effect on fine motor and language skills development because ω^2 is closer to 0.14 which is a greater effect. Further to that the results indicates that age has a medium effect on gross motor development because ω^2 of 0.07 is greater than ω^2= 0.06 which according to Allen and Bennett (2010) is a medium effect. A post hoc analysis of Games- Howell was chosen because the Levene's test indicates that the variances are unequal (Morgan, Leech, Gloeckner, & Barrett, 2004). Post hoc multiple comparisons usually give us which specific means are different from which other ones ibid and below are the Games-Howell Post test results:

Gross motor development

Post hoc analysis shows that the difference in gross motor development between under aged and normal aged is statistically significant with p=.001. Further to that normal aged pupils are more developed in gross motor than over aged because their difference is statistically significant with p=.047. Finally, there is no statistically significant difference in gross motor development between under aged pupils and over aged pupils with

p=.495. As it has been reported in literature that most of the Malawian children are stunted, under weight and wasted, there is high likelihood that over aged pupils who were less developed that normal aged pupils are from this category of children. Hence there late entry could be attributed to their poor health status.

Fine motor development

Post hoc analysis shows that the difference in fine motor development is statistically significant between under aged and normal aged as well as between under aged and over aged. However the difference in fine motor development between over aged and normal aged is not statistically significant with p=.735

Language skills development

Post hoc analysis show that under aged pupils are the least developed in language skills when compared to normal aged and over aged pupils with being significant in both scenarios. However the difference in language skills development between normal aged and over aged pupils is not statistically significant.

This means that all the null hypotheses are rejected and that there is a statistically significant differences in gross motor, fine motor and language skills development amongst the under aged , normal aged and over aged pupil’s in Standard one.

4.3.3 Relationship between pupils entry age and pupil's performance

The relationship between pupil's entry age and performance is going to be compared in numeracy and literacy test scores. Analyses for the two subjects were run separately using one way ANOVA and their results have been presented separately.

4.3.3.1 Relationship between entry age and pupil's performance in numeracy

The mean score of the three entry age groups of pupils in numeracy shows that over age performs better, closely followed by normal aged and finally under aged pupils. It was also discovered that the mean score of the under aged is below the minimum level required for a pass rate. So in this section, the researcher wanted to find out whether the difference in the above explained performance is statistically significant bearing in mind that the preceding chapter has found that age is a significant predictor of performance in numeracy.

Using the hypothesis presented below, one way ANOVA was used to find out whether under aged, normal aged and over aged pupils differ in numeracy test

H_o = there is no difference in numeracy test scores among under aged, normal aged and over aged pupil's

H_1 = there is a difference in numeracy test scores among under aged, normal aged and over aged pupil's

Table25: A one way ANOVA output for numeracy test

	SS	df	MS	F	P
Between groups	6445.92	2	3222.96	4.332	.015
Within groups	99691.20	134	743.96		
Total	106137.12	136			

From the **Table 4.18** above we can see that the overall F values for numeracy is significant, meaning that pupil's performance in the subject is different, across the three entry ages is statistically significant. The effect value of ω^2 was calculated (see formula Appendix M) and it was found that ω^2= 0.04 which is slightly a moderate effect because it is lower than a medium effect of ω^2= 0.06 and slightly higher than a lower effect of ω^2= 0.01 (Field, 2009).

However, to know the between groups difference, a post hoc analysis for Turkey HSD was run because the Levene's test shows that F (2, 134) = 1.569, p= .212, which means that the variances are equal (Morgan G. A., Leech, Gloeckner, & Barrett, 2004). Post hoc multiple comparisons, sometimes called follow up test usually give us which specific means are different from which other ones (Morgan G. A., Leech, Gloeckner, & Barrett, 2004).

Tukey's post hoc results show that the difference in numeracy performance is statistically different between over aged pupils and under aged pupils with the former performing better than the later with p=.019. In addition to that the difference in pupil's performance in numeracy between normal aged and over aged pupils, as well as between normal aged and over aged is statistically not significant.

4.3.3.2 Relationship between entry age and pupil's performance in literacy

The mean score of the three entry age groups of pupils in literacy shows that over age performs better, closely followed by normal aged and finally under aged pupils. It was also discovered that the mean score of the three entry age group is above the minimum pass rate. Basing on these results, the researcher wanted to find out whether the difference in the above explained performance is statistically significant bearing in mind that the preceding chapter has found that age is a significant predictor of performance in literacy.

Using the hypothesis presented below, one way ANOVA was used to find out whether under aged, normal aged and over aged pupils differ in literacy test

H_o = there is no difference in literacy test scores among under aged, normal aged and over aged pupil's

H_1 = there is a difference in literacy test scores among under aged, normal aged and over aged pupil's

Table26: A one way ANOVA output for literacy test

	SS	df	MS	F	P
Between groups	4446.42	2	2223.21	4.145	.018
Within groups	71880.10	134	536.42		
Total	76326.53	136			

From the **Table 26** above we can see that the overall F values for literacy is significant, meaning that pupil's performance in the subject is different across the three ages is statistically significant. The effect value of ω^2 was calculated (see formula Appendix M) and it was found that ω^2= 0.04 which is slightly a moderate effect because it is lower than a medium effect of ω^2= 0.06 and slightly higher than a lower effect of ω^2= 0.01 (Field, 2009).

In an attempt to find the between group differences, a post hoc analysis for Turkey HSD was run because the Levene's test was found that F (2, 134) = 1.569, p= .185 meaning that the variances are equal (Morgan, Leech, Gloeckner, & Barrett, 2004).

Tukey's post hoc results show that the difference in literacy performance is statistically different between over aged pupils and under aged pupils with the former performing better than the later with p=.019. Further to that, post hoc analysis shows that there is no statistically significant difference in performance between normal aged and over aged as well as between normal aged and over aged.

CHAPTER FIVE

CONCLUSION AND IMPLICATION OF THE STUDY

This section presents the conclusions made from the data analysis and it has been presented following the sequence of research questions. The first conclusions are made on whether age is a significant predictor of pupil's development and pupil's performance; the development of standard one pupil's by age; and the performance of pupil's in numeracy and literacy by age

5.1 Significant predictors of pupil's development and pupil's performance in numeracy and literacy test

According to literature and empirical evidence, some of the factors that affect performance are age, gender and SES. In this study, regression analysis was used to find out how age, gender and SES can predict pupils performance and development.

It was found that both gender and SES are not statistically significant predictors of pupil's development and performance in literacy and numeracy test. This is in sharp contrast to what Tinklin et al (2001) observed about the difference in development and performance between boys and girls in a classroom set up.

> Girls are seen as better prepared, more conscientious, cooperative, organized, and respectful and their work is better presented. Boys, on the other hand, are seen as ill-prepared, competitive, disruptive, overconfident and less attentive. Boys generally have lower standards of behaviour and are involved in more disciplinary problems

The results from the data analysis has got a huge impact on this study in the way that it has given the paper a justification on why the effect of age on performance should be carried out. In addition to that it should increase the reliability of the findings since the effect of gender and SES is statistically insignificant.

5.2 Standard 1 pupil's development in gross motor, fine motor and language skills by age

Most people in Malawi do not have birth certificates and due to high illiteracy level and coupled with the discretion that parents have on whether to or not to send their child to school provides a conducive environment for parents to send their children to school basing on physical development. This study therefore wanted to find out whether there is a statistically significant difference in gross motor, fine motor and language skills development amongst the new entrant to Standard One in Malawi.

The results from one way ANOVA analysis confirm what the cognitive development theorist purports that child development is rapid but decelerating growth in infancy; a slower, constant rate during early and middle childhood; and a sharp increase in early adolescence, followed by a swift decrease as the body approaches its adult size (Berk, 2009, p. 177). Another major finding from this paper is that pupil's aged 5 years are the

least development in the three measures of development and this simply means that in circumstances where the age of the learner is known at the time the child wants to start Standard One, his/her gross motor, fine motor and language skills development can be used instead.

5.3 Performance of pupil's in numeracy and literacy test by entry age

Empirical research evidence shows that the effect of entry age on performance is mixed and that researchers seem not to agree on one thing. The findings from this paper have found that older pupil's perform much better than younger and normal aged pupils.

The findings of the research confirm the quality of efficiency indicators that are prevalent in the Malawi education system which shows the dismal performance of pupils in Standard One. This poor performance has an effect in promotion because it is below the minimum level required for one to proceed to the next class and EPCD (2009, p. 14) found that repetition rates are highest in the first years of primary especially in grade 1. EPCD suggested that this is due to failure to master the skills needed to be promoted to the next level by younger pupils. Further to that high repetition rates among underage pupils in first grade suggest that parents are sending their underage children to school early as a replacement for kindergarten or early childhood care.

5.4 IMPLICATIONS OF THE STUDY

Researchers have been looking at factors that affect pupil's performance in numeracy and literacy test score and this study has made significant contribution to the available literature. The paper has shown that age predicts both development and performance of pupils. This means that if a child is sent to school at a younger age s/he is under developed in gross motor, fine motor and language skills and is likely to perform poorer in numeracy and literacy test. Perhaps the best advice to parents is that sending children to school at the tender age does not help at all. Perhaps emphasis needs to be placed on what EPDC (2009) observed that parents are sending their underage children to school early as a replacement for kindergarten or early childhood care. It should be noted that sending children to school at an early age can not constitute ECD training.

Another implication that could be drawn from the study is that if admission policy is not strictly adhered to in admitting pupils who are 6 years old and above, the indicators of quality of education will continue being at poor levels as is the current trend. As a policy on admitting student to start formal schooling, strict adherence to the policy may lead to improvement in the education quality indicators at entry level. Further to that, the research paper has shown that under aged pupils are performing poor when admitted to start Standard 1 and since they do not meet the minimum requirement for a child to be promoted to Standard 2 hence they form a greater part of repeaters and drop out.

Finally, since it has been noted that age contributes to 36% of the factors that affect performance, a further study needs to be carried out to find out the effect of school related factors on performance of pupils. This will ultimately help to inform policy makers on what on what are the factors that are contributing tp the poor performance of our pupils in the Malawi primary school education cycle.

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APPENDICES

APPENDIX 1: Introductory letter from Chancellor College

UNIVERSITY OF MALAWI

CHANCELLOR COLLEGE

Principal: Christopher Kamlongera,
B.A., Dip TEO., M.A., Ph.D

P. O. Box 280, Zomba, MALAWI
Tel: (265) 01 524 222
Telex: 44742 CHANCOL MI
Fax: (265) 01 524 046

Our Ref.: EDF/6/19
Your Ref.:

24 February 2012

TO WHOM IT MAY CONCERN

INTRODUCTORY LETTER FOR MASTER OF EDUCATION RESEARCH

Mr Christopher Francis Namagowa is a Master of Education (MEd/PPL/27/10) student in Policy, Planning and Leadership in the Department of Educational Foundations at Chancellor College, University of Malawi.

Mr Namagowa is working on his thesis *The Effect of School Starting Age on Performance in Thyolo District.* This is meant to be a request to your institution or organization to assist our student in his/her endeavor to collect data for the said thesis from your institution.

Thank you

24 FEB 2012

Mr Frank Mtemang'ombe
HEAD, DEPARTMENT OF EDUCATIONAL FOUNDATIONS

No objection

APPENDIX 2: Questionnaire

My name is Christopher Francis Namagowa, a Masters of Education student at Chancellor College. Am doing a research entitled *"The Effect of Entry Age on Pupils Performance in Numeracy and Literacy Test in Thyolo District"*. This questionnaire intends to find the background information for the participants in the research

1. Name of the pupil: _____

2. Name of the school:_____

3. Date of Birth:

Day	Month	Year

4. Did the child attend nursery school?
   a. Yes
   b. No

5. Did the child repeat a class?
   a. Yes
   b. No

6. If yes, how many times?
   a. 1
   b. 2
   c. 3
   d. More than 3 times

7. Does your school have School Feeding Programme?
   a. Yes
   b. No

8. What is the type of roof for your house?
   a. Iron sheets
   b. Grass thatched

9. Which types of books are available at your home?
   a. School books
   b. Newspaper
   c. Books
   d. No books

10. What is the source of your drinking water?
   a. Tap water
   b. Borehole
   c. Well

11. What is the type of toilet used at your home?
    a. Flush toilet
    b. Pit latrine
    c. No toilet

12. What is the main source of energy for cooking?
    a. Electricity/ Gas
    b. Charcoal
    c. Firewood

13. What is the main source of energy for lighting?
    a. No lighting
    b. Electricity
    c. Paraffin/ Candle

14. What is the availability of meals at your home?
    a. Breakfast
    b. Lunch
    c. Supper

15. What is the pupil's mother highest level of education?
    a. Did not attend school
    b. Primary level
    c. Secondary level
    d. University or College

16. What is the pupil's father highest level of education?
    a. Did not attend school
    b. Primary level
    c. Secondary level
    d. University or College

17. Which assets are available at your home in a function able (good) condition?

Radio	
Television	
Refrigerator/ Deep freezer	
Cooker or hot plate	
Bicycle	
Motorcycle	
Car/ Truck	
Telephone/ Cell phone	
Ox- cart	
Cattle, goats, pig	

THANK YOU VERY MUCH FOR COMPLETING THE QUESTIONNAIRRE AND MAY GOD BLESS YOU ABUNDANTLY!!!!!!!!!!

APPENDIX 3: Mathematics

(100 MARKS)

1. Copy the following numbers

   a. 1 2 3 4 5

   b. 5 4 3 2 1

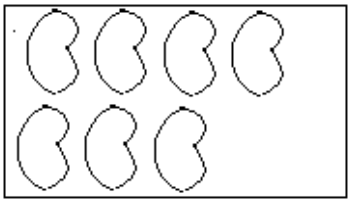
   (10 Marks)

2. Fill in the blank spaces

   5 ☐ 7 ☐ 9

   (10 Marks)

3. How many?



   (10 Marks)

4. 2 + 2 = **(10marks)**

5. 5 + 4 = **(10marks)**

6. 4 – 0 = **(10marks)**

7.
```
   3
 - 2
 ---
 ---
```
(10 Marks)

8.
```
   7
 - 0
 ---
 ---
```
(10 Marks)

9. 6t + 3t = **(10marks)**

10.
```
   K4
 + K5
 ----
 ----
```
(10 Marks)

END OF QUESTION PAPER!!!!

APPENDIX 4: English

(100 MARKS)

1. Draw the following patterns

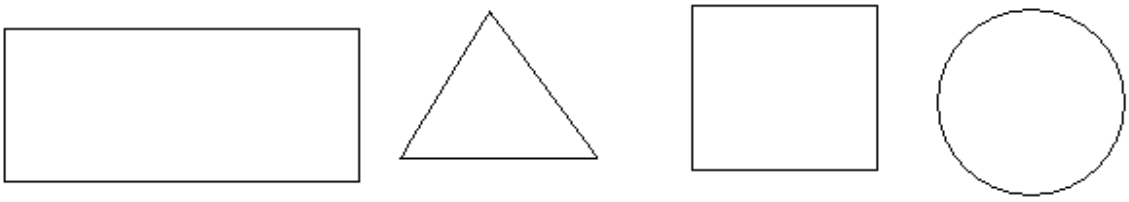
u u u
n n n
m m m

(10 Marks)

2. Copy the following alphabet letters

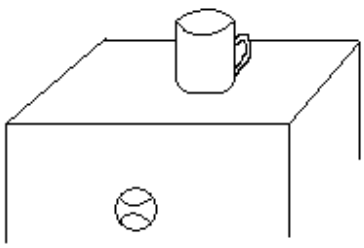
e f g h **(10marks)**

3. Draw the following shapes



(10 Marks)

4. Copy the following

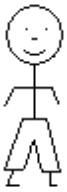


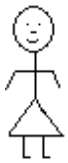
(10 Marks)

5. Write the following words

Book bell cat car sun **(20 Marks)**

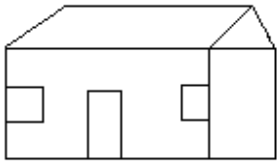
6. Draw the following

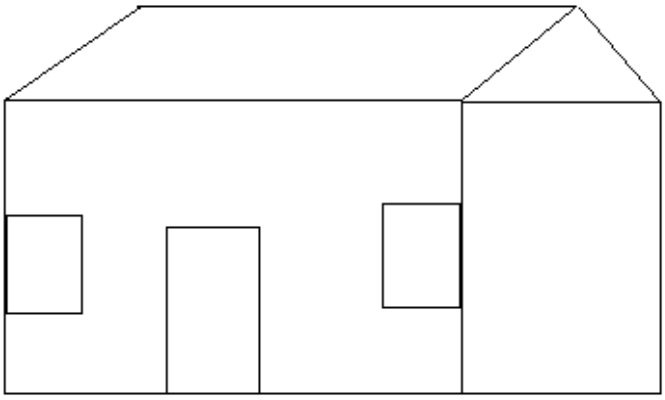




Father Mother **(20 Marks)**

7. Copy the following





a small house

a big house **(20 Marks)**

END OF QUESTION PAPER!!!!!!!!!!

APPENDIX 5: Chichewa

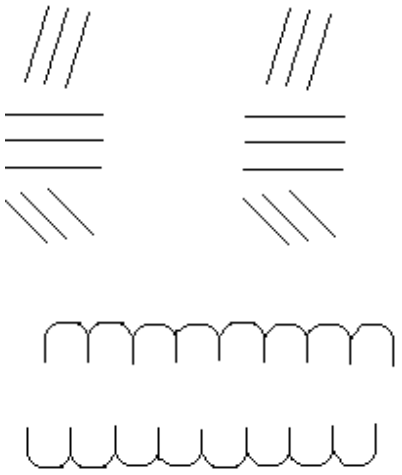
(50MARKS)

1. Lembani izi:

   a e i o u

   u a o e i **(10marks)**

2. Lembani zitchetche izi



(10 Marks)

3. Tsirizani mawu awa

   An_ at_te **(10marks)**

4. Lembani mawu ndi ziganizo izi

   leza bulu **(10 Marks)**

   agogo ali ndi ndodo **(10 Marks)**

END OF QUESTION PAPER!!!!!!

APPENDIX 6: Early grade reading assessment

(50MARKS)

1. Lembani matchuliro amaliwu amalembo awa

   a n i k u m **(12 marks)**

2. Lembani matchuliro a maphatikizo awa

   ni ka mu to de **(10marks)**

3. Lembani matchuliro a mawu awa

   ana kana nana

   Una uku mama

   Ima mutu atate **(18 Marks**

4. Lembani matchuliro a ziganizo izi:

   a. Ana inu ukani

   b. Onani doko **(10 marks)**

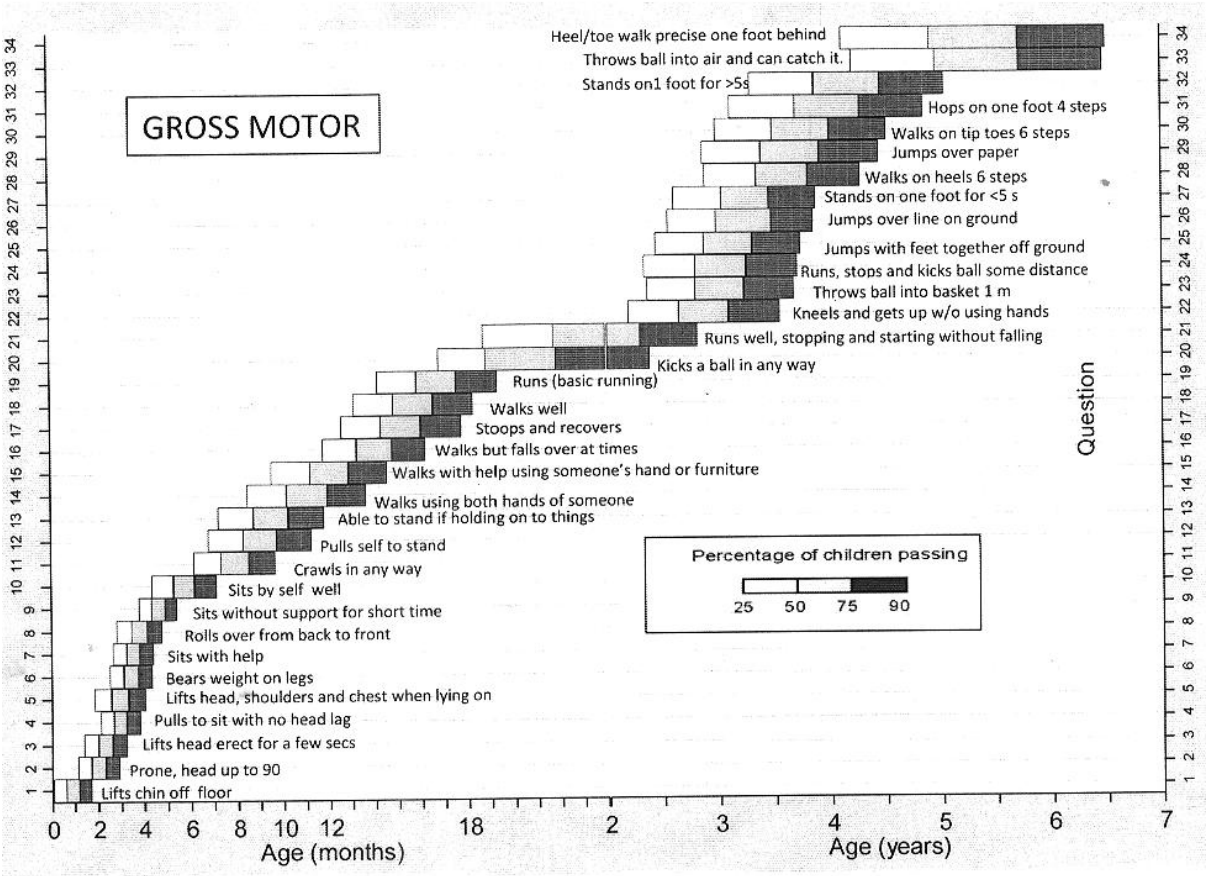
END OF QUESTION PAPER!!!!!!!!!

APPENDIX 7: Gross motor development test

GROSS MOTOR/PHYSICAL SKILLS:

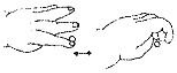
1. Amadzutsa chibwano kwa kamphindi	2. Amadzutsa mutu koti amatha kuyang'ana kutsogolo	3. Amalimbitsa khosi kwa kamphindi pang'ono akamu-nyamula pa phewa kapena akamubereka kumbuyo.	4. Amadzikoka kuti akhale pansi	5. Amamitsa mutu, mapewa ndi chifuti ndipo amawongola manja ake, amadzutsa chidafi kuchokera pansi ndi manja onse	6. Amalimbitsa miyendo yake mukamunyamula kuti ayime
7. Amakhala pansi mothandizidwa (with a nice straight back.)	8. Amatembenuka ndikuchotsa manja ake kuti akhale chilutiji mimba	9. Amakhala opanda kuthandizidwa kwa kamphindi/sinathamakhazike kwa nthawi yaitali.	10. Amakhala pansi bwinobwino.	11. Amakwawa mafi monse (ngakhale ndi matako)	12. Ameyesera kudzidzutsa thupi lake kuti aime
13. Amagwira chinthu kuti ayime bwino osagwa	14. Amatha kuyenda mukagwira manja onse.	15. Amatha kuyenda atagwira mkono umodzi wa munthu wina.	16. Amayenda bwino koma amatha kugwa nthawi zina	17. Amatha kuwerama kapena kutola chinthu pansi osagwa	18. Amatha kuyenda yekha bwino
19. Amathamanga 'mwapang'onopang'ono kugwa nthawi zochepa	20. Amatha kumenya mpira ngakhale ndi pang'ono	21. Amathamanga bwino osagwa	22. Akhonza kugwada ndikuthanso kuima opanda kugwirira chinthu.	23. Amaponya mpira ndikugwetsera mubasiketi kamodzi maulendo atatu pamtunda wa metre imodzi	24. Amathamanga, kudzima ndikumenya mpira bwino bwino kwa kaulendo ndithu
25. Amalumpha ndi miyendo yonse iwiri pamodzi	26. Amalumpha chingwe kapena mzere ojambulidwa pansi	27. Amaima ndi mwendo umodzi kwa kamphindi < 5 secs	28. Amatha kuyenda ndi chidendene mu sitepe osachepera asanu ndi imodzi.	29. Amatha kulumpha pepala lomwe lakidwa kusogolo.	30. Amayenda ndi zala za kumiyendo sitepe zokwana zisanu ndi imodzi.
31. Amalumpha ndi mwendo umodzi kokwana masitepe anayi	32. Amaima ndi mwendo umodzi kwa kanthawi monga (eg. >10s < 1 min	33. Amatha kuponya mpira umwamba ndi kuwuwakha.	34. Amayenda mogundaniza mapazi potsatira mzere wolembedwa pansi		

APPENDIX 8: Gross motor development graph and interpretation

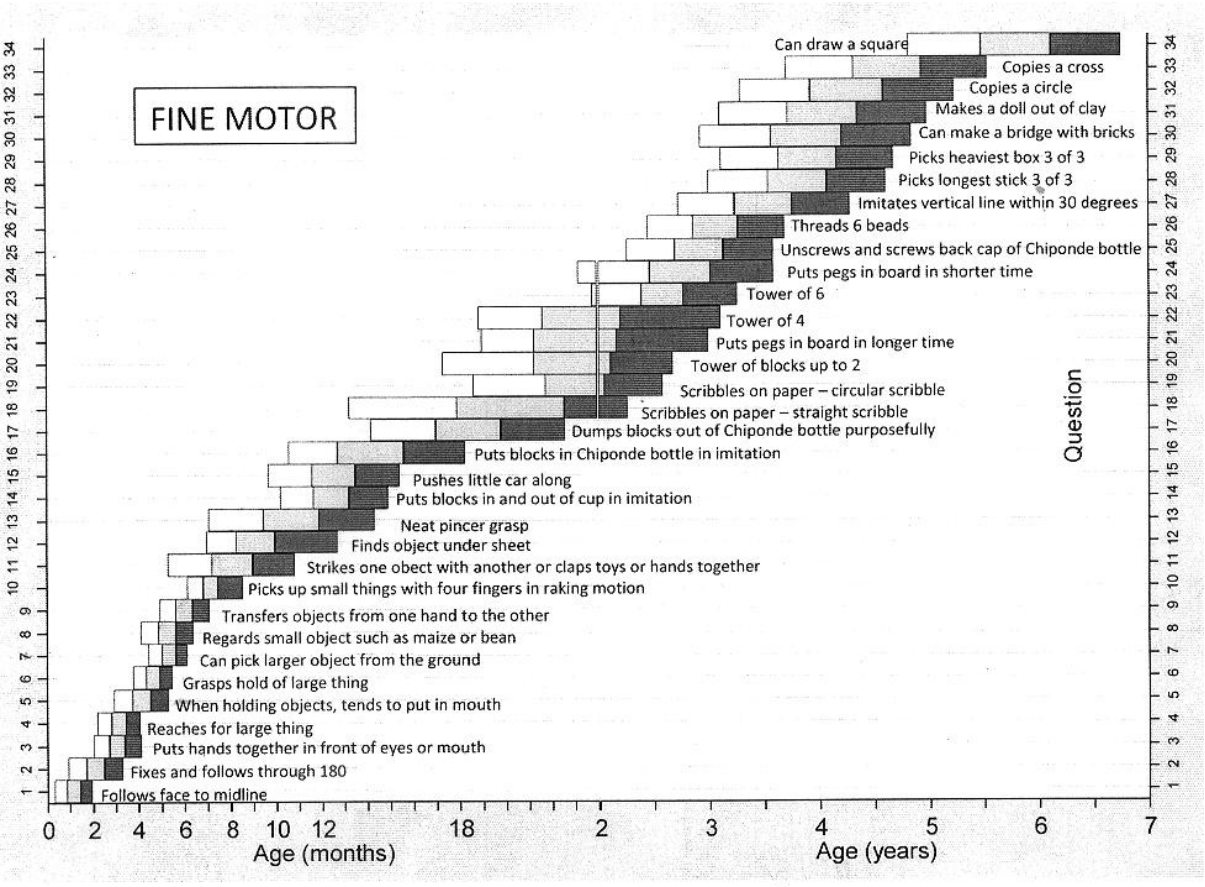


APPENDIX 9: Fine motor development test

FINE MOTOR/VISUOPERCEPTION:

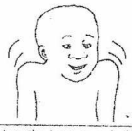
1. Amatsatira ndi maso nkhope ya munthu kapena chinthu chowala, ngakhale chitasunthu pang'ono. 	2. Amatsatira ndi maso chintau chowala kapena chinnene akuemona kwambiri kuchokera ku manja mpaka kumanzere 	3. Amabwereresa manja ake onse awiri kunkhope ndipo amatha kuvazinedikira kapena kuwaika mkamwa. 	4. Amafuna kulikira chinthu 	5. Kuwiri kawiri akagwira chinthu amafuna kuchiyika mkamwa 	6. Amatha kulumbira chinthu ndi dzanja lake. 
7. Amatha kunyamula chinthu chokulilapo pansi monga miyala olo supuni. 	8. Amazindikira zinthu zazing'ono monga chinanga nyemba, amazuna olo amafuna kuzitikira 	9. Amatha kuchotsa chinthu dzanja lina ndikuika dzanja lina 	10. Amatola zinthu zazingo'ono ndi zala zonse zinayi 	11. Amamenyetsa zinthu ziwiri zomwe wazigwira mmanja 	12. Amapeza choseweretsa pansi pa chiterje 
13. Amatha kugwira mbewu ya chimanga kapena nyemba pakati pa chala choyamba ndi chachiwiri 	14. Amatsanzira kuponya zinthu monga miyala mu kapu. 	15. Amatha kukankha galimoto yaing'ono (yoseweretsa) 	16. Amatsanzira kuponya miyala mu botolo la chiponde 	17. Amakhanula miyala kuchokera mu botolo la chiponde mozindikira 	18. Amakhwatchakwatcha inizere papepala pogwiritsa ntchito choko kapena makala 
19. Amazungulizazungulira papepala pogwiritsa ntchito choko kapena makala 	20. Amapanga chipirara cha miyala iwiri 	21. Amaika mapegi asanu ndi atatu mu mabowo a bolodi mwanthawi yosapyola mphindi ziwiri (<2 min) 	22. Amapanga chipirara cha miyala inyai 	23. Amapanga chipirara cha miyala isanu ndi imodzi 	24. Amaika mapegi asanu ndi atatu mu mabowo a bolodi mwanthawi yosapyola mphindi ziwiri .....theka la mphindi (<30s) 
25. Amatha kuseka chitsekerero cha botolo la chiponde mozungulira ndi kusegula 	26. Amatenga mikanda isanu ndi imodzi ndi kuika mu chingwe kapena ulusi 	27. Amatha kujambula mzere wowongoka	28. Amasankha mtengo wautali pa mzake pamaulendo atatu) "Wautali ndi uti?" 	29. Amatha kuzindikira bokosi lomwe liri lolemera kuposa linzake? "Lolemera koposa liti" 	30. Amapanga mlatho 
31. Amatha kuumba munthu olo gafanoto ndi dongo (or other complex things eg. A car) 	32. Amatha kukopela lozungulira lopanda mpata 	33. Amatha kukopela, mtanda 	34. Amatha kukopela "square" 		

APPENDIX 10: Fine motor development graph and interpretation

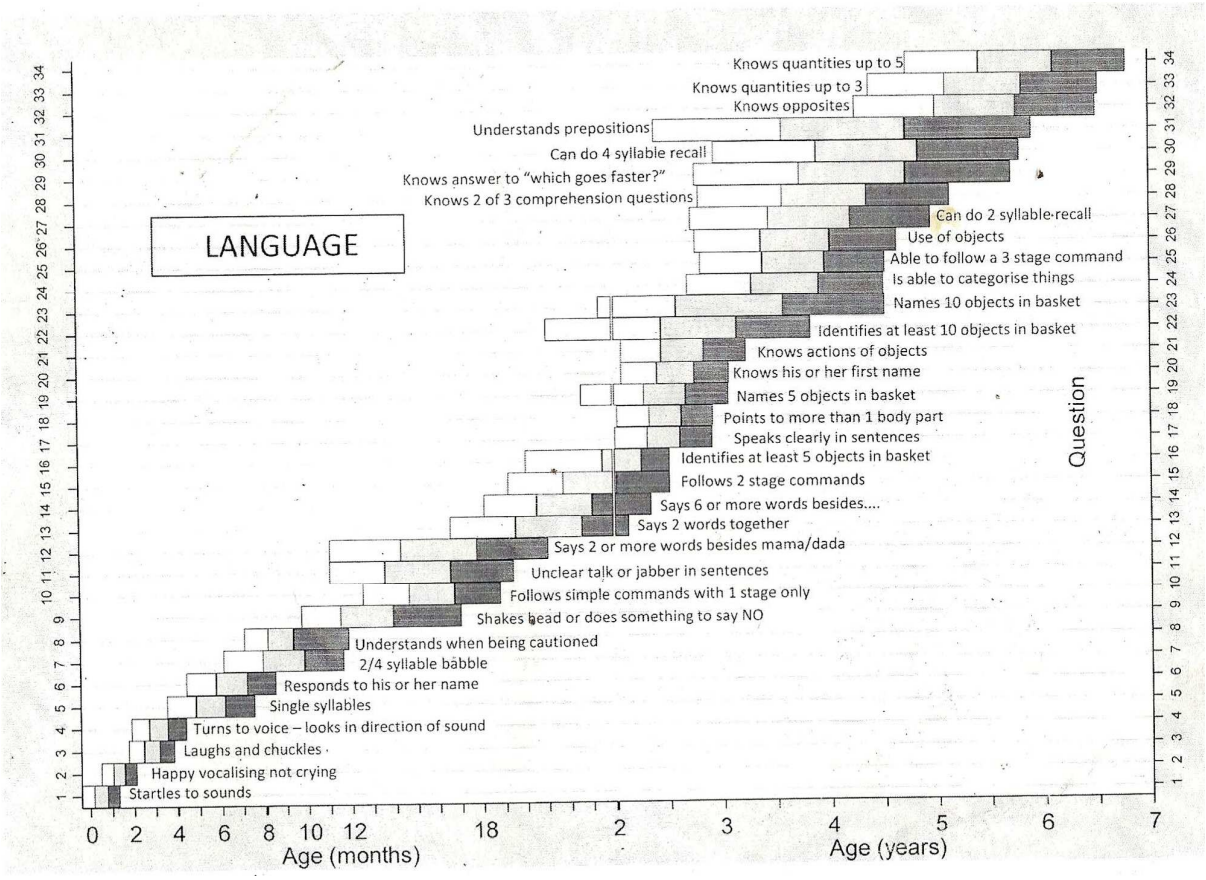


APPENDIX 11: Language skills development test

LANGUAGE/HEARING:

1. Amadzidzimuka akamva phokoso	2. Amapanga phokoso osati kufira monga "uh", "ch", "a"	3.Amaseka 	4. Amambemukira komwe kukumveka mau(ngati munthu sakumveka kodi amayang'ana komwe kukuchokera mau kapena phokoso?) 	5. Amapanga phokoso lomveka ndi liu limodzi monga ma/da/pa/ba	6. Amazindikira dzina lake ndipo amasonyeza kuzindikira kuti waitanidwa 
7. Amapanga phokoso dada, mama, mimi, tata, mau awiri kufikira anayi opanda tanthauzo.	8. Amadzindikira pamene achenjezedwa pa choopsya monga ponena kuti "ayi" amasiya kwakanthawi pang'ono 	9. Amakana pogwedeza mutu kapenanso mapewa 	10. Amapanga chomwe wauzidwa, monga "ndi patse kapu" 	11. Amayankhula mau osamveka bwino, amayesera kuyankhula koma zimakhala zopanda pake	12 Amanena mawu awiri
13. Amanena mau awiri ophatikizana monga mama-nsima, mama-pita, madzi-kumwa, dadi bwera.	14 Amanena mawu isanu ndi imodzi	15. Amatha kupanga zinthu zimene wauzidwa monga "tenga kapu ndipo ike mu basiketi".	16. Amazindikira zinthu monga .... njinga, sipuni, kapu, mpira, galimoto, mbale. Kumuuza kuti..... "Ndi patse....." More than 5 recognised	17. Amatha kuyankhula bwino mwachidule zinthu zimene zachitika.	18. Amaloza ziwalo za nthupi lake Kumunfunsa: "kodi.....ili pati?" > 1 body part 
19. Amatchula mayina a zinthu zimene zili m'bokosi. Kumfunsa mwana kuti ichi ndichani?" Named at least 5.	20. Mwana amadziwa dzina lake (amatha kutchula dzina lake)	21. Amazindikira mchitidwe ya zinthu monga "Chodyera phala ndi chiti?". "Chosesera ndi chiti?" "Chomwera madzi ndi chiti?"	22. Amazindikira zinthu monga .... njinga, sipuni, kapu, mpira, galimoto, mbale. Kumuuza kuti..... "Ndi patse....." More than 10 recognised	23. Amatchula mayina a zinthu zimene zili m'bokosi. Kumfunsa mwana kuti ichi ndichani?" Named at least 10	24. Kumunfunsa mwana... "Ndiuze zinthu zimene umadya..." or "Ndiuze ziyama zimene umadziwa...."
25. Amatha kupanga zinthu zitatu zimene wauzidwa, monga " imilira, womba mmanja ndi pita uko....."	26. Funsani....Umatani ndi njinga? Umatani ndi pensulo? Pamafunika mayankho monga, timakwera njinga timajambulira zithuzi, timamwera madzi.	27. Akhonza kukumbukira zilembo – chilembo : "Pa, Chi, Tu, Gio" 2 out of 4 eg. Pa, Chi	28. Funsani..... Umatani ukamva njala? Umatani ukatopa? Umatani ukatenthedwa?	29. Amadziwa yankho la funso monga "kodi galimoto ndi njinga chimathanangga kwambiri ndi chiani?"	30. Akhonza kukumbukira zilembo – chilembo : "Pa, Chi, Tu, Gio" 4 out of 4
31. Mufunse mwana aike PANSI, PAMWAMBA, KUSELI, PAKATI..... *Angathe kuchita zinthu zitatu mwa zinthu zimene zili pamwambapa. 	32. Amadziwa mawu otsutsana a zinthu monga. "abambo ndi aakulu, mwana ndi ....." "moto uli wothentha, madzi ndiwo....." "Ngati dzuwa lituluka masana mwezi, utuluka ..... (must do 2 of 3 of these)	33. Amadziwa kuchuluka kwa zinthu zokwana zisanu. Mwachitsanzo ukafunsa kuti izi ndi zingati.... Can count up to THREE bricks	34. Amadziwa kuchuluka kwa zinthu zokwana zisanu. Mwachitsanzo ukafunsa kuti izi ndi zingati.... Can count up to FIVE bricks		

APPENDIX 12: Language skills development graph and interpretation



APPENDIX 13: Effect size formula's

ANOVA effect size formula

$$\omega^2 = \frac{SS_M - (df_M)MS_R}{SS_T + MS_R}$$ (Field, 2009, p. 389)

Multiple regression effect size formula

$$f^2 = \frac{R^2}{1 - R^2}$$ (Allen & Bennett, 2010, p. 193)