ETHIOPIAN FIFTH NATIONAL LEARNING ASSESSMENT OF GRADES FOUR AND EIGHT STUDENTS

NATIONAL EDUCATIONAL ASSESSMENT AND EXAMINATIONS AGENCY

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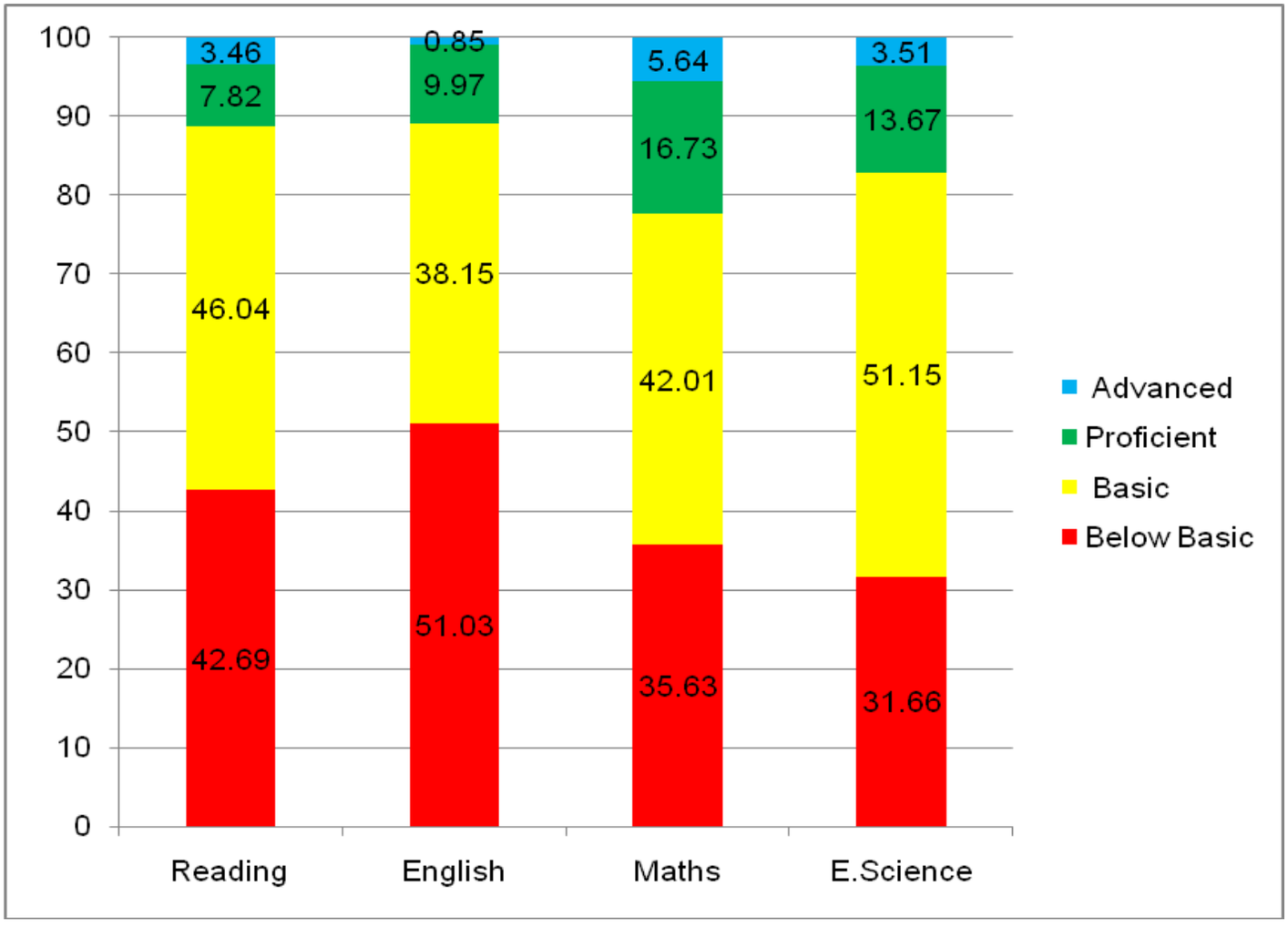
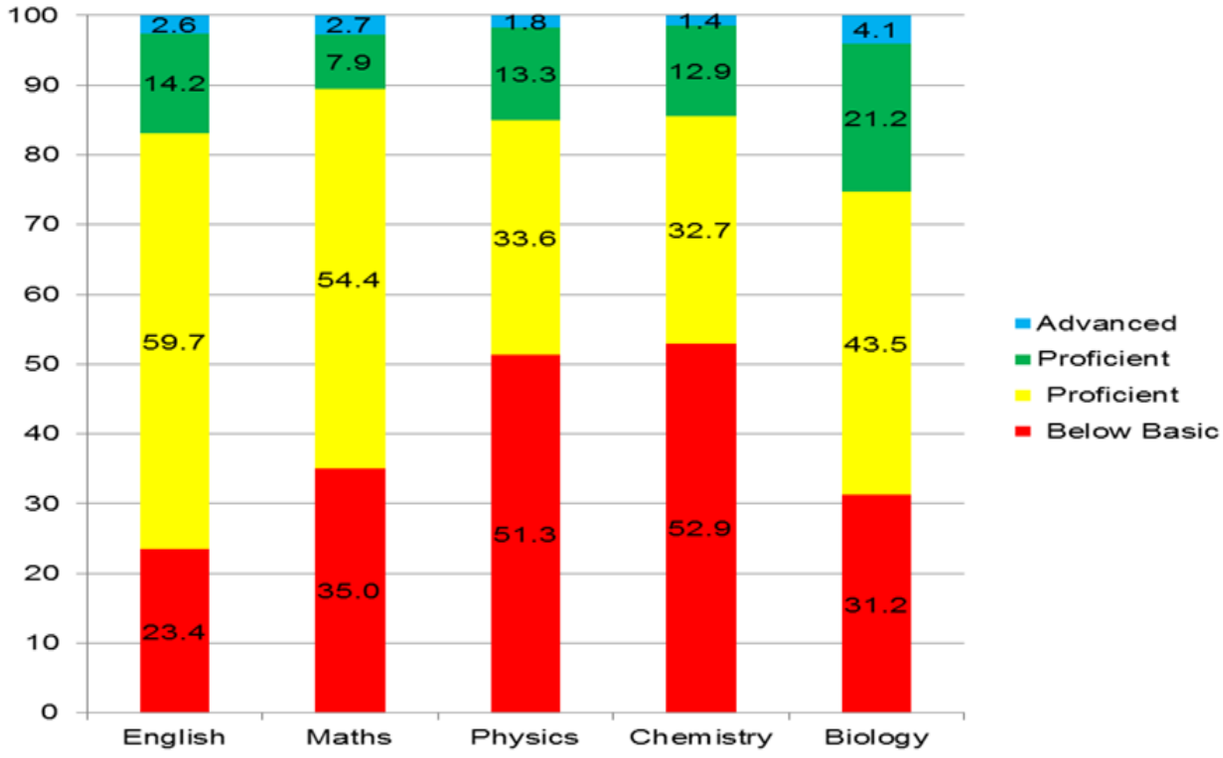
ETHIOPIAN 5th NATIONAL LEARNING ASSESSMENT OF GRADES 4 AND 8 STUDENTS



Performance of Grade 4 students at different Proficiency levels



Performance of Grade 8 students at different Proficiency levels

A Study Carried out By Educational Assessment Directorate,

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Table of Contents

List of Table

List of Figures

Acronyms and Abbreviations

ANOVA	Analysis of Variance
CTT	Classical Test Theory
EFA	Education for All
FGD	Focus Group Discussion
ESDP	Education Sector Development Program
ESNLA	Ethiopia Second National Learning Assessment
ESDP	Education Sector Development Program
ETNLA	Ethiopian Third National Learning Assessment
ETP	Education and Training Policy
GEQAEA	General Education Quality Assurance and Examinations Agency
GEQIP	General Education Quality Improvement Program
GTE	Government of Transition of Ethiopia
IATA	Item and Test Analysis
IEA	International Association for the Evaluation of Educational Achievement
IRT	Item Response Theory
MLA	Monitoring Learning Achievement
MML	Minimum Mastery Learning
DML	Desirable Mastery Learning
MLC	Minimum Learning Competency
MOE	Ministry of Education
NAE	National Agency for Examinations
NAEP	National Assessment of Educational Progress
NEAEA	National Educational Assessment and Examinations Agency
NLA	National Learning Assessment
NOE	National Organization for Examinations
PISA	Program for International Student Assessment
PLD	Performance Level Descriptors
PTA	Parent Teacher Association
SACMEQ	South African Consortium for Monitoring Educational Quality
SNNPR	Southern Nations, Nationalities and Peoples Region

SPSS	Statistical Package for Social Sciences
TAP	Test Analysis Package
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development

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Executive Summary

Overview

The main purposes of the Ethiopian Fifth National Learning Assessment for the First Cycle Primary Education were to measure learning achievements of Grades 4 and 8 students and identify the factors that determine those achievements. It is also intended to get comparative information on school improvement since the Ethiopian Fifth National Learning Assessment conducted in 2012. In order to obtain the required information for the study, both quantitative and qualitative research approaches were employed. The target population was Grades 4 and 8 students in the country. A total of 14, 835 sample students from 401 schools in grade 4 and 13,420 students from 362 in grade 8 in all regions participated in the study. For the purpose of generating data on factors which determine the academic achievement, 1,498 teachers and 347 school principals were included in grade 4. Similarly, for grade 8, about 1,715 teachers and 339 school principal were participated.

The data collection instruments included achievement tests, attitude surveys, and questionnaires for students, teachers and school directors, and focus group discussion guides. Here are the main findings of the study.

Overall Achievement

The achievement of students as measured by the composite scores at national level were less than the minimum expected score (50%) by the Ethiopian education and training policy. The national average percent score in four subjects (Reading English, Mathematics and Environmental Science) for grade four was 44.74% and for grade 8 in five subjects (English, Mathematics, Physics, Chemistry, and Biology) was 41.14%.

The summary of descriptive statistics for the achievement tests indicates that except for mathematics in grade 4 of the tested subjects, the scores of students is far less than 50%. The percentage of students who scored 50% and above in total average score were low in both grade levels. Only 36.6% and 25.2% of the students were able to score 50% and above in grade 4 and 8 respectively in average scores.

Gender and Achievement

Boys performed better than girls in the composite score at national level. There were 7,703 (51.4%) males and 7,132 (48.6%) females in the national sample for grade 4. For grade 8, there were 6, 962 (52%) males and 6, 458 (48%) females. Boys scored an average of 46.27 % *whereas* girls had an average of 43.24 in grade 4. In grade 8, ***boys*** performed better than girls in all subjects except in biology at national Level. All the mean differences were statistically significant at P<0.0001. Achievement of boys was higher than girls by 1.81 % in the average score. As it is evident from the findings, the gender gap is still persistent.

Location and Achievement

In all subjects at both grade levels, urban students performed better than rural students at the national level. At grade 4, the mean scores for urban and rural students were 47.75% and 44.19% respectively and difference was statistically significant. Similarly in grade 8, the mean scores for urban and rural were 43.91% and 39.88% respectively and the difference was statistically significant.

Achievement across regions

There exist variations in academic achievement of students across regions. In grade 4, Addis Ababa and Dire Dawa were found to be exceptional with the highest mean scores of 57.78% and 53.42%, respectively; whereas Gambella and Benishangul Gumuz regions were achieved the lowest mean scores 37.66% and 34.85%, respectively.

Similarly in grade 8, the result indicated that the achievement of students from Dire Dawa (47.43 %) and Addis Ababa (46.32 %) was found to be the highest where as those from Gambella (30.84 %**)** and Benishangul Gumuz (31.66 %) was the lowest.

Achieved Performance Standards

The students' achievement scores were divided into four standards (Below Basic, Basic, Proficient and advanced**)**. The proportion achieving each standard for the subject tested for both grades (4 and 8) was described. In grade 4, at below basic level, English (51.03%), was the highest and Environmental science (31.66%) was the least. At basic level, Environmental science (51.15 %) was the highest and English (38.15%) was the least. At proficient level, mathematics (16.73) was the highest and reading (7.82%) was

the least. At advanced level, mathematics (5.64%) was the highest and English (0.85%) was the least. For grade 8, at below basic level, chemistry (52.9%) and physics (51.3%) received the highest percentage. At basic Level, English (59.7%) was the highest and chemistry (32.7%) and physics (33.6%) received the least. At proficient level**,** biology (21.2%) is the highest and mathematics (7.9%) is the least. At advanced level, Biology (4.1%) and Chemistry (1.4%) were the least.

Trends in Academic Achievement

The concept of scale scores and test equating are crucial to compare the trends of academic achievement across time. Scaled score is a conversion of a student's raw score on a test to a common scale that allows for a numerical comparison between students' achievement. In order for a fair and consistent decision to be made on test results, scores from different forms of a test should indicate the same level of performance no matter which test form a test taker has received.

Thus, in order to equate the 2012 and 2015 tests, **the fixed common item parameter** method was employed. Furthermore, in test equating process the parscale software was used in calibrating the test scores.

In grade 4, except for mathematics, which was increased from 300.5 to 313.3 in scaled score, the achievement of students in 2015 in all subjects were decreased when compared to 2012 NLA results. However, looking at the total average scaled score; the difference between the students' achievement in 2012 and 2015 was very negligible and about 0.6 point.

At grade 8, except for biology, which was decreased from 301 to 297.9 in scaled score, the achievements of students in 2015 in all subjects had shown slight increment as compared to 2012 NLA results . With respect to the average scaled score; the achievement of students in 2015 was higher than that of 2012 by about 5 points.

Background Variables and Achievement

Multiple regression analysis based on the students' background questionnaires resulted in a model which was able to explain 12.3 % of the variations observed in the composite scores in grade 4. Lack of sufficient curriculum materials (textbooks, teachers' guides, and syllabi, students' absenteeism**,** students'

lack of respect for teachers**,** lack of motivation for schooling, large number of students in classroom was found to negatively affect students' achievement.

In Grade 8, teacher related variables such as teacher characters, teachers' attitudes towards teaching profession, portion coverage, teachers' training, frequency of teacher-parent communication, understanding level of the subject matter, managing students in a class and supervision by principals explained 41.8% of the variance. Regarding to portion coverage, some teachers were unable to cover the entire portion of their subjects' content as per the opinion of participants from focus group discussion.

Based on the findings of the study, the following recommendations are provided:

- Steps should be taken at all levels to improve the performance of the school system. The observed low academic achievement score calls for immediate action.
- Disparity between boys and girls still needs attention and there is a need to provide additional support to girls.
- There is a need to improve the academic achievement of students over time by making use of the recommendations made by the previous and current national learning assessments.
- A regular monitoring of learning achievement and identifying of problems of the education system particularly of primary education is of paramount importance.
- The existence of a wide variation in the achievement of students among regions requires special attention, particularly, to those regions with low students' academic achievement (Gambella and Benishangul Gumuz).
- As the shortage of curriculum materials such as textbooks, teachers' guides and syllabi contributed to low achievement of students, immediate measure should be taken to provide textbooks for every student at 1:1 ratio. In addition, syllabi and teachers guides should be available for every subject in each school.
- Teachers' continuous professional development particularly with reference to different subject matter content knowledge and methodology, formative assessment techniques, action research and special needs education should be strengthened.
- Every subject teacher should be committed to cover the entire portion of the subject matter. In this regard, school supervisors and Woreda Education Offices ought to follow up the progress regularly.

CHAPTER ONE:

INTRODUCTION

1.1 Background

The provision of quality education at all levels of the education system is of paramount importance not only for the wellbeing of individuals but also for social and economic development of a nation. It is widely accepted that the quality of human capital as an essential determinant of the productivity of any economy relies on the quality of the education system. Thus, monitoring the quality of the education system becomes an issue for decades in most countries of the world. Both developed and developing countries have been monitoring the quality of their education through assessment. Assessment, particularly the assessment of students' learning achievements, has received a good deal of attention and implemented all over the world (Kellaghan & Greaney, 2001).

Nowadays, it is commonly recognized that educational quality is measured not only by inputs and outputs alone, but also by learning achievement indicative of what has been learned and the knowledge and skills acquired in the course of the learning cycle. National assessments represent an overall shift in assessing educational quality from a focus on inputs to a focus on learning outcomes. The assessments describe the achievement of students in a curriculum area, which is then aggregated to provide an estimate of the achievement level in the education system as a whole at a particular age or grade level (Greaney & Kellaghan 2008). Measurement of learning outcomes, therefore, provides information that can be used to improve educational planning, management, and teaching (Stephens & Moskowitz 1999). Student learning is unlikely to improve unless national assessment findings are used to develop policies and strategies directed at changing school and classroom practices (Greaney & Kellaghan 2008).What students have learned or can do has a direct bearing on instructional practice (Schubert & Prouty-Harris 2003), which is framed largely by what teachers know, the learning environment and supportive structures that enable instruction, both at school and home.

National assessment data, therefore, provide useful information on both strengths and weaknesses of the curriculum on the basis of learning achievement results. Those data can, therefore, provide a rich source of additional information for identifying strategic actions that are necessary to improve the quality of

education. Such actions can be targeted at resource allocation, teacher training, for accountability purpose, monitoring changes in achievement, and other variables over time (Greaney & kellaghan 2008).

The Government of Ethiopia has long recognized the importance of student learning as a yardstick to measure the health of its education system. Consequently, it has made the commitment to not only raise enrolment rate but also to improve the quality of education throughout the entire system. This commitment has been reflected in the government's policy documents. For instance, GEQIP was launched in order to support the provision of quality education that prepares citizens for the competitive global market economy. The GEQIPII has a learning assessment component to check whether or not the quality of education has improved. Similarly, in the ESDPV document, it has been documented that Ethiopia has planned to carry out the national learning assessments at a four-year interval at each exit sub cycle of the primary (grades 4 and 8) and secondary (grades 10 and 12) education (MOE, 2015). So far the country has conducted four national learning assessments at grades 4 and 8 since 1999/2000 in collaboration with USAID; it had been also conducted at grades 10 and 12 in 2010 and 2014.

In the second, third, and fourth national learning assessments of grades 4 and 8, the achievements of students were far below the minimum standard of 50% (the standard of having at least 50% of the test items correctly answered). Besides low achievement in students' learning, there exists a difference in the achievement between sub groups: boys versus girls, urban versus rural, across regions and school status (level 1 to 4).

Thus, the fifth national learning assessment at grades 4 and 8 was intended to measure the achievements of students in core subjects (Reading, English, Mathematics, Environmental Science, Physics, Chemistry and Biology) to check whether improvements have been made since the last assessment, and analyze the determinant factors that affect the quality of primary education.

1.2 Purpose of the Study

Education is moving from being a privilege for the few to becoming the right for all. However, this quantitative expansion has brought about serious challenges to its quality. Quality does not mean only what goes into schools and input materials, but also what goes in the mental, behavioral change or physical change of children. It is important to develop the knowledge, skills, attitudes and habits of students in addition to giving emphasis to input factors.

Developing countries have tried to assess and measure student achievement and improve their educational systems. Improving student learning has remained one of the most desired goals of educational processes. The information obtained in a national assessment can supplement information on inputs to an education system (educational resources or teacher qualifications), on educational processes and outcomes.

These types of information provide policy makers, stakeholders and education managers with evidence about their education system's achievements and constraints it may be operating under, the problems (weaknesses and failures) it may be experiencing, all of which should provide a basis for proposals for remedial action. Since it is difficult for an education system to plan for improvement without such information, national assessments can be considered as an essential component of the professional administration of any education system (Postlethwaite & kellagen, 2008).

In Ethiopia, since quality assurance has been an important part of the reform process, the attention paid to learning assessment was invaluable. Thus, the main purpose of conducting the fifth national learning assessment was to provide information about learning attainments by students, trends in achievement and the factors that determine those attainments in the Ethiopian primary education so that attention can be paid to the improvement of the system as whole. Specifically, the purpose of this study could be illustrated in the following basic research questions.

1.3 Basic Research Questions

- What does the overall achievements of Grades 4 and 8 students in key subjects look like?
- Is there a significant difference in achievement mean scores for each subject across sub groups (gender, location, school status, region,)?
- To what extent do students in the different proficiency levels vary with respect to the cut mean scores for both grades in each subject?
- Is there any progress in students' achievement as compared to the fourth NLA?
- What does the attitude of students towards socially relevant issues (health, environment, civics and ethics, school and education) look like?
- What are the major non-school and school factors that significantly correlate with students' learning achievement and what factors mainly account for students' achievement?
- What does the opinions and judgments of stakeholders (directors, teachers, students and parent representatives) look like on the effectiveness and problems of learning in schools?

1.4. Objectives

The main objective of this study is to find out the status of students' learning achievement at the exit levels of primary education and identify the determinant factors that influence the academic achievement of students.

Moreover, the specific objectives of this study are to:

- Find out the overall achievements of Grade 4 and 8 students in key subjects (including English and Mathematics for both grades, Reading and Environmental Science for G4, Physics, Chemistry and Biology for G8).
- Analyze student learning achievement results by region, gender, school location and status.
- Explore achievement of students across different proficiency levels based on performance standards.
- Attitude of students towards socially relevant issues.
- Compare the trends of students' achievement with 2012 NLA study.
- Identify major non-school and school factors that influence the overall academic achievement of students.
- Identify students, teachers and principal variables that influence the overall academic achievement of students.
- Provide feedback to decision makers, planners and managers at different educational levels and concerned stakeholders about the academic attainment of students in various subjects.

1.5. Significances of the Study

Over the last two decades, substantial attempts have been made to expand primary education, and improve access, equity and efficiency in Ethiopia. Now the emphasis has shifted towards improving quality in all areas and in particular towards student learning achievement. This national learning assessment study, therefore, provides an indication or feedback of where students' achievement in the country stands in relation to the stated profiles of the curriculum- what learners know, understand, and can do in relation to some or all of the learning goals determined in the curricula.

Student learning assessments can provide baseline information from which progress can be made at the end of a key stage/cycle/ in general education. Since it focuses on actual learning, it enables one to find out the extent to which an educational system is effective as a whole. If it is properly integrated into the system of education, student learning assessments can help actors and stakeholders to focus their collective attention, examine their assumptions, and create a shared academic culture dedicated to assuring and improving the quality of education.

The Ethiopian fifth national learning assessment is a nationwide program and a continuation of the Ethiopian fourth national learning assessment. In this respect, this will serve as a key tool for monitoring changes or improvements since the time the Ethiopian fourth national learning assessment was conducted.
The Education and Training Policy of the Federal Government decentralized the education system. Regions can plan and administer primary education based on the guidelines and standards set by the MOE since 2003. Regions can implement the policy according to their own specific conditions. Besides, the policy states that primary school children should learn in their mother tongue. This implies that some of the features of these regions affect the practice of primary education in relation to curriculum development, material preparation, teacher education, school management, teacher practices, school-community relations, etc., and the extent to which students learn from their schooling. The Ethiopian fifth national learning assessment contributes to monitoring how expected national standards have been implemented and if each of the regions has developed realistic mechanisms to convert national guidelines into local tools for school development.

Ethiopia has spent about 5% of GDP of its public finance on education (it is one of the highest among sub Saharan Africa countries). In order for the education sector to justify this expenditure and retain support, both the government and the public require that the money spent should help to enhance the quality of learning and train the required skills in students. Hence, information from the national learning assessment provides an immense potential for policy makers to identify, allocate and manage the resources of education to improve quality in education.

Thus, the Ethiopian fifth national learning assessment was intended to provide relevant and reliable information to policy makers, education leaders, curriculum developers, teachers and other stakeholders as to how the primary education is functioning with regard to student's learning achievement.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Concept of National Assessment

A national assessment is defined as an exercise designed to describe the level of achievement, not of individual students, but of a whole education system or a clearly defined part of one (e.g. grade 4 students or 11years-olds) (Greaney & Kellaghan, 1996). National assessments were introduced to address the fact that the educational data on inputs that had been collected in the past years were often of little relevance or use to educational planners. As a result, national assessments would address this issue by providing information on the "products" or "outcomes" of schooling (e.g. student achievements or inequalities in the system). It was hoped that the information could be used in conjunction with the input data in order to provide a sounder basis for policy-and decision-making in education.

Ever since the *Education for All* (EFA) movement was launched in 1990 and followed by the *Dakar Framework for Action* in 2000, there has been a gradually increasing awareness of the importance of a focus on the quality of the education offered to children, young people and adults at all levels. After the World Declaration on Education for All held in Jomtien, governments, non-governmental organizations, and international aid agencies expressed their commitment to provide a basic education of high quality to all the children of the world. Thus, the framework has contributed to the emergence of the national assessment movement and pointed out that all schooling efforts should lead to student learning and that quality education should strictly mean student achievement.

As the Dakar Framework for Action stressed the importance of having "a clear definition and accurate assessment of learning outcomes, governments tried to work for ensuring basic education quality for all" (UNESCO, 2000). As Pritchett (2004) noted, the completion of primary schooling or higher itself does not guarantee that a student has mastered the needed skills and competencies. Today, the quest for quality learning has become the concern of both the industrialized and developing countries. In fact, all of the available evidence suggests that in nearly all developing countries the levels of learning achievement is very low. So, there is a strong belief that the use of assessment results will help improve educational quality. Although, the evaluation of schools has traditionally been mediated by school inspectors or

supervisors for years, since 1990s, however, many countries began to use performance of students based on achievement tests in national and state-wide assessments to determine the status of student learning.

National Assessment (sometimes called system assessment, learning assessment, and assessment of learning outcomes) is the area of great importance that has been given most attention in the context of improving the quality of education since 1990. Recently, countries throughout the world have reached to consensus on the importance of measuring educational performance of children (Wolff, 1998 as cited in Thomas Kellaghan, Vincent Greaney, T. Scott Murray, 2009). As Chinapah (2003) explains, measuring students' learning outcomes is an integral part of the educational process, and it is crucial for monitoring the implementation of educational programs and the evaluation of their impact.

The basic purpose of a national assessment is to provide information on student achievement particularly, its short comings which are a prerequisite for intervention (Aguerrondo, 1992). If data are available from assessments carried out at different times, trends in achievement (whether it is improving, remaining the same, or deteriorating) can be identified. This information has sometimes been used to monitor the effects on student achievement of changes in the education system.

According to (Greaney & Kellaghan, 1996) all national assessments seek answers to one or more of the following questions.

- How well are students learning in the education system with reference to general expectations?
- Is there any evidence of particular strengths and weaknesses in students' knowledge and skills?
- Do particular subgroups in the population perform poorly? Are there, for example, disparities between the achievements of boys and girls, of students in urban and rural locations, of students from different language groups, or students in different regions of the country?
- What factors are associated with students' achievement? To what extent does achievement vary with characteristics of learning environment?
- Does achievement of students vary overtime?

2.2 International Experiences of Learning Assessments

Two basic models for the implementation of national assessments are used worldwide. One is sample based (analytical view of achievement) derived from USA and the other approach is a census type (holistic performances) derived from the United Kingdom assessment (Greaney & Kellaghan, 1996).

In the United States, the National Assessment for Educational Progress (NAEP), which is mandated by the National Congress, has become a standard feature of the education system since 1969.The objective of the program is to measure students' achievements at specified ages and grades (4, 8, and12) on 11 instructional areas. Since 1969, assessments have been conducted periodically in reading, mathematics, science, writing, and other subjects. England and Wales first applied a large scale survey or national assessment in 1948 at the age levels of 9, 11, 15 years. In 1978, an improved assessment system was made on three main areas; language, mathematics and science at ages of 11, 13, and 15 years. It was given much weight by politicians in the 1980s and exhibited the various functions of assessment such as formative, diagnosis, summative, and evaluative (Greaney & Kellaghan, 1996).

National learning assessment in France has been introduced since 1979 using both sample and census models of USA and United Kingdom respectively. On the sample based, students are assessed about every five years at the end of grades 7, 9 and 10 to provide information on achievements at the system level in relation to the curriculum. In the other method, the total population of students in grades 3, 6, and 10 are provided with diagnostic assessment designed to provide information on individual schools and feedback is sent to schools, students, and parents with assisting teachers to adapt their pedagogical skills to the needs of their students.

Sample based National Learning Assessments conducted in six countries of Latin America-Chile, Argentina, Brazil, Costa Rica, Mexico, and Colombia- showed similar results in that students scored far below expectations, and students from urban and private schools scored better than their counterparts. Colombia is another country in Latin America that conducted an assessment in 1991 on Grades 3 and 5.The purpose was to find out to what extent students attained the minimum standards set in mathematics and language.

2.2.1 International Large Scale Assessments

International large scale assessments are conducted in various languages and regions throughout the world (Clarke, 2011) and were designed to explore cross-national variation in student learning, education systems and processes (Best et al, 2013).

Trends in Mathematics and Science Studies (TIMSS) is mathematics and science assessment that monitors trends in student achievement, based on the curricula of participating countries and that is administered to students in grades 4 and 8. TIMSS is supported by the International Association for the Evaluation of Educational Achievement (IEA) and has been administered in four year cycles since 1999, with 63 countries having participated in the 2011 cycle (FTI, 2009).

The Progress in International Reading Literacy Study (PIRLS) is a reading literacy assessment that monitors trends in students' achievement and is administered to students in grade 4 and 8. PIRLS is supported by the IEA, and has been implemented in four year cycles since 2001, with 49 countries having participated in 2011 (FTI, 2009)

As developing reading literacy ability is vital to every student's growth and maturation, IEA has been conducting regular international assessments of reading literacy and the factors associated with its acquisition in several countries around the world for more than 50 years. In addition, Progress in International Reading Literacy Study (PIRLS) was inaugurated in 2001 as a follow-up to IEA's 1991 Reading Literacy Study. Conducted every five years, PIRLS assesses the reading achievement of young students in their fourth year of schooling—an important transition point in children's development as readers. Typically, at this point in their schooling, students have learned how to read and are now reading to learn. PIRLS is designed to complement IEA's TIMSS assessments of mathematics and science at the fourth grade (Mullis & Martin, 2015).

Program for International Student Assessment (PISA) is an assessment that monitors trends in student literacy, mathematics and science achievement, based on literacy's or skills and competencies in these areas, and is administered to 15 year old students. PISA is supported by the Organization for Economic Co-operation and Development (OECD), and has been administered in three year cycles since 2000, with 66 countries and economies having participated in 2012 (LMTF, 2013).

2.2.2 African Experiences on International Learning Assessments

African countries have been participating in international learning assessments in four major categories of learning assessments where three of which involve similar activities in several countries. As it was stated in Callaghan (2004), there are four major categories of learning assessment in Africa, where three of which involve similar activities in several countries. These are: The Monitoring Learning Achievement (MLA) project, the Southern Africa Consortium for Monitoring Education Quality (SACMEQ) project, and the PASEC (Programmed' Analyse des Systems Educatifs des Pays de la COFEMEN), and the fourth is a national learning assessment conducted by individual countries.

SACMEQ is a regional assessment that is administered to students in grade 6 in Anglophone African countries, based on common curricula of the participating countries.
SACMEQ was established in 1995, with support from UNESO IIEP and the government of the Netherlands. To date, three cycles of SACMEQ have been administered across 15 participating countries. A unique feature of SACMEQ is that in some national assessments, teachers are also administered assessments to evaluate their curricular knowledge and skills. SACMEQ aims to serves to monitor educational quality in the region, and to serves to develop institutional capacity in assessment use and dialogue between researchers, policymakers and practitioners.

In PASEC, twelve African countries including Burkina Faso, Cameroon, the Republic of Congo, Cote d'Ivoire, Djibouti, Guinea, Madagascar, Mali, Niger, the Central African Republic, Senegal, and Togo have participated. Like SACMEQ, PASEC also encourages the involvement of senior decision-makers and other stakeholders in policy issues, and emphasizes the need to base decisions on reliable data and to follow up these decisions with realistic agenda for action (Kulpoo & Coustere, 1999). In PASEC, students of Grades 2 and 5 were assessed in French and Mathematics. Later, it expanded to include students in all grades from 2 through 6, while data were collected from students and teachers on a variety of school and background factors.

According to Kellaghan & Greaney (2004), PASEC differs from other national assessments in Africa in that students are assessed both near the beginning (November) and at the end (May) of the academic year. This is done to obtain indications of growth or the "value" added during the year under consideration, though it only captures students who survive in the system.

Currently, however, PASEC is undergoing major changes, aimed at strengthening the measurement of the learning outcomes to enable appropriate comparisons across participating countries and over time. Thus, PASEC intends to measure student performance on a common scale using Item Response Methodology (IRT) that will enable the accurate performance estimates at the country level and for sub-group of interest within countries, depending on the sampling design within countries. The changed PASEC will be implemented at three levels of that are considered important points of the education system (LMTF, 2013).
The Monitoring Learning Achievement (MLA) project was conducted in 1999 by sampling 50,000 grade 4 students in response to the World Declaration of Education For All in 1990 in Jomtien to evaluate the extent to which students actually acquire useful knowledge, reasoning ability, skills and values. MLA – I was carried out for grade 4 students to assess reading and writing literacy, numeracy, and life skills that is relating to awareness and knowledge of health, nutrition, sanitation, and hygiene. The achievement report has shown that only four countries had met their Jomtien learning target (i.e. 80 percent of students should attain the intended learning competencies) (Kellaghan, 2004).

2.3. Importance of National Learning Assessment

Research evidences indicated that educational quality has been the basis for the rising of modern assessment. The emergence of learning assessment is believed to come up with an objective appraisal system of a given education system before arriving at sound judgment. It is also important to note that one of the modern assessment procedures focus on outcomes. Today, the dominant question posed by many stakeholders, including policymakers, has become on the outcomes of education: whether students are acquiring the desired knowledge, skills, behavior and attitudes. As a result, policymakers or educational managers need information that would be necessary to reach informed judgment as related to the adequacy of student achievements obtained in the system. Likewise, teachers may need similar information on the achievement of their students in order to make some form of comparisons and assess their own professional effectiveness. At the classroom level, learning assessments can inform teachers and help them adapt their pedagogical skills, beliefs or practices to enhance learning.

2.4. Use of National Learning Assessment Results

Unless assessment results are integrated into the educational policy decision-making processes, it cannot have considerable impact on the quality of students' learning. Hence, there has to be effective strategies to

be drawn in a view to the communication and use of assessment results. All the information derived from national learning assessment should be valuable to stakeholders: curriculum developers, school supervisors, education leaders, teachers, parents and other education partners.

Appropriate dissemination of assessment results to may include broad dissemination to stakeholders at various levels, as well as targeted dissemination appropriate to the stakeholder group. Dissemination should also be timely, as appropriate for the assessment (Liberman & Clarke, 2012). More successful learning assessments communicate in different modes and with different complexities to the general public, schools, parents, teachers as well as education policy-makers. Besides serving as a means of obtaining information on the status of educational systems, assessment is used as a lever of reform (Madaus & Kellaghan, 1992; Popham, 1987). It is generally agreed that assessments play significant roles in changing teacher behavior as well as classroom instruction, both of which are expected to raise the standard of students' learning.

2.5. Learning Assessments in Ethiopia

The Ethiopian First National Learning Assessment was launched in 1999/2000 (1992 E.C.) by the Ministry of Education (MOE) in collaboration with the Basic Education System Overhaul (BESO) I project. The main objective of this National Learning Baseline Assessment was to determine the various levels of students' performances at both Grades 4 and 8 in four key academic subject areas. Grade 4 students were assessed four subjects: English, basic reading, mathematics and environmental science all prepared in the different instructional languages; and Grade 8 students were assessed five core subjects: English, mathematics, chemistry, physics and biology. Moreover, teachers and head teachers and the overall conditions of school compounds, in addition to students, were considered as major sources of data collected for the study (MOE, 2000). According to the findings of the Ethiopian First National learning Assessment, no one region scored above the acceptable minimum level of 50% achievement (NOE, 2002).

The Ethiopian Second National Learning Assessment was the continuation of the First National learning Assessment, and it was aimed to collect information on the level of student achievement, to identify factors that enhance or retard student learning and to recommend appropriate remedial actions to improve performance in the primary educational system. The Second National Learning Assessment was started and

carried out in Grades 4 and 8 in 2003/04 (1996 E.C). The National Organization for Examinations (NOE) initiated the assessment and AED/BESOII provided the necessary financial and technical assistance.

Results from the study showed that the composite achievement results at national level for both Grades 4 and 8 were less than the expected minimum standards set by the Ministry of Education. Moreover, in both grades male students performed better than female students. The percentage score of all subjects and the composite score of all regions showed that there was disparity in student achievement in all regions.

The Ethiopian Third National Learning Assessment was conducted in 2007/2008(2000 E.C). Similar to the First and Second National Learning Assessment, the mean score for each subject and consequently their composite score were below the minimum expected score (50%) set by MOE. The median score which was less than the mean score (40.9%) showed that 50% of the students in the composite score obtained only 40.0%. The mean score for English (36.5%) was the least and much lower than the composite score.

The Ethiopian Fourth National Learning Assessment was conducted in 2011/2012 (2004 E.C). Similar to the first, second, third Ethiopian National Learning Assessments, the fourth NLA results from the study showed that the composite achievement scores at national level for both Grades 4 and 8 were less than the expected minimum standards set by the Ministry of Education. Moreover, in both grades male students performed better than female students. The percentage score of all subjects and the composite score of all regions showed that there was disparity in student achievement in all regions. For both grades, the study revealed that student background factors, teachers' related factors, school structure and curricular materials, language of instruction, school management and instructional support services play a significant role in the variability of student achievement scores.

2.6. Factors Influencing the Academic Achievement of Students

Research evidences indicated that academic achievement of students is influenced by several factors within and outside of the school. The students' home environment, learning facilities, the instructional language, time of instruction, and frequency of homework are some examples. Moreover, teachers' motivation, teachers' education level and teaching experiences, all potentially influence students' achievement.

School Related Factors: There are so many school related factor that may influence the academic achievement of students. Among those factors, the quality of **t**eachers is one of the essential elements in

quality learning. According to Fuller (1986), the quality of teachers highly influences school achievement. The scholar holds that the most marked effects are teachers' experience and verbal competence. In addition, teachers' educational level was most strongly related to achievement of students. Greenwald, Hedges, and Laine (1996) found in their meta-analytical study that teaching experience had a positive and significant effect on student achievement. Schneider (2003) found out that school facilities have a direct effect on teaching and learning. Text books enable the pupils to follow the teacher's sequence of presentation and aids in understanding of lessons (Ubogu, 2004).

The Quality and Availability of Learning Materials: Many Researchers argued that school's learning achievement is a function of the material inputs expended per pupil and the efficiency with which these inputs are managed by the teachers and the headmaster (Fuller, 1986). As it stated in (Fuller, 1986), textbook availability is the most important factor in influencing students' learning. In Uganda, textbook availability strongly influenced student learning achievement in English language. In Malaysia and Chile, textbook availability was related to higher academic achievement. The influence of textbooks also appears to be stronger within rural schools and among students from lower income families.

School library is another instructional resource that significantly influences students' achievement. The most consistent findings from Latin America shows that school library is related to better school performance with multiple measure of school library utilization. The regular utilization of school library also contributed to student achievement (Fuller, 1986). It was evidently documented that school infrastructure influences the quality of various elements of educational success. The size and organization of classrooms can also influence the instructional methods of teachers for instance arranging seating in a circle to enable maximum interaction instant of lecturing children sitting in rows. Children's learning is also influenced by the availability of text books and learning materials. The space and furniture available for studying, availability of toilets affects the attendance and absenteeism amongst boys and girls (UNICEF, 2009).

Consistent to the various findings of the influence of textbook availability on students' achievement, in the current findings, students having their own textbooks scored higher than those sharing or not having textbooks.

Socioeconomic Status of the family

Otieno and Yara (2010) asserted that, learners from low socio-economic status families tend to value domestic activities more than schooling. Such children are subjected to child labor and have little time for their learning. Children of tender age in such families have to work for their living.

Many studies also indicate that socioeconomic status is the single best predictor of academic achievement, with low socioeconomic status predicting low achievement. Specifically, girls' test scores are more likely to be influenced by family socioeconomic status (Mashile, 2001). Parents education and income levels have been found to have significant positive correlations with their daughters 'education (Sackey 2007).

In consistent with various research findings, the current finding revealed that students with family of low income achieved lower scores than those of students with better socioeconomic status. Child malnutrition is a common problem in many developing countries, and there is a large amount of evidence that well-nourished children have better educational outcomes (Glewwe and Miguel, 2008). The current finding is also supporting this evidence that students who got meals twice a day have better achievement than those who do not get meal properly. Thus, Ethiopia has implemented school feeding programs that provide meals to students, for some schools.

CHAPTER THREE

METHODOLOGY

In order to obtain the required information, a mixed concurrent research approaches (Quantitative and qualitative) was used. In the quantitative approach, a cross-sectional data on achievement tests and questionnaires were collected to determine the extent to which learning takes place in primary schools and factors associated to learners' achievement. A qualitative part was used to supplement the quantitative study through FGD. In this section, sample, instrument, procedure and data analysis techniques of the study are presented in detail.

3.1. Target Population

The target population of the study was both grades 4 and 8 students who enrolled to attend their education in 2015 academic year in all regions of Ethiopia. The sampling frame was designed based on the EMIS data of 2014 of grade 3 and 7 students, since the data for 2015 was not available. It was decided to take a maximum number of 40 students in a class per school and schools with less than 50 numbers of students in both grade 3 and 7 were excluded from the frame except for some regions where there were no alternative schools. The school data for Grade 3 and 7 were taken as the frame, since these students were expected to be in grade 4 and 8.

3.2. Sampling Techniques

The study used a two-stage cluster and stratified sampling to select the participant students and purposive sampling for teachers, school principals and FGD participants. In the first stage, schools were taken as primary sampling unit (PSU) and allocated to strata proportional to size (PPS). Within the strata, schools were ranged according to their locations and sizes. During allocation, some regions received a measure of size of zero based on their total number of schools in the region. Therefore, a constant number of schools were added to all regions in order to cover all regions and comparison is possible. Then, these allocation data were merged with school profile data which included school names with their total number of students, and samples were drawn randomly using complex samples in SPSS, taking region as strata and school as cluster units. The defined target population was grade 4 and 8 students attending primary schools in the year 2015 found in all regions of Ethiopia and schools that had less than 50 numbers of students in the previous academic year were excluded.

3.3. Sample Size

To determine the sample size of the study, the intra class correlation roh was calculated from the previous NLA data and was found to be 0.4 and 0.3 for grade 4 and grade 8, respectively. This gave us the design effect of cluster sampling equal to 16.6 for grade 4 and 12.7 for grade 8 using the formula deff=(1+roh*(M-1)), where M is the cluster or class size and roh is the rate of homogeneity or intra class correlation coefficient (Kissh,1965 & Lohr,1999 cited in Greany and Kellagan,2011).Thus, to obtain an effective sample size equivalent to 400 under simple random sampling(SRS), the obtained design effect was multiplied by 400. Then, the result showed that the effective sample size for grade 4 and 8 was 6,640 and 5,080 students, respectively. When these results were divided by the class size of 40, the total number of schools to be included in the sample became 166 for Grade 4 and 127 for Grade 8.

However, adjustment was made by adding a constant number so as to have information including regions that had zero school allocation. Accordingly, the final sample turned to be 401 for grade 4 and 362 for grade 8. There was a discrepancy between the selected and the achieved sample and this was due to some of the schools hadn't the intended grade level as indicated in the sample frame.

These samples were also weighted. Weighting is an estimation technique for producing information about a population of interest based on data gathered from a sample of that population. By weighting sampled units using the inverse of their selection probability, sample statistics (including means, totals, etc.) are unbiased estimates of population statistics. To ensure that the data analysis reflected the population from which the sample drawn, a weight for each student was calculated based on the selection probability of the school within each stratum and on the selection probability of the student within each school. The following procedure has been followed to compute the weight.

1. The selection probability for each school was calculated by dividing the number of schools selected in the stratum (region, urban, rural) by total number of schools in each stratum.
2. As students within schools were stratified by gender; the selection probability for each sampled girl was calculated by dividing the number of girls sampled from the school by the total number of girls in the selected grade in the school and likewise for boys.
3. The final selection probability of sampled students was calculated by multiplying the selection probability of the student by the selection probability of the school. The sample weight for each student is the inverse of the final selection probability.

Table 1: Grade 4 and 8 planned and achieved Sample by Region and Location

Region	Location	Planned sample by region		Planned sample by location		Achieved sample by region		Achieved sample by location	
		G4	G8	G4	G8	G4	G8	G4	G8
Tigray	Rural	31	31	24	27	31(100%)	31(100%)	24	27
	Urban			7	4			7	4
Afar	Rural	25	25	12	14	25(100%)	25(100%)	12	14
	Urban			13	11			13	11
Amhara	Rural	58	51	44	39	58(100%)	51(100%)	44	39
	Urban			14	12			14	12
Oromiya	Rural	81	62	63	47	81(100%)	62(100%)	63	47
	Urban			18	15			18	15
Somali	Rural	29	25	20	18	29(100%)	25(100%)	20	18
	Urban			9	7			9	7
B/Gumuz	Rural	25	25	18	15	25(100%)	25(100%)	18	15
	Urban			7	10			7	10
SNNP	Rural	53	47	40	34	53(100%)	47(100%)	40	34
	Urban			13	13			13	13
Gambella	Rural	25	24	23	22	25(100%)	24(100%)	23	22
	Urban			2	2			2	2
Harari	Rural	25	24	10	10	24(96%)	24(100%)	10	10
	Urban			14	14			14	14
Addis Ababa	Urban	25	24	25	24	25(100%)	24 (100%)	25	24
Dire Dawa	Rural	25	24	6	6	25(100%)	24(100%)	6	6
	Urban			19	18			19	18

3.4. Instruments

The study was mainly used achievement tests and questionnaires as instruments to address the research questions. In addition, FGD has also taken place for the sake of completeness. In grade 4, the achievement tests for Reading, English, Mathematics and Environmental Science were used. Likewise, in grade 8, the achievement tests for English, Mathematics, Physics, Chemistry and Biology were employed. All the achievement tests comprised of 40 items. Due to curriculum change, some test questions were omitted during analysis.

During the development of the instruments, subject matter teachers, exam development, curriculum and assessment experts were involved. Except for English, the other grade 4 tests were originally produced in Amharic and translated to other languages (e.g., Tigrigna, Somali, Afan Oromo etc.).

All grade 8 tests were produced by English language and latter translated and adopted into Somali, Afan Oromo and Tigragina languages.

3.5. Validity and Reliability of Instruments

To assure content validity of the tests, table of specifications were produced to adequately represent content of the curriculum. The total number of 40 items that were decided to be included in the test for each subject was selected in accordance with the period allotment of related topics in the curriculum. The cognitive domains to be measured were also set based on Bloom's taxonomy. Accordingly, the adequacy of the items and their consistency to the content and the cognitive domains were checked by groups of item writers, subject teachers, exam development and assessment experts. Moreover, the tests were piloted to 25 schools with a class size of 40 in Tigray, Somali, Oromiya, SNNP and Addis Ababa regions both for grades 4 and 8. After piloting, item and test analysis was done by using Test Analysis program Software (TAP).Based on classical test theory, items and tests were improved in a workshop involving item writers, subject teachers, and curriculum and assessment experts. Then, grade 4 tests and questionnaires were translated to 21 languages by three subject teachers who were native speaker of the language, functioning as forward, moderator and backward translators. Similarly, Grade 8 tests and questionnaires were also translated to three languages. The questionnaires were produced by assessment experts and reviewed by higher officials, and administered to students, teachers, and principals. Moreover, to check the consistency of the results, Kuder-Richardson 20 was calculated for each test after the pilot and it was found about 0.8 and above.

3.6. Procedure

The hard copies of the instruments were arranged and packed for the sampled schools. Then, they were distributed to data collection focal persons selected from each regional education Bureaus. Most of these focal persons were either examination or assessment experts. They were given training of trainers (TOT) on how to collect quality data at the agency for three and half days. The training focused on general concept of national learning assessment, sampling and administration of the instruments. Afterwards, the focal persons returned to their assigned station and in turn they provided the training to the recruited data collectors. Two data collectors (one for each grade level) were assigned to administer the tests and questionnaires. Students were expected to take two tests per day including the questionnaires. Overall, the data collection process was accomplished with in a maximum of three days. After completing the data collection and checking the completeness of the instruments, they delivered it to their focal person.

Finally, the focal person approved the quality of the data and provides all the full filled data to the assessment experts at the Agency according to the time schedule.

3.7. Performance of Students at Varying Levels of Standards

Standard setting is a process of determining students test score into different performance levels. It requires producing proficiency level descriptors and setting cut scores. The general performance levels descriptors agreed up on for the Ethiopian national learning assessment were categorized as below basic, basic, proficient and advanced. Accordingly, the modified Angoff method was decided to determine the proficiency levels of students' performance at each subject assessed in both grade levels. A group of panelists comprised of 10 to 12 participants for each subject was formed during the process. Teachers from low, medium and high performed sample schools from both rural and urban of all regions were participated in the standard setting process in order to produce the specific level descriptors and rate students' performance. Curriculum, exam development and assessment experts were also participated in the process.

Intensive training was provided to participants for three days on how to produce performance level descriptors and rate student performances. Then, teachers rate student performance in two rounds. After the first round rating, feedback was given to them based up on the impact data result. Taking into consideration the feedback they received and power of judgment, round two rating was followed. Finally, data were analyzed and the cut score for proficiency levels of each subjects were decided for both grade levels and the results were incorporated in the report.

3.8. Data Analysis Techniques

Both quantitative and qualitative methods were used to analyze the data. Descriptive statistics for the achievement data were presented; independent t- tests were executed to observe gender and location differences in student achievement, and one-way ANOVA was used to check regional differences; correlation was used to find the association between some factors and students' achievement, multiple regressions were employed to explore factors that explained the variations of students' achievement.

Qualitatively, the data from focus group discussion were thematically analyzed in order to provide detailed information on teaching, learning, and school environment, and communities and supplements the quantitative data evidences.

CHAPTER FOUR:

FINDINGS OF THE STUDY

For any education system that strives for quality education, perhaps the most important thing is the extent to which the students have learned what they were meant to learn. In this chapter, the results obtained from the assessment of students' academic achievement, questionnaires (students, teachers and principals) and FGD were analyzed. It consists of two parts. The first part presents the findings of grade 4 students' learning achievement and the second part deals with findings of grade 8 students learning achievement.

4.1. Grade 4 Students Achievement outcomes

This part deals with the result obtained from grade 4 students' academic achievement in the four selected subject tests (Reading, English, Mathematics, Environmental science). Data collection was taken place at the second half of the Ethiopian school years in April, 2007(2015) .The raw scores of each subjects were converted into percentages and scale scores. Each achievement test was analyzed primarily at national and regional levels and then by gender, the location of schools and school status. The analysis of each achievement test was accompanied by tables, figures, charts and etc. which show summary of the descriptive statistics, t-tests, one-way analysis of variance and homogeneous subset groupings whenever appropriate. Moreover, correlation analysis was also computed to find out the relationship between some in school and out of school factors and students achievement. A multiple regression analysis was included to show the factors that influence learning of grade 4 students. In addition to the four subjects' achievement test score, the information from the questionnaires designed for the students, teachers and school principals' variables as well as focus group discussion were also incorporated in the analysis.

4.1.1. Summary of Students Achievement Outcomes

Table 2 below shows the estimated mean scores for the four subjects (Reading, English, Mathematics and Environmental Science) and the composite score. The summary descriptive statistics shows that the mean score for each subject except Mathematics and consequently their composite score were below the minimum expected score (50%) set by MOE. In this case, the total average score is (44.74 %) and the mean score for English was the lowest (39.67). Surprisingly, the estimated mean score for Mathematics (51.32%) was the highest. However, looking at the standard deviation, the widest variation in the achievement scores among the students was also observed in Mathematics (19.91%).

Table 2: Students Estimated Mean Scores by Subject in Percent at National Level

Subject	Weighted N	Minimum	Maximum	Mean	Scale score	Std. Dev.
Reading	2,563,664	0	100	47.00	297.08	18.91
English	2,562,576	0	100	39.67	289.48	18.30
Mathematics	2,549,228	0	100	51.32	313.31	19.91
Environmental Science	2,553,528	0	97	40.98	296.61	15.84
Average	2,553,759	0.83	97.43	44.74	299.13	15.76

Figure1 below shows the percentage of students with average scores of 50% and above in each subject and total average score. Thus, 51.9% in Mathematics (highest), 44.9 % in Reading, 31.8% in Environmental Science and 27.4 % in English(lowest) were able to score 50% and above. Similarly, in average score, only 36.6% of the students were scored 50% and above.

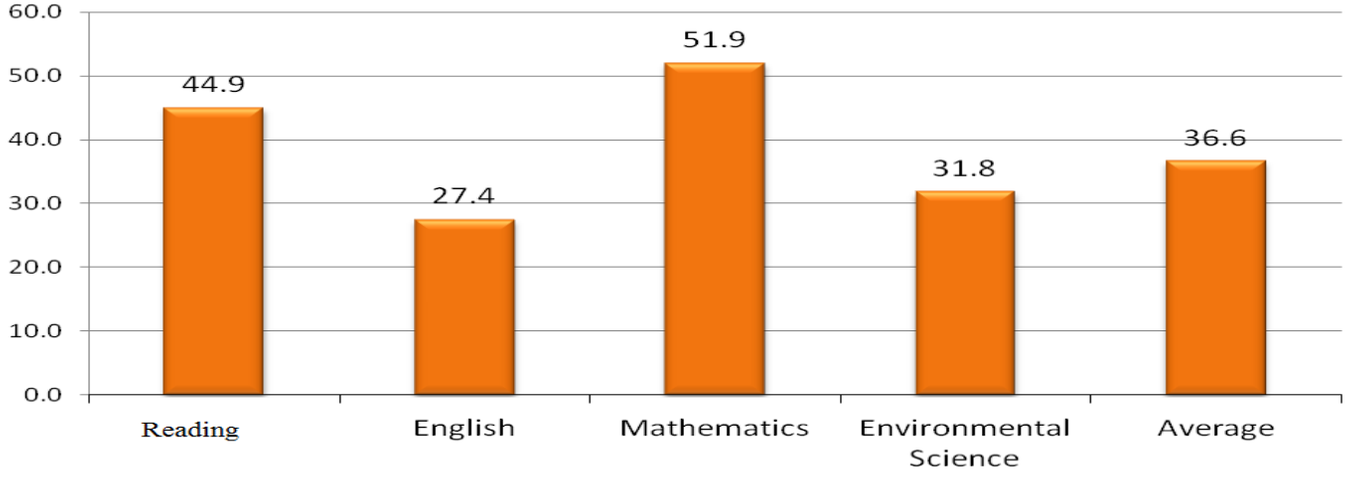


Figure 1: Percentage of Students Achieving 50% and above by Subject

4.1.2 The Correlations among four subjects and the achievement of students' at five key marker points

Table 3 below shows the inter correlations among the four subjects in grade four and the total average score. There was a positive relationship in all cases, in which the coefficients of correlation were statistically significant at $p < .01$. This shows that students performing well in one subject did the same in the other subjects. Mathematics showed the strongest correlation with the average score ($r = 0.89$), indicating that those who did well in Mathematics performed better in their overall achievement.

Table 3: Pearson Product Moment Correlations between the Four Subjects and the Average Score

Subject	Reading	English	Mathematics	Environmental Sc.
English	.63**			
Mathematics	.71**	.63**		
Environmental Sc.	.68**	.60**	.70**	
Average	.88**	.83**	.89**	.85**

**. Correlation is significant at the $p < 0.01$ level (2-tailed).

The achievement scores of students on national learning assessment and school based assessment of the first semester in the academic year obtained from the school rosters were computed to observe their relationship between each subject. As a result, there was moderate positive correlation between each subject that was statistically significant correlation at $p<0.05$. Here, although the direct prediction is impossible due to various processes in test development and the way of test administration, the relationship shows that those who did well at their school based assessment also did better in national learning assessment (See Table 4 below).

Table 4: The correlation between students' achievement on national and school based assessment

National Learning Assessment	School Based Assessment				
	Reading	English	Mathematics	Env. Science	Average
Reading	.514**				
English		.447**			
Mathematics			.491**		
Env. Science				.426**	
Average					.595**

Table 5 below shows the mean scores and the range of achievements in the four subjects at five key marker points: 10^{th}, 25^{th}, 50^{th}, 75^{th} and 90^{th} percentiles. Students at the 90^{th} percentile achieved 66.46% in the average score. This means only 10% of the students were able to achieve 66.46% and above score. On the other hand, students at 10^{th} percentile achieved only 26.18% in the average score and this means 10% of the students scored about the chance level of multiple choice type test items with four alternatives.

Particularly, except in Mathematics, at this marker point the achievement of students was below the chance level for all other subjects. Concerning the median score (50^{th} percentile), 50% of the students scored at or below 43.19% in the average.

Table 5: Range of Achievement Scores (%) at Five Key Marker Points

Percentiles	Reading	English	Mathematics	Environmental Sc.	Average
10^{th}	22.50	20.00	27.50	22.22	26.18
25^{th}	32.50	27.50	35.00	27.78	32.08
50^{th}	45.00	35.00	50.00	38.89	43.19
75^{th}	62.50	50.00	67.50	52.78	56.60
90^{th}	72.50	67.50	80.00	61.11	66.46

According to (MOE, 1994), in order to get promotion from one grade level to the next, students are required to achieve a minimum of 50%. However, as it is shown in Table 6 below, the achievement of students was below the minimum passing mark (50%) in each subject except for Mathematics. A one sample t- test indicated that the difference between each subject mean score and 50% passing mark is statistically significant at $p < 0.001$. The mean differences of the three subjects (Reading, English, and Environmental Science) were in the range from -10.33 to -3.00 while that of Mathematics was 1.32.

Table 6: The Mean Differences in Achievement of Students for each Subject

Subject	N	Mean	Std. Err	Test Value = 50			
				t	df	MD	Sig.
Reading	2563664	47.00	0.01	-254.18	2563663	-3.00	0.000
English	2562576	39.67	0.01	-903.16	2562575	-10.33	0.000
Mathematics	2549228	51.32	0.01	106.01	2549227	1.32	0.000
Environmental Science	2553528	40.98	0.01	-910.21	2553527	-9.02	0.000
Average Score	2553759	44.74	0.01	-533.24	2553758	-5.26	0.000

4.1.2. Performances' of Students at Various Proficiency Levels

In order to determine the performance level of students in each subject at different proficiency levels (Below Basic, Basic, Proficient and Advanced), the modified Angoff method was used. Thus, as shown in

figure 2 below, large numbers of students were categorized under below basic and basic levels for each subject. Particularly, 51.03% of students in English, 35.63 in Mathematics, 42.69% in Reading and 31.66% in Environmental Science were in below basic level. In this regard, the number of students in below basic was high in English as compared to other subjects. On the contrary, few numbers of students were able to achieve at advanced level for each subject within the range of 0.85% for English to 5.64% for Mathematics.

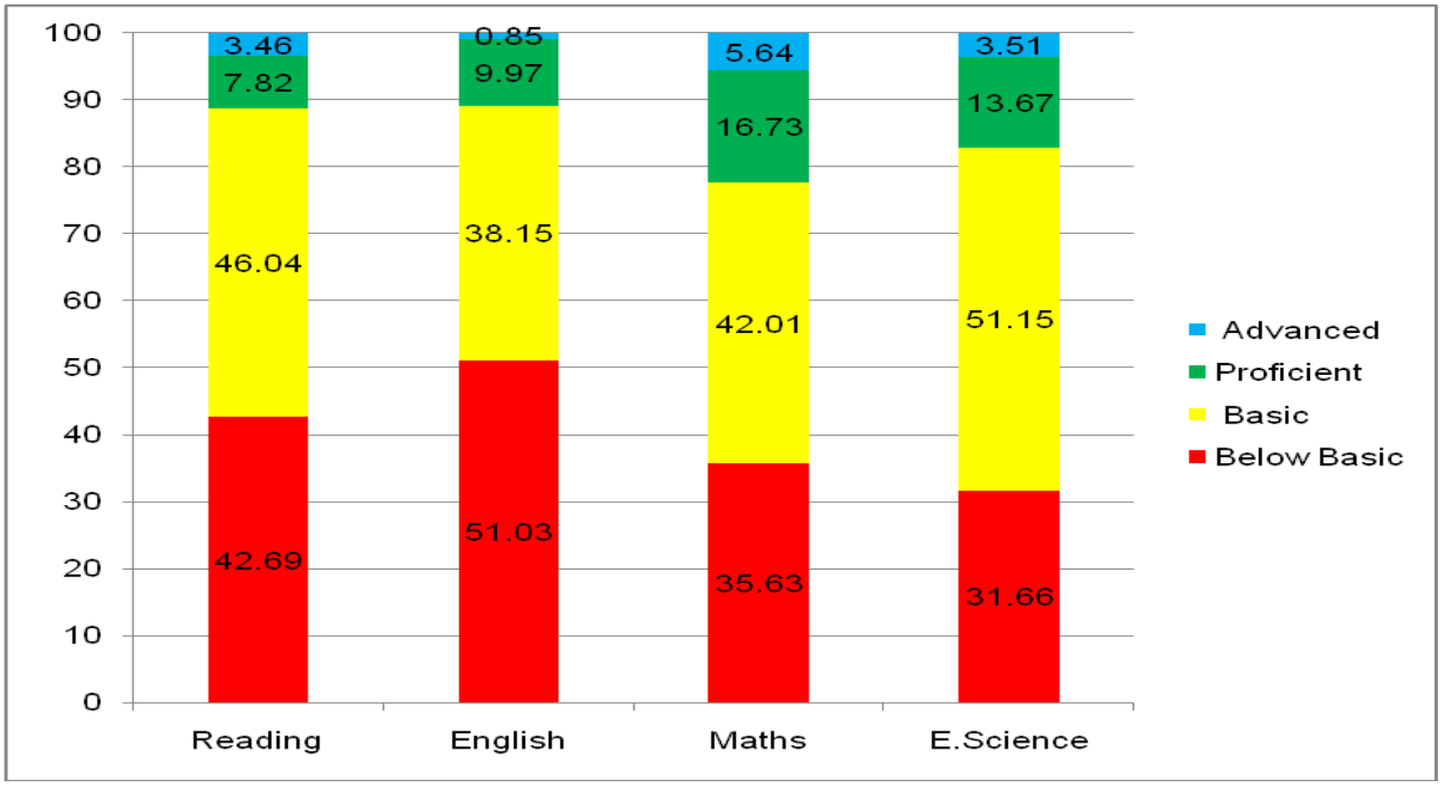


Figure 2: Grade Four performance level at different proficiency levels

4.1.3 Gender and Achievement

In Table 7 below, the achievement of boys in the average score was higher than that of girls by 3.02%. Similarly, the mean difference of the four specific subjects between boys and girls ranged from 2.03% (Reading) to 4.84% (Mathematics). In all subjects as well as in the average score, the difference between boys and girls was statistically significant at $p < .001$, which was in favor of boys.

Table 7: Independent Sample t-test for Estimated Mean Scores between Boys and Girls

Gender		N	Mean	Std. Dev.	t	df	MD	Sig
Reading	Boys	1305306	47.99	18.95	85.92	2545220	2.03	0.000
	Girls	1239916	45.96	18.79				
English	Boys	1299380	41.11	18.40	125.84	2535343	2.87	0.000
	Girls	1235965	38.24	17.86				
Mathematics	Boys	1291697	53.76	20.40	195.38	2520092	4.84	0.000
	Girls	1228397	48.92	18.89				
Environmental Science	Boys	1295392	42.13	16.09	115.97	2524690	2.29	0.000
	Girls	1229300	39.84	15.26				
Average Score	Boys	1296685	46.27	15.98	154.12	2527598	3.02	0.000
	Girls	1230915	43.24	15.17				

Note: *N= Number of estimated population*

4.1.4. School Location and Achievement

In Table 8 below, the achievement of students in urban schools was higher than that of students in rural schools in the average score by 3.56% and the mean differences of the specific subjects of urban and rural schools ranged from1.61% to 4.95%. Moreover, in all subjects as well as in the average score, the differences among urban and rural schools were statistically significant at $p<0.001$, which was in favor of urban students.

Table 8: Independent Sample t-test for Estimated Mean Scores between Rural and Urban schools

Subject	Location	N	Mean	Std. Dev.	t	df	MD	Sig
Reading	Rural	2168782	46.38	18.78	-122.42	2563662	-3.99	0.000
	Urban	394882	50.38	19.29				
English	Rural	2170911	38.92	17.96	-156.57	2562574	-4.95	0.000
	Urban	391666	43.87	19.55				
Mathematics	Rural	2154476	51.07	20.01	-46.71	2549226	-1.61	0.000
	Urban	394752	52.68	19.31				
Env. Science	Rural	2158755	40.41	15.64	-134.41	2553526	-3.67	0.000
	Urban	394772	44.08	16.54				
Average Score	Rural	2159556	44.19	15.70	-130.75	2553757	-3.56	0.000
	Urban	394203	47.75	15.79				

4.1.5 Students Achievement by School Status

The one way analysis of variance (ANOVA) in Table 9 below revealed that there is a statistically significant difference in the achievement of students of the schools that have been categorized as "A"(level 4),"B" (level 3)and "C" (level 2) in a mean score at p<0.000. In this case, the analysis among the school categories was based on the response of the participant school principals from the sampled schools.

Table 9: One-way analysis of variance of students' achievement by school Status

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	14465221150.5	2	7232610575.2	26563187.7	0.000
Within Groups	238643808540.7	876466419	272.3		
Total	253109029691.2	876466421			

The Post Hoch test of Tukey HSD homogenous subset grouping revealed the performance of students from students in school 'A' (level 4)was better than that of students from schools 'B'(level 3) and 'C'(level 2). Likewise, students from school 'B' (level 3) were performed better than those from students school C (level 2). The Tukey test divided the schools in to three subgroups at alpha = 0.05, which indicated the existence of a statistically significant difference among the groups (Table 10 below).

Table 10: Subset Groupings in Average Score (%) by School Status

Rank of the school	N	Subset for alpha = 0.05		
		1	2	3
Level 2(C)	119944078	40.7893		
Level 3(B)	581817795		44.3456	
Level 4(A)	174704549			53.4547
Sig.		1.000	1.000	1.000

The line graphs in the figure 3 below display the difference the of students achievement in average score among regions by school status. Except Oromia region, in most regions school 'A' (Level 4) performed highest and school 'C' (Level 2) performed lowest. However, in Oromia region, there was a slight difference between schools "A" and "B" in students' achievement. In SNNP, students in school "C" (Level 2) achieved better than those in school "B" (Level 3). In the case of Gambella, there was a slight difference

between the achievement of students in schools “B” and “C”. In the case of Addis Ababa, students in school “B” achieved better than those in school “A” and students in schools “A” (Level 4) and “C” (Level 2) more or less performed equally. In Benishagul Gumuz region and Dire Dewa, unfortunately schools categorized as ‘A’ (Level 4) and ‘B’ (Level 3) was not included in the sample schools respectively.

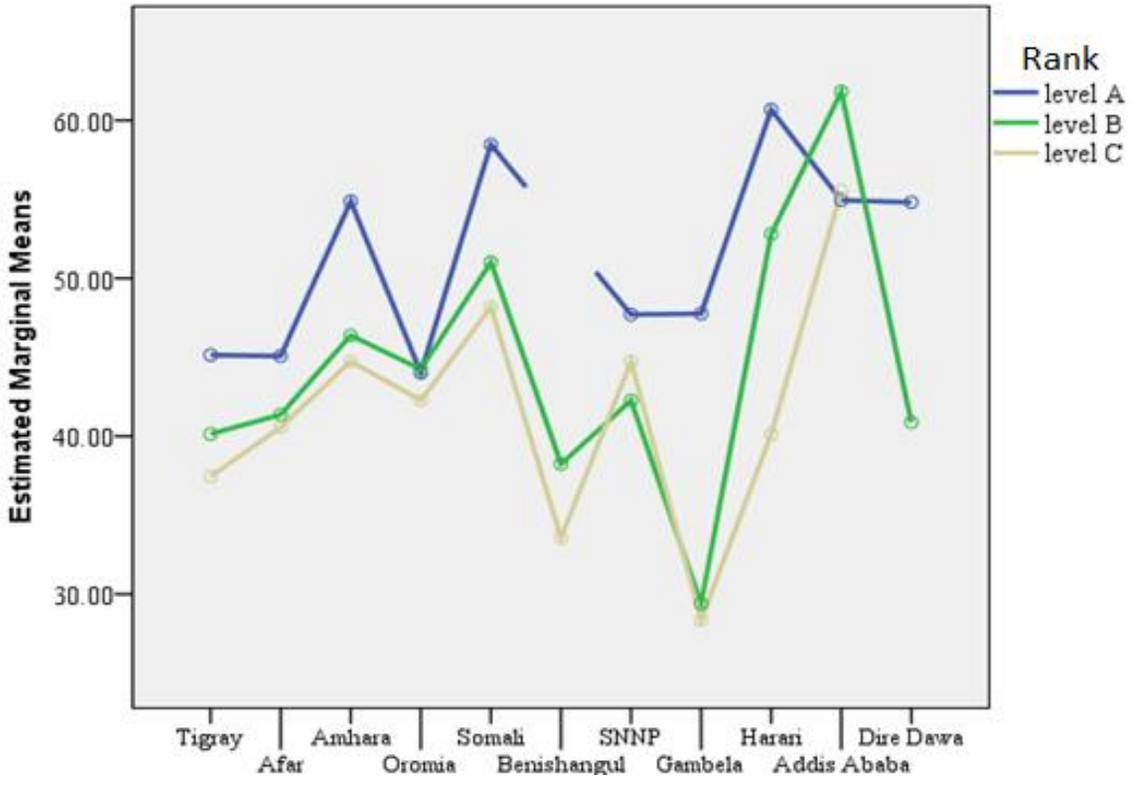


Figure 3: Achievement of students by school ranks across regions

4.1.6 Students Mean Scores by Region

Table 11 presents the estimated mean achievement of students by region in each subject. In this regard, students from Addis Ababa (64.21%) in Reading and Somali (60.83%) in English language outperformed than other regions. Similarly, in Mathematics and Environmental Science students from Harari and Addis Ababa with mean scores of 58.14% and 58.50% respectively outperformed the other regions. On the contrary, the mean scores of students from Benishangul Gumuz in Reading (35.25%) and English (31.62%), and from Gambella in Mathematics (37.36%) and Environmental Science (33.21%) were the lowest. In general , concerning the overall average score, Addis Ababa (57.78%), Somali (53.42%), Harari (50.09%), Dire Dawa(45.53%) and Amhara (45.09%) were also scored above mean score (44.74), while Benishangul Gumuz (34.85%) and Gambella (37.66%) performed the lowest.

Table 11: Students Estimated Mean Scores by Region (%)

Region	Reading	English	Mathematics	Envir. Science	Average Score
Tigray	46.68	35.38	47.40	37.94	41.89
Afar	46.49	35.63	45.40	40.55	42.00
Amhara	48.47	36.74	52.60	42.33	45.09
Oromia	45.87	38.49	50.68	39.76	43.65
Somali	51.86	60.83	56.80	44.34	53.42
Benishangul Gumuz	35.25	31.62	38.63	33.96	34.85
SNNP	45.39	38.77	50.58	40.45	43.82
Gambella	40.98	39.18	37.36	33.21	37.66
Harari	52.23	45.92	58.14	45.07	50.39
Addis Ababa	64.21	51.02	57.49	58.50	57.78
Dire Dawa	45.91	42.35	51.67	42.01	45.53
Average	47.00	39.67	51.32	40.98	44.74

Significant differences of Students' Achievement in each Subject across Regions

As it is shown in Table 12, the One-Way Analysis of Variance (ANOVA) indicated the presence of statistically significant mean differences of students' achievement in each subject across the regions at < 0.001.

Table 12: One-way analysis of variance for each subject means scores across Regions

Subject	Group	Sum of Squares	df	Mean Sq.	F	Sig.
Reading	Between Groups	23889485.8	10	2388948.6	6856.7	0.000
	Within Groups	893209966.2	2563653	348.4		
	Total	917099452.0	2563663			
English	Between Groups	92347598.5	10	9234759.9	30897.6	0.000
	Within Groups	765906525.7	2562565	298.9		
	Total	858254124.2	2562575			
Mathematics	Between Groups	16279195.5	10	1627919.6	4173.6	0.000
	Within Groups	994328962.8	2549217	390.1		
	Total	1010608158.3	2549227			
Env. Science	Between Groups	20359173.7	10	2035917.4	8382.8	0.000
	Within Groups	620167757.3	2553517	242.9		
	Total	640526931.0	2553527			
Average Score	Between Groups	25412608.8	10	2541260.9	10653.0	0.000
	Within Groups	609194958.1	2553748	238.6		
	Total	634607566.8	2553758			

4.1.7 Subject wise comparisons among regional's using the Post Hoc Test

This part deals with each subject separately taking region as a grouping factor. In this case, following the one way analysis of variance that was a carried out to detect the presence of statistically significant mean differences between regions, the Sheffe Post Hoc test of Turkey HSD used to produce homogenous subset groupings.

The Hoc test of Tukey HSD homogenous subset grouping revealed the performance in Reading test for students from Addis Ababa was higher than all the other regions. On the other hand, students from Benishangul Gumuz and Gambella regions performed the lowest. The Tukey test divided the regions in to eight subgroups, in which the mean differences among the groups were statistically significant at $p<0.001$ (See table 13 below).

Table 13: Homogeneous Subset Groupings in Reading Mean Score (%) by Regions

Region	N	Subset for alpha = 0.05							
		1	2	3	4	5	6	7	8
Benishangul Gumuz	20532	35.25							
Gambela	14117		40.98						
SNNP	559693			45.39					
Oromia	1042410			45.87	45.87				
Dire Dawa	6837			45.91	45.91				
Afar	4878				46.49	46.49			
Tigray	102833					46.68			
Amhara	597068						48.47		
Somali	170027							51.86	
Harari	3570							52.23	
Addis Ababa	41693								64.21
Sig.		1.000	1.000	.452	.180	.999	1.000	.866	1.000

As noted from Table 14 below, based on English mean score, the regions were categorized into nine homogenous subsets. Harari (45.92%), Addis Ababa (51.02%) and Somali (60.83) regions became the highest achieving subset groups; while Afar, Tigray, and Benishangul Gumuz regions were grouped in the lowest achieving subset.

Table 14: Homogeneous Subset Groupings in English Mean Scores across Regions

Region	N	Subset for alpha = 0.05								
		1	2	3	4	5	6	7	8	9
B/Gumuz	20506	31.62								
Tigray	102609		35.38							
Afar	4866		35.63							
Amhara	595921			36.74						
Oromia	1042030				38.49					
Gambela	14128					39.18				
SNNP	559613				38.77	38.77				
Dire Dawa	6962						42.35			
Harari	3574							45.92		
Addis Ababa	41522								51.02	
Somali	170840									60.83
Sig.		1.000	.979	1.000	.961	.653	1.000	1.000	1.000	1.000

Based on mathematics mean score, the regions categorized in to nine homogeneous subset groupings. As it can be indicated from Table 15 below, students from Harari (58.14%), Addis Ababa (57.49%) and Somali (56.80%) regions became the first three highest achieving regions. On the other hand, Gambella, Benishangul Gumuz, and Afar were last grouped under the lowest three achieving regions in mathematics.

Table 15: Homogeneous Subset groupings in Mathematics Mean Score across Regions

Region	N	Subset for alpha = 0.05								
		1	2	3	4	5	6	7	8	9
Gambella	14063	37.36								
B/Gumuz	20236		38.63							
Afar	4882			45.40						
Tigray	102251				47.40					
SNNP	556126					50.58				
Oromia	1036492					50.68				
Dire Dawa	6953						51.67			
Amhara	593412							52.60		
Somali	169882								56.80	
Addis Ababa	41400								57.49	57.49
Harari	3527									58.14
Sig.		1.000	1.000	1.000	1.000	1.000	1.000	1.000	.121	.175

Similar to mathematics and English mean score, the regions were categorized into nine homogeneous subset groupings in their students' achievement mean score on environmental science. Based on Environmental Science mean score among regions, Addis Ababa (58.50%) and Harari (45.07%) were grouped under high performing regions, whereas students from the two emerging regions (Gambella and Benishangul Gumuz) were categorized in the lowest performing regions as displayed in Table 16 below.

Table 16. Homogeneous Subset groupings in Environmental Science Mean Score across Regions

Region	N	Subset for alpha = 0.05								
		1	2	3	4	5	6	7	8	9
Gambella	14216	33.21								
Benishangul Gumuz	20325		33.96							
Tigray	102140			37.94						
Oromia	1040239				39.76					
SNNP	556067					40.45				
Afar	4872					40.55				
Dire Dawa	6957						42.01			
Amhara	593545						42.33			
Somali	169986							44.34		
Harari	3528								45.07	
Addis Ababa	41647									58.50
Sig.		1.000	1.000	1.000	1.000	1.000	.847	1.000	1.000	1.000

As depicted in Table 17 below, the regions were categorized into eight homogeneous subset groupings based on their students' average score. The three best performing regions based on students' average score were Harari (50.39%), Somali (53.42)and Addis Ababa (57.78%), but the two emerging regions (Benishangul Gumuz and Gambella) were grouped under the lowest performing regions.

Table 17: Homogeneous Subset groupings in Average Score across Regions

Region	**N**	**Subset for alpha = 0.05**							
		1	2	3	4	5	6	7	8
Benishangul Gumuz	20328	34.85							
Gambell a	14188		37.66						
Tigray	102140			41.89					
Afar	4882			41.98					
Oromia	1040831				43.64				

SNNP	556701				43.82				
Amhara	592062					45.09			
Dire Dawa	6965					45.53			
Harari	3535						50.39		
Somali	170430							53.42	
Addis Ababa	41693								57.78
Sign.		1.000	1.000	1.000	.997	.379	1.000	1.000	1.000

As illustrated in figure 4 below, when the average scores of girls and boys were compared across regions, the achievements of girls were higher than boys in Addis Ababa and Harari. However, in all the other regions, boys were performed better than girls except in Somali where the difference was slight.

Regarding the achievement of students by school location across regions, the average scores of students from rural schools were higher than urban schools in Somali and Gambella regions, whereas in other regions, urban students performed better than rural. Concerning, the achievement of students by school types, government and non-government, the average mean score of students from the non-government sample schools was higher than that of government schools in all subjects and regions.

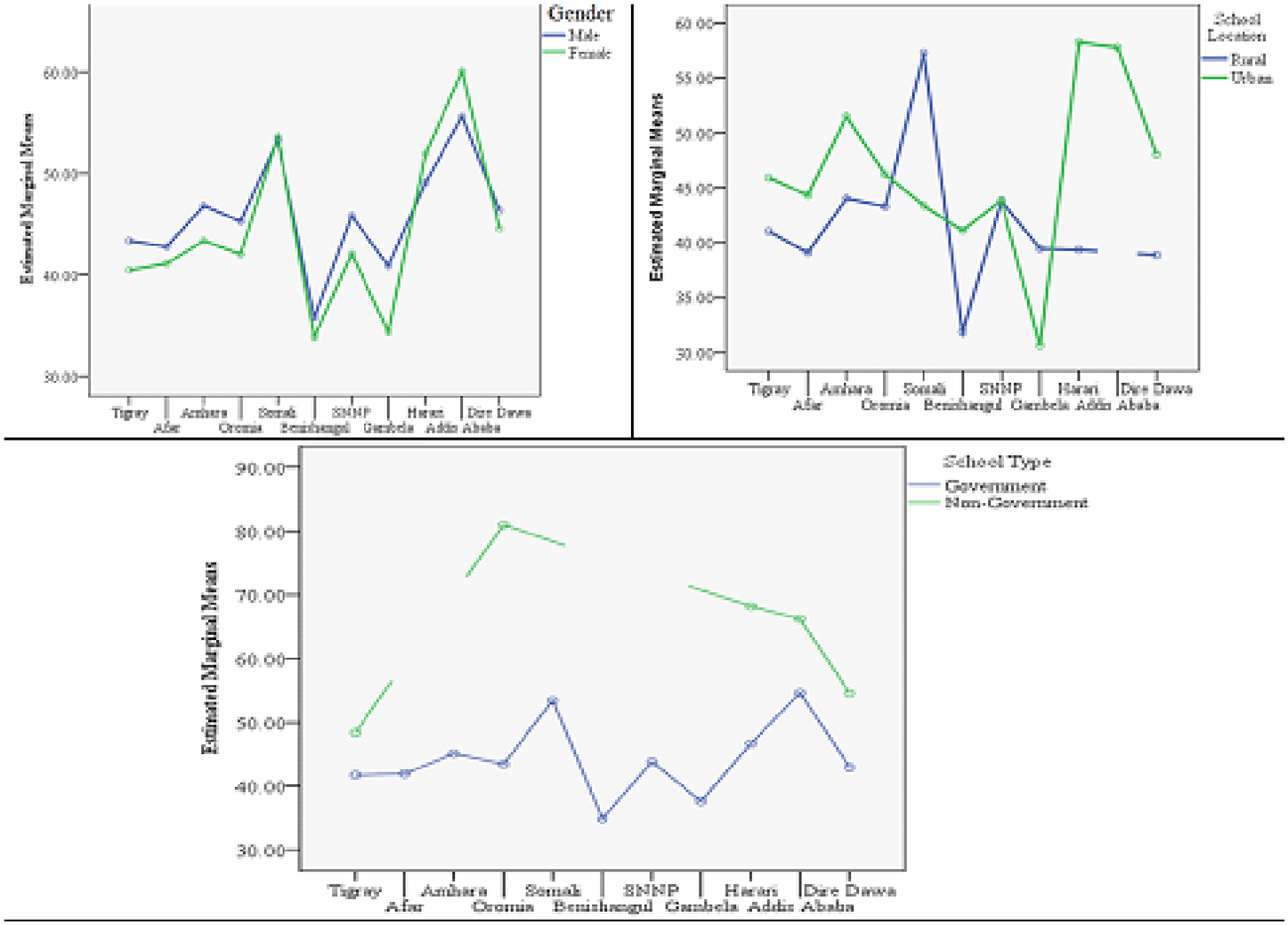


Figure 4 : Show Achievement of Regions by Gender, School Location and School Types

4.1.8 Trends of Students Achievement in 2012 and 2015

In comparing the trends of students' performance over time, Item Response Theory (IRT) models was employed. IRT allows computing the estimates of underlying "ability" (θ), and uses the same "ability" scale to describe properties of students and properties of test items. It also provides more information that takes into consideration various item and test characteristics depending on the specific model used. Particularly, Test Characteristic Curve (TCC) describes the relationship between "ability" and expected performance on the whole test and can be compared when their items are calibrated to the same ability scale .Thus, as shown in figure below 5, the Test characteristic curves of the 2012 tests of each subjects were slightly more difficult than that of in 2015 tests, though, there is a slight difference in difficult levels between the two tests in environmental science. However, since all the tests are located on the same ability scales, it possible to compare using different equating methods.

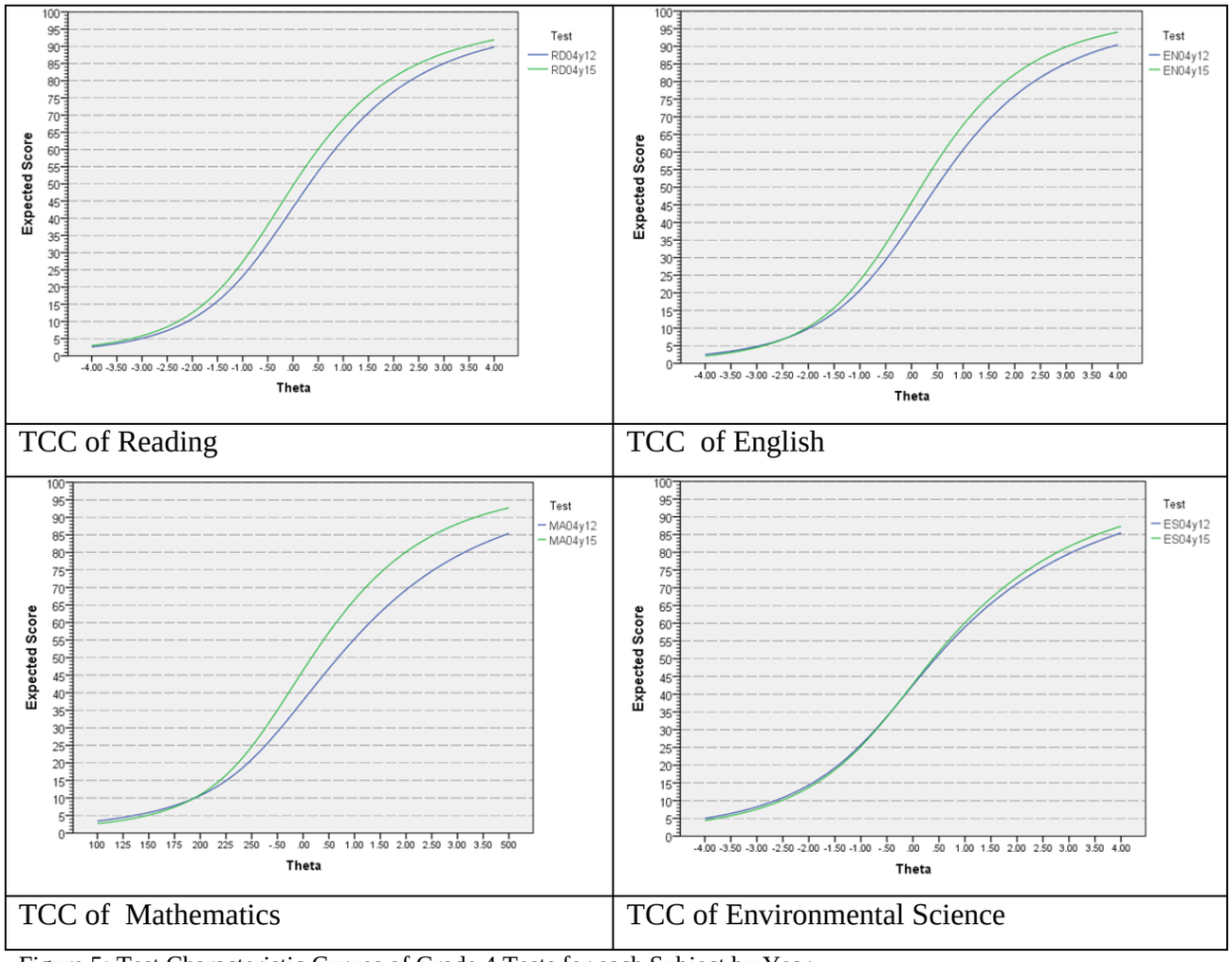


Figure 5: Test Characteristic Curves of Grade 4 Tests for each Subject by Year

The concept of scale scores and test equating are crucial to compare the trends of academic achievement across time. Scaled score is a conversion of a student's raw score on a test to a common scale that allows for a numerical comparison between students. In order for a fair and consistent decision to be made on test results, scores from different forms of a test should indicate the same level of performance no matter which test form a test taker has received. Thus, scaled scores are useful for comparing test scores over time, such measuring year-to-year growth of individual students or groups of students in a content area. In case of NLA, the raw percentage scores of subject converted to the scale score by using the arbitrary number of mean score 300 and standard deviation 50. In order to equate the 2012 and 2015 tests, the fixed common item parameter method was employed. Furthermore, in test equating process the Par scale software was used in calibrating the test scores.

Figure 6 below presents the comparison of students achievement in each subject and the mean score in fourth (2012) and fifth (2015) national learning assessment. As a result, except in Mathematics, which was

increased from 300.5 to 313.3 scaled scare, the achievement of students in 2015 in all subjects were decreased when compared to 2012. However, looking at the total average scaled score; the difference between the students' achievement in 2012 and 2015 was very negligible and about 0.6 point.

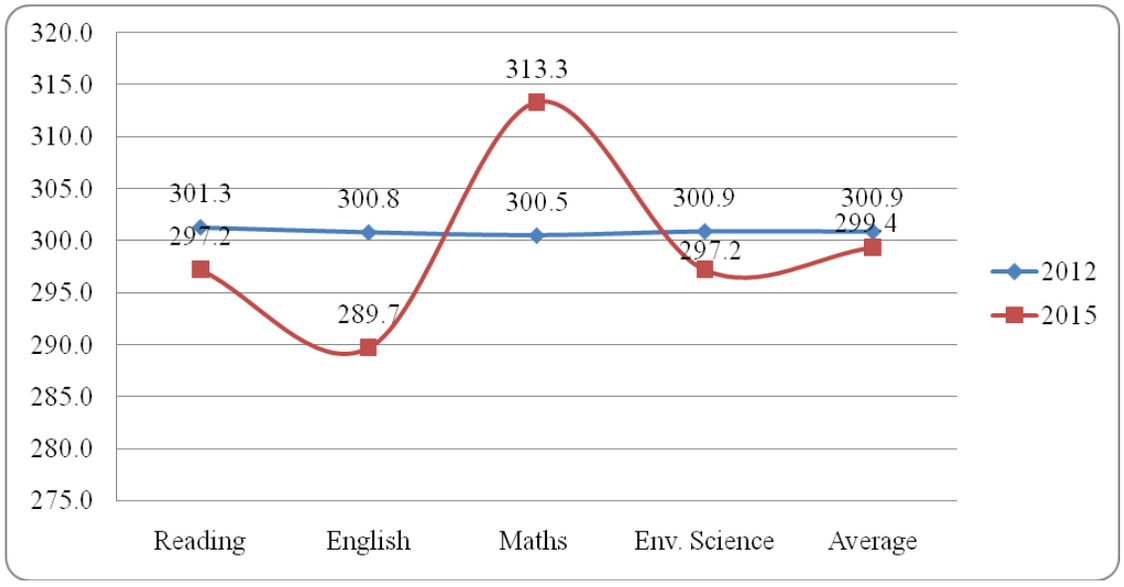


Figure 6. Comparisons of students' achievement mean score in 2012 and 2015

4.1.9 Attitude of students to some social related issues

Assessing students' academic performance alone does not helpful to produce the citizens with all rounded personality. Therefore, in order assess the attitude of students some social related issue item were incorporated in students questionnaire. Thus, table 18 below presents the findings of the study.

Students' opinions on health and environment were also found to have a high predicting value. For instance, these opinions included that I have the responsibility to take care of my school and the environment (83.3%), I can take care of myself not to get affected by HIV/AIDS (74.4%), possibility to prevent diseases by caring for oneself and environment (76.9%), and throwing waste materials to the road will pollute the environment (66.6%). Surprisingly, 49.5% of students had the opinion that to protect drought and afforestation is not important. Thus, it needs some efforts to change the attitudes of the students at a grassroots level.

Table 18: Students' Opinion related to the Social related issues (Health and Environment)

Social Related Issues		N	%
I know how HIV/AIDS transmitted, therefore, I can take care of myself not to get affected by HIV/AIDS	No	615549	25.6
	Yes	1785324	74.4
	Total	2400874	100
By caring for personal and environmental hygiene, it is possible to prevent diseases.	No	547620	23.1
	Yes	1824773	76.9
	Total	2372393	100
I have the responsibility to take care of my school and the environment.	No	403783	16.7
	Yes	2009138	83.3
	Total	2412921	100
To protect drought, afforestation is not important.	No	1167746	49.5
	Yes	1193445	50.5
	Total	2361190	100
Throwing waste materials to the road will pollute the environment.	No	775627	33.4
	Yes	1544309	66.6
	Total	2319936	100

4.1.10 Factors Associated with Students' Academic Achievement

4.1.10.1 Students related variables

In addition to the tests, a questionnaire was also administered to the students. The student questionnaire included questions designed to document basic demographic characteristics of students and their home environment, as well as their schools and subject teacher's instructional practices and behaviors. Moreover, it also included items that assessed students' attitudes towards certain social issues. The intention was to gather information to better contextualize the test results and to get insight into factors that might help facilitate or hinder students' performance.

Descriptives of the students' background information.

The students' background information from the figure 7 below shows that the 51.4% of boys and 48.6% f girls were participated in the study . With respect to their gardian, 73.5% of the Students were living

with their parents , 10.4% living with their mothers, 4.4 % lving with their fathers, 7.4% living with their relatives and 4.3% living with others. Also, the percentage of students who get meal once, twice , three times and above a day were 8.2%, 16.1% and 75.8% respectively. Moreover, a distance from shools that students are travelling daily was assessed and it reveals that 21.3% of the students were travelling from one to two hours in a single trip a day.

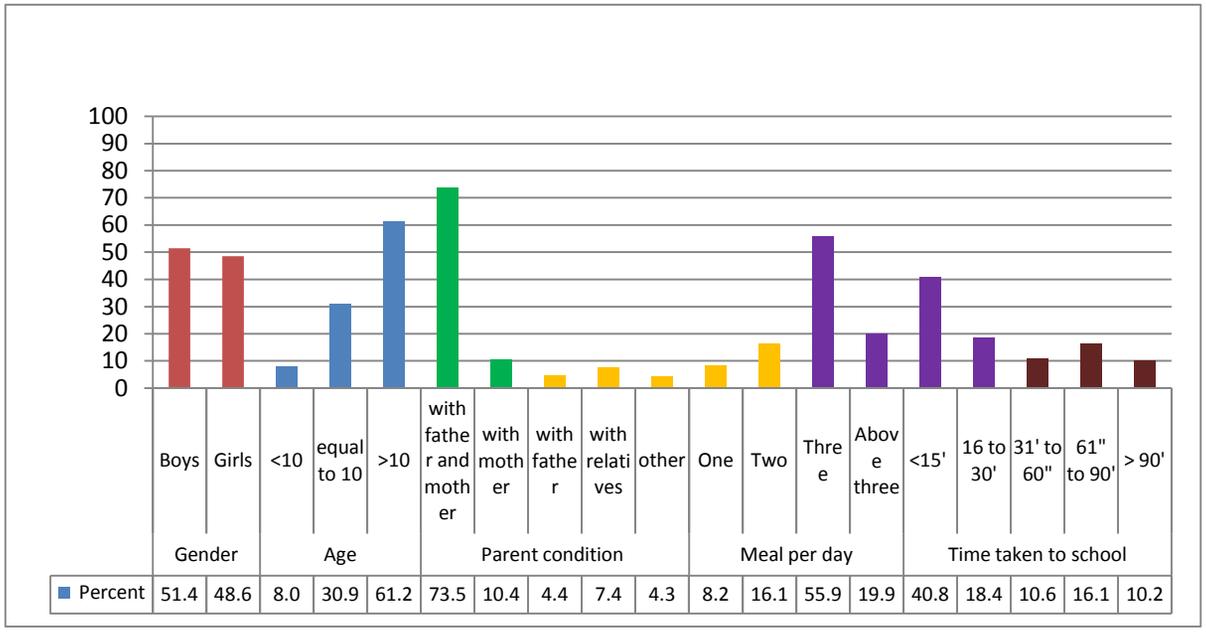


Figure 7: Grade 4 students' background information

Correlations and Multiple Regressions of Students' Personal Information, Family Background and Home Variables

As shown in Table 19 below, several personal characteristics of students had a statistically significant relationship with their academic achievements. Among these, being female (r = - 0.096), frequency of watching TV (r = - 0.084) and frequency of students' absenteeism (r= - 0.217) had a negative relationship with students achievement.

Furthermore, reading additional books rather than text books (r = 0.041) and frequency of listening to radio (r= 0.007) had a positive correlation with students' academic achievement. In all cases, the relationships were statistically significant at p<0.000.

Table 19 : Correlation between Students' Personal Information across their Mean Score

Variables	N	Pearson correlation	Sig.
Gender (coded boy =1, Girl =2)	2527600	-.096**	0.000
Age of a student	2376687	.064**	0.000
Reading additional books rather than text books	2465203	.041**	0.000
Frequency of listening radio per week	2378403	.007**	0.000
Frequency of watching Television per week	2298355	-.084**	0.000
Frequency of students' absenteeism	2487912	-.217**	0.000

Table 20 below shows that the correlations between students' family and home variables with their mean score. As a result, living with others rather than mother and father or either (r = - 0.164) and large members of students within the family (r = - 0.039) had a negative relationship with students achievement. On the other hand, family properties (SES) (r = 0.285), family support in studying at home(r =0.122), frequency of having a meal per day(r = 0.105), similarity of home language with instructional language(r =0.042), having access to electricity light at home(r = 0.034) had a significantly positive correlation with students' academic achievement**.** Surprisingly**,** the relation between family education/literacy level and their students' achievement score was low (r = -0.140) and in a negative direction. Thus, since it contradicts with several exiting research evidences, it needs further investigations.

Table 20: Correlation between Students' Family and Home Variables with their Mean Score

Variables	N	Pearson correlation	Sig.
Living with others rather than mother and father or either	2463894	-.164**	0.000
Similarity of home language with instructional language	2454771	.042**	0.000
Large family members that are students	2441476	-.039**	0.000
Frequently of supporting family	2473979	.142**	0.000
Family education levels(father or & mother)	2395278	-.140**	0.000
How many days in a week someone helps you in studying?	2237061	-.008**	0.000
Family support in studying at home	2399606	.122**	0.000
Family properties (SES)	2431459	.285**	0.000
Frequency of having a meal per day	2459883	.105**	0.000
Having access to electricity light at home	2389186	.034**	0.000

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

Correlation between textbooks Availability and students' perception towards the subject matter with academic achievement

Availability of textbooks for the students and their scores in the tested subjects were related to each other according to the students' responses. Students having their own textbooks scored higher than those shared or not had textbooks for all subjects. In this case, the correlation coefficient in English (r = 0.118), Mathematics (r = 0.175) and Environmental science (r = 0.174)**.** With regarding **to** the relationship between the perception of students towards understanding each subject matter and students achievement score, the result showed the existence of week relationship with the correlation coefficients Mathematics (r = 0.199), English (r = 0.170) and Environmental Science (r = 0.163) . Correspondingly, there was also a relationship between students' perception regarding to the difficulty of text books for each subject and achievement scores with the coefficient of correlations r= 0.022, r=0.103 and r=0.118 for English, Mathematics and Environmental Science text books respectively. In all cases, the relationships were positive and statistically significant at $p<0.01$ (See table 21 below).

Table 21: Correlation between textbook availability and students' perception towards the subject matter with academic achievement.

Variables related to textbooks and subject matters	N	Pearson Correlation	Sig. (2-tailed)
Availability English text book	2398836	.118**	0.000
Availability mathematics text book	2423687	.175**	0.000
Availability Environmental science text book	2438117	.174**	0.000
understanding English subject	2451302	.170**	0.000
understanding Mathematics subject	2464201	.199**	0.000
understanding Environmental Science subject	2440391	.163**	0.000
Difficulty of English text book	2428353	.022**	0.000
Difficulty of mathematics text book	2428319	.103**	0.000
Difficulty of Environmental Science text book	2447665	.118**	0.000

**. Correlation is significant at the $p < 0.01$ level (2-tailed).

Table 22 below presents the correlation between schools-related variables and the students' achievement mean scores. Good student-teacher relationships (r = 0.206), perception of students towards teachers (r = 0.211), frequency of receiving mathematics homework in a week (r = 0.068) and frequency of receiving homework in a week English (r = 0.043) had a positive correlation with students' achievement score.

The distance students travel to their schools and back home was also assumed to have an impact on their achievement. Students who were traveling more distance from school to home achieved less than those who were travelling less distance. Although the correlation was weak (r = - 0.160), it was statistically significant.

Table 22: Correlation between some schools related variables and students' academic achievement

School related variables	N	Pearson Correlation	Sig. (2-tailed)
Good student-teacher relationship	2443727	.206**	0.000
Perception of students towards teachers'	2432516	.211**	0.000
Time taken to reach to school/come back to home	2487912	-.160**	0.000
Frequency of taking class attendance	2487912	-.144**	0.000
Frequency of receiving English homework in a week	2448498	.043**	0.000

Frequency of receiving mathematics homework in a week	2443204	.068**	0.000

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

Among students' related variables, only some of them were statistically significant in predicting students' achievements.

As shown in table 23 below, about 7.3% of the total variation in student test scores was accounted for by gender, students' absenteeism, frequency of reading additional materials and frequency of listening radio.

Table 23: Regression Model Summary and Coefficient of Correlation of Students' Personal related Variables

	Sum of Squares	df	Mean Square	F	R	R^2	Adj. R^2	Sig.
Regression	37335436.873	6	6222572.812	27446.314	.270	.073	.073	.000
Residual	475190028.349	2095952	226.718					
Total	512525465.222	2095958						

As indicated in Table 24 below, among the student related variables gender, absenteeism and high frequency of watching television were negatively affecting students' achievement scores, while the remaining variables have positive effect.

Table 24: The Coefficients of student related variables that affected academic achievement

Student related variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	52.072	.096		539.977	.000
Gender (Female)	-3.021	.021	-.097	-144.438	.000
Reading additional books	.154	.016	.007	9.806	.000
Frequency of listening radio	.233	.007	.023	32.631	.000
Frequency of watching television	-.766	.007	-.081	-116.634	.000
Frequency of school absenteeism	-3.224	.009	-.232	-347.160	.000

From the Table 25 below, one can see that 13.9% of the total variation in student test scores was accounted for by living with mother and father ,access to electricity /light at home, similarity of home and instructional language, family properties/ SES/, family support in learning, and frequency of having meals per day and the large family size .

Table 25: Regression Model summary of Student Home variables

	Sum of Squares	df	Mean Square	F	R	R^2	Adj. R^2	Sig.
Regression	64086159.685	9	7120684.409	35137.50	.373	.139	.139	.000
Residual	396434702.310	1956234	202.652					
Total	460520861.996	1956243						

As shown in Table 26 below, looking at the unstandardized coefficients (B) for each variables, the top three family and home related variables those have a positive effect on students' academic achievement were living with mothers and fathers, similarity of home and school language, having a meal per day and access to electricity/ light at home .

Table 26: The Coefficients of students' Family and Home variables that affect academic achievement

Students' Family and Home variables	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	Std. Error	Beta		
(Constant)	19.097	.127		150.601	.000
Family educational status	-.588	.004	-.089	-132.550	.000
Family properties/ SES/	.475	.001	.277	415.189	.000
Having access to electricity light at home	1.397	.021	.046	67.668	.000
Similarity of home and instructional language	1.540	.021	.050	74.228	.000
Family support in studying at home	.059	.012	.003	5.038	.000
Living with mother and father	1.792	.010	-.122	-181.583	.000
Large family members that are students	-.593	.008	-.050	-75.159	.000
Frequency of having a meal per day	1.461	.013	.075	112.395	.000

Table 27 below shows that 11% of the variance of the average scores among students in regression model was accounted for by availability of textbooks, perception of students towards understanding the subject matter and the difficulty of the textbooks for each subject.

Table 27 : Regression Model summary of Textbook Related Variables

	Sum of Squares	df	Mean Square	F	R	R^2	Adj. R^2	Sig.
Regression	57283581.58	9	6364842.38	30107.49	.332	.110	.110	.000
Residual	463930034.24	2194519	211.40					
Total	521213615.82	2194528						

Looking at Table 28 below, the availability of text books for each subject had more positive impact on over students' academic performance. Particularly, the unstandardized coefficients for the availability of English, Mathematics and Environmental science text books were about 4.07, 3.65 and 3.5 respectively.

Table 28 : The Coefficients of variables that related to text books and students' perception towards subject matters those affect academic achievement

Variables that related to text books and students' perception towards subjects	Un standardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.594	.096		16.66	.000
Availability English text book	4.074	.031	.091	131.51	.000
Availability mathematics text book	3.649	.032	.078	113.91	.000
Availability Environmental Science text book	3.501	.033	.074	106.88	.000
Perception students towards understanding English	1.316	.011	.080	117.19	.000
Perception students towards understanding Mathematics	2.282	.013	.120	172.75	.000
Perception students towards understanding Environmental Science	1.544	.013	.082	119.43	.000

As can be indicated in Table 29 below, the multiple regression analysis from the responses of the students concerning their school related variables were able to explain 9.5% of the variance in the average score achievement.

Table 29: Regression Model summary of some School Related Variables

	Sum of Squares	df	Mean Square	F	R	R^2	Adj. R^2	Sig.
Regression	53238601.543	7	7605514.51	35066.240	.308	.095	.095	.000
Residual	508694560.215	2345404	216.89					
Total	561933161.758	2345411						

Among some school related variables, three of them, i.e. time taken from home to school or vice versa, positive perception of students towards their teachers and good relationship between teachers and students were highly affect the achievement of students. In this case, while the former has negative impact, the letters have positive impacts (See table 30 below).

Table 30: The coefficients of some school related variables that affected academic achievement

some school related variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	25.127	.082		307.81	.000
Time taken to reach to school/come back to home	-1.089	.007	-.105	-165.83	.000
Frequency of receiving mathematics homework	.714	.009	.055	78.20	.000
Frequency of receiving Environmental science homework	-.642	.008	-.053	-77.88	.000
Frequency of receiving English homework	.205	.009	.016	23.05	.000
Good student-teacher relationship	5.971	.026	.144	226.57	.000
Perception of students towards teachers'	7.045	.029	.158	246.77	.000

4.1.10.2 Teachers variables and Academic Achievement

Teachers of sampled students responded to a questionnaire related to themselves and their students. As indicated in pie chart of figure 8 below, 56.3% of the teachers were females and the remaining were males, 42% taught for the subject less than 5 years and 43% of them taught the subject between 6 to 10 years. Concerning the age of respondents, about 64% of them were between 21-30 years, 24% between 31-45years and 9% above 45 years and the remaining 3% below 20 years.

In terms of qualifications, 17.2% were TTI certificate holders while 76.9% had diploma and the rest of them (6%) had a first degree.

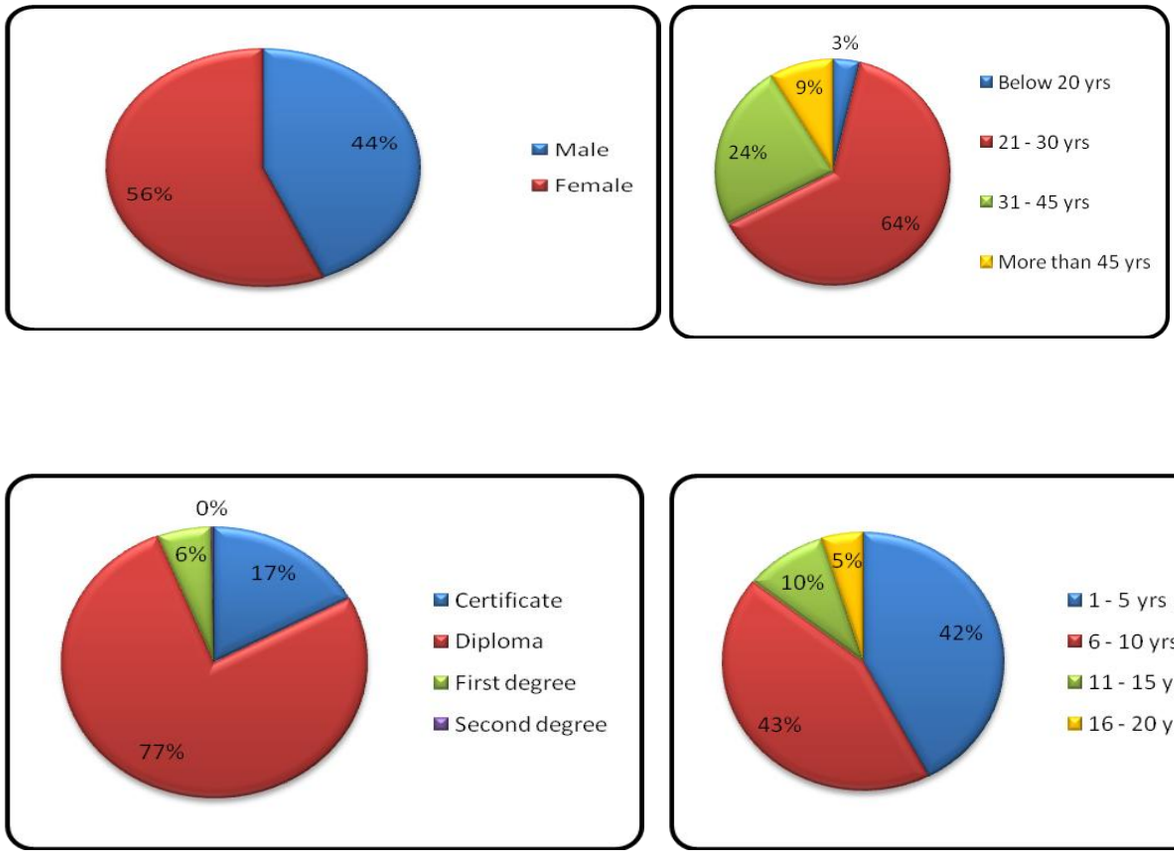


Figure 8: Teachers' Background information in percentages

As shown in table 31 below, regarding the current experience in teaching the specified subjects, majority (54.1%) of the teachers with five and above years were teaching all subjects, probability self-contained. On the other hand, among fresh graduate teachers with only one year teaching experience 30% of them were teach English and 26.2% of them were teach Mathematics.

Table 31: The percentage of teachers with current experience in teaching the specified subjects

Subjects	Current experience of teaching specified subjects						Total
	1 year	2 years	3 years	4 years	5 years	> 5 years	
Reading	14.2	11.7	9.6	12.2	6.9	45.4	100
English	30.7	6.8	5.3	6.9	3.9	46.4	100
Mathematics	26.2	0.0	0.0	40.3	13.4	20.1	100
Environmental science	6.2	10.2	18.6	12.4	18.6	34.1	100
All subject	15.6	6.1	6.9	9.6	7.7	54.1	100
Total	15.1	10.0	9.0	12.1	7.7	46.2	100

Several factors related to teachers' personal characteristics had a statistically significant and positive relationship with academic achievements of students. Among these, gender (r =0.075), age (r = 0 .108), number of times teachers supervised per semester (r = 0.103), distance from school to teachers' home or vice versa (r= 0.076), education level (r =0.061), teaching experience(r =0.047), frequency of teachers' communication with students' parents (r =0.033) and availability of in-service training(r=0.022) had a positive relationship with students' achievement as shown in Table 32 below . Furthermore, large class size (r= -0.065) and teaching load per week (r = -0.018) had a negative correlation with students' academic achievement which were statistically significant according the response of the teachers.

Table 32: Correlation between Teachers' Personal Information with Students' Mean Score

	Mean score		
Variables	N	Pearson Correlation	Sig.
Gender	13959	.075**	.000
Age	13911	.108**	.000
Education level	13991	.061**	.000
Teaching experience	12797	.047**	.000
Distance from school to home or vice versa	13833	.076**	.000
Large class size	12641	-.065**	.000
Number of period load per week	13833	-.018*	.039
Number of times teachers supervised per semester	13744	.103**	.000
Frequency of teachers' communication with students' parents	13920	.033**	.000
Mode of training /In-service Training/	13401	.022*	.011

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

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

As shown in Figure 9, the percentage of the teachers those who participated in short term training for the last two years related to curriculum issues, continuous assessment, action research, classroom management and special need education were less than 50% except for the training method of teaching (61.7%).

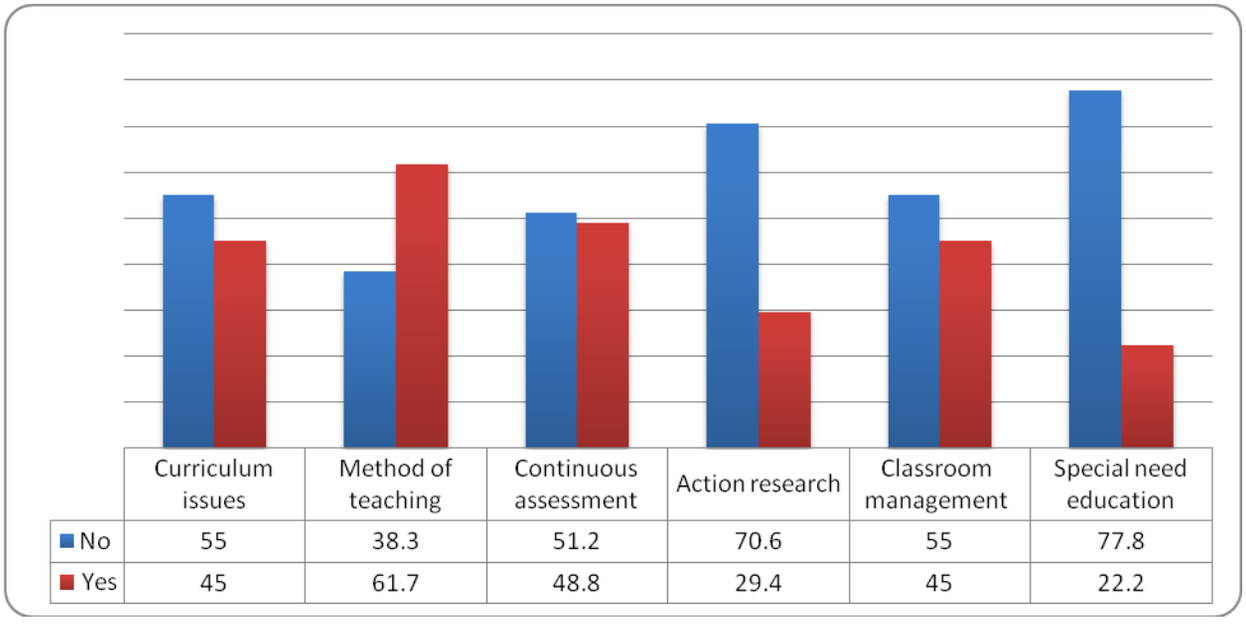


Figure 9: Participation of Teachers in Different Training program for the last two Years (%)

As indicated in table 33 below, the accessibility of teachers to different training program had a positive correlation with students' academic achievement (curriculum issues r= 0.072), action research (r = 0.069), classroom management (r=0.066), continuous assessment(r = 0.048), method of teaching (r = 0.042) and special need education(r=0.036) and that was statistically significant at p<0.000.

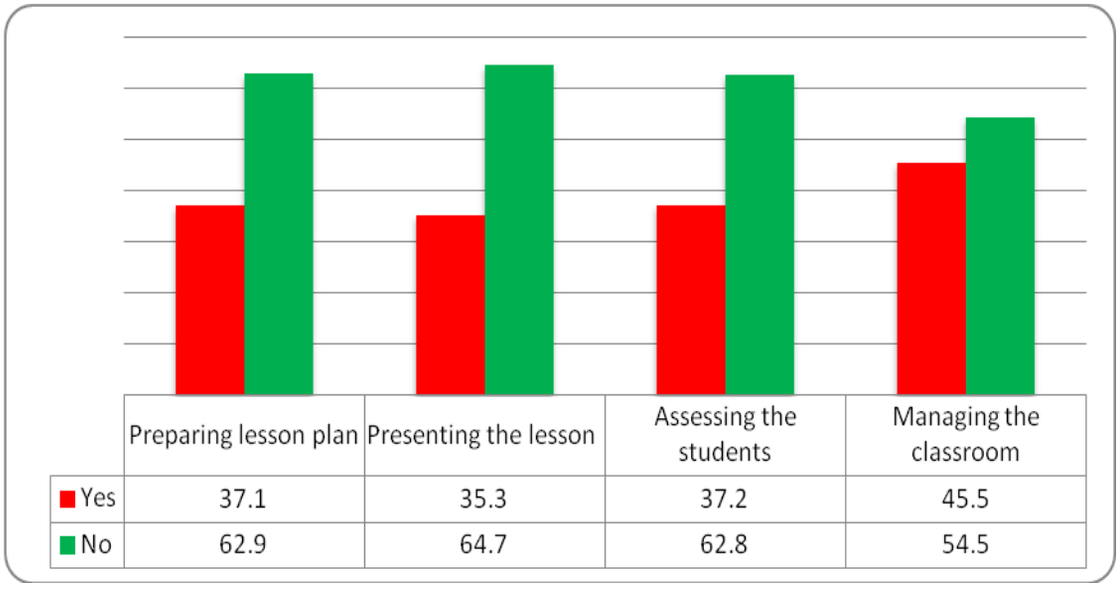
Table 33: The Correlation between Teachers Trainings and Students Achievement

	Students mean score		
Training Topics	N	Pearson Correlation	Sig. (2-tailed)
Curriculum issues	12843	.072**	.000
Method of teaching	13217	.042**	.000
Continuous assessment	12950	.048**	.000
Action research	12420	.069**	.000
Classroom management	12725	.066**	.000
Special need education	12850	.036**	.000

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

Teachers were also asked to indicate their opinions regarding the challenges they faced in the teaching-learning process. As a result, Figure 10 below revealed that, preparing lesson plan, lesson presentation,

assessing students, and managing students in the class were challenging for teachers with the range of 35.5% presenting the lesson (lowest) to 45.5% managing class room (highest).



	Preparing lesson plan	Presenting the lesson	Assessing the students	Managing the classroom
Yes	37.1	35.3	37.2	45.5
No	62.9	64.7	62.8	54.5

Figure 10: Opinion of Teachers regarding the Challenges in the Teaching- Learning Process

As indicated in pie Figure 11 below, the response of teachers to the question why they joined the teaching profession?, were "like teaching profession" (71.20%),"by chance" (14.12%), "lack of other options" (13.55%), and "other reasons" (1.13%). The level of satisfaction with teaching profession revealed in Figure 12 shown that highly (42.6%), somewhat (39.03%) and not all (18.35).

As shown in pie chart 13 below, the response of teachers to question why teachers dissatisfied with their jobs?, were lack of in-service training (23%), lack of incentive (19.2%), low concern and respect for the profession (17.4%), students' misbehavior/disciplinary problems (16.3%), low service delivery by schools to customers (13.1%) and weakness of school management (10.4%).

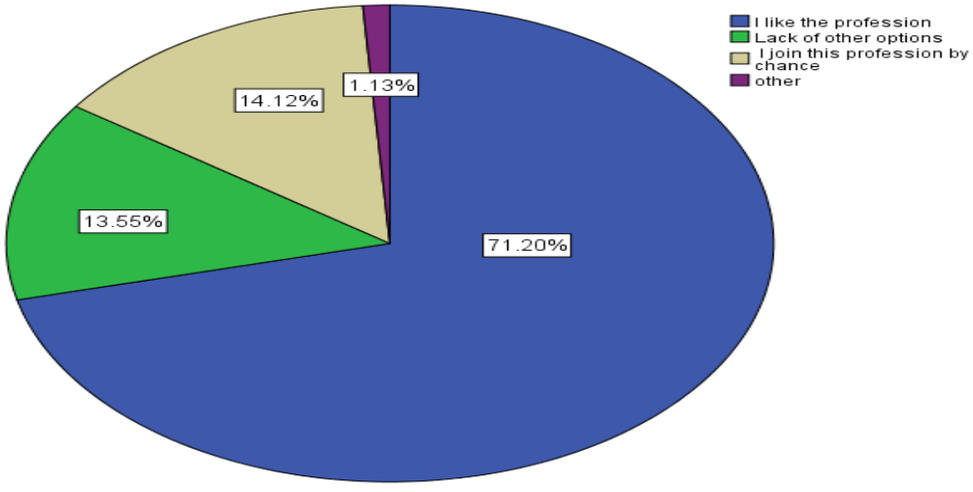


Figure 11: Reasons of teachers to join profession (%)

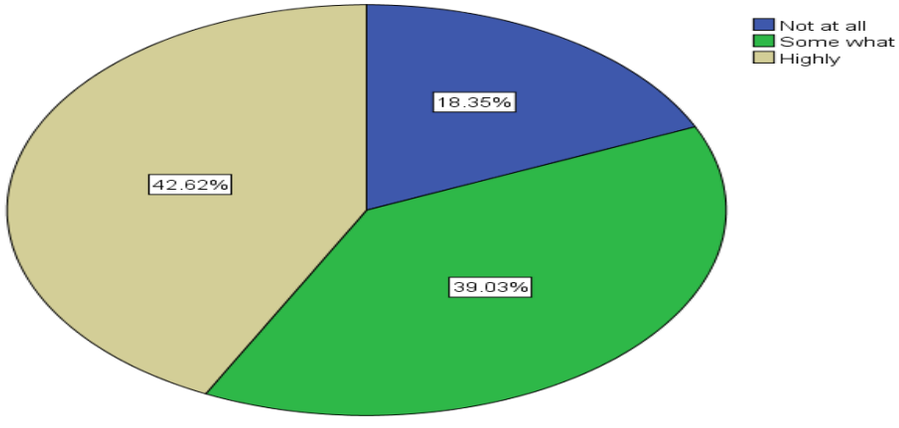


Figure 12: Degrees of satisfaction with the Profession

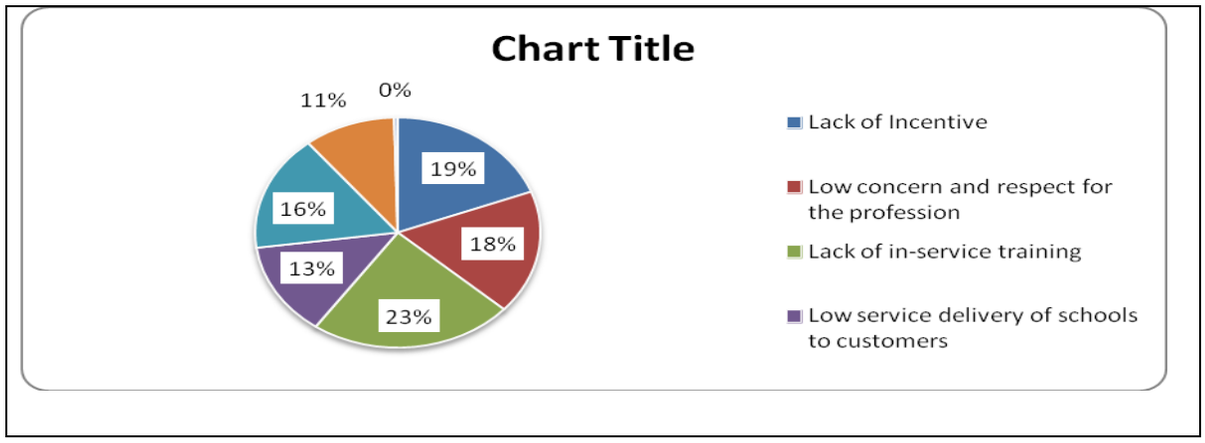


Figure 13: Reason for dissatisfaction (%)

With reference to curriculum, the availability of teacher's guides, syllabus and students' texts were found to have a significant impact on teachers' performance. As depicted in graph 14 below, Reading (72.3%),English (66.6%),Mathematics(65.4%) and Environmental science(67.7%) of teachers confirmed that syllabus were not available in their schools. Similarly, teachers of mathematics (27.3%), environmental Science (34.3 %), English (35.3), reading (44.7%) confirmed that teachers' guides were not available in their schools. 9% (Mathematics) to 17 %(Reading) teachers confirmed that textbooks were not available in their schools.

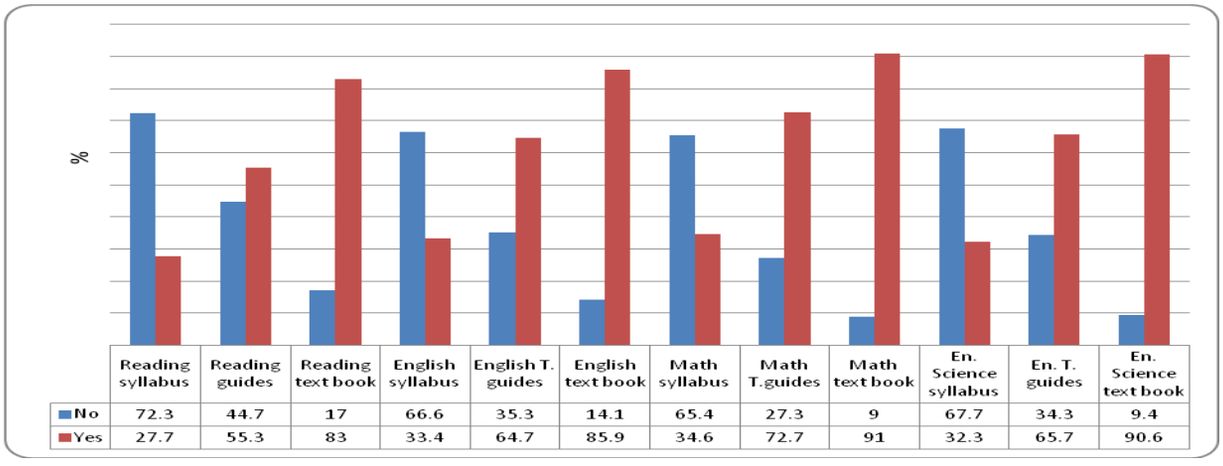
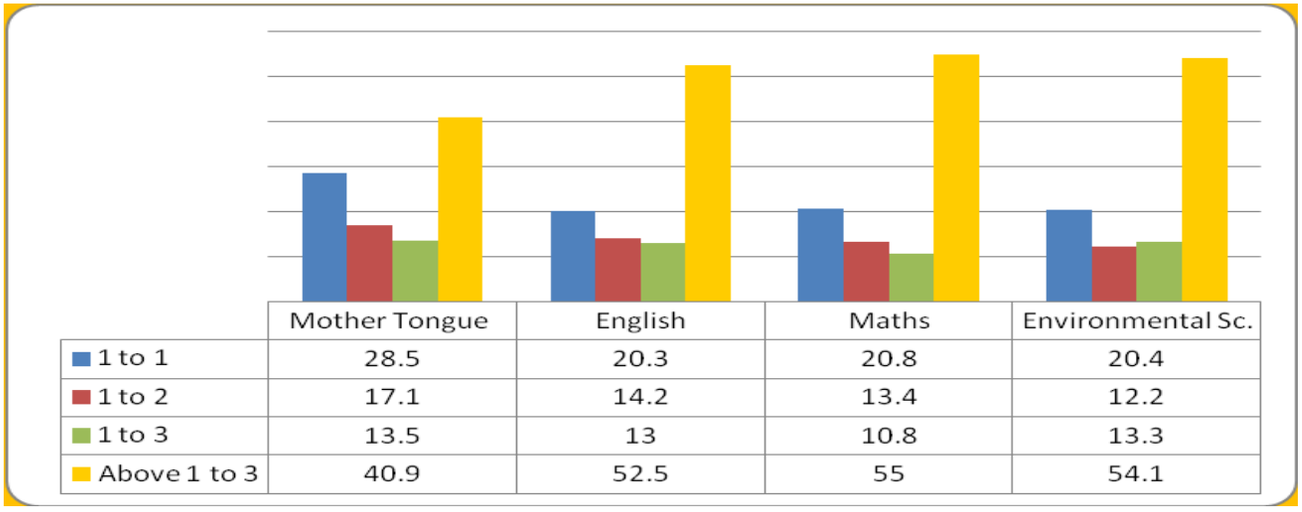


Figure 14: Teachers' response regarding availability of curriculum materials

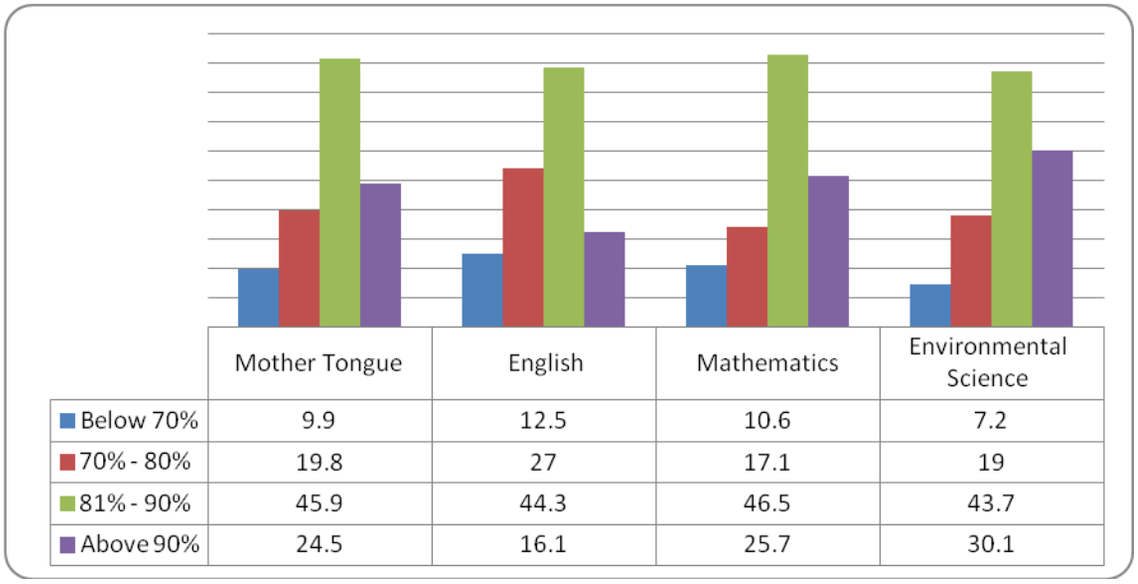
Students' to textbooks ratio as reported by the teachers was presented in Figure 15 below. From 20.3 % (English) to 28.5% (Reading) teachers reported that students had textbooks for their own .one text book to two students ratio was reflected in environment science(12.2%) to a maximum of 17.1%) of teachers in environmental science. Similarly, one textbook to three students' ratio was reported by teachers in Mathematics (10.8%) to maximum of (13.5%). On the other hand, on average 40.9% to 55% of teachers reported that students shared textbooks in the key subjects for more three students.



	Mother Tongue	English	Maths	Environmental Sc.
1 to 1	28.5	20.3	20.8	20.4
1 to 2	17.1	14.2	13.4	12.2
1 to 3	13.5	13	10.8	13.3
Above 1 to 3	40.9	52.5	55	54.1

Figure 15: **Student Textbook Ratio as Reported by Teachers**

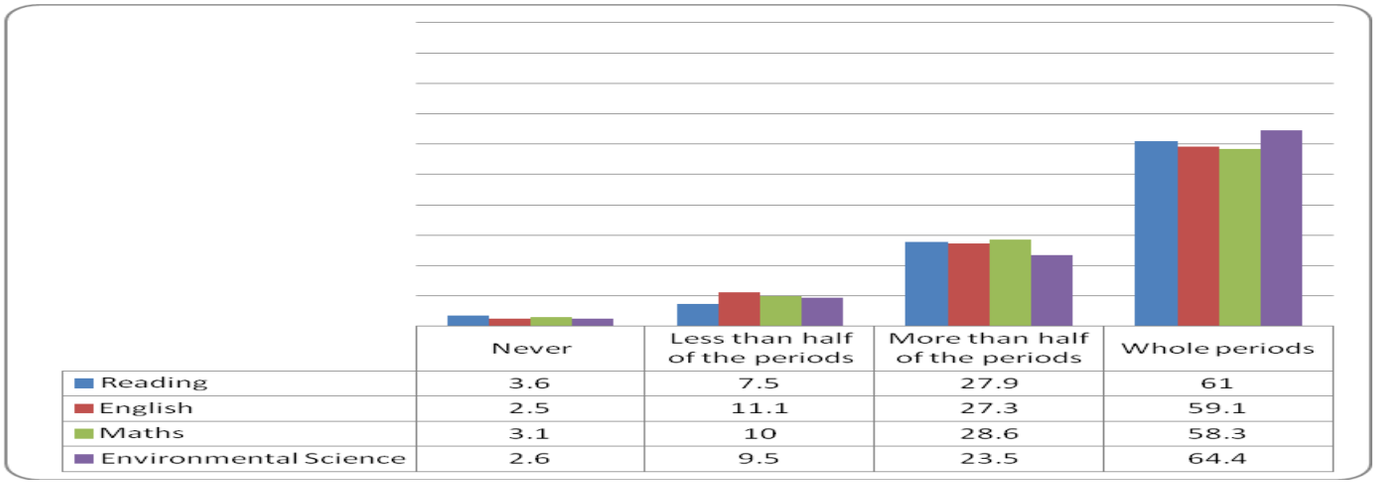
As shown in Figure 16 below, content coverage per academic year with regard to portion coverage, about 16.1%, 24.5 %, 25.7% and 30 % of teachers covered above 90 % of the portion in English, Reading, Mathematics and Environment Science respectively. On the other hand, about 7.2 % (Environmental science), 9.9% (Reading), 10.6% (Mathematics) and 12.5% (English) responded that the portion covered in their respective subject was below 70 %. The rest teachers responded that the portion covered in their subjects were in the range of 70 % to 90%.



	Mother Tongue	English	Mathematics	Environmental Science
Below 70%	9.9	12.5	10.6	7.2
70% - 80%	19.8	27	17.1	19
81% - 90%	45.9	44.3	46.5	43.7
Above 90%	24.5	16.1	25.7	30.1

Figure 16: Content coverage per academic year

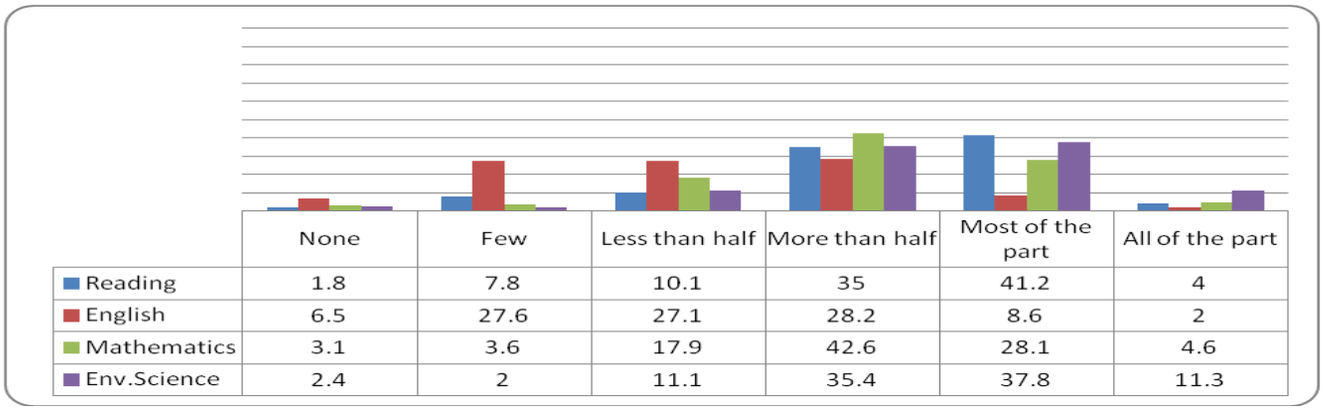
According to the teachers responses, frequency usage textbook in their lessons were 83.4% in mathematics, 86% in English, 87.9% in environmental science and 88.9% reading of them used more than half and whole periods, where as 2.5% (English) to 3.6% (reading) rated of them never used in their lessons (Figure 17 below).



	Never	Less than half of the periods	More than half of the periods	Whole periods
Reading	3.6	7.5	27.9	61
English	2.5	11.1	27.3	59.1
Maths	3.1	10	28.6	58.3
Environmental Science	2.6	9.5	23.5	64.4

Figure 17: **Frequency of using textbooks in the classroom**

Regarding to teachers' opinion concerning students' understanding of the contents of the textbooks as indicted in (Figure18), Mathematics (32.7%), English (34.1%), Reading (45.2%) and Environmental science (49.1%) teachers responded that students might understand more than half of the content of textbook.



	None	Few	Less than half	More than half	Most of the part	All of the part
Reading	1.8	7.8	10.1	35	41.2	4
English	6.5	27.6	27.1	28.2	8.6	2
Mathematics	3.1	3.6	17.9	42.6	28.1	4.6
Env.Science	2.4	2	11.1	35.4	37.8	11.3

Figure 18: Teachers' opinion concerning students' understanding of the contents of the textbooks

The teachers were asked to rank those factors based on their impact on student achievement; accordingly the top five were :1st - Less parents' support while students study, 2nd -students spending time on house chore activities, 3rd -stationary materials, 4th - low nutrition, hygiene and care children received at home and 5th - unavailability of reading materials (**Table 34 below**).

Table 34: Factors affecting students' achievement according to teachers' opinion

Factors	N	Min.	Max.	Mean	Rank
Unavailability of quality and safe school building (walls, windows, etc.)	12230	1	10	6.18	9th
Lack of quality and conducive school ground (playing Field, fences, sports equipment etc.)	12418	1	10	5.96	7th
Lack of teaching aids (chalk board, chalk, globe, map etc.)	12301	1	10	6.88	10th
Shortage of reference reading materials (novels, books, etc.)	12538	1	10	5.98	8th
Unavailability of reading materials (novels, reference books, etc.)	12535	1	10	5.09	5th
Shortage of learning materials (science equipment, tools, etc.).	12295	1	10	5.47	6th
Lack of students' personal learning materials (pen, pencil, exercise book etc.)	12150	1	10	4.60	3rd
Students to spending time on house chore activities	12348	1	10	4.54	2nd
Less parents support while students studying	12638	1	10	3.31	1st
Low nutrition, hygiene and care children received at home	12517	1	10	5.04	4th

The correlation of Grade 4 Teachers' related variables and students achievement

As indicted in Table 35 below, there was positive relation between teachers gender (r=0.142), age (r=0.159), education level (r=0.092), teaching experience (0.059), communication of teachers with parents (r=0.082) and frequency of getting supervision (0.095). On the other hand number of teachers load per week (r=-0.016) and teaching in large class size(r=0.082) and time taken fro to school (-0.022) were correlated negatively with students achievement. In all cases the association was statistically significant at p <0.001.

Table35: Correlation between teachers' related variables and achievement of students in the mean scores

Variables	**N**	**Pearson Correlation**	**Sig.**
Gender of teachers	1001043046	.142**	0.000
Age of teachers	998601149	.159**	0.000
Education level	1005534789	.092**	0.000
Teaching experience	942938449	.059**	0.000
Teaching load per week	990933589	-.016**	0.000
Class size	884692034	-.117**	0.000
Communication with parents	1000105881	.082**	0.000
Time taken to school	1001283875	-.022**	0.000
Frequency of getting supervision	97265013	.095**	0.000

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

Table 36 below presents the correlation between the accessibility of teachers to some short term training on certain issues and students' academic achievement. As a result, all listed areas of training (curriculum, methods of teaching, continuous assessment, action research issues, classroom management and special need education) were positively related with the achievement of the students. The range of their coefficient of correlation was between (r=0.042) the lowest to (r=0.099) the highest.

Table 36: Teachers access to short term trainings and students' achievement mean scores

Areas of short Training	N	Pearson Correlation	Sig.
Curriculum issues	919392469	.076**	0.000
Methods of teaching	944575592	.042**	0.000
Continuous assessment	928970105	.042**	0.000
Action research	882626871	.099**	0.000
Classroom management	909123470	.088**	0.000
Special need education	925837764	.093**	0.000

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

In Grade 4 there exist positive relationship between the four subjects' achievement test and content portion coverage. The correlations were statistically significant in all cases at $p < .01$ (Table 37). This shows that when the content portions were well covered, it could improve students' achievement mean scores.

Table 37: **Correlation between Portion Coverage and achievement of students in mean scores**

Content Portion coverage	Subject achievement mean scores			
	Reading	English	Mathematics	Environmental Sc.
Reading	.113**			
English		.062**		
Mathematics			.136**	
Environmental Science				.096**

**. Correlation is significant at the $p < 0.01$ level (2-tailed

Regression Analysis of Grade 4 Teachers' related variables

Table 38 below shows that 8.5% of the variance of the average scores of students in regression model accounted for by gender, age, frequency of communication with parents, teachers' educational level, teaching experience, teachers' load per week, frequency of getting supervision, time taken from home to school or vice versa and class size. Among these variables, while teachers' load per week, time taken from home to school or vice versa and large class size were negatively affected students' academic achievement, the rests had a positive impact on students' performance (see Table 39).

Table 38: Multiple regression models summary based on Teachers related variables

	Sum of Squares	df	Mean Square	F	R	R^2	Adj. R^2	Sig.
Regression	18792917371.3	9	2088101930.1	7952057.8	.292	.085	.085	.000
Residual	201271008421.4	766494527	262.6					
Total	220063925792.7	766494536						

Table 39: **The Coefficients of teacher related variables that affected students' academic achievement**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Err.	Beta		
(Constant)	18.32	0.00		3663.91	0.000
Gender (Female)	5.35	0.00	0.16	4432.81	0.000
Age	5.29	0.00	0.21	4017.90	0.000
Education level	2.54	0.00	0.07	1959.80	0.000
Teaching experience	2.04	0.00	0.16	2964.20	0.000
Time taken from home to school	-1.43	0.00	-0.09	-2519.66	0.000
Teaching load per week	-0.10	0.00	-0.01	-178.37	0.000
Frequency of getting supervision	1.36	0.00	0.10	2687.78	0.000
Class size	-2.03	0.00	-0.09	-2528.38	0.000
Frequency of communication with parents	0.57	0.00	0.02	504.31	0.000

Table 40 below shows 14% of the variance of the average scores of students in regression model accounted for by teachers' access to short trainings such as awareness on curriculum materials, method of teaching, action research, continuous assessment, classroom management and special need education.

Table 40: **Multiple regression model summary of Teachers Training**

	Sum of Squares	df	Mean Square	F	R	R^2	Adj. R^2	Sig.
Regression	3570940611.7	6	595156768.6	2047987.8	.12	.014	.014	.000
Residual	246267302178.9	847427879	290.6					
Total	249838242790.6	847427885						

As shown in table 41below, trainings related to action research, special need education and continuous assessment had high positive impact on students' achievement relatively that the others.

Table 41: The coefficient of some training areas that affect students' achievement

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig.
(Constant)	38.588	.003		15291.6	0.000
Curriculum issues	.260	.001	.007	180.6	0.000
Method of teaching	.508	.002	.014	337.3	0.000
Continuous assessment	2.110	.002	.061	1320.9	0.000
Action research	3.067	.002	.081	1881.5	0.000
Classroom management	1.059	.002	.031	699.6	0.000
Special need education	2.483	.002	.060	1552.0	0.000

As indicated in table 42 below, 5.3% of the variance of the average scores of students in regression model accounted for by teachers' portion coverage of student text book. Furthermore, covering the contents for each subject has positive impact on students' achievement (see table 43).

Table 42: Multiple regression model summary of Portion coverage

	Sum of Squares	df	Mean Square	F	R	R^2	Adj R^2	Sig.
Regression	4857310677.9	4	1214327669.5	5182868.8	.23	.053	.053	.000
Residual	86601742566.9	369624671	234.3					
Total	91459053244.8	369624675						

Table 43: **The coefficient of content coverage for each subject that affects students' achievement**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	34.084	.003		12109.3	0.000
Reading	4.042	.002	.227	2487.4	0.000
English	3.581	.002	.208	2327.7	0.000
Mathematics	1.134	.002	.067	597.3	0.000
Environmental Science	1.248	.002	.071	696.0	0.000

4.1.10.3. Analysis of School Principals Questionnaires

This part addresses school-level variables related to the teaching and learning processes. The data were based on responses of school directors about the school, students, and teachers. A series of questions were asked to the school directors and they are presented as follows.

From Table 44 below, it could be observed that the majority of schools principles were males (88.2%). Concerning the age of respondents, the majority of them were between 21 to 40 years (82.4%). specifically, 52.3% were between 21 to 30 years and 30.1% of principles age were between 31 to 40 years. Similarly, experience as principles or vice principals were 1 to 5 years **(**48.3%), 6 to 10 years (33%) , 11 to 15 years (10.1%) and remaining above 16 years(8.6%). This implies that, majority of them have less experience as a school principles.

Regarding to educational qualification, 54.2**%** and 41.4 % of the teachers were diploma and first degree holders respectively, whereas 2% and 2.3% of them had second degree and certificate respectively. For the majority of them, the distance from school to home or vice versa was below 15 minutes (51.3%), 15 to 30 minutes (27.7%), 30 to 60 minutes (14%) and remaining above 60 minutes (7%).

Table 44: School principals' Profiles

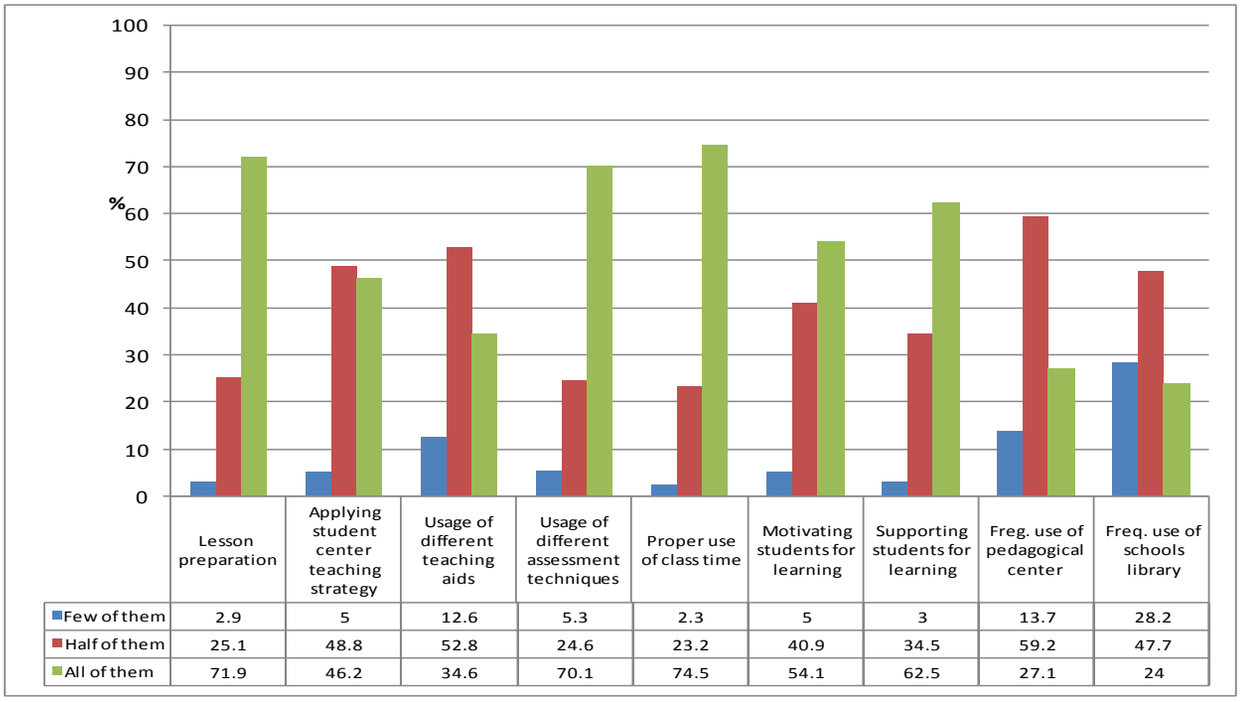
Respondents information		Frequency	Percent
Gender	Male	306	88.2
	Female	41	11.8
	Total	347	100
Age	Below 21 years	3	9
	21 to 30 years	181	52.3
	31 to 40	104	30.1
	41 to 50	42	12.1
	Above 50	16	4.6
	Total	346	100
Position of the Respondent	Principal	205	59.8
	Vice principal	110	32.1
	Representative	14	4.1
	Other	14	4.1
	Total	343	100
Educational Qualification	Certificate	8	2.3
	Diploma	187	54.2
	First degree	143	41.4
	Second degree	7	2.0
	Total	345	100
Experience as principal or vice principal	1 to 5 years	158	48.3
	6 to 10 years	108	33.0
	11 to 15 years	33	10.1
	16 and above years	28	8.6
	Total	327	100
Experience in Current school	1 to 5	244	71.1
	6 to 10	71	20.7
	11 to 15	13	3.8
	16 and above	15	4.4
	Total	343	100
Time taken from school to home	Below 15 min.	176	51.3
	15 to 30 min.	95	27.7
	30 to 60 min.	48	14.0
	Above 60 min.	24	7.0
	Total	343	100.0

The majority of schools were categorized under 1 to 8 grade level (86.1%), the rest belonged to 1 to 4 grade level (5.3%),1 to 10 grade(4.7%) and others(3.8%). Regarding to mode of schooling, 51.3% used shift system; the rest belonged to half day (31.2%) and full day (17.5%) as presented in Table 45 below.

Table 45. Principals' Responses to the Sampled Schools' Information

Category	Alternative	Frequency	Percent
Level of schools	1 to 4	18	5.3
	1 to 8	292	86.1
	1 to 10	16	4.7
	Other	13	3.8
	Total	339	100
Mode of schooling	Full day	60	17.5
	Half day	107	31.2
	With shift	176	51.3
	Total	343	100

As shown in Figure 19 below, majority of principals rated their teachers either as high or medium for their effectiveness in different teaching and learning activities. In this case, 71.9% of principles rated that all teachers were preparing their lesson whereas 25.1% of principals rated that half of the teachers were preparing their lesson. Regarding to the applying student center teaching strategy, 48.8% and 46.2% rated as half and all of teachers respectively applied student center method. Similarly, except 12.5% teachers, 87.4 % of teachers used more than 50 % as rated by the principles.



	Lesson preparation	Applying student center teaching strategy	Usage of different teaching aids	Usage of different assessment techniques	Proper use of class time	Motivating students for learning	Supporting students for learning	Freg. use of pedagogical center	Freq. use of schools library
Few of them	2.9	5	12.6	5.3	2.3	5	3	13.7	28.2
Half of them	25.1	48.8	52.8	24.6	23.2	40.9	34.5	59.2	47.7
All of them	71.9	46.2	34.6	70.1	74.5	54.1	62.5	27.1	24

Figure 19. The Effectiveness of teachers in implementing different teaching methodologies and learning activities as per the opinion of school principals.

Regarding to the availability of syllabus in four subjects, 56.5 % (Mathematics), 59.9% (English) and 61% (both for Reading and environmental science) of teachers had no syllabus in their schools according to responses of principals. Similarly, 40.5 % (Reading), 50 % (English), 59.4% (Mathematics) had no teacher guides in their schools. Concerning to availability of textbooks, 6.4 %(Reading), 2.1 % (English), 0.9 % (Mathematics) and 2.7 % (Environmental science) had no textbook in their schools (Figure 20 below).

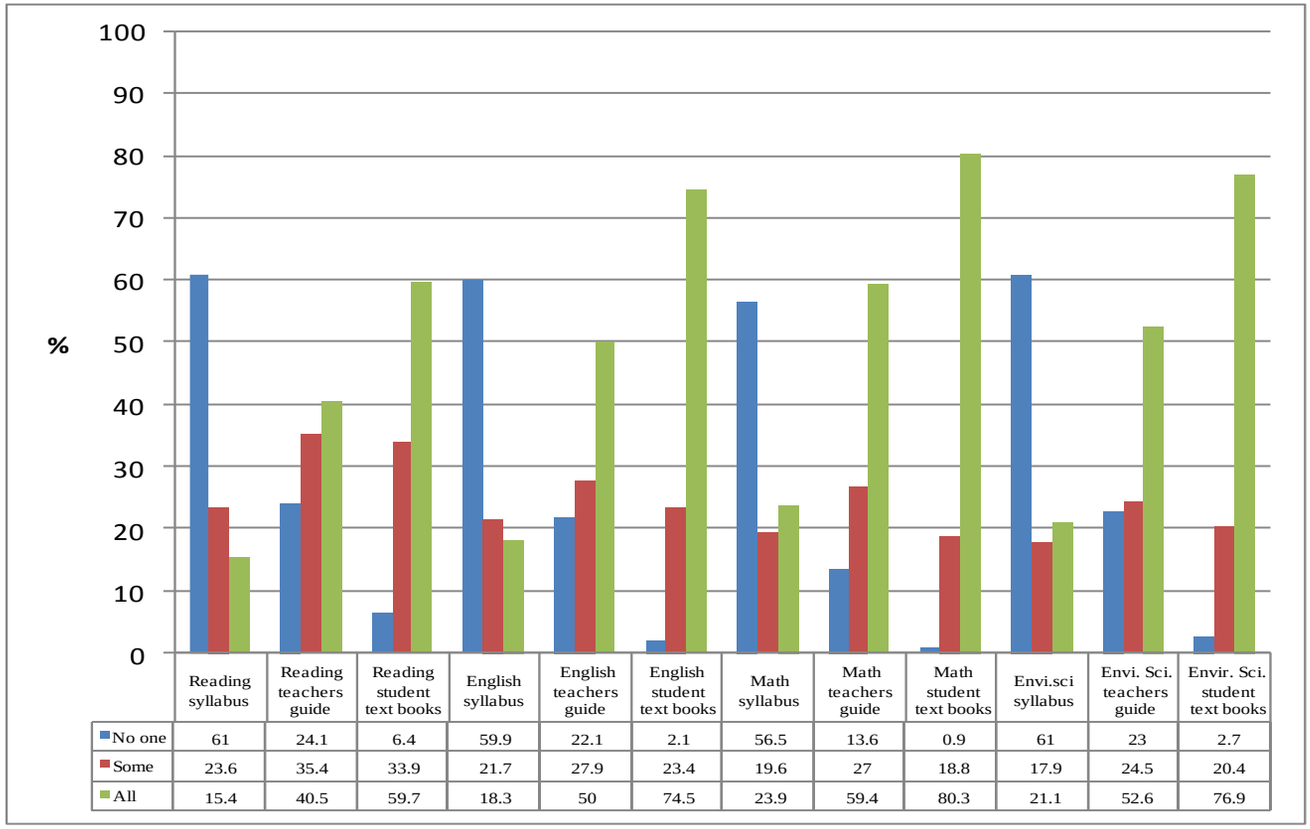


Figure 20: Availability of syllabus, teachers' guide and textbooks

The source of income for schools had different source i.e. government (29.1%), parents fee (22%), selling school products (14.7%), rent farming land /equipment (10.9%), school lounge (9.9%) and donation (13.2%) as presented in Table 46.

Table 46: **Source of income for schools**

Source of school income	Responses		Percent of Cases
	N	Percent	
Government	271	29.1	81.1
Parents students or parents fee	206	22.2	61.7
Selling school products	137	14.7	41.0
Renting farming land /equipment	101	10.9	30.2
School lounge	92	9.9	27.5
Donation	123	13.2	36.8
Total	930	100	278.4

Regarding to efficiency of schools in using school grant as presented in Table 47 below, 181 (56.2%) of schools were used 90% to 100% school grant efficiently. Similarly, 17.8% of schools from 80% to 89 %,, 7.8% of them 70 % to 79%. 5% of them 60% to 69% and 4.3% of them 50% to 59% used the school grant efficiently as per the response of schools' principals.

Table 47. Efficiency of Schools in Using School Grant in Percent

Category	Frequency	Percent
0% to 9%	6	1.9
10% to 19%	3	.9
20% to 29%	6	1.9
30% to 39%	7	2.2
40% to 49%	9	2.8
50% to 59%	14	4.3
60% to 69%	16	5.0
70% to 79%	25	7.8
80% to 89%	55	17.1
90% to 100%	181	56.2
Total	322	100.0

The most influential aspects in the discussion of meeting about school grant were ranked by principals as present in table 46 below. PTA chair person, other PTA members including school principle, teachers, fathers of students (non PTA), Zonal /Woreda/ other education officials/experts, mothers of students(non PTA), community leaders/known persons, religious leaders and other community members ranked 1 to 9 respectively as the most influential/important personals in meeting of school grant (Table 48 below).

Table 48: **The most influential in the Discussion of Meeting about School Grant**

Most influential	**N**	**Minimum**	**Maximum**	**Mean**	**Rank**
PTA chair person	314	1	9	1.76	**1**
Other PTA members	302	1	9	2.85	**2**
Mothers of students(non PTA)	227	1	9	5.19	**6**
Fathers of students(non PTA)	225	2	9	4.99	**4**
Teachers	300	1	9	3.16	**3**
Zonal/Woreda/ other education officials/experts	229	1	9	5.03	**5**
Community leaders/known persons	200	1	9	6.30	**7**
Religious leaders	191	1	9	6.81	**8**
Other community members	205	1	9	7.31	**9**

Table 49 below presents about nine priority discussion issues of the participants on meeting about school grant. Among those availability of teaching aids (Chalk board, chalk, globe, map, etc.), safety and quality of school buildings (repairs to walls, windows, etc.), availability of class related materials (text books, workbooks, and others), safety and quality of school grounds (fences, play grounds, sports equipment, etc.), availability of reading materials (Novels, books, other literatures), library organization ,availability of learning materials (science equipment, tools etc.), students having personal learning materials (pen, pencil, note book etc.) and delivering tutorials to students who are in need of support were ranked 1 to 9 as the main issues of discussion in the meeting in that order.

Table 49: The Priority discussion issues of the participants on meeting regarding School Grant

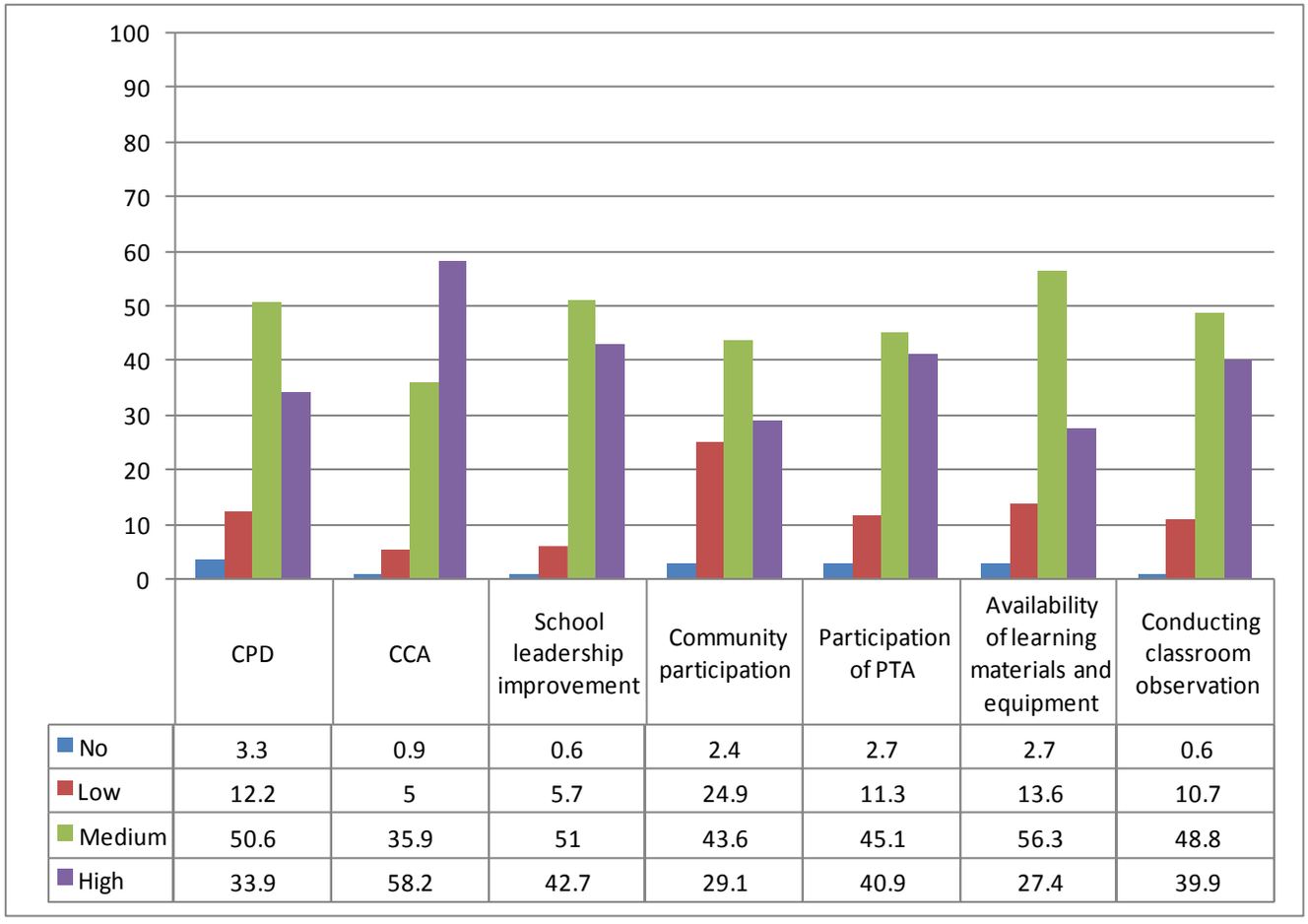
Priority discussion issues	N	Min.	Max.	Mean	Rank
Safety and quality of school buildings (repairs to walls, windows, etc.)	310	1	9	3.53	**2**
Safety and quality of school grounds (fences, play grounds, sports equipment, etc.)	310	1	9	4.77	**4**
Availability of teaching aids (Chalk board, chalk, globe, map, etc.)	315	1	9	3.18	**1**
Availability of reading materials (Novels, books, other literatures)	307	1	9	4.41	**5**
Availability of text books ,workbooks ,and other class related materials	309	1	9	4.14	**3**
Library organization	303	1	9	5.16	**7**
Availability of learning materials (science equipment, tools etc.)	309	1	9	5.07	**6**
Students having personal learning materials (pen, pencil, note book etc.)	292	1	9	6.71	**8**
Delivering tutorials to students who are in need of support	296	1	9	6.95	**9**

Table 50 below shows issues raised during school grant meeting, whether the participants are discussing students' learning, the ability of students to spend time on homework (rather than chores or playing, ability of students to receive help from parents/others at home. Also issues related to nutrition ,hygiene and care children receive at home. The result shows that 78.4% of them indicated as they discuss about the ability of students to spend time on homework (rather than chores or playing, 78.1% about ability of students to receive help from parents/others at home and 53.6% about nutrition , hygiene and care children receive at home.

Table 50: **Existence of discussion on below issues during meeting on school grant**

	No	Yes	%
Ability of students to spend time on homework (rather than chores or playing	20.6	79.4	100
Ability of students to receive help from parents/others at home	21.9	78.1	100
Nutrition ,hygiene and care children receive at home	46.4	53.6	100

Figure 21 below shows the degree of improvement the schools had made concerning different issues for the last two years. Thus, the response of the principals revealed, the highest improvement made at schools was on continuous assessment (58.2%) and the improvement of the rest issues were at medium level range from 43.6% to 56.3 %.



	CPD	CCA	School leadership improvement	Community participation	Participation of PTA	Availability of learning materials and equipment	Conducting classroom observation
No	3.3	0.9	0.6	2.4	2.7	2.7	0.6
Low	12.2	5	5.7	24.9	11.3	13.6	10.7
Medium	50.6	35.9	51	43.6	45.1	56.3	48.8
High	33.9	58.2	42.7	29.1	40.9	27.4	39.9

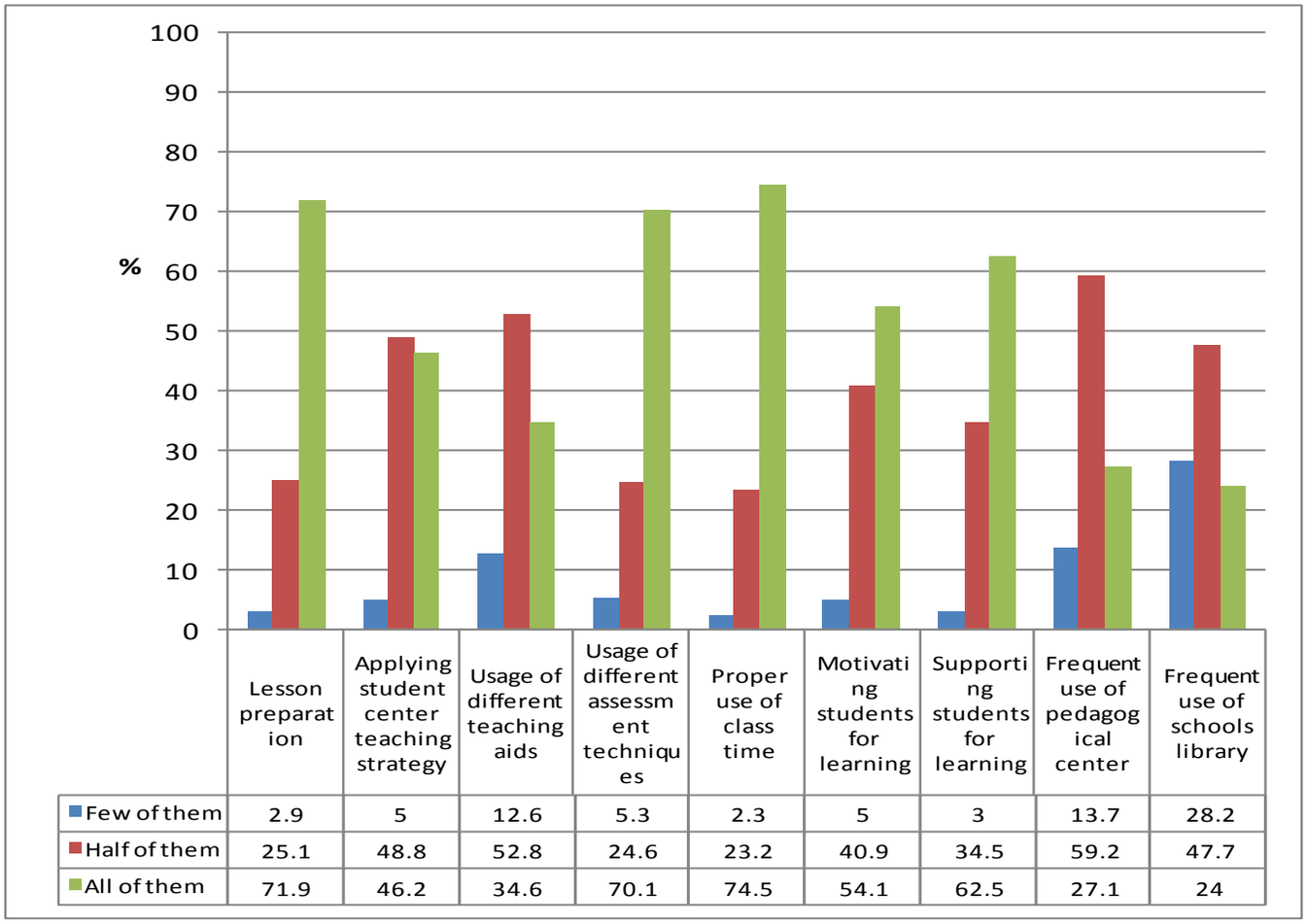
Figure 21: The improvement that schools had shown for the last two years on different issues

One of the most important teachers' professional ethics was motivation and interest to the profession. As observed in Table 49 below, 47% and 41.7% of the principals were rated their teachers as medium and high respectively to motivation and interest to the profession. Similarly, regarding teachers' respect for their profession, 42.3 %) and 43.8 % of the principals rated their teachers medium and highest respectively. Teachers are expected to provide quality education for all students. A professional code of ethics must address this fact; teachers must make effort to make students competent. As shown in table 51 below, 49.7% and 43.2% of school principals had rated their teachers as highest and medium with regard to their effort to make students competent respectively.

Table 51: Teachers Professional Ethics

Class room tasks		Low	Medium	High	Total
Motivation and interest of teachers to the profession	Frequency	38	159	141	338
	Percent	11.2	47.0	41.7	100.0
Teachers respect for their profession	Frequency	47	143	148	338
	Percent	13.9	42.3	43.8	100.0
Teachers effort to make students competent	Frequency	24	146	168	338
	Percent	7.1	43.2	49.7	100.0

When Principals asked to the teachers' effort towards classroom tasks, 73.9 % of them rated that the teachers had lesson plans for each session, 22.8% had lesson for most part of lessons and 3.3% had lesson for few subjects. Regarding to the applying students centers methods, 43.9 % of the teachers used for whole section, 49.9% used for most part of the lessons and 6.1% of them used for few lessons. Concerning usage of different teaching aids while teaching their subjects, 29.5% of them used for each lessons, 57% of them used for most part of the lessons and the rest 13.5% for few lesson. Similarly proper use of class time, 75.5% of teachers used their time properly and 22.5% of them used their most part of time properly. Regarding, teachers were motivating students for whole lesson (48.3%), most part of the lesson (45.5%) and few lesson (6.2%) according principal respondents. About 58.2% of teachers had supporting whole students for learning, 37.5% had supporting most part and 4.3% for few students learning. About 22.8% and 23.7 % of teachers' frequent use of pedagogical center of the school and library respectively, 60.6 % and 52.7% teachers used partially in pedagogical center of the school and library respectively (Figure 22).



	Lesson preparation	Applying student center teaching strategy	Usage of different teaching aids	Usage of different assessment techniques	Proper use of class time	Motivating students for learning	Supporting students for learning	Frequent use of pedagogical center	Frequent use of schools library
Few of them	2.9	5	12.6	5.3	2.3	5	3	13.7	28.2
Half of them	25.1	48.8	52.8	24.6	23.2	40.9	34.5	59.2	47.7
All of them	71.9	46.2	34.6	70.1	74.5	54.1	62.5	27.1	24

Figure 22: Teachers effort towards classroom tasks as per principals' view

According principals responses, the major school related problems were mostly at medium degree as shown in Table 52. Among those low relationship of school and parents(45.5%),low motivation of students to score high grades (40.1%), student absenteeism (39.6%),Students lack motivation for learning (35%), gap of teacher- student relationship (34.8%), unavailability of different school materials(33.4%),Students late come to schools (31.7%) and discipline of students(29.8%) were rated as some of the medium school problems.

Table 52 Principals' opinion on major school related problems

Major school related problems		Degree of the problems				
		No	Low	Medium	High	Total
Student absenteeism	%	4.1	36.4	39.6	19.8	100.0
Gap of teacher- student relationship	%	21.8	35.2	34.8	8.2	100.0
Discipline of students	%	22.0	39.9	29.8	8.3	100.0
Teacher absenteeism	%	26.2	54.2	16.7	3.0	100.0
Students lack respect for their teachers	%	33.3	35.7	21.4	9.5	100.0
Resistance of teachers for change	%	36.5	32.0	25.1	6.3	100.0
Addiction of students to drugs and alcohol	%	71.3	18.3	6.3	4.2	100.0
Shortage of students text book	%	26.6	34.7	29.3	9.3	100.0
Low relationship of school and parents	%	9.2	26.5	45.5	18.8	100.0
Shortage of qualified teachers	%	35.3	27.6	24.3	12.8	100.0
Unavailability of different school materials	%	14.9	36.1	33.4	15.5	100.0
Lack of support and respect among students	%	30.4	39.7	22.1	7.8	100.0
Low motivation of students to score high grades	%	11.9	31.8	40.1	16.3	100.0
Students late come to schools	%	7.1	47.0	31.7	14.2	100.0
Students lack respect for school rule and regulation	%	20.8	46.4	23.2	9.6	100.0
Students lack motivation for learning	%	8.3	35.6	35.0	21.1	100.0

Among several variables that were presented for the school principals, only few of them were found to be correlated with students' achievement. As shown in Table 53 below, the correlations between school related factors and students' achievement were positive and statistically significant (education level, r =0.158), age r=0.139, current experience r=0.095, experience as principal or vice principal=0.089) and gender, r = -0.037).

Table 53 Correlation between principals' personal information and students' achievement

Principals' Personal information	N	Correlation coefficient	Sig.
Gender	12840	-.037**	.000
Age	12800	.139**	.000
Education level	12778	.158**	.000
Experience as principal or vice principal	12093	.089**	.000
Years of experience current school	12730	.095**	.000

**. Correlation is significant at the $p < 0.01$ level (2-tailed).

Table 54 below presents the correlation between some school situations and students achievement. Among those school locations (urban/rural), school shifting system and large number student in the school were negatively correlated with the students' achievement. However, the presence of large number teachers in school was positively related with the students' performance.

Table 54. Correlation between school situations and students' achievement mean score

Variables	N	Correlation coefficient	Sig.
School location (urban =1, rural= 2)	12324	-.144**	.000
Mode of schooling /shifting	12717	-.128**	.000
Large number of students	11731	-.032**	.000
Large number of teachers	11041	.043**	.000

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

As shown in table 55 below, under instructional support using teachers effort to make students competent, motivation and interest of teachers to the profession , supporting students for learning ,teachers respect for their profession, motivating students for learning, frequent use of schools library , proper use of class time and preparation of teachers to teach the subject applying student center teaching strategy, usage of different teaching aids while teaching the subject, usage of different assessment techniques in their subject and frequency use of pedagogical center showed significant positive relationships with academic performance.

Table 55. Correlation between teachers' performance and students' achievement in mean score

Variables	**N**	**Correlation coefficient**	**Sig.**
Preparation of teachers to teach the subject	12674	.167**	.000
Applying student center teaching strategy	12667	.136**	.000
Usage of different teaching aids while teaching the subject	12627	.188**	.000
Usage of different assessment techniques in their subject	12636	.108**	.000
Proper use of class time	12627	.174**	.000
Motivating students for learning	12593	.209**	.000
Supporting students for learning	12439	.233**	.000
Frequent use of pedagogical center of the school	12453	.162**	.000
Frequent use of schools library	12326	.194**	.000
Motivation and interest of teachers to the profession	12512	.234**	.000
Teachers respect for their profession	12522	.201**	.000
Teachers effort to make students competent	12522	.238**	.000

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

Student absenteeism (r = - 0.230), problem of late comer students(r = -0.228), students' lack respect for their teachers (r = - 0.185), low motivation of students in learning(r = -0.171), unavailability of different school materials (r = - 0.167), shortage of qualified teachers (r= - 0.158), lack of support and respect among students (r= - 0.155), low teacher- student relationship (r= - 0.152), low motivation of students to score high grades(r = -0.148), disciplinary problem of students (r= - 0.120), teachers absenteeism(r = - 0.114), addiction of students to drugs and alcohol (r= - 0.077), resistance of teachers for change (r= - 0.054), and shortage of student textbooks (r = -0.052) were negatively associated with students' achievement and they were all statistically significant at p<0.001(See Table 56).

Table 56 Correlation between schools related factors and students' achievement in mean score

Some schools related factors	**N**	**Correlation Coefficient**	**Sig.**
Student absenteeism	12510	-.230**	.000
Low teacher- student relationship	12217	-.152**	.000
Disciplinary problem of students	12467	-.120**	.000
Teacher absenteeism	12448	-.114**	.000
Students lack respect for their teachers	12468	-.185**	.000
Resistance of teachers for change	12378	-.054**	.000
Addiction of students to drugs and alcohol	12369	-.077**	.000
Shortage of students text book	12369	-.052**	.000
Low relationship between school and parents	12456	-.007	.414
Shortage of qualified teachers	12488	-.158**	.000
Unavailability of different school materials	12408	-.167**	.000
Lack of support and respect among students	12408	-.155**	.000
Low motivation of students to score high grades	12495	-.148**	.000
Problem of late comer students	12528	-.228**	.000
Students lack respect for school rule and regulation	12295	-.165**	.000
Low motivation of students in learning	12488	-.171**	.000

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

The variables under school situations explained about 2.7% of the variance in learners' achievement. Of these variables, the most influential was school location (see table 57 and 58). Stating the situations of location, Ezike (1997) conceptualized urban environment as those environment which had high population density containing a high variety and beauty and common place views. He further identified the rural environment as being characterized by low population density containing a low variety and isolated place views.

Earlier in his contribution, Lipton (1962) corroborated that "rural community is characterized by low population, subsistence mode of life, monotonous and burdensome ".Citing hotels, recreational centers, markets, banks and good road network as being present in their urban environment. Owolabi (1990) accentuated that our highly qualified teachers prefer to serve therein rather than the rural areas.

As a corollary of the above, Kuliman et al (1977) observed that teachers do not accept postings to rural areas because their conditions are not up to the expected standard as their social life in the areas is virtually restricted as a result of inadequate amenities; facilities are deficient, playground are without equipment, libraries are without books while laboratories are glorified ones.

Table 57: Regression model summary on school situations

	Sum of Squares	Df	Mean Square	F	R	R^2	Adj. R^2	Sig.
Regression	12088953.066	4	3022238.266	12408.048	.164	.027	.027	.000
Residual	434967972.155	1785797	243.571					
Total	447056925.221	1785801						

Table 58: Coefficients of Teachers Performance

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	54.405	.087		626.371	.000
School location	-2.371	.030	-.069	-80.345	.000
Mode of schooling /shifting	-1.707	.017	-.079	-101.415	.000
Large number of students	-.005	.000	-.121	157.306	.000
Large number of teachers	.396	.005	.075	-86.944	.000

Teachers' performance and behaviors with students explained 6.6% of the variance in achievement of students. Among the various variables that made up this block, teachers' effort, usage of teaching aids and evaluation were found to be more important in enhancing student achievement. It was also observed that teaching method in new teaching techniques, motivation of teachers and interest in teaching, respect of their profession, regular usage of pedagogical center and library contributed positively to learners' achievement as shown in table 59 and 60 below.

Table 59. Regression model summary of teachers' performance and students' achievement in mean score

	Sum of Squares	df	Mean Square	F	R	R^2	Adj. R^2	Sig.
Regression	32992696.90	12	2749391.409	11946.776	.256	.066	.066	.000
Residual	470573605.24	2044757	230.137					
Total	503566302.14	2044769						

Table 60. The Coefficients of teachers' performance in affecting students' achievement

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. err	Beta		
(Constant)	25.87	0.09		301.53	0.000
Preparation of teachers to teach the subject	0.04	0.03	0.00	1.69	0.092
Applying student center teaching strategy	-2.31	0.02	-0.08	-102.40	0.000
Usage of different teaching aids while teaching the subject	2.85	0.02	0.11	121.40	0.000
Usage of different assessment techniques in their subject	-1.86	0.03	-0.06	-73.24	0.000
Proper use of class time	3.27	0.03	0.09	107.38	0.000
Motivating students for learning	0.49	0.03	0.02	18.35	0.000
Supporting students for learning	1.82	0.03	0.06	64.02	0.000
Frequent use of pedagogical center in the school	-0.89	0.03	-0.04	-33.92	0.000
Frequent use of schools library	2.05	0.02	0.10	105.23	0.000
Motivation and interest of teachers to the profession and in teaching	-0.51	0.02	-0.02	-22.26	0.000
Teachers respect for their profession	3.02	0.02	0.13	147.19	0.000
Teachers effort to make students competent	-0.09	0.02	0.00	-4.12	0.000

As shown Table 61 below, some school related factors accounted for 8.3% of the variation in students' achievement. Among those, student absenteeism, the problem of late comer students and students' lack of respect for their teachers were the most factors the affect students' achievement (Table 62 below).

Table 61: Regression Model summary of schools related factors and students' achievement in mean score

	Sum of Squares	df	Mean Square	F	R	R^2	Adj. R^2	Sig.
Regression	39429747.85	16	2464359.24	10994.04	.288	.083	.083	.000
Residual	435431487.72	1942555	224.15					
Total	474861235.55	1942571						

Table 62 :Coefficients of schools' related factors that affect students' achievement

	Unstandardized Coefficients		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. err**	**Beta**		
(Constant)	65.07	0.06		1024.95	0.000
Student absenteeism	-3.43	0.02	-0.17	-202.86	0.000
Low teacher- student relationship	0.63	0.02	0.04	39.13	0.000
Disciplinary problem of students	1.09	0.02	0.06	53.74	0.000
Teacher absenteeism	-1.88	0.02	-0.08	-88.27	0.000
Students lack respect for their teachers	-2.34	0.02	-0.14	-136.03	0.000
Resistance of teachers for change	1.25	0.02	0.08	80.44	0.000
Addiction of students to drugs and alcohol	1.08	0.02	0.05	61.23	0.000
Shortage of students text book	0.35	0.01	0.02	24.07	0.000
Low relationship between school and parents	-1.70	0.01	-0.10	-126.55	0.000
Shortage of qualified teachers	0.83	0.01	0.05	67.93	0.000
Unavailability of different school materials	-0.41	0.02	-0.02	-25.48	0.000
Lack of support and respect among students	-1.09	0.02	-0.06	-55.61	0.000
Low motivation of students to score high grades	0.51	0.02	0.03	31.63	0.000
Problem of late comer students	-2.74	0.02	-0.14	-140.05	0.000
Students lack respect for school rule and regulation	1.55	0.02	0.08	66.03	0.000
Low motivation of students in learning	-0.72	0.02	-0.04	-39.86	0.000

4.2 Grade 8 students Achievement and Factors Affecting Learning Outcomes

4.2.1 Summary of Students Achievement outcomes

As it can be seen from Table 63 below, the summary descriptive statistics shows that the percent mean score for each subject and consequently their composite score were below the minimum expected score (50%). The minimum passing mark set by the Education and Training Policy is (50%). The mean score for Mathematics (35.20%) is the lowest and much lower than the composite score (41.14), whereas the mean score for Biology is the highest (46.26%).

Table 63 : Students estimated mean scores by subject in percentage at national level

Subject	N	Minimum	Maximum	Mean	Scale score	Std. Dev.
English	1261204	3	100	40.31	308.14	17.75
Math	1256614	3	100	35.20	300.36	16.47
Physics	1252502	0	98	42.58	306.12	16.34
Chemistry	1255217	0	100	41.29	305.28	16.89
Biology	1255964	0	97	46.26	297.86	18.31
Average	1262191	6.15	98.33	41.14	303.56	13.88

Figure 23 below shows the percentage of students who scored 50% and above in the five subjects and the composite score. In mathematics, only 18.4% of the students achieved 50% and above, whereas in Biology (42.8%), physics (32.6%), English (28.9%) and Chemistry (28.2%) achieved 50% and above. In the composite score, only 25.2% of the students scored 50% and above. Thus, from the figure below, it is evident that the majority of students in all the tested five subjects didn't meet the expected minimum passing score set in the ETP.

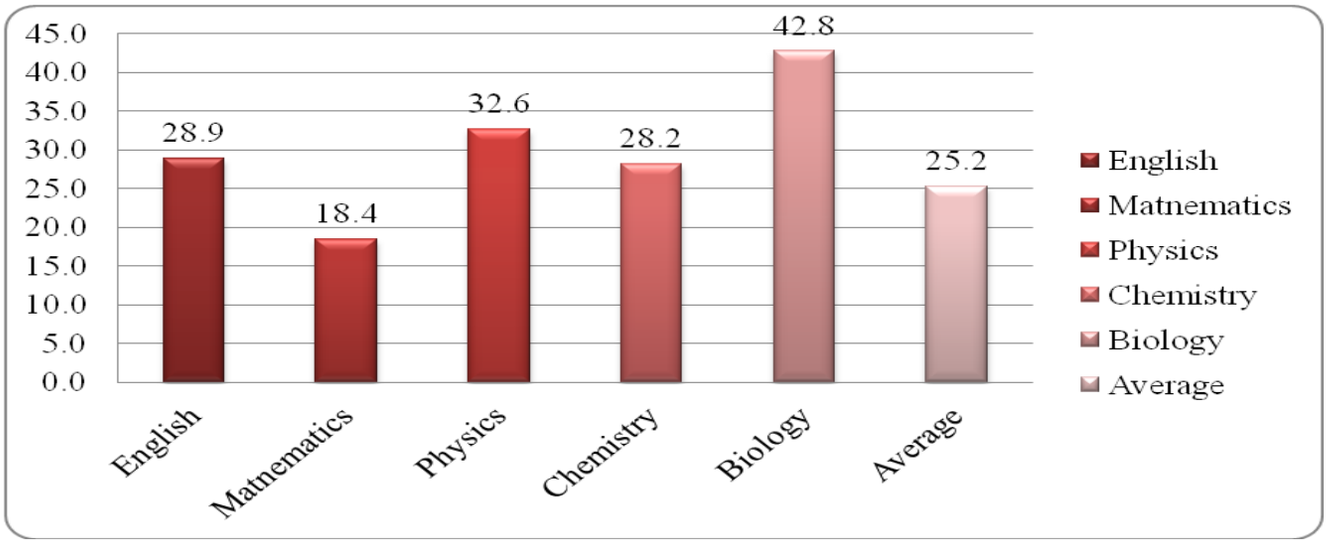


Figure 23. The percentage of students who scored 50% and above in the five subjects

There were positive relationships among the achievement scores in the five subjects: English, Mathematics, Physics, Chemistry and Biology as well as the composite score. The correlations were found to be statistically significant in all cases at $p < .01$ (Table 64). This shows that students performing well in one subject did the same in the other subjects. The strongest correlation is found between physics and the composite score ($r = 0.851$).

Table 64. Pearson product moment correlations between the five subjects and average Score

Subject	English	Mathematics	Physics	Chemistry	Biology
Mathematics	.622**				
Physics	.557**	.678**			
Chemistry	.480**	.609**	.652**		
Biology	.487**	.508**	.581**	.525**	
Average	.781**	.840**	.851**	.804**	.775**

**. Correlation is significant at the $p < 0.01$ level (2-tailed).

The achievement scores of students on national learning assessment and school based assessment of the first semester in the academic year obtained from the school rosters were computed to observe their relationship between each subject. As a result, there was a slight moderate positive correlation between each subject that was statistically significant correlation at $p<0.05$. Here, although the direct prediction is impossible due to various processes in test development and the way of test administration, the relationship

shows that those who did well at their school based assessment also did better in national learning assessment (See table 65).

Table 65. The correlation between students' achievement on national and school based assessment

National Learning Assessment	Classroom Based Assessment					
	English	Mathematics	Physics	Chemistry	Biology	Average
English	.393**					
Mathematics		.281**				
Physics			.413**			
Chemistry				.254**		
Biology					.331**	
Average						.493**

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

Table 66 below illustrates the range of achievement in the five subjects and the composite scores. The table indicates scores achieved at five key marker points: 10th, 25th, 50th, 75th and 90th percentiles. Students at the 90th percentile only achieved scores of 60.93% in the composite average. This means only 10% of the students were able to achieve a score of 60.93% and above.

On the other hand students at the 10th percentile scored only 25.61% and this means 10% of the students scored at or below chance level in all subjects. Similarly, 50% of the students scored about 38.22% and below in the composite mean.

Table 66. Range of achievement scores (%) at five key marker points

Percentiles	English	Mathematics	Physics	Chemistry	Biology	Average
10th	20.00	17.50	22.50	20.69	23.33	25.61
25th	27.50	22.50	30.00	27.59	33.33	30.28
50th	37.50	30.00	40.00	37.93	43.33	38.22
75th	52.50	42.50	52.50	51.72	60.00	50.09
90th	65.00	60.00	65.00	65.52	73.33	60.93

From Table 67 below, similar to the previous learning assessment report results, the mean composite score of the five tested subjects was 41.14%, which is below the minimum expected average score (50%).

In this case, the one sample t- test also confirmed that there was a statistically significant mean difference between the mean scores of each subject and the minimum passing score 50% at p<0.001.

Table 67. The Mean differences in achievement of students for each subject by one sample t-test

	N	Mean	Std. Err	**Test Value = 50**			
				t	**df**	**MD**	**Sig.**
English	1261204	40.31	.016	-612.93	1261203	-9.69	.000
Mathematics	1256614	35.20	.015	-1007.25	1256613	-14.80	.000
Physics	1252502	42.58	.015	-507.95	1252501	-7.42	.000
Chemistry	1255217	41.29	.015	-577.74	1255216	-8.71	.000
Biology	1255964	46.26	.016	-228.99	1255963	-3.74	.000
Average	1262191	41.14	.012	-717.30	1262190	-8.86	.000

4.2.2 Performance of students at various proficiency levels

As shown in figure 24 below, large numbers of students were categorized under below basic and basic levels for each subject. Particularly, 522.9% in Chemistry, 51.3% students in Physics, 35% in Mathematics, 31.2% in Biology and 23.4% in English were fall under below basic level. In this regard, the number of students in below basic level was high in Chemistry and physics as compared to other subjects. On the contrary, few numbers of students were able to achieve at advanced levels for each subject with the range of 1.4% for chemistry to 4.1 % for Biology.

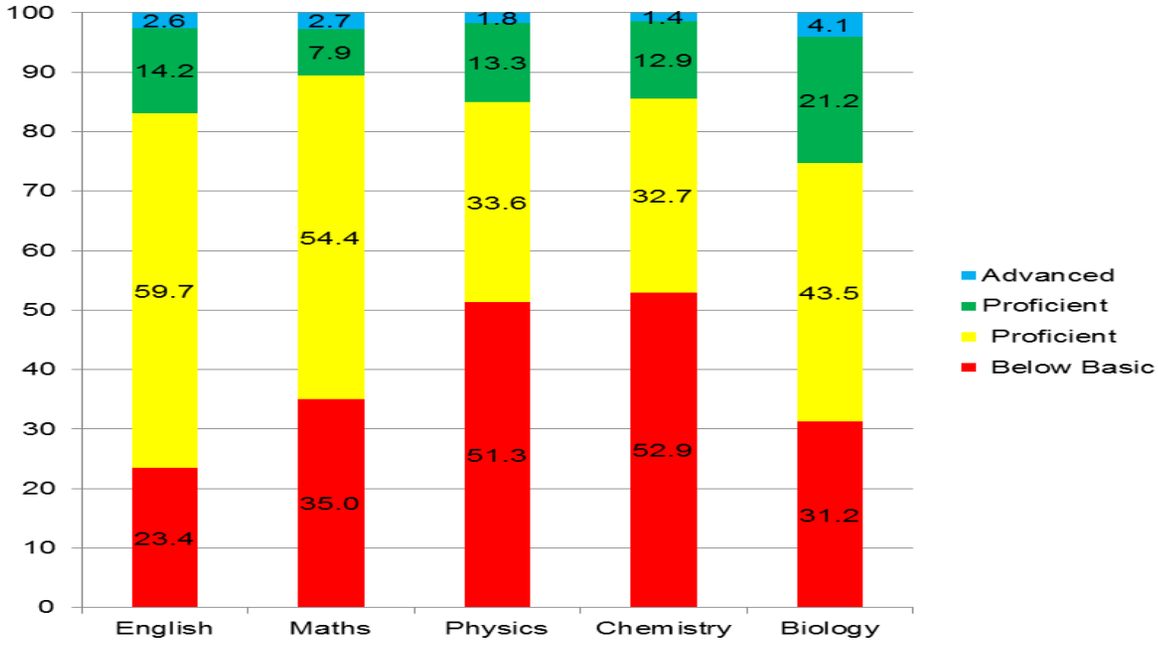


Figure 24: Grade Eight performance level at different proficiency levels

4.2.3 Gender and Achievement

Achievement of boys is higher than girls by 1.81 % in the composite score and it ranges from 1.81% (Chemistry) to 2.99% (Physics) in the five subjects (Table 68), except in Biology where girls achieved a mean score 0.21% higher than boys. In all cases, the differences were found to be statistically significant at $p < .001$.

Table 68: Independent sample t-test for estimated mean scores between boys and girls

Subject	Gender	N	Mean	Std. Dev.	t	df	MD	Sig
English	Boys	645012	41.47	17.978	75.79	1250328	2.40	.000
	Girls	605318	39.07	17.408				
Mathematics	Boys	641119	36.18	16.806	67.71	1243098	2.10	.000
	Girls	601980	34.18	16.057				
Physics	Boys	637516	44.07	16.765	101.92	1239145	2.99	.000
	Girls	601631	41.08	15.760				
Chemistry	Boys	640482	42.16	17.232	59.72	1241685	1.81	.000
	Girls	601205	40.35	16.445				
Biology	Boys	641493	46.20	18.113	-6.42	1245000	-0.21	.000
	Girls	603510	46.41	18.536				
Average	Boys	644649	42.03	14.25	72.97	1249063	1.81	.000
	Girls	604416	40.22	13.43				

4.2.4. School Location and Achievement

Table 69 below shows that the mean differences between urban and rural students in all subjects. The mean difference in the composite score between rural and urban schools ($t = 152.56$, $p < .000$) was statistically significant, which is in favor of urban students. The mean difference in Biology (5.62) is the highest whereas that of Mathematics is the lowest (2.91).

Table 69: Independent sample t-test for estimated mean scores between rural and urban schools

Subject	Location	N	Mean	Std. Dev.	t	df	MD	Sig
English	Rural	868795	39.09	17.04	-115.77	1261202	-3.93	.000
	Urban	392409	43.02	18.96				
Mathematics	Rural	866866	34.30	15.94	-91.90	1256612	-2.91	.000
	Urban	389748	37.21	17.43				
Physics	Rural	859895	41.52	15.70	-108.47	1252500	-3.40	.000
	Urban	392607	44.92	17.43				
Chemistry	Rural	863026	40.01	16.22	-127.05	1255215	-4.11	.000
	Urban	392190	44.11	17.96				
Biology	Rural	868913	44.53	17.36	-160.65	1255962	-5.62	.000
	Urban	387052	50.15	19.71				
Average	Rural	868408	39.88	13.14	-152.56	1262189	-4.03	.000
	Urban	393783	43.91	15.03				

4.2.5 Students Achievement by schools' category/status

The one way analysis of variance (ANOVA) in Table 70 below revealed that there is a statistically significant difference in the achievement of students of the schools that have been categorized as "A" (level 4), "B" (level 3), and "C" (level 2) in a mean score at $p<0.000$. In this case, the analysis among the school categories was based on the response of the participant school principals' from the sampled schools.

Table 70: One-way analysis of variance of students' achievement by school status

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	147534228.5	2	73767114.2	400845.1	.000
Within Groups	1584527746.7	8610208	184.0		
Total	1732061975.2	8610210			

As shown in Table 71 below, the Post Hoch test of Tukey HSD homogenous subset grouping revealed that the performance of students from school 'A' is better than that of students from schools 'B' and 'C'. However, students from school 'C' performed the least. The Tukey test divided the schools in to three subgroups at alpha = 0.05, which indicated the existence of a statistically significant difference among the groups.

Table 71: Subset Groupings in Average Score (%) by School Status

Rank of the school	N	Subset for alpha = 0.05		
		1	2	3
Level2 (C)	1224373	32.8015		
Level 3 (B)	5839296		39.2021	
Level 4(A)	1546542			47.2360

4.2.6. Achievement of the students across regions

Table 72 shows the summary of the descriptive statistics for the average scores of the five subjects at regional level. In this regard, Dire Dawa and Addis Ababa are exceptional with the highest mean scores of 47.43% and 46.32%, respectively; whereas Gambella and Benishangul Gumuz regions achieved the lowest mean scores of 30.84% and 31.66%, respectively. Thre regions namely: Tigray (44.69%), Ethiopian Somali (42.65%) and Oromia (41.75%) achieved above average score (41.14%).

Table 72: Students estimated mean scores by region (%)

Region	**English**	**Mathematics**	**Physics**	**Chemistry**	**Biology**	**Average**
Tigray	37.40	40.18	44.86	47.81	53.56	44.69
Afar	36.13	7.85	36.83	34.64	33.67	33.83
Amhara	42.36	37.55	42.89	40.97	37.69	40.27
Oromia	35.15	32.38	43.35	43.04	54.76	41.75
Somali	50.22	32.92	41.35	39.27	50.03	42.65
B/Gumuz	33.24	27.42	32.20	31.45	34.26	31.66
SNNP	43.09	34.60	40.82	37.52	42.63	39.76
Gambella	31.36	25.30	31.80	32.15	33.70	30.84
Harari	45.26	34.18	43.81	41.49	38.59	40.64
Addis Ababa	53.98	42.86	45.61	44.48	44.64	46.32
Dire Dawa	51.85	41.32	49.41	46.39	48.07	47.43
National Average	40.31	35.20	42.58	41.29	46.26	41.14

As shown in Table 73, the One-Way Analysis of Variance (ANOVA) also indicated statistically significant mean differences of students' achievement in each subject across the regions.

Table 73. One-way analysis of variance for each subject means score across regions

		Sum of Squares	df	Mean Square	F	Sig.
English	Between Groups	30527759.81	10	3052775.98	10497.25	0.000
	Within Groups	366776202.95	1261193	290.82		
	Total	397303962.76	1261203			
Mathematics	Between Groups	12613058.48	10	1261305.85	4828.27	0.000
	Within Groups	328266571.67	1256602	261.23		
	Total	340879630.16	1256612			
Physics	Between Groups	4960732.18	10	496073.22	1885.84	0.000
	Within Groups	329469685.33	1252490	263.05		
	Total	334430417.51	1252500			
Chemistry	Between Groups	12328857.83	10	1232885.78	4475.44	0.000
	Within Groups	345781625.34	1255205	275.48		
	Total	358110483.17	1255215			
Biology	Between Groups	67945833.07	10	6794583.31	24182.6	0.000
	Within Groups	352884458.89	1255953	280.97		
	Total	420830291.96	1255963			
Average	Between Groups	6041275.67	10	604127.57	3213.54	0.000
	Within Groups	237282884.00	1262179	188.00		
	Total	243324159.68	1262189			

4.2.7. Subject wise comparisons among regions using the Post Hoc Test

The Post Hoc test of Tukey HSD homogenous subset grouping revealed that the performance in English test for Addis Ababa (53.98%) is better than the other regions. In contrast; Gambella had the lowest performance in English (22.62%). The Tukey test divided the regions into ten subgroups with statistically significant difference among the groups. For instance, Addis Ababa, Dire Dawa, and Ethiopian Somali are relatively high performing regions whereas Gambella, Benishangul Gumz and Oromia are the lowest performing regions in English (Table 74 below).

Table 74. Homogenous subset groupings by region for English

Region	N	Subset for alpha = 0.05									
		1	2	3	4	5	6	7	8	9	10
Gambella	8665	31.36									
B/Gumuz	14191		33.24								
Oromia	417434			35.15							
Afar	1840				36.13						
Tigray	94549					37.40					
Amhara	337051						42.36				
SNNP	293440						43.09				
Harari	2093							45.26			
Somali	38947								50.22		
Dire Dawa	5173									51.85	
Addis Ababa	47816										53.98
Sig.		1.000	1.000	1.000	1.000	1.000	.253	1.000	1.000	1.000	1.000

It can be noted from Table 75 below, based on mathematics mean scores; the regions were categorized in to eight homogeneous subset groupings. Addis Ababa (42.86%), Dire Dawa (41.32 %) and Ethiopian Somali (40.18%) have got the highest scores whereas Gambella (25.30%), Benishangul Gumuz (27.42%) and Afar (27.85%) have the lowest scores.

Table 75. Homogenous subset groupings by region for Mathematics

Region	N	Subset for alpha = 0.05							
		1	2	3	4	5	6	7	8
Gambella	8675	25.30							
B/Gumuz	14213		27.42						
Afar	1834		27.85						
Oromia	416195			32.38					
Somali	39213			32.92					
Harari	2092				34.18				
SNNP	291655				34.60				
Amhara	336088					37.55			
Tigray	93786						40.18		
Dire Dawa	5158							41.32	
Addis Ababa	47699								42.86
Sig.		1.000	.865	.606	.890	1.000	1.000	1.000	1.000

Table 76 below shows the homogenous mean subset groupings in physics by region. Gambella (31.80 %) and BenishangulGumz (32.20%) achieved the lowest, whereas Dire Dawa (49.41%), Addis Ababa (45.61%) and Tigray (44.86%) relatively achieved the highest.

Table 76. Homogenous subset groupings by region for Physics

Region	N	Subset for alpha = 0.05						
		1	2	3	4	5	6	7
Gambella	8549	31.80						
B/Gumuz	13991	32.20						
Afar	1834		36.83					
SNNP	292224			40.82				
Somali	39397			41.35				
Amhara	334111				42.89			
Oromia	415311				43.35	43.35		
Harari	2079					43.81		
Tigray	92591						44.86	
Addis Ababa	47291						45.61	
Dire Dawa	5118							49.41
Sig.		.923	1.000	.649	.828	.822	.150	1.000

Table 77 below shows the homogenous mean subset groupings in Chemistry by region. Gambella (31.45 %) and Benishangul Gumz (32.15%) achieved the lowest whereas Tigray (47.81%), Dire Dawa (46.39%) and Addis Ababa (44.48%) achieved relatively the highest scores.

Table 77. Homogenous subset groupings by region for Chemistry

Region	N	Subset for alpha = 0.05								
		1	2	3	4	5	6	7	8	9
B/Gumuz	14000	31.45								
Gambella	8667	32.15								
Afar	1834		34.64							
SNNP	290919			37.52						
Somali	39487				39.27					
Amhara	335611					40.97				
Harari	2083					41.49				

Oromia	417399						43.04			
Addis Ababa	47488							44.48		
Dire Dawa	5119								46.39	
Tigray	92602									47.81
Sig.		.248	1.000	1.000	1.000	.695	1.000	1.000	1.000	1.000

In the case of Biology, similar to chemistry, the regions were categorized in to nine homogeneous subset groupings in their students' mean scores (Table78). Thus, based on Biology mean scores, Oromia (54.76%), Tigray (53.56%) and Somali (50.03%) were grouped under highly performing regions whereas the students' academic achievement in Biology for Afar (33.67 %), Gambella (33.70%) and Benishangul Gumz (34.26%) were the lowest.

Table 78. Homogenous subset groupings by region for Biology

Region	N	Subset for alpha = 0.05								
		1	2	3	4	5	6	7	8	9
Afar	1840	33.67								
Gambela	8710	33.70								
B/Gumuz	14191	34.26								
Amhara	337051		37.69							
Harari	2098			38.59						
SNNP	293394				42.63					
Addis Ababa	47816					44.64				
Dire Dawa	5173						48.07			
Somali	38819							50.03		
Tigray	94549								53.56	
Oromia	412318									54.76
Sig.		.525	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

From Table 79 below, there were ten homogenous mean subset groupings by region in the composite score which revealed statistically significant mean differences in overall students' academic achievement score. There was a significant difference in students' composite score ranging from the lowest scorer (31.84 %) of

Gambella to the highest scorer (47.43%) of Dire Dawa. From these composite scores, it is evident that there was no region that attained above the minimum passing score.

Table 79. Homogenous subset groupings by region for Composite/average score

Region	N	Subset for alpha = 0.05									
		1	2	3	4	5	6	7	8	9	10
Gambella	8691	30.84									
B/Gumuz	14226		31.66								
Afar	1836			33.83							
SNNP	293335				39.75						
Amhara	336975				40.27	40.27					
Harari	2096					40.64					
Oromia	418503						41.75				
Somali	39546							42.65			
Tigray	94026								44.70		
Addis Ababa	47793									46.32	
Dire Dawa	5158										47.43
Sig.		1	1	1	0.42	0.86	1	1	1	1	1

As shown in Figure 25 below, when the average scores of girls and boys were compared across regions, the achievements of girls on average score was higher than boys in Somali and Harari. However, in all the other regions, boys performed better than girls. Regarding the achievement of students by school location across regions, the average scores of students from urban schools was higher than rural schools in all regions except where rural students performed better than urban in SNNP.

Concerning, the achievement of students by school types, government and non-government, the average mean score of students from the non-government sample schools was higher than that of government schools in all subjects and regions.

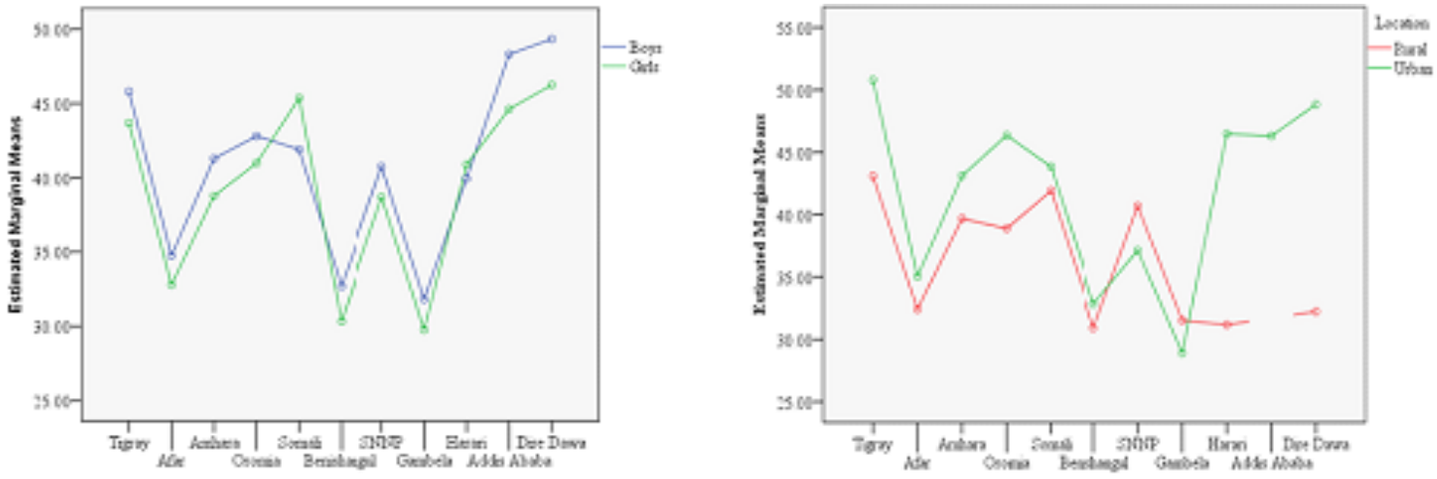
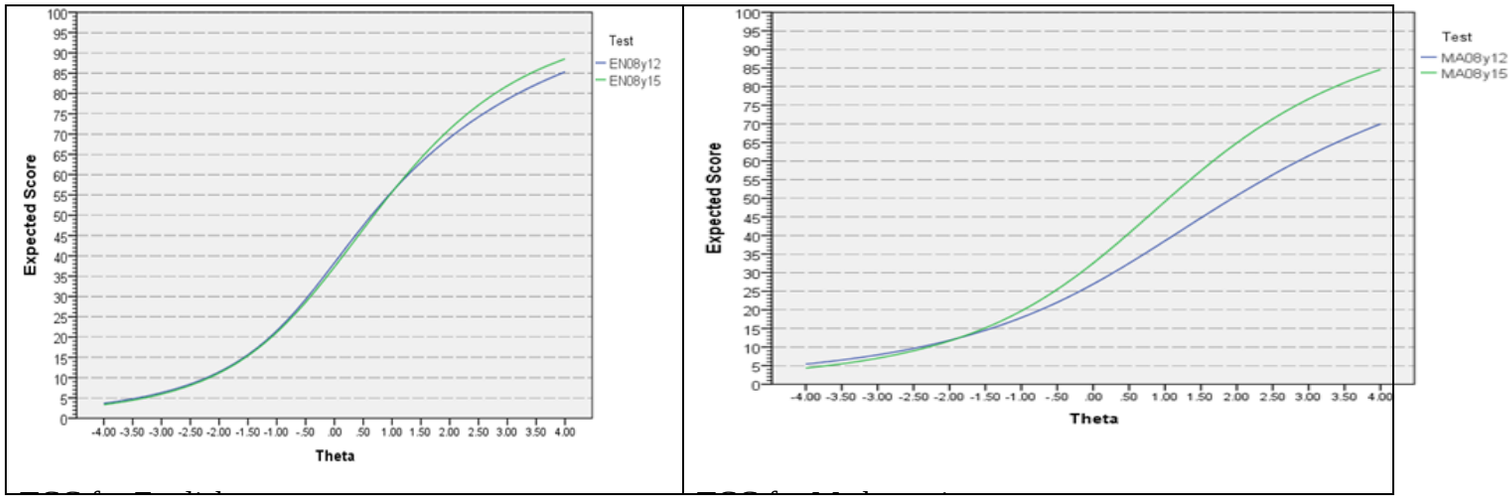
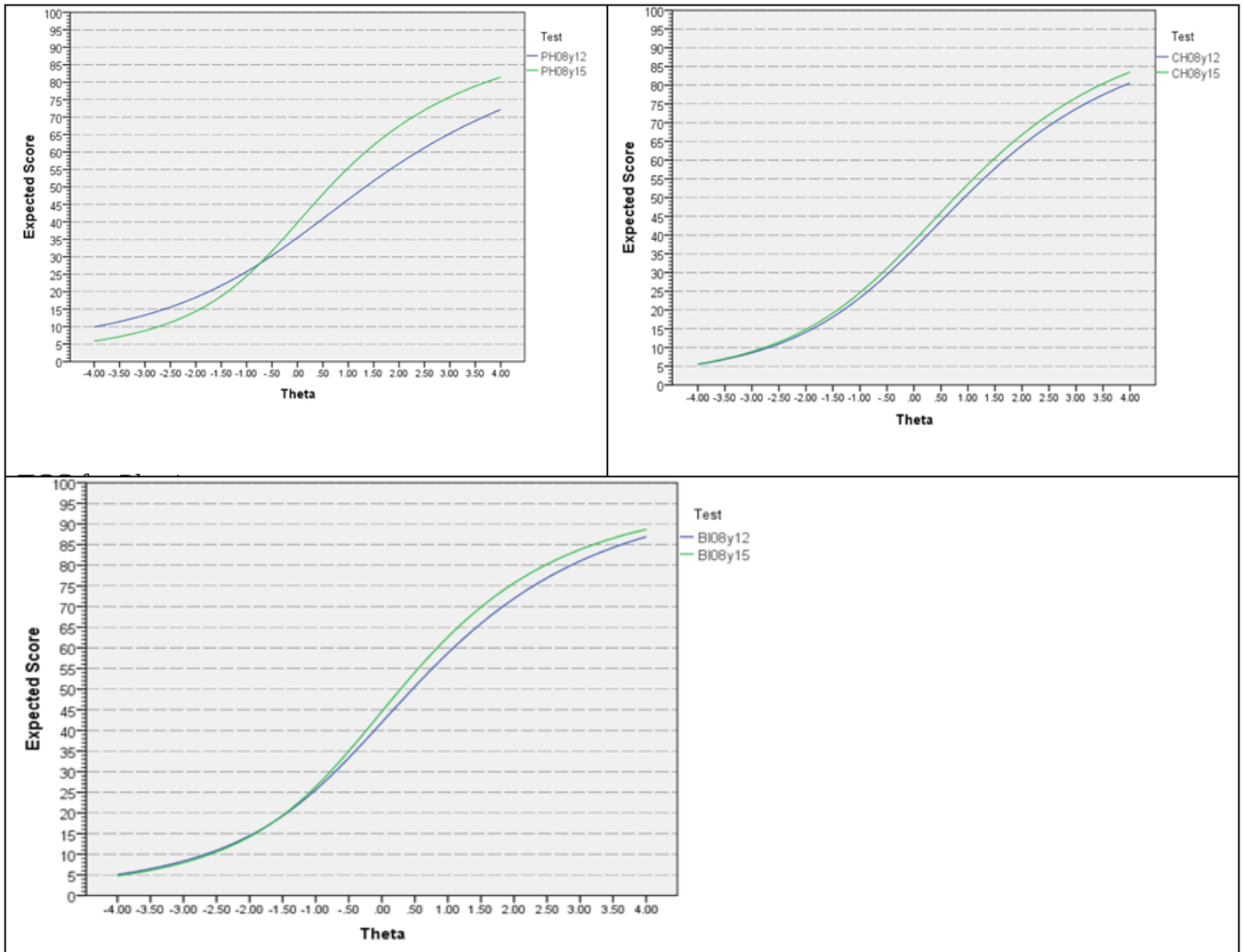


Figure 25: Achievement of regions by gender and school location

4.1.8. Trends in students' achievement across years (2012 and 2015)

Test characteristic curves in figure 26 below show that tests for the five subjects in 2012 were found to be more difficult than that of the year 2015. As the tests are located on the same ability levels and converted to the scaled scores, it is possible to compare students' achievement across time using test equating methods.





TCC for Biology tests across years

Figure 26: Test characteristic curves of grade 8 tests for each subject by year

Figure 27 below presents the comparison of students' achievement in each subject and the mean score in (2012) and (2015) national learning assessment. As a result, except in Biology, which was decreased from 301 to 297.9 in scaled score, the achievements of students in 2015 in all subjects were found to show slight increment as compared to 2012. Looking at the total average scaled score; the average score of students'

achievement in 2015 was higher than that of 2012 by about 5 points.

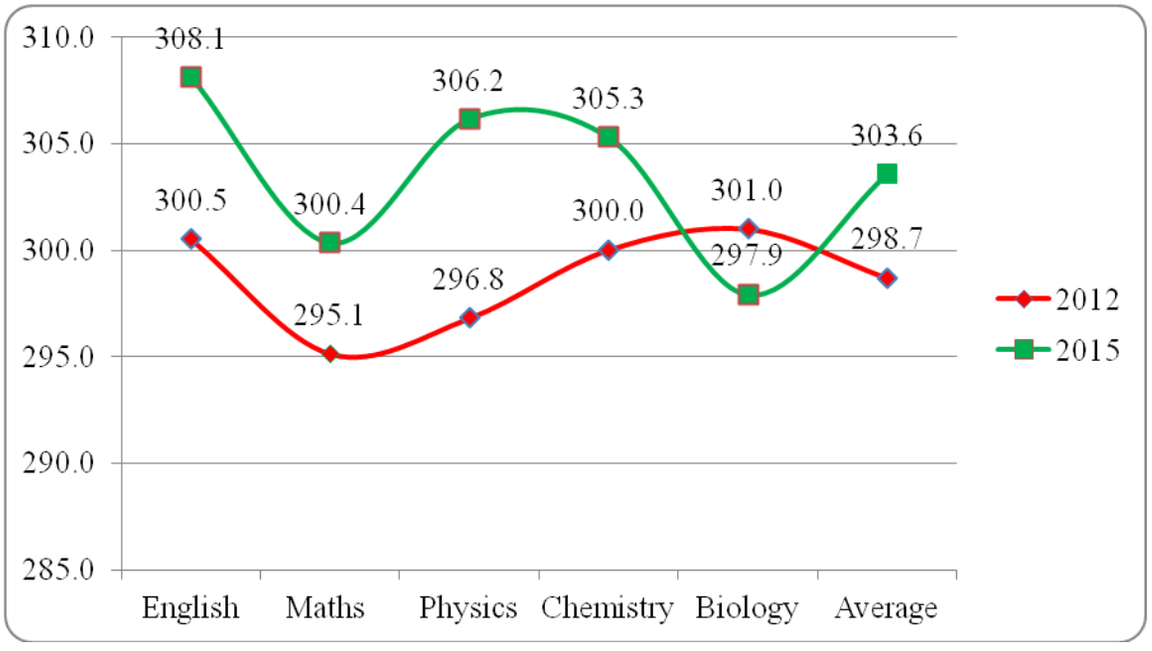


Figure 27: Comparison of achievement score between 2012 and 2015

4.2.9. Attitude of students to some social related issue

Table 90 below shows the opinion of students towards some social relevant issues and their schools. 89% of students responded that by keeping personal and environmental hygiene, it is possible to prevent transmitted diseases, 92% had shown that it is their responsibility to care for their schools and environment, 84% responded that throwing wastes to the road will pollute the environment, 83% said that most teachers tried to solve the problem of students in schools, 79.5% showed their satisfaction with most of their teachers' behavior and 31.9% said that to protect drought afforestation is not important. Thus, although majority of the students showed positive attitudes towards different issues, it needs to do more with regard to students' towards the importance of afforestation.

Table 80. Students' opinion related to some social related issues and their schools

Social related issues		Disagree	Agree	Total
By keeping personal and environmental hygiene, it is possible to protect transmitted diseases	N	124451	1102890	1227341
	%	10.1	89.9	100.0
I have the responsibility to take care of my school and environment	N	88172	1146020	1234192
	%	7.1	92.9	100.0
To protect drought afforestation is not important	N	832220	390510	1222729
	%	68.1	31.9	100.0
Throwing wastes to the road will pollute the environment	N	187085	1041732	1228817
	%	15.2	84.8	100.0
Most of the teachers in our school tries to solve the problem of students	N	207974	1019475	1227449
	%	16.9	83.1	100.0
I am satisfied with most of the teacher's behavior in our school	N	248985	967906	1216891
	%	20.5	79.5	100.0

4.2.10 Factors Affecting Students Achievement

4.2.10.1 Students background variables and academic achievement

This part reports the composite mean score of the achievement tests in relation to the responses students gave to the background questionnaire. The questionnaire for collecting background information from the students comprised 29 items, which focused on their family background, interests, attitude towards their teachers, the extent to which they used various school facilities, time spent on listening radio or watching television programs, the number of meals they got per day etc.

Correlation of students' personal information, family back ground and home variables with achievement

As observed in Table 80, the relation between gender (boys and girls) (r = - 0 .065) and age of students (r= -0.020) had a significant negative relationship with students' achievement. Absenteeism (-0.117) was also found to be negatively correlated with the achievement score**.**

Similarly, frequency of watching TV (r = - 0.084) and frequency of listening to radio (r= - 0.067) were negatively correlated with students' academic achievement. Listening to radio or watching TV every day for recreation purpose may have negative influence on achievement.

The point is students' needs to give adequate time for their academic performance. This can be one explanation why frequent radio listeners or TV watching earned less academic results in Ethiopia.

Table 81: Correlation of students' personal information with achievement score

	N	Pearson Correlation	Sig.
Gender (Coded: boys =1, girls =2)	1249065	-.065**	0.000
Age of a student	1213231	-.020**	0.000
Frequency of listening radio per week	1218776	-.067**	0.000
Frequency of watching Television per week	1185730	-.047**	0.000
Frequency of students' absenteeism	1250156	-.117**	0.000

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

Table 81 shows that the students whose home and school language was the same had a statistically significant and positive correlation(r = 0.057) with academic achievement. Similarly, students who had the opportunity of getting meal three times in a day scored higher than that those getting once or twice a day. However, the correlation was weak (r = 0 .015). Family properties (SES) were a key factor that was expected to have an influence on achievement. In this regards, students SES had a statistically significant and positive correlation (r =0.160). Family education levels, family support in studying at home, frequently supporting family and access to electricity light at home had also statistically significant and positive correlations with students' achievement.

In contrast, students who were living with others rather than mother and father or either showed a lower academic achievement. Likewise, students with a large number of family members had a lower academic achievement. In addition, frequency of family support during studying had a negative correlation with students' achievement which could be attributed to the fact that low performing students were in need of more family support compared with high performing students.

Table 82. Correlation between students' family and home variables with their achievement in mean score

	N	**Pearson Correlation**	**Sig.**
Living with others rather than mother and father or either	1241090	-.042**	.000
Similarity of home language with instructional language	1237571	.057**	.000
Large family members that are students	1240483	-.009**	.000
Family education levels	1228607	.033**	.000
Family properties (SES)	1241858	.160**	.000

Family support in studying at home	1230744	.019**	.000
Frequency of having a meal per day	1231562	.015**	.000
Having access to electricity light at home	1180791	.005**	.000
How many times someone helps you in studying?	430415	-.102**	.000
Frequently of supporting family	1194409	.013**	.000

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

Availability of textbooks for students in the tested subjects were positively correlated with students' academic achievement, although the correlations were weak (ranges between r = 0.008 to r =0. .056). Students having a textbook for his/her own scored higher than those sharing or did not have at all any of the five subjects. Similarly, students who said they easily understand their subjects performed better than those who did not. The highest correlation was observed in biology (r = 0 .083). The correlations were weak, although there was a statistically significant value in all subjects (Table 82 below).

Table 83. Correlation between texts books availability and students' perception towards understanding the subject with academic achievement

	N	Pearson Correlation	Sig.
Availability of English text book	1213249	.052**	.000
Availability of Mathematics text book	1217129	.008**	.000
Availability of Physics text book	1209656	.056**	.000
Availability of Chemistry text book	1213331	.019**	.000
Availability of Biology text book	1211538	.018**	.000
Perception to understand English subject	1207496	.008**	.000
Perception to understand Mathematics subject	1194733	.006**	.000
Perception to understand Physics subject	1171431	.026**	.000
Perception to understand Chemistry subject	1171045	.010**	.000
Perception to understand Biology subject	1180357	.083**	.000

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

As depicted in Table 83 below, the time taken to reach school and come back to home was hypothesized to have an association with the students' achievement. Thus, its correlation with students' achievement was weak (r = -0 .096) but statistically significant. This means, students traveling long distance achieved lower than those traveling short distance from their schools.

A positive correlation also exists between teachers' support and students' achievement. Students who get material and moral support from their teachers had better achievement than those who didn't get support. Similarly, these who said "I am satisfied with most of the teacher's behavior in our school" had higher scores.

Table 84. Correlation between some schools related variables and students' academic achievement

School related variables	**N**	**Pearson Correlation**	**Sig.**
Time taken to reach to school/come back to home	1250156	-.096**	.000
Frequency of taking class attendance	1250156	-.045**	.000
Most of the teachers in our school tries to solve the problem of students	1250156	.046**	.000
I am satisfied with most of the teacher's behavior in our school	1250156	.048**	.000

**. Correlation is significant at the $p < 0.01$ level (2-tailed).

Multiple regression analysis based on students' personal information variables resulted in a model which was able to explain 2.8% of the variation in the composite scores (Table 85).

Table 85. Regression summary model students' personal information

	Sum of Squares	df	Mean Square	F	R	R^2	Adj. R^2	Sig.
Regression	6241386.78	6	1040231.13	5555.20	.168	.028	.028	.000
Residual	215679783.03	1151807	187.25					
Total	221921169.82	1151813						

As indicated in table 86 below, mainly students gender, high frequency of their absence from school and reading relevant additional books had their own impact on students' achievement.

Table 86. Coefficients of some students' characteristic that affect their achievement

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Err	Beta		
(Constant)	52.987	.079		674.02	.000
Gender (Coded: boys =1, girls =2)	-1.623	.026	-.058	-63.52	.000
Age of a student	-.716	.010	-.064	-69.98	.000
Reading additional books rather than text books	-1.231	.025	-.045	-48.42	.000
Frequency of listening radio per week	-.605	.009	-.062	-66.08	.000
Frequency of watching Television per week	-.328	.008	-.039	-41.80	.000
Frequency of students' absenteeism	-1.296	.011	-.110	-119.54	.000

As shown in Table 87 below, about 3% of the total variance in student test scores was accounted for by family and home variables. In this case, particularly, the similarity of home language with instructional language, living with others rather than mother and father and family socio economic status had their own influence on students achievement (see table 88 below).

Table 87. Regression summary model Family and home variables

	Sum of Squares	df	Mean Square	F	R	R^2	Adj. R^2	Sig.
Regression	6532945.20	8	816618.15	4298.81	.174	.030	.030	.000
Residual	208651109.92	1098373	189.96					
Total	215184055.12	1098381						

Table 88. The Coefficients of some family and home variables affecting students' performance

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Err	Beta		
(Constant)	32.883	.103		317.911	.000
Living with others rather than mother and father or either	-.418	.013	-.030	-31.308	.000
Similarity of home language with instructional language	1.309	.027	.046	49.086	.000
Large family members that are students	-.158	.010	-.015	-15.296	.000
Family education levels	.202	.013	.016	15.913	.000
Family properties (SES)	.635	.004	.165	170.283	.000
Family support in studying at home	.067	.027	.002	2.467	.014
Frequency of having a meal per day	.323	.019	.015	17.163	.000
Having access to electricity light at home	.581	.028	.021	-20.981	.000

As presented in Table 89 below, about only 1% of the total variance in student test scores was accounted for by text books availability and perceptions to the subjects they learn and time taken by the students from their home to school and vice versa. In this case, while text books availability and perceptions to the subjects had some positive impacts, the longtime taken to travel by the students had negative impact on their achievement (Table 90 below).

Table 89. Regression summary model of text books availability, perceptions to subjects and time taken from school

	Sum of Squares	df	Mean Square	F	R	R^2	Adj. R^2	Sig.
Regression	2317924.62	3	772641.54	4030.14	.099	.010	.010	.000
Residual	234394607.61	1222616	191.72					
Total	236712532.24	1222619						

Table 90. Coefficients for availability of textbooks, perceptions towards subject and time taken from school to home

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	40.291	.093		434.119	.000
Availability of Textbooks	.139	.009	.015	16.041	.000
Perceptions towards subject matter	.118	.004	.030	33.334	.000
Time taken from school to home	-.841	.008	-.093	-103.459	.000

4.2.10.2. Teachers Questionnaires Analysis

Teachers of sampled schools responded to a questionnaire related to themselves, school and their students. Observation of figure 28 below shows that 78.7% of the teachers were males. Concerning the age of respondents, 69.7% of them were between 21-30 years, 23.2% between 31-45years and 6.2% above 45 years and the remaining 9% were below 20 years.

In terms of qualification s, the majority (70.9%) had diploma, 26.3% had a first degree, and 2.2% were TTI certificate and remain 0.6% had second degree. Regarding the teaching experience, 31.2% taught for the subject less than 5 years, 39.7% taught the subject between 6 to 10 years, 14.2% of them taught the subject between11 to 15 years and the rest 14.8% taught above16 years.

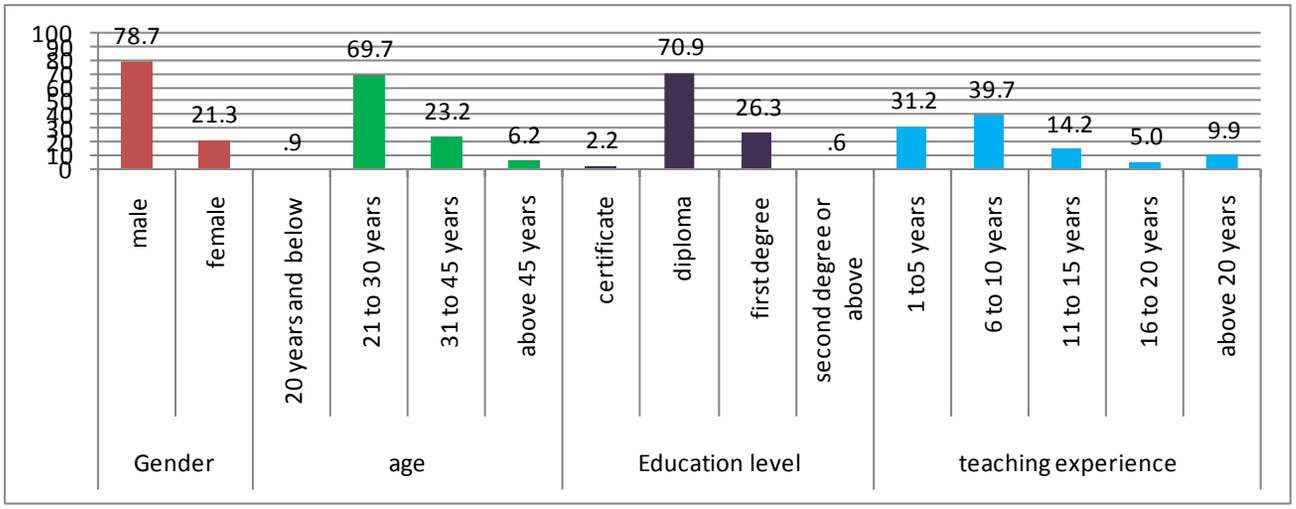


Figure 28: Teachers Characteristics

As shown in figure 29 below, the source of finances for their current education levels were 56.1% from government; 41.7% of teachers were self-sponsors and the remaining 2.3% from other source while they were pre-training and in-services program.

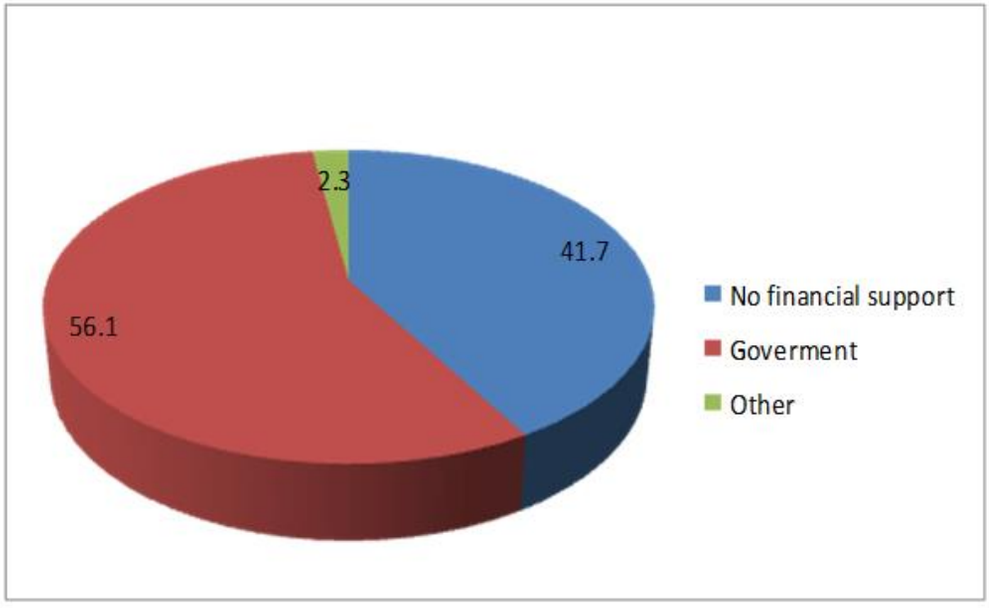


Figure 29: The source of finance for their Education

As it presented in Figure 30 below, the percentages of sample schools who had less than 50 students in class were 50.3%, those who had 51 to 70 were 37.2% and the remaining 12.5% schools belonged to greater than 70 students in a class.

Furthermore, items related to support, teacher load and communication with parents showed that 9.4% of the teachers were never supervised and the remaining ones were supervised from one to three times, 35.2% of the teachers met more than three time students parents during the second semester of 2015 academic year, while from 13.9 % to 28.8 % met the parents one to three times. Regarding to teachers load, the teachers' teaching workload from the sampled schools ranges from 16 to 20 periods per week (37.7%) of them; and 26 to 30 periods a week for 20 % of them. About 27% of the teachers had workloads ranging between 21 to 25 periods; and the rest 4.7%% reported to teach more than 30 periods a week. On the other hand, only 15% of the teachers said that they had fewer than 15 periods in a week time.

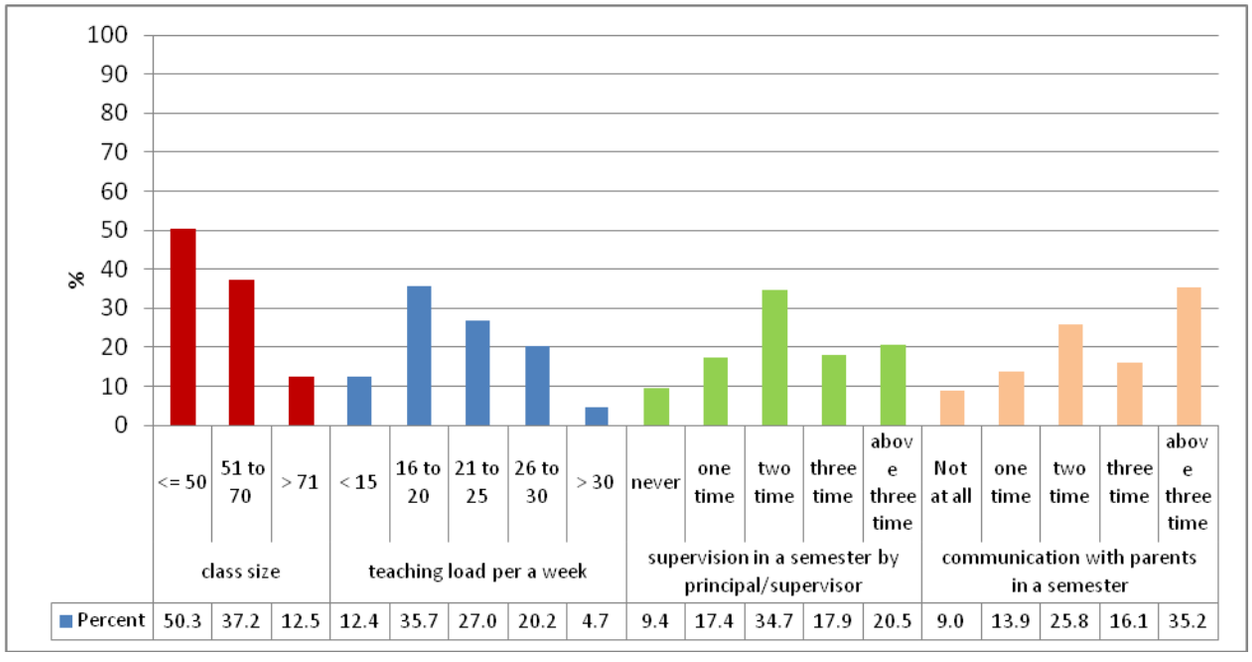


Figure 30: Teaching Environment

As depicted in Figure 31 below, teachers attended different training programs for the last two years related to teaching methods (55.6%), continuous assessment (45.6%), classroom management (38.5%), action research (29.9%) and special need education (16.8%).

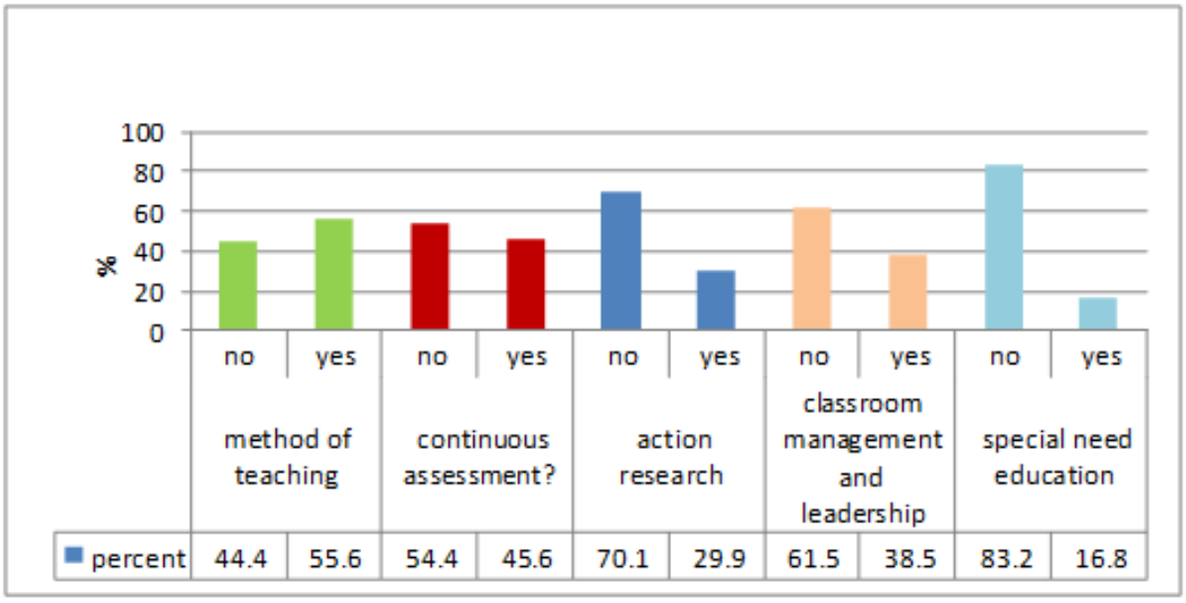


Figure 31: Exposure to on Job Training

When teachers asked to identify their perception of a difficult task in relation to teaching learning process, about 35.3% of them rated the preparation of lesson plans as the most difficult one. About equivalent proportions of teachers (33.1% of them) reported presentation of lessons, managing students in a class (47.3%), assessing student work and preparation of exams or learning (34.3%) as most difficult tasks in relation to teaching learning (Figure 32).

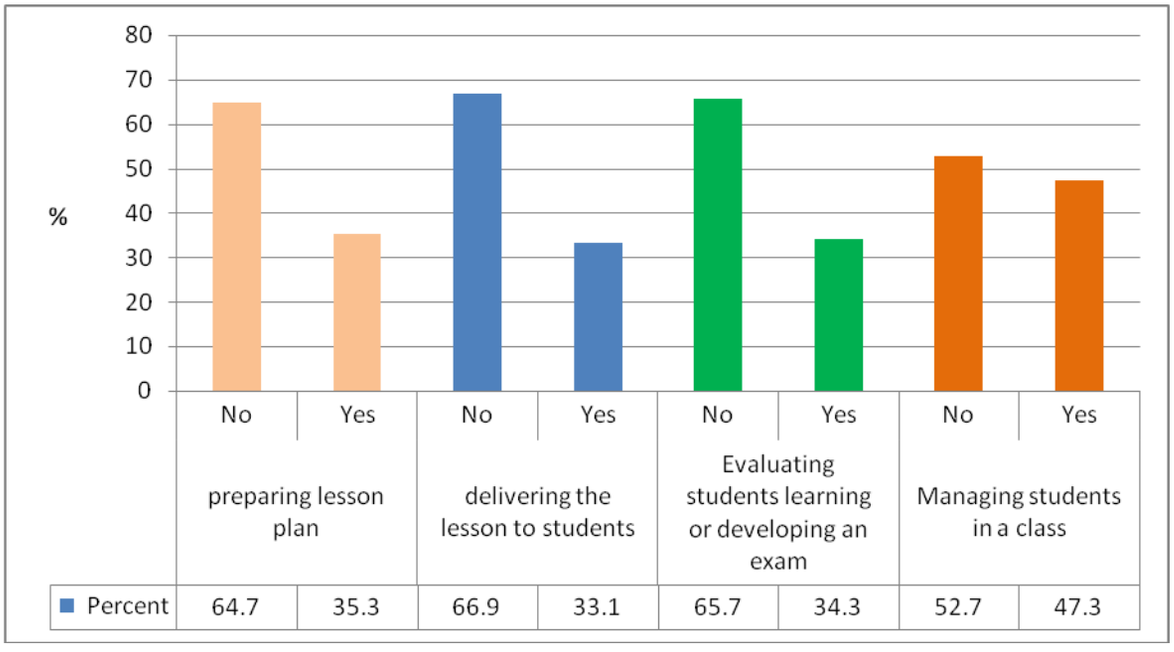


Figure 32: Opinion of Teachers towards Classroom Tasks

Regarding to the type of program in which teachers were attended to be qualified, 55.8% of teachers had got their qualification through in-service training program and the remaining 42.2% by pre-service program (Figure 33).

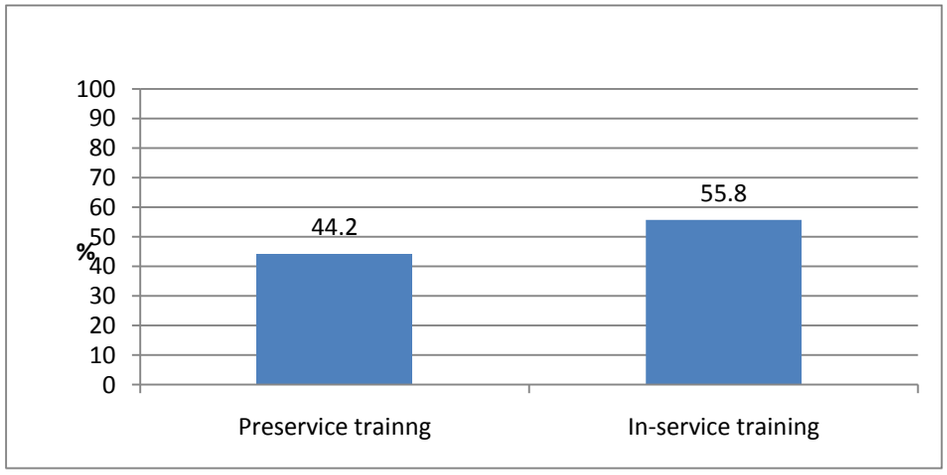
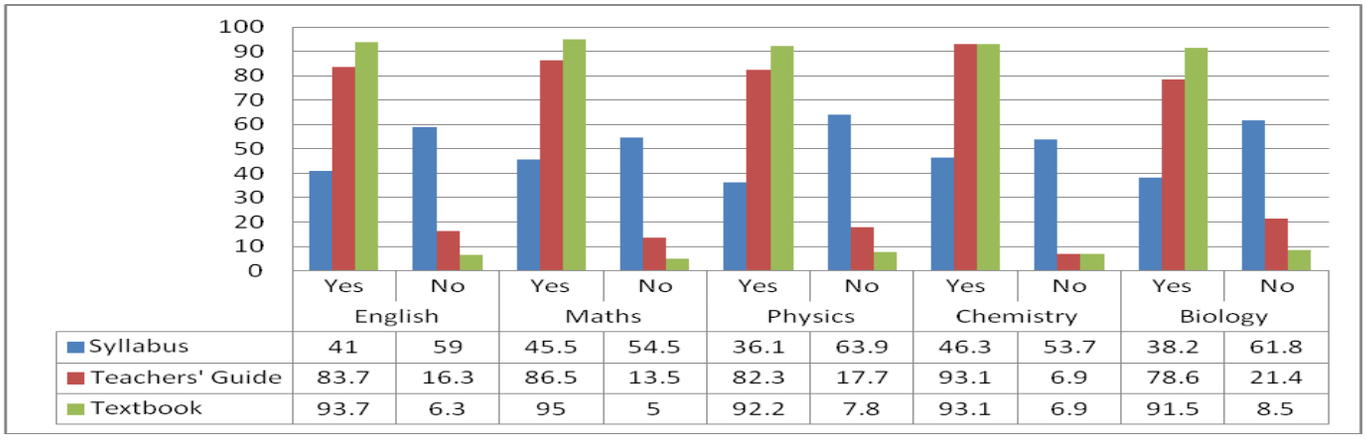


Figure 33: Type of Training

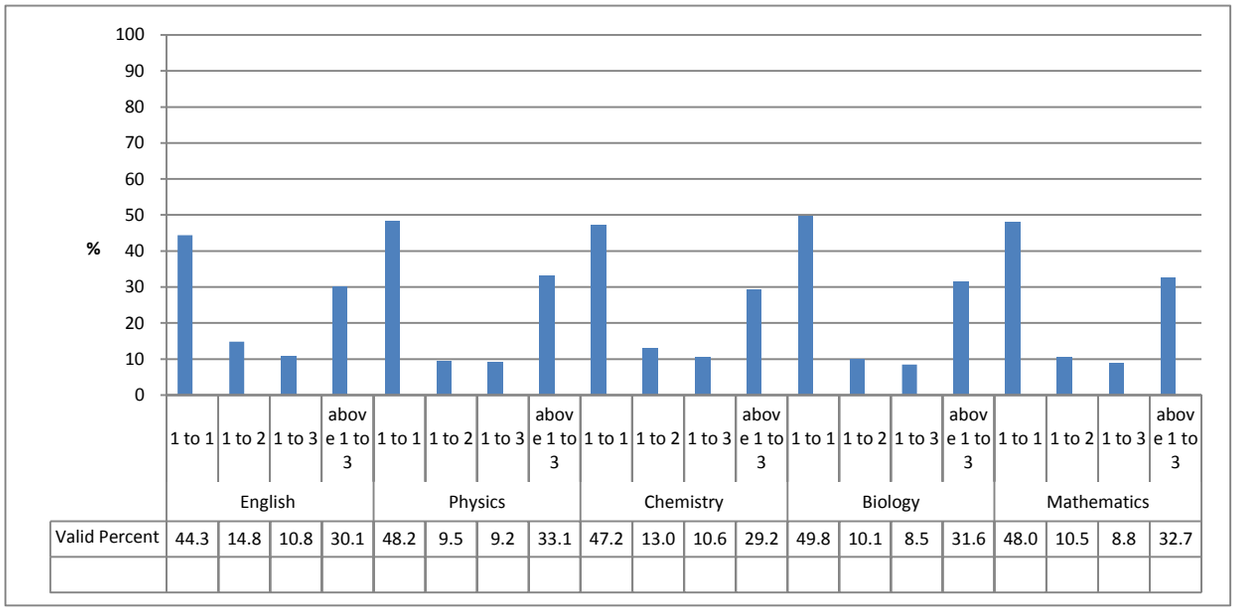
As indicated in Figure 34 below, teachers who had syllabus were in the range of 36.1% (Physics) to 46.31 % (Chemistry). Similarly, teachers who had teachers' guides were in the range of 78.6% (Biology) to 93.1 % (Chemistry). However, it seems to be significant figures that lack teaching resources such as syllabi and teachers' guides (13.5% in Mathematics, 16.3% in English and 21.4% in Biology). Regarding availability of students textbook in schools, 91.5 % (Biology) to 95 % (Mathematics) of teachers reported that they have got student textbooks from their schools, while 6.3% of English, 6.9% of Chemistry and 7.8% of Physics' teachers' confirmed that they didn't get students textbooks.



	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
	English		Maths		Physics		Chemistry		Biology	
Syllabus	41	59	45.5	54.5	36.1	63.9	46.3	53.7	38.2	61.8
Teachers' Guide	83.7	16.3	86.5	13.5	82.3	17.7	93.1	6.9	78.6	21.4
Textbook	93.7	6.3	95	5	92.2	7.8	93.1	6.9	91.5	8.5

Figure 34: Availability curriculum materials at schools

Figure 35 below also presents students' to textbooks ratio as reported by the teachers. As a result, from a minimum of 47.2% of teachers in Chemistry to a maximum of 49.8% of teachers in Biology were reported that students had textbooks for their own without sharing. On the other hand, on average 29.2% to 33% of teachers reported that students shared textbooks in the key subjects for more three.



	English				Physics				Chemistry				Biology				Mathematics			
Valid Percent	44.3	14.8	10.8	30.1	48.2	9.5	9.2	33.1	47.2	13.0	10.6	29.2	49.8	10.1	8.5	31.6	48.0	10.5	8.8	32.7

Figure 35: Student Textbook to Students' Ratio

With regard to portion coverage, about 42%, 48.6%, 49.1%, 50.0 % of teachers reported that they had covered above 90 % of the portions in English, Physics, Chemistry and Biology respectively. On the other hand, about 10.4 % (English), 5.4% (Mathematics), 4.7% (Physics), 6% (Chemistry) and 4.6% (Biology) responded that the portion covered in their respective subject was below 70 % (Figure 36 below).

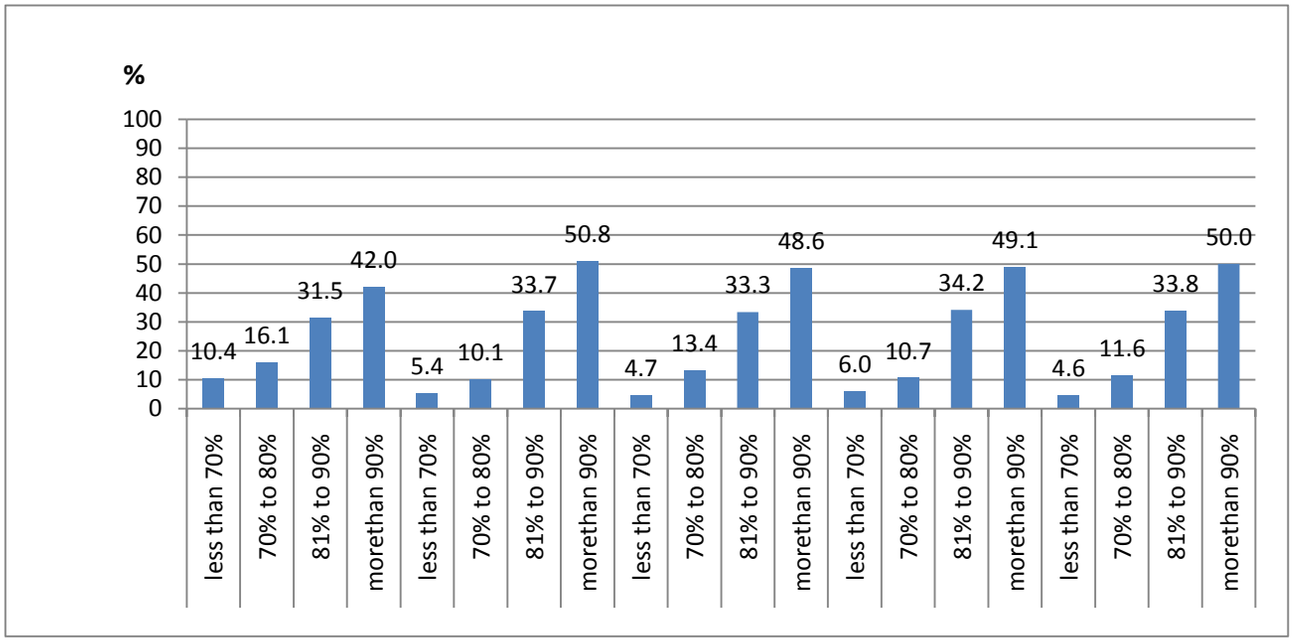


Figure 36: Portion coverage

As it is shown in Figure 37 below, students' level of understanding of the textbooks for each subject were categorized at different levels. In this regard, 22.2% (Biology) to 29.6% (English) teachers reported that students could understand less than half of the part of the textbooks. Likewise, from the range of 9.3% (Biology) to 19.8% (English) teachers respectively, indicated that students could be able to understand only few contents of their text books for each subject.

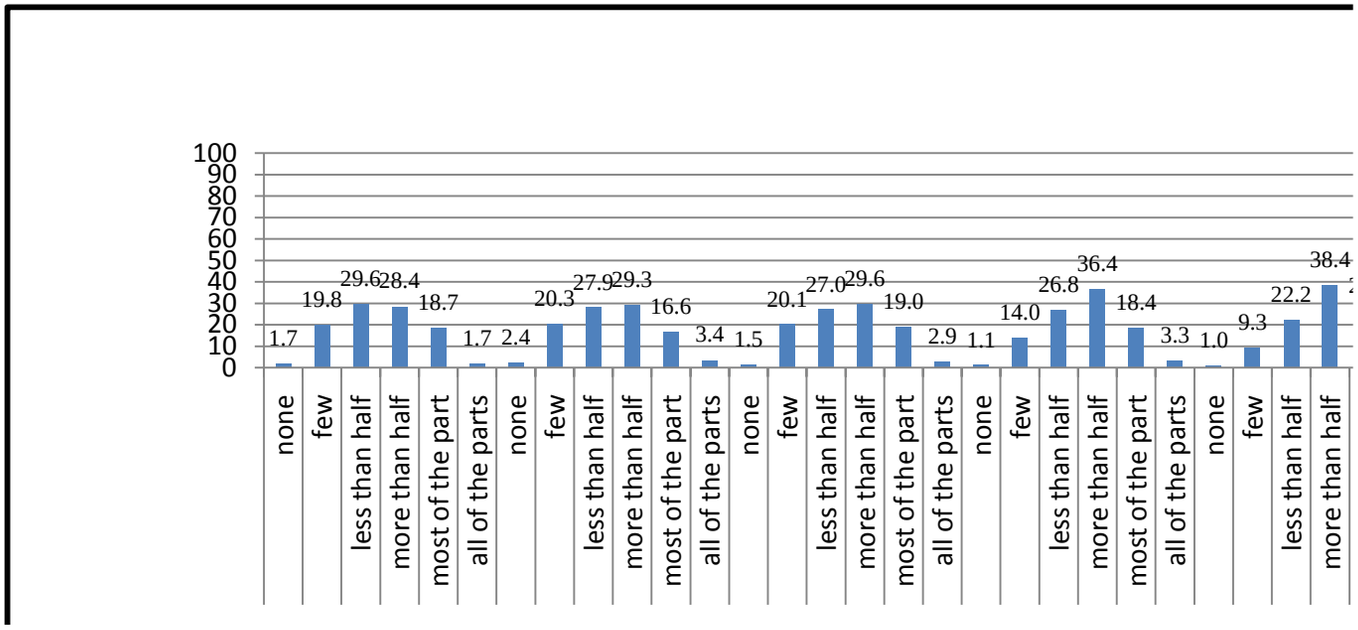


Figure 37. Students Level of Understanding Textbook

Correlation of Teachers Response with Students achievement

Table 91 below shown that, teachers' personal variables had significant relations with academic achievement. In this case, all the teachers' profiles were positively related with the students' achievement. The coefficients of correlation for each teacher's characteristics were: gender (r=0.042), age (r=0.079), teaching experience (r=0.053) and teachers' qualification (r=0.087).

Table 91. Teachers Personal Information with Students Achievement

Factors	N	Pearson Correlation	Sig.
Gender of teachers(Females')	12365	.042**	.000
Age of teachers	12323	.079**	.000
Teaching experience	11328	.053**	.000
Level of qualification in education	12326	.087**	.000

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

Table 92 below presents the correlation of some curriculum materials (syllabus, teachers' guide, textbook) of each subject that were significantly related with the students' performance. In this regard, the availability of Biology (r = 0.126), Mathematics (r = 0.04), English (r = 0.042), Chemistry (r = 0.086) and Physics (r = 0.091) materials for the teachers were positively related to students achievement.

Table 92. Correlation of curriculum materials with students' achievement

Factors	N	Pearson	Sig.
Availability of biology curriculum materials	9897	.126**	.000
Availability of mathematics curriculum materials	9860	.040**	.000
Availability of English curriculum materials	11743	.042**	.000
Availability of chemistry Curriculum materials	9496	.086**	.000
Availability of physics curriculum materials	8593	.091**	.000

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

As indicated in Table 93, the access of teachers' to short term trainings for the last two years on curriculum, method of teaching, continuous assessment, action research, class room management and leadership, special need education issues had positive correlation with students' achievement.

Table 93. Correlation of teachers In-service training program with Students Achievement

	N	Pearson Correlation	Sig.
Did you receive training for the last two years on curriculum?	11056	.162**	.000
Did you receive training for the last two years on method of teaching?	11843	.149**	.000
Did you receive training for the last two years on continuous assessment?	11586	.141**	0.001
Did you receive training for the two years on action research?	11319	.077**	.000
Did you receive training for the last two years on classroom management and leadership?	11403	.181**	.000
Did you receive training for the last two years on special need education?	11364	.192**	.000

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

Table 94 below shown that the number of times teacher supervised by principal or supervisor was found to have significant positive correlation with students' academic performance where r = 0.07.

Moreover, the more frequent teachers discuss with parents, the better the students test performance with the positive coefficient of correlation r = 0.074. However, teachers load per week (r= -0.116) has a negative correlation with students performance.

Table 94. Teachers communication with parents and supervised by principal/supervisor response

	N	Correlation	Sig.(2-tailed)
How many times did you communicate with parents of students in this semester?	**12170**	.070**	.000
How many times did you supervised by principal or a	**7979**	0.074*	.000

supervisor in this semester?			
Teachers load per week	12207	-.116**	.000

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

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

As indicated in Table 95, teachers were asked to rank some school factors based on their degree of impact on student achievement; accordingly the top five that were identified by the teachers were:1st - less family support for the students during studying at home, 2nd – Students spending more time on home chores or playing rather than on homework, 3rd- low nutrition, hygiene and care students receive at home, 4th - unavailability of learning materials (science equipment, tools, etc.) and 5th - Students not having personal learning material (pen, pencil, exercise book etc.).

Table 95. Factors affecting students' achievement as per teachers' Opinions

Factors	**N**	**Min.**	**Max.**	**Mean**	**Rank**
Students to receive less help from parents during studying	11503	1	10	2.54	1st
Students to spend time on chores or playing rather than on homework	11387	1	10	3.93	2nd
Low nutrition, hygiene and care children to receive at home	11543	1	10	5.30	3rd
Unavailability of learning materials (science equipment, tools, etc.)	11309	1	10	5.61	4th
Students not having personal learning material (pen, pencil, exercise book etc.)	11349	1	10	5.63	5th
Lack of teaching books and other useful materials	11348	1	10	5.73	6th
Unavailability of reading materials (novels, reference books, etc.)	11388	1	10	6.10	7th
Unavailability of quality and safe school ground (playground, fences and sports equipment	11428	1	10	6.16	8th
Unavailability of quality and safe school building (repairs to walls, windows, etc.)	11401	1	10	6.42	9th
Unavailability of teaching aids (chalk board, chalk, globe, map etc.)	11348	1	10	7.22	10th

Regression Analysis of Teachers Questionnaire

Regression model below was able to explain 41.8% of variance observed in students' achievement which was accounted for by teacher attitudes, portion coverage, teachers' trainings, teacher-parent communication, understanding of subject matter, managing students in a class and teacher back grounds information and teachers supervision (Table 96 below).

Table 96: Model Summary of Teachers' Achievement

Model	R	R Square	Adjusted R Square	Std. Error
1	.653[a]	0.427	0.418	10.92878

As shown in the table 97 below, the unstandardized coefficient of teachers' ability to manage the classroom and regular teachers' parent communication had high positive impact on students' achievement scores than the others.

Table 97: Coefficient of Teachers variables

Model		Un standardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.297	3.205		3.213	0.001
	Teacher backgrounds	0.33	0.12	0.134	2.753	0.006
	How many times did your supervised by principal or a supervisor in this semester?	2.391	0.679	0.216	3.524	0.000
	Teachers-parent communication	8.791	1.25	0.353	7.032	0.000
	Managing students in a class	15.092	1.444	0.446	10.451	0.000
	portion coverage	1.076	0.135	0.328	7.995	0.000
	understanding of subject matters	0.346	0.137	0.127	2.522	0.012
	teacher trainings	-1.282	0.292	-0.169	-4.394	0.000
	teacher attitude	-0.649	0.196	-0.182	-3.302	0.001

4.2.10.3 Principal Questionnaire Analysis

Principals of sampled schools responded to a questionnaire related to themselves, their schools, teachers and students. As it could be observed from figure 38 below, 6.8% and 93.2% were females and males respectively. With regard to position of the respondents, 78.7% and 15.3% assigned as principals and vice principals respectively, and the remaining act as representative (3.4%) and 2.6% others. Concerning the experiences of respondents as principals, 42.9%, 33.9%, 12.4% and 10.8% had 1to 5, 6 to 10, 11 to 15 and above 16 years of experience respectively. Similarly, regarding the age of respondents, the majority of them were 21 to 40 years (45.4%) and 31 to 40 (33.8%), the remaining were 41 to 50 (15.7%) and above 50 years (4.4%).

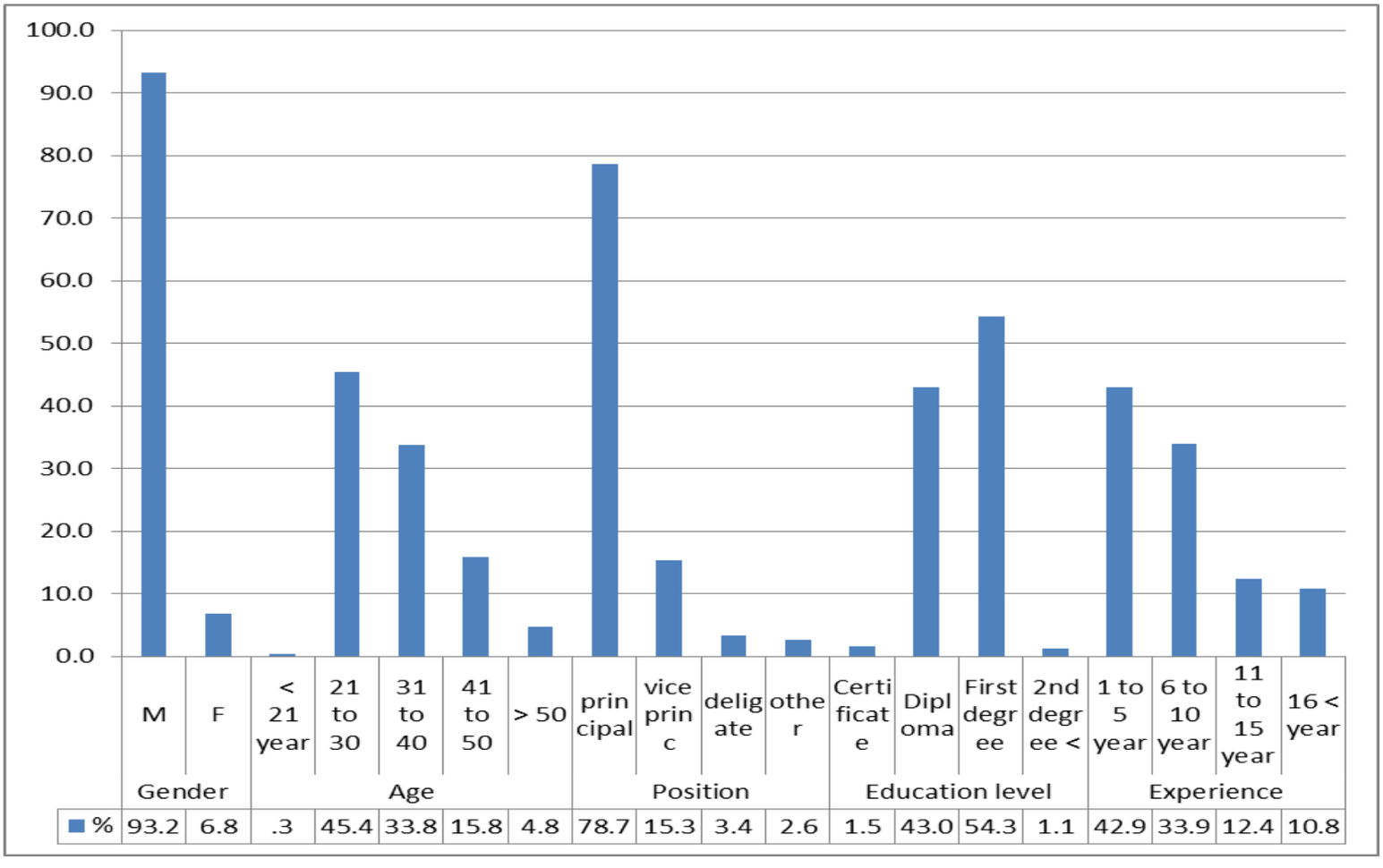


Figure 38: Characteristics of Principals

There were positive relationships between characteristics of principals and the composite score. The correlations were found to be statistically significant in some cases at $p < .01$ (Table 98), among those, the gender of principals ($r = 0.069$), the age of principals($r = 0.089$), the position of respondents($r = 0.033$), the

education level of respondent (r= 0.148), and principals characteristics (r= 0.112) had positive correlations with students' achievements.

Table 98 : Correlation of Principals' Characteristics with Students' Achievement

	N	Pearson Correlation	Sig. (2-tailed)
Gender of principal	12241	.069**	.000
Age of principal	12321	.089**	.000
Position of the principal	12078	.033**	.000
Education level of the respondent	12130	.148**	.000

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

Table 99 below shows that large numbers of teachers' professional variables had statistically significant relations with academic achievement according to the response of the principals.

Among these, motivating students for learning (r= 0.182), supporting students for learning (r= 0.164), frequent use of schools library (r= 0.150), applying student centered teaching strategy (r= 0.131), preparation of teachers to teach their subject matter (r= 0.123), frequent use of pedagogical center (r= 0.114), usage of different teaching aids while teaching the subject (r= 0.110) , proper use of class time (r= 0.107) and usage of different assessment techniques (r= 0.100) had a positive correlations with students' academic achievement with statistically significant values at $p<0.001$.

Table 99: Correlation of Principals Opinion towards Different Teachers Professional tasks with students' achievement

	N	Pearson Correlation	Sig.
Preparation of teachers to teach their subject	12094	.123**	.000
Applying student center teaching strategy	12081	.131**	.000
Usage of different teaching aids while teaching the subject	12161	.110**	.000
Usage of different assessment techniques in their subject	12165	.100**	.000
Proper use of class time	12201	.107**	.000
Motivating students for learning	12127	.182**	.000
Supporting students for learning	12161	.164**	.000

Frequent use of pedagogical center of the school	12097	.114**	.000
Frequent use of schools library	12018	.150**	.000

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

As indicated in Table 100 below, location of school(r= 0.102**), mode of schooling /shift (r=.079**), Opinion principals to the absence of school problem(r=.247**) and good opinion of principals to the teacher ethics(r=.204**) had positive correlation with students' academic achievement in which the correlations were statistically significant

Table 100: Location of School, Mode of Schooling, Opinion to School Problem and Teacher Ethics

Factors	N	Pearson correlation	Sig.
How much percent of the school grant used?	12721	.023**	.010
Opinion to the absence of school problems	10913	.247**	.000
Location of the school	12011	.102**	.000
Mode of schooling	12162	.079**	.000
Good opinions to teacher ethics	12020	.204**	.000

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

Regarding to the availability of curriculum materials on average about half of the school principals indicated that teachers had no any syllabus for each subject. However, on average about 62% and more than 80% of the principals reported that sample school teachers had teachers guide and textbooks for each subject respectively (Figure 39 below).

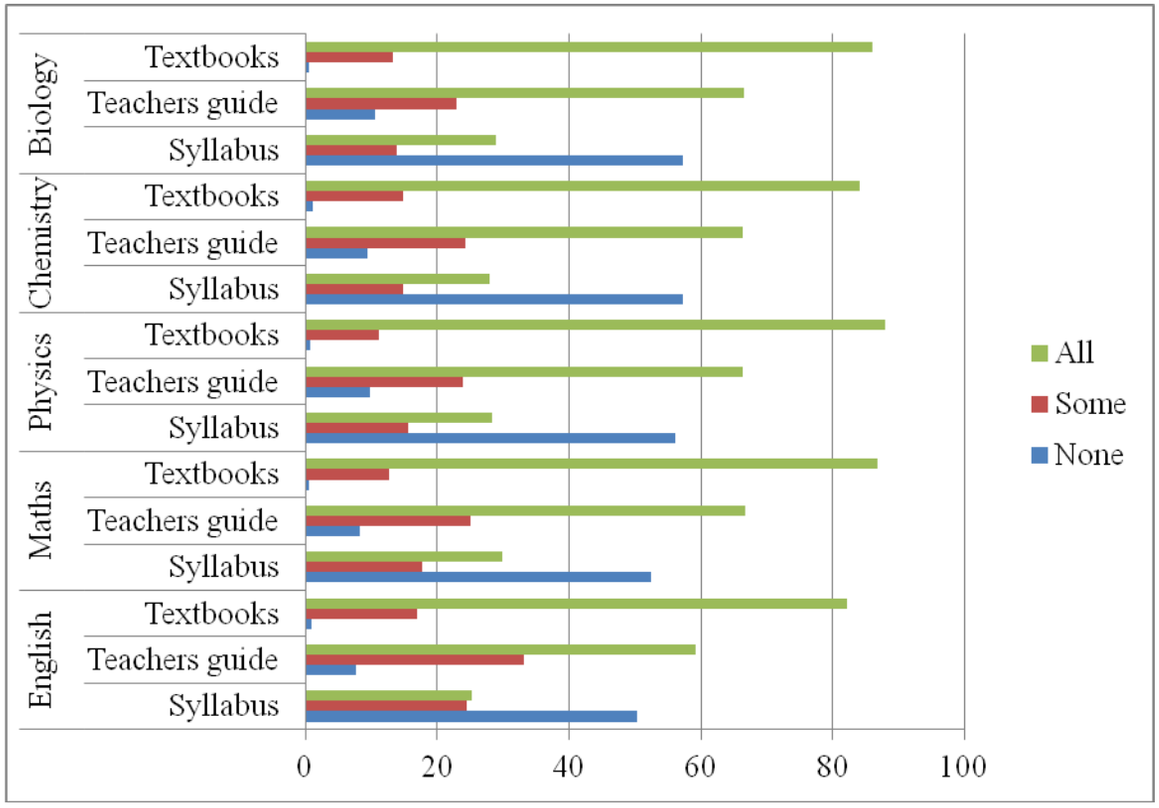


Figure 39: Availability of syllabus, teachers' guide and textbooks

The income of schools had different source i.e. government (31.8%), parents fee (24.5%), selling school products (12.3%), rent farming land /equipment (8.8%), school lounge (8.8%) and donation (13.8%) as presented in Table 101 below.

Table 101: Source of school Income

Sources of School Income	Principals Response		Percent of Cases
	N	Percent	
Government	7111809	31.8%	81.2%
From students' parents or parents	5462856	24.5%	62.4%
Selling products of schools	2741109	12.3%	31.3%
Renting a farming land	1958618	8.8%	22.4%
Income from school lounge	1968062	8.8%	22.5%
Income from donation	3076102	13.8%	35.1%
Other sources	24320	.1%	.3%
Total	22342876	100.0%	255.1%

Figure 40 below presents whether the schools were ever received a grant under the school grant program or not. Thus, the responses of the school principals showed that, majority (92.1%) of schools were received the school grant and 7.7% said they did not receive any school grant. The rest 0.2% responded as they do not know about the school grant.

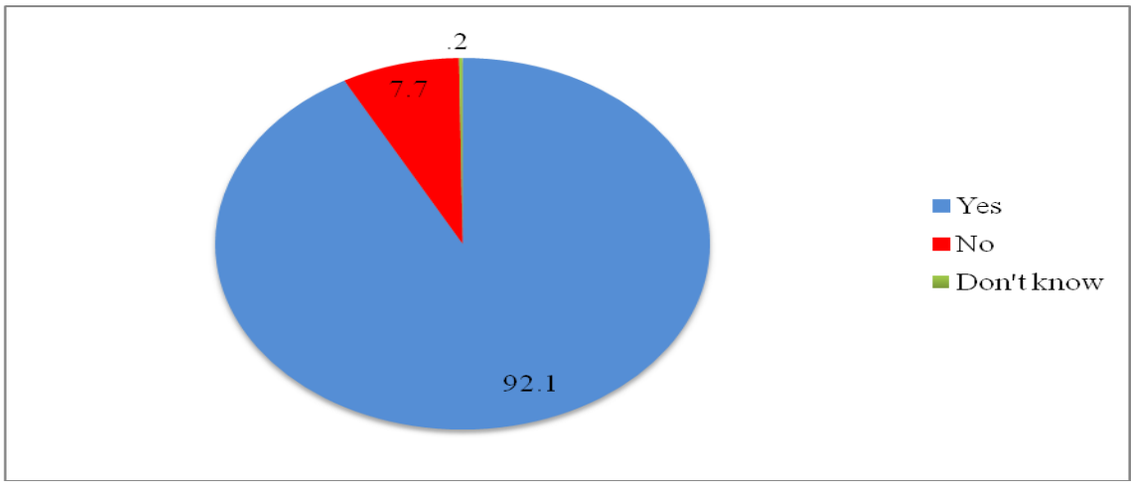


Figure 40 : Percentage of schools received school grant

Regarding to efficiency of schools in using school grant as presented in Table 102 below, 181 (56.2%) of schools were used 90% to 100% school grant efficiently. Similarly, 18.3% of schools ranges from 80% to 89 %, 7.1% of them 70 % to 79%. 5.3% of them 60% to 69% and 5.6% of them 50% to 59% used the school grand efficiently as principal response.

Table 102.Efficiency of schools in using school grant in percent

	Frequency	Percent
0% to 9%	8	2.5
10% to 19%	3	0.9
20% to 29%	5	1.5
30% to 39%	4	1.2
40% to 49%	5	1.5
50% to 59%	18	5.6
60% to 69%	17	5.3
70% to 79%	23	7.1
80% to 89%	59	18.3
90% to 100%	181	56.0
Total	323	100.0

Table 103 below presents the most influential participants in the discussion of meeting about school grant by rank according to the principals' response. As a result, PTA chair person, other PTA members including school principle, teachers, Zonal/Woreda/ other education officials/experts, fathers of students (non PTA), mothers of students(non PTA), community leaders/known persons, religious leaders and other community members were ranked 1 to 9 respectively as the most influential/important personals in meeting of school grant discussion.

Table 103. The most influential participant in the discussion of meeting about school grant

Meeting Participants	N	Minimum	Maximum	Mean	Rank
PTA chair person	11839	1	9	1.88	1
Other PTA members	11540	1	9	2.98	2
Teachers	11623	1	9	3.40	3
Zonal/Woreda/ other education officials/experts	9996	1	9	5.50	4
Fathers of students(non PTA)	9567	1	9	5.58	5
Mothers of students(non PTA)	9677	1	9	5.70	6
Community leaders/known persons	8982	1	9	6.75	7
Religious leaders	8495	1	9	7.21	8
Other community members	9087	1	9	7.63	9

Table 104 below presents about nine priority discussion issues of the participants on meeting about school grant. Among those availability of teaching aids (Chalk board, chalk, globe, map, etc.), safety and quality of school buildings (repairs to walls, windows, etc.), availability of class related materials (text books, workbooks, and others), availability of reading materials (Novels, books, other literatures), safety and quality of school grounds (fences, play grounds, sports equipment, etc.), availability of learning materials (science equipment, tools etc.), library organization, students having personal learning materials (pen, pencil, note book etc.) and delivering tutorials to students who are in need of support were ranked 1 to 9 as the main issues of discussion in the meeting respectively.

Table 104. The priority discussion issues of the participants on meeting about school grant

	N	Min	Max	Mean	Rank
Availability of teaching aids (Chalk board, chalk, globe, map, etc.)	11727	1	9	3.14	1
Safety and quality of school buildings (repairs to walls, windows, etc.)	11568	1	9	3.62	2
Availability of text books ,workbooks, and other class related materials	11559	1	9	4.42	3
Availability of reading materials (Novels, books, other literatures)	11602	1	9	4.69	4
Safety and quality of school grounds (fences, play grounds, equipment, etc.)	11494	1	9	4.90	5
Availability of learning materials (science equipment, tools etc.)	11528	1	9	5.13	6
Library organization	11527	1	9	5.21	7
Students having personal learning materials (pen, pencil, note book etc.)	11255	1	9	6.97	8
Delivering tutorials to students who are in need of support	11139	1	9	7.13	9

Table 105 below shows the degree of improvement the schools had made concerning different issues for the last two years. Thus, the response of the principals revealed, the highest improvement made at schools was on continuous assessment and school leadership with 55.1% and 46.1% respectively and the improvement of the rest issues were at medium level range from 46.8% to 55%.

Table 105: Principals' response concerning the improvement made at schools since last two years

	Degree of Improvement in %				
	No	Low	Medium	High	Total
Continuous Professional Development (CPD)	2.3	11.1	55	31.6	100
Continuous Assessment	0.3	3.8	40.8	55.1	100
School Leadership	0	4	49.8	46.1	100
Community Participation	3.1	23.5	46.8	26.6	100
Participation of PTA	1.5	10.7	51.4	36.4	100
Conducting Classroom Observation	1	7.4	49.8	41.8	100

The overall multiple regression analysis based on principals' variables which explained 12.3% of the variance in the composite score (Table 106) was accounted for by total number of grade 8 students, opinion to school improvement, mode of schooling, principal character, Principal opinion to curriculum availability and time taken to reach schools.

Table 106. Multiple Regression Model summaries based on principals' variables

Model		Sum of Squares	df	Mean Square	F	R	R Square	Adj. R Square	Sig.
1	Regression	186402	9	20711.3	118.476	.353[a]	0.123	0.123	.000[b]
	Residual	1311633	7503	174.815					
	Total	1498035	7512						

Table 107: The confidents of variables that affect achievements as principals' opinions

Model		Un standardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Err	Beta		
1	(Constant)	16.11	1.17		13.83	0.000
	How much time do you take to reach to school	0.60	0.17	0.04	3.60	0.000
	Principal character	0.03	0.02	0.02	1.31	0.190
	Mode of schooling	1.96	0.20	0.11	9.60	0.000
	Opinion to teacher performance	0.23	0.05	0.06	4.22	0.000
	Principal opinion to curriculum availability	-0.09	0.03	-0.04	-3.65	0.000
	Opinion to school improvement	0.59	0.07	0.12	9.06	0.000
	Opinion to teacher ethics	0.27	0.12	0.03	2.17	0.030
	Opinion to school problem	0.32	0.03	0.19	13.14	0.000
	Total number of grade 8 students	0.01	0.00	0.09	8.32	0.000

4.3 Major Findings of the Qualitative Study

Overview

This section presents the analysis and interpretation of results from the qualitative data. This additional study was conducted to complement the quantitative study as well as to reveal different aspects of student learning not accessed by the instruments developed for the quantitative study. It was also meant to explore the conditions that influence student learning basically by using similar questions with the quantitative study.

The collection of qualitative data was carried out in all regions where the quantitative data was undertaken**.** The modes for collecting data were focus group discussions.

4.3.1 Participants of the study

The types of participants in the qualitative study were four categories comprising seven members. These were representatives from teachers (from grades 4 and 8), students (male and female), parents and school principals. The data were organized in theoretical themes coined on the basis of the framed group discussion topics. The views from the participants under each theme were summarized.

The findings of the qualitative data are juxtaposed with the findings of the quantitative data to elaborate the implications of the findings to the stakeholders.

4.3.2 Learning acquisitions and satisfactions from their schools

The intention of any teaching learning process is to assist students acquire knowledge and skills. It is expected that parents, teachers and students themselves observe and feel the extent to which learning takes place, and express some level of satisfaction. It was in line with this that each of these categories of respondents was asked to express their opinions on learning acquisitions by students and their levels of satisfactions.

- It is shown that parents in most regions have doubts about the quality and relevance of what students learn in primary schools. Even in some schools, a clear dissatisfaction in that students lack either the interest to learn or the expected basic skills including reading and writing in lower grades. Students' free promotion which is misconception with continuous assessment. Teachers in most cases had the view that students learn useful materials for their life, but still expressed the lack of interest, motivation and attention towards schooling/ learning by students.

4.3.3 Students' motivation, moral development and behavior

Students' attitudes and behavioral qualities according to the views of participants were summarized as follows.

- Students do not respect their teachers in urban area.
- Some students' do not have interest towards their schooling.
- Students' misbehavior reflected in some urban schools.
- Students lack attention towards their learning/schooling.

Most participants perceived that students are not motivated to learn. According to them, they are more motivated to non-school activities including video and film shows. The reasons for not being motivated to learn could be many. The participants attributed students' lack of motivation, lack of employment, poverty, students' absenteeism and the difficulty nature of the subject matter.

Children are not born with the interest of learning but it can be developed during the early years of schooling. In this regard, parents, schools and teachers have the major role in helping children to develop positive attitudes towards schooling/learning.

4.3.4 Factors that affect students' learning

There are various factors that affect students' learning but in this study, the focus was on the support from parents (home), teachers and schools.

1. **Support from Home/parents**

The contribution of parents to either facilitate or hinder student performance is very well recognized. Though this could be through multiple ways, giving students sufficient study time, providing them with learning materials, close follow up of the progress of their children and helping them with homework were some of the essential supports expected from parents.

Among the factors that affect students' learning as per the response of the participants were the following.

- Parents need their children for labor at home and harvesting. This is more serious for girls. It is difficult to cease students from assisting their family. However, this assistance should be reasonable to their maturity level and engagement in learning tasks. As could be understood from the ideas above, most of the parents need children labor and engage them in domestic activities. At the same time there are students who attend school through self-help activities. Though the difficulty level of the task is not clear for the time being, it is obvious that labor at home takes more of their study time. This reduces their attention and interest to learn.

- Poverty at home seems to commonly impede students' learning. In many areas as it was reported by participants, a large number of students lack proper meal.
- Lack of parental support in doing home works.
- Lack of providing supplementary reading materials and
- Lack of follow up of the progress of their students.

2. Teachers support of students learning

In many developing countries like Ethiopia, where educational facilities are scarce, teachers' support is of paramount importance. This includes provision of tutorial classes, homework/assignments, checking student progress, and academic guidance and counseling services. Besides this, teachers' competence to support students' learning is the basis for all-round development of the learner and academic achievement. In this regard, participants were requested to express their views on the extent to which teachers provide support to students.

- Most of teachers give tutorial, homework/ assignments to support students' classroom learning. The participants attribute this deficiency to the large number of students in a classroom. There are also cases where students do not come to the tutorial class.
- Lack of preparation before class to teach. Participants in some regions asserted that teachers do not have the necessary competence, do not have sufficient preparation and do not go to class regularly.
- Some teachers miss their classes due to meetings at Kebele and Woreda level, social affairs and personal problems. Besides, teachers lack professional interest.

3. Support from school and leadership

Support from school and leadership includes provision of educational materials and facilities and makes every effort to alleviate students' problems in learning. As per the response from the participants during focus group discussion, most schools both in urban and rural areas lack school facilities such as: libraries, laboratories, reference books, science kits, well organized school pedagogical centers and separate clean toilets for boys and girls. Above all, laboratories are places where theoretical issues are animated and made practical. Learning through practice not only helps to recall the lesson, but also develops the investigative and analytic power of students.

Other problems that most schools face are shortage of classrooms, and congestion due to large number of students in a class. Congestion of students could be as a consequence of shortage of teachers and classrooms where the school leadership is obliged to merge students in limited classroom. These deficiencies significantly influence students' learning.

4.3.5 Views on curriculum materials

Participants' views on the curriculum materials and its implementation were captured during discussion. The opinion of participants on the availability of textbooks, difficulty level (simplicity/complexity) of textbooks, portion coverage and relevance of the curriculum was presented as follows.

Availability of textbooks, teachers' guide and syllabus:

Participants responded that in some schools, textbook to student ratio was not 1:1. But rather it was 1 to 2, 1 to 3, and 1 to 4 ratios. In addition, there was a shortage of teachers' guides and syllabi in most schools.

Simplicity/complexity of the curriculum materials

The participants viewed English was the most difficult for students in the first cycle of primary education. All regions respondents agreed that an English textbook was difficulty. For instance, according to the view of participants, some examples from English textbooks were not related the immediate environment and life of students especially for grades 1 through 4. According to their opinion, some contents where even difficult for teachers to explain the concepts. In addition, Environmental Science was reported to be more complex than other subjects as it integrated contents from both social and natural sciences. At the second cycle of primary education, subjects such as Mathematics (trigonometry part), English and Physics (Dimension) were viewed as difficult. In the case chemistry, it was difficult to cover the portion at grades 7 and 8. Among the factors related to the complexity of the concept in subjects were the volume of books, shortage of localized examples, lack of science kits and laboratory are considered to be hindering effective learning.

Parents and community participation in school

One of the issues during the focus group discussion was the involvement of parents and the community in school affairs. The community participates in terms of providing construction material, raising fund, labor and involving in administrative issues. However, there are cases where the participation of parents is negligible.

For instance, Community participation is very low; they are not interested to come to school. Even they do not know what their responsibility is in the education of their children. It seems that there is a gap between schools and parents. This gap could be bridged by the local administration and the school to make parents know what is expected of them when they send their children to school.

5. Conclusions and Recommendations

5.1 Summary of the Main Findings

The finding revealed that the achievement of students as measured by the composite scores at national level were less than the minimum expected score (50%) by the Ethiopian education and training policy.

The national average percent score in four subjects (Reading English, Mathematics and Environmental Science) for grade four were 44.74% and for grade 8 in five subjects (English, Mathematics, Physics, Chemistry, and Biology) were 41.14%. Based on the average scale score result, in grade 4 no progress had been obtained as compared to fourth NLA whereas in Grade 8 there was an increment of 4.9 in average scale scores.

The proficiency levels were computed for both grades 4and 8.Accordingly, in grade four showed that 56% of students, 43 %(Reading) and 39 %(both for Math and Environmental science) were categorized under Below Basic. In Reading (47%) ,Math(44%), Environmental science (42%) and31%(English)of students were found at the basic level. Likewise, 7% in reading (lowest) to 14% of students in Environmental science (highest) were categorized under Proficient level. Similarly, at advanced level, the percentage of students ranges between 2% (English) to 5% (Environmental Science).

Similarly in grade 8, at advanced level, the percentage of students ranges between 1% (Physics and Chemistry) to 3% (English and Biology). At proficient level, the percentage was between 5% (Math) to 14 % (Biology). Students at the basic level were between 33% (Physics) to 53% (English). The highest percentage of students was found in chemistry (56%) and Physics (55%).

The achievements were analyzed across subgroups (gender, region, location and school status). The findings indicated that there was an achievement variation across groups. At both grade levels, the achievement of boys in average scores was higher than girls and the difference was statistically significant. Likewise, in all subjects at both grade levels, urban students outperformed rural students and the mean differences were also statistically significant.

At regional level, Addis Ababa was the highest achieving whereas Gambella and Benishangul Gumuz were grouped under the lowest achieving regions in all subjects at grade 4. Similarly, in grade 8, the result indicated that Dire-Dewa and Addis Ababa were the highest achieving where as Gambella and BenishangulGumuz were the lowest achieving regions.

There is also variation in the achievement of students across school status. Students in school "A" (level 4) outperformed those in school "B" (level 3) and "C" (level 2). Likewise, students from school "B" (level 3) performed better than those in "C" (level 2) at national level at both grades 4 and 8.

Various factors influence students' academic achievement and some of them were identified in grade 4. Multiple regression analysis based on students' related variables such as age, gender, students' absenteeism, reading additional books and listening to radio were able to explain 7.3% of the variance in the achievement of students. In addition, text book availability, difficulty level of text books and perception towards understanding of the subject matter explained 11% of the variance in the achievement of students.

Home related variables such as family educational level, family support in studying, living with mother and father, access to light/electricity at home, family property, frequency of having meal and similarity of home language with instructional languages were able to explain 13.9% of the variance.

School related variables such as time to school, class attendance, frequency mathematics and English homework and perception to teachers explained 9.5% of the variance.

Similarly, in Grade 8, personal related variables such as age, gender, reading additional books, frequency of listening to the radio and watching TV per week as well as absenteeism explained 2.8% of the variance in academic achievement. Home and family related variables such as similarity of home and instructional languages, family educational levels, family support in studying, meal per a day, availability of light/electricity and family property were able to explain 3% and availability of text books, perception to subjects and time taken to schools explained 1% of the variance.

In grade four, teachers related variables such as gender, age, frequency of communication with parents, teachers' educational level, teachers 'load per a week, teaching experience, frequency of getting supervision, time taken from home to school and class size explained 8.5% the variance. Among these, class size, teachers' load in a week and time taken from home to school were negatively correlated to students' academic achievement.

Moreover, teachers' trainings such as awareness on curriculum materials, method of teaching, action research, continuous assessment and classroom management explained 14% and portion coverage in respective subject matter was able to explain 5.3% of the variance in academic achievement.

In Grade 8, teacher related variables such as teacher characters, teachers' attitudes towards teaching profession, portion coverage, teachers' training, frequency of teacher-parent communication, understanding level of the subject matter, managing students in a class and supervision by principals explained 41.8% of the variance. Regarding to portion coverage, some teachers were unable to cover the entire portion of their subjects' content as per the opinion of participants from focus group discussion.

In Grade 4, variables such as principals' opinion to teachers' behaviors, applying active teaching method, motivating students and attitudes towards teaching, usage of school pedagogical center, library and teachers' effort explained 6.6%. School situation such as school location, mode of schooling and large number of student explained 2.7% of the variance in achievement. School related factors such as student absenteeism, teacher absenteeism, shortage of textbooks, low relationship between school and parents, unavailability of school facilities and low motivation of students towards schooling were able to explain 8.3 % of the variance. Similar finding was obtained from focus group discussion that reflects shortage of library, shortage of curriculum materials in particular textbooks, lack of laboratory and lack of respective facilities for most schools that affect students learning. Moreover, English textbook was found to be the most difficult for the students to understand especially for the first cycle of primary education.

Likewise, in grade 8, principal related variables such as numbers of students, mode of schooling, principal characters/back ground information, opinion to curriculum availability, opinion to teacher ethics, opinion to teacher performance, opinion to school problem and time taken to school explained 12.3% of the variance.

Furthermore, the following findings were obtained from qualitative survey during focus group discussion.

- The academic achievement of students was insufficient as per the responses of the participants. It was stressed that some students were promoted from grades 1 through 4 without having sufficient knowledge and skills; even they failed to read and write letters.
- Parents need their children for labor at home and harvesting. This is very common for girls in rural schools.
- Shortage of textbooks, and references in the school.
- Students demonstrated undesirable behavior in some urban schools.
- Students do not have motivation to learn from their schools.
- One of the challenges for rural school students was parents need children for labor at home, harvesting and engage them in domestic activities. It seems more critical for girls.

- Shortage of library, laboratory and lack of respective facilities affected students learning.
- There was lack of competencies by some teachers especially in self-contained class.
- Some teachers unable to cover the entire portion of their subjects' content.
- Lack of motivation and professional interest by most teachers.
- English textbook was found to be difficult for the students to understand especially for the first cycle of primary education.
- Shortage of qualified teachers with new methodologies, classroom seats and over congestion of students in some classrooms .
- There are situations where the community participates in school affairs in a form of constructing, maintaining and facilitating schools. On the other hand, there are cases where the participation was very low, indicating low involvement of the community in schools' affairs which contributed to the existence of gap between the school and community.
- Shortage of curriculum materials such as Textbooks, teachers' Guides and Syllabi in some schools.

5. 2 Recommendations

Based on the findings of the study, the following recommendations are forwarded.

- The low achievement in composite score at national level in both grades 4 and 8 requires strong interventions and continued efforts by government and all concerned stakeholders. Thus, a comprehensive and integrated school improvement program should be highly strengthened so as to bring improvement in the academic achievement of students. School facilities like libraries, sufficient supplementary reading and reference materials, separate toilets for boys and girls, school pedagogical centers, model charts, laboratories and Science kits are among the priorities.
- The achievement gap persists between boys and girls. Therefore, there is a need for further investigations to find out the root cause of the problem. In this regard, MOE, REB with stakeholders should take the leading role. Also, every school is required to strengthen support for girls' learning.
- The existing achievement difference between rural and urban schools also calls for immediate actions to be taken by all stakeholders. REBs, Zone and District Education Office in collaboration with PTA/School communities should work together to narrow the gap between urban and rural schools. In this regard, the responses from FGD indicated low involvement of communities in most schools' affairs. Therefore, strong parental and community involvement in overall school improvement program should be enhanced.
- The existence of a wide variation in the achievement of students among regions requires special attention, particularly, to those regions with low students' academic achievement (Gambella and Benishangul Gumuz). With this regard, the MOE and REBs should take the leading role for immediate actions. Also, there should be the sharing of experiences among those regions that had better students' achievement.
- There was variation among school performances based on data obtained from school principals' responses regarding school status. School categorized under level 4(A) performed higher than level 3 (B) and level 2(C). Therefore, school categories under level 3 (B) & 2 (C) should share experience from "4" level" (A) schools and a close supervision and follow up is required for school categories under level 3 (B) &2 (C), in order to bring them to the level "4" (A).
- Teachers' continuous professional development particularly with reference to different subject matter content knowledge and methodology, formative assessment techniques, action research and special needs education should be strengthened by MOE, REBs and TTCs.
- Designing the provision of incentive mechanisms for teachers especially who are working in remote and hardship areas and creating conducive working environment/good leadership in schools, ensuring of a highly

motivated teachers and their emphasis on academic activities, upholding of high level student-teacher relationships and fostering of respect among the school community. In addition, the government and community should take the initiatives to avail teachers and principals to have residence close to schools.

- Encourage regular school attendance by students.
    - Woreda Education Office and schools should closely work together to reduce students' absenteeism by making awareness of parents on the benefits of regular school attendance on students' learning.
    - School feeding program has to be extensively provided to needy students by the government, community and non-governmental organizations to alleviate problems such as absenteeism and low motivation in schooling.
- As the shortage of curriculum materials such as textbooks, teachers' guides and syllabi contributed to low achievement of students, immediate measure should be taken. Thus, MOE and REBs should be committed to provide textbooks for every student at 1:1 ratio. In addition, syllabi and teachers guides should be available for every subject in each school.
- According to period allotment for each content area, every subject teacher should be committed to cover the entire portion of the subject matter. In this regard, school supervisors and Woreda Education Offices ought to follow up the progress regularly.
- Similarity of home and instructional languages has a positive impact on students' learning. Thus, for those students whose home and instructional language differ, every region should be committed to implement the medium of instruction in mother tongues especially for first cycle of primary education.
- The qualitative study revealed that English for first cycle of primary education was the most difficult. Also, in the quantitative study, English score was the lowest. Thus, curriculum Directorate of MoE should identify the area of difficulty in English and take immediate actions accordingly.
- MoE and REBs' curriculum Directorate should develop students' work book, work sheet and additional supportive reading and reference materials for students.
- According to proficiency levels determined, more percentage of students was categorized under Below Basic and Basic levels in all grades and subjects. Thus, the government and other concerned stakeholders should make an effort to shift students from Below Basic to Basic levels, Basic to Proficient level and Proficient to advanced level.

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