THE ACHIEVEMENT OF S 2 STUDENTS IN MATHEMATICS, ENGLISH LANGUAGE AND BIOLOGY

NATIONAL ASSESSMENT OF PROGRESS IN EDUCATION
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ACRONYMS AND ABBREVIATIONS

BOG	Board of Governors
BTVET	Business, Technical and Vocational Education and Training
DCs	District Coordinators
DEO	District Education Officer
DES	Directorate of Education Standards
DIS	District Inspector of Schools
DTE	Diploma in Teacher Education
EFA	Education For All
EMIS	Education Management Information System
EPRC	Education Policy Review Commission
ESC	Education Service Commission
ESSP	Education Sector Strategic Plan
HOTs	Higher Order Thinking Skills
IMU	Instruction Materials Unit
INSET	In-Service Education and Training
LCM	Lowest Common Multiple
LOTS	Low Order Thinking Skills
MDG	Millennium Development Goals
MoES	Ministry of Education and Sports
NAPE	National Assessment of Progress in Education
NCDC	National Curriculum Development Centre
NTCs	National Teachers' Colleges.
PGDE	Post Graduate Diploma in Education
PLE	Primary Leaving Examination
PPP	Public Private Partnership
PTA	Parents Teachers' Association
S 2	Senior Two
S/E	Standard Error
SESEMAT	Secondary Science and Mathematics Teachers' Program
SMCs	School Management Committees
TIE	Teacher Instructor Education
TLs	Team Leaders
UACE	Uganda Advanced Certificate of Education
UCE	Uganda Certificate of Education
UNEB	Uganda National Examinations Board
UPE	Universal Primary Education
UPPET	Universal Post Primary Education & Training
USE	Universal Secondary Education
ZCs	Zonal Coordinators

A WORD FROM THE MINISTER

The government of Uganda considers good quality education as a pathway to national economic development in an increasingly globalised world. For the last seventeen years now, the government, through the Universal Primary Education (UPE), has made efforts to have all school going children in school. In order to provide access to secondary education for the increased number of pupils who complete the primary education cycle, the government launched the Universal Secondary Education (USE) programme in the year 2006. This greatly increased the number of students in schools at the secondary education level as well.

With increased access to education and an improved learning environment, there now arises the question of quality of learning obtaining in schools. The quality of learning in any education system higly revolves around what actually happens in the classroom.

Issues of quality of education are some of the major concerns that dominate local and international debates on education for sustainable economic development. Such concerns can only be addressed with empirical evidence generated by monitoring and evaluation studies. This is one reason why modern education systems participate and conduct at least three fundamentally and purposefully different assessement systems: These are:

- *Summative assessment*: for determination of performance of individual learners in relation to others.
- *National assessment*: for monitoring and evaluating the quality of the education system across several time points.
- *International assessment*: for comparison purposes of education standards of countries within and across continents. Uganda, is already participating and conducting the three assessments.

Indeed, it is gratifying to note that UNEB has over time developed a strong national assessment system in the country, which system is now at the level of one of the few success stories of national assessment in Africa. National assessment is a very expensive venture, not only ir terms of funds but also in terms of the required expertise. Many other countries that conduct such assessment still depend on university experts and research consultancy agencies, that are even more expensive, to handle specialized areas of national assessment such as test development, sampling and statistical analysis.

In order to monitor and evaluate the quality of learning in our schools, the government of Uganda, through National Assessment of Progress in Education (NAPE), conducts national assessment on an annual basis.

The findings of the assessment provide us with a wider picture of where we are and where we need to go as an education system. NAPE even goes ahead to suggest some possible steps that could be taken to be able to move forward.

It is important to note that the findings are made public as a norm, like is done in all other countries which conduct national assessment. This is done, so that all stakeholders: parents, schools, communities, amongst others, can positively act on the information, and be well informed of the areas which need their immediate action. This also generates debate on important issues pertaining to education.

This report contains the findings of the 2013 assessment at the S 2 level. I petition you all to be enthusiastic to study and use the findings in this report, with the aim of improving the quality of learning in our schools.

For God and my Country.

Hon. Major (Rtd) Alupo Jessica Rose Epel, (MP)
Minister of Education and Sports.

FOREWORD

Uganda's effort in prioritization of education as a key strategy to achieving socio-economic transformation and integral development has brought success in the education sector.

As Uganda approaches the Education For All (EFA) target year 2015, long term goals have been established like Universal Primary Education (UPE), Universal Secondary Education (USE) and Transforming post-Secondary education from purely an academic curriculum to include technical and vocational training, among others.

The government of Uganda, through Uganda National Examinations Board (UNEB), conducts annual National Assessment of Progress in Education (NAPE) at both Primary and Secondary levels. NAPE has over the years continued to give key indicators of the achievement levels of learners and map out areas that urgently need attention in order to improve the quality of teaching and learning.

This report is the sixth of NAPE findings at the secondary level. The assessment at this level targets S 2 students in the subject areas of Mathematics, English Language and Biology.

The report is meant for the key players in the Education sector, responsible for translating this information into effective education policies and practices, as well as those who monitor and assess the processes and outcomes. The readers will note that this report format differs from that of academic researchers, due to the wide range of intended users: from parents and students to politicians and academicians.

It is my sincere hope that it will benefit all stakeholders in education. We do welcome any feedback that you may wish to offer.

M. B. B. Bukenya
EXECUTIVE SECRETARY

EXECUTIVE SUMMARY

The main objective of 2013 NAPE Assessment was to monitor the performance of students in Mathematics, English Language and Biology with reference to the general expectations of the curriculum at S 2 level.

The sample at the national level comprised 524 government and private secondary schools selected from the 112 districts of Uganda. The total sample of students was 21,647. Of these, 11,825 (54.6%) were boys and 9,822 (45.4%) were girls. An interview meant to establish the level of assessment knowledge and practice of S 2 teachers was carried out in all schools sampled. In each school, one teacher, of each of the assessed subjects: English Language, Mathematics and Biology was interviewed. The national sample of teachers interviewed was 1,741. Out of these, 1,402 (80.5%) were male and 339 (19.5%) were female.

Overall level of achievement
In Mathematics, about a half of the students (46.9%) reached the defined competency level. A lower proportion of the students (43.1%) were rated proficient in English Language, while less than a quarter of the students (14.5%) were rated proficient in Biology.

Achievement by gender
The girls (45.3%) performed significantly better than the boys (40.9%) in English Language. However, boys performed significantly better than girls in Mathematics and Biology. This may be due to girls' attitude to science subjects and having few female role models. This is also explicit in this year's findings about teachers' assessment knowledge and practice. The percentage of teachers by subject they teach and gender shows that only a tenth (10.9%) and (7.2%) of teachers who teach Biology and Mathematics, respectively, are female.

Achievement by age
The proportions of students reaching the desired proficiency levels in all subjects decreased with increase in age from 13 years old to 19+ years old. Girls aged 13 years performed better than boys, while boys aged 16 - 19+ years performed significantly better than girls in the same age bracket.

Achievement by school ownership and USE status
The highest proportions of students with desired rating came from government non-USE schools, followed by those from private non-USE schools. On the other hand, Private USE schools and government USE schools registered lower numbers of students rated proficient. The achievement of boys was significantly better than girls in all school types.

Achievement by school programme
Slightly more students from single-session schools reached the desired proficiency rating in the three subjects compared to students from double-session schools. More

boys than girls were rated proficient in Mathematics and Biology and the reverse is true in English Language in both school programmes.

Achievement by school location
Urban schools performed significantly better than rural schools in all the three subjects. This may be due to better learning environment and inducements in urban areas. In Biology and Mathematics, boys performed significantly better than girls in each school category, while girls from urban schools performed better than boys in English Language.

Achievement by zones
South West, Kampala and Central I had higher achievement levels in all subjects. Zones in the Eastern region, North West and Mid West registered fewer students rated proficient in all subject areas. Some of the districts with low levels of achievement are areas where fishing and other commercial activities have tended to distract the students.

Teacher assessment knowledge and practice
Most of the teachers interviewed responded positively on many issues of preparation for effective assessement, that they do. However, majority of them could not tell the basic requirements for the preparation of tests.

Chapter 1

INTRODUCTION

1.1   BACKGROUND

Uganda is one of the countries in East Africa, located between Latitudes 4^0 12'N and 1^0 29'S and Longitudes 29^0 34'E and 35^0 0' E; astride the equator. It has a total area of 241,550.7 square kilometers of which land accounts for 199,807.4 square kilometers and the rest, 41,743.2 square kilometers is open water and swamps[*]. The climate is generally tropical in nature, although it differs from one region to another.

Uganda is a land-locked country, bordered by Kenya in the East, the Democratic Republic of Congo in the West, Tanzania in the South, Rwanda in the South West and the Republic of South Sudan in the North. The country is mostly a plateau, whose fringes are marked by mountains and valleys, which together with other physical features affect the provision of social services, like education in some areas. For instance, access to schools in the Island district of Kalangala, which is composed of many small islands on Lake Victoria, poses a challenge, not only to pupils and teachers, but also to education administrators and inspectors. The same applies to the rocky and mountainous districts: Bundibugyo and Kisoro in the West; Bukwo and Bududa in the East. The country is currently divided into 112 districts (see map on page 3). With the policy of decentralization, the districts are administered by the local governments, which are supervised by the Central Government's Ministry of Local Government.

Uganda's population has continued to grow rapidly over time. It increased from 9.5 million in 1969 to 24.2 million as at 13th September 2002, and was estimated at 35.4 million by mid-2013[†]. The population is increasingly becoming urban due to creation of new urban administrative units and the rural-urban migration. This is good news in the struggle to provide quality education as urban areas tend to have better social amenities which attract manpower to work in the schools. On the other hand, about a half of the population is below 15 years of age, which creates a high level of child dependence. For instance, the number of primary school pupils is expected to increase from 8.4 million in 2010 to 18.4 million in 2037[‡]. The high rate of population growth affects the country's effort to achieve and sustain quality education.

The population comprises about fifty ethnic groups, each with a different local language, which is supposed to be used as the medium of instruction in lower primary while English is taught as a subject. However, English is the medium of instruction in upper primary and institutions of higher learning. Kiswahili is also taught in some primary and secondary schools.

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[*] Uganda Bureau of Statistics, 2013 Statistical Abstract, Page 1 http://www.ubos.org
[†] Uganda Bureau of Statistics, 2013 Statistical Abstract, Page 8 http://www.ubos.org

[‡] Ministry of Finance and economic Development, Population Secretariat: *Uganda – Population Factors and   National Development, January 2010, Page 2*

A list of the districts in Uganda showing the zones and regions as well as the major languages is given in Table 1.01

Table 1.01

TABLE 1.01: REGIONS, ZONES AND DISTRICTS IN UGANDA AND THE MAJOR LANGUAGES SPOKEN

REGION	ZONE	DISTRICTS	MAJOR LANGUAGES
Central	Central I	Buikwe, Butambala, Buvuma, Gomba, Kayunga, Mpigi, Mukono, Wakiso.	Luganda.
	Central II	Kiboga, Kyankwanzi, Luweero, Mityana, Mubende, Nakaseke, Nakasongola.	Luganda, Lululi, Runyoro.
	Central III	Bukomansimbi, Kalangala, Kalungu, Lwengo, Lyantonde, Masaka, Rakai, Sembabule.	Luganda, Runyankore.
East	Far East	Amuria, Bukedea, Kaberamaido, Katakwi, Kumi, Ngora, Soroti, Serere.	Ateso, Kumam.
	Mid East I	Bududa, Bukwo, Bulambuli, Kapchorwa, Kween, Manafwa, Mbale, Sironko.	Kupsabiny, Lumasaba.
	Mid East II	Budaka, Busia, Butaleja, Kibuku, Pallisa, Tororo.	Ateso, Dhopadhola, Kiswahili, Lugwere, Lunyole, Lusamya.
	Near East	Bugiri, Buyende, Iganga, Jinja, Kaliro, Kamuli, Luuka, Mayuge, Namayingo, Namutumba.	Lusoga, Lusamya.
Kampala		Kampala.	English, Kiswahili, Luganda.
North	Mid North I	Alebtong, Amolatar, Apac, Dokolo, Kole, Lira, Otuke, Oyam.	Lango.
	Mid North II	Agago, Amuru, Gulu, Lamwo, Kitgum, Nwoya, Pader.	Acoli.
	North East	Abim, Amudat, Kaabong, Kotido, Moroto, Nakapiripirit, Napak.	Ngakarimojong, Thur.
	West Nile	Adjumani, Arua, Koboko, Maracha, Moyo, Nebbi, Yumbe, Zombo.	Alur, Kakwa, Lugbara, Madi.
West	Far West	Kabale, Kanungu, Kisoro, Rukungiri.	Rukiga, Kinyarwanda, Rufumbira.
	Mid West	Bundibugyo, Kabarole, Kamwenge, Kasese, Kyegegwa, Kyenjojo, Ntoroko.	Kiswahili, Lukhonzo, Lwamba, Rutooro.
	North West	Buliisa, Hoima, Kibaale, Kiryandongo, Masindi.	Kiswahili, Runyoro.
	South West	Bushenyi, Buhweju, Ibanda, Isingiro, Kiruhura, Mbarara, Mitooma, Ntungamo Rubirizi, Sheema.	Kinyarwanda, Runyankore.

MAP OF UGANDA: SHOWING THE DISTRICTS

1.2   EDUCATION IN UGANDA

Uganda's formal system of education is four-tier: seven years of primary education, four years of lower secondary, two years of upper secondary and two to five years of tertiary education.

The Constitution of Uganda stipulates that education is a fundamental right for every citizen. It is therefore essential for the country to provide quality and relevant education to all its citizens, irrespective of cultural, gender, regional or social differences. Because of this and in response to *the 1990 World Conference on Education for All* (EFA) and *The Millennium Development Goals* (MDGs), Government introduced Universal Primary Education (UPE) in 1997. Ten years later, in 2007, Universal Secondary Education (USE) was also introduced. Accordingly, the total enrolment at secondary level increased by 10 % between 2008 and 2009 and by 2.0 percent in 2010.[*] The enrolment further increased by 2.6% from 2010 to 2011, and only to reduce slightly by 0.8% from 1,258,084 to 1,247,437 students between 2011 and 2012. Because of the high number of students, some schools are implementing the double-session system. In addition, Government entered into a Public-Private-Partnership (PPP) arrangement with some private schools to make it possible for every qualifying student to access secondary education under USE.

Regarding equity, Government has improved the learning environment in schools to make it more conducive for both boys and girls. To reinforce the success in gender parity at the primary level and to roll out gender equity in the entire education sector, Government launched *The Gender Policy in Education* in 2010. The Ministry of Education and Sports (MoES) has also made effort in the area of special needs education, leading to an increase in the number of secondary school students with special needs by about 20% between 2008 and 2010.[†]

To improve the quality of education in schools, Government and its development partners have put in place a number of quality enhancement initiatives. Classrooms, libraries and laboratories are being constructed. The curriculum is also under review to make it more relevant to the country's needs. In addition, more resources have been provided to the Directorate of Education Standards (DES) for supervision and monitoring of the teaching-learning process. Recruitment of more teachers, training of Science and Mathematics teachers through Secondary Science and Mathematics Teachers (SESEMAT) programme are some of the quality improvement initiatives. Uganda National Examinations Board (UNEB) too, has been provided with resources to regularly assess and monitor the learning achievement of students.

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[*]Uganda Bureau of Statistics, 2013 Statistical Abstract , Pg 14
  http://www.ubos.org

[†] Uganda Bureau of Statistics, 2013 Statistical abstract, Page 14
http://www.ubos.org

1.3   NATIONAL ASSESSMENT OF PROGRESS IN EDUCATION

The Education Policy Review Commission (EPRC, 1989) reported lack of reliable and up-to-date data on educational indicators.   Back then, the only assessment information used for monitoring and evaluation was based on the end of cycle examination results and reports by examiners.   However, these examinations are designed to primarily serve as tools for certification and selection to higher institutions of learning.   National Assessment of Progress in Education (NAPE) was, therefore, established to supplement the information from the examinations.   NAPE is used to ascertain the level of students' learning achievement and to monitor changes in the achievement levels over time.   It determines the skills that a cohort of students have acquired and are capable of acquiring in relation to the objectives of the curriculum.   The first national assessment in Uganda at the secondary level was conducted in S 2 in 2008, though at primary level, it started as early as 1996.   Since then, it has been conducted annually in the same class.

1.3.1   Objectives of NAPE

The main objectives of NAPE are:

- Determine and monitor the level of achievement of students over time.
- Generate information on what students know and can do in different curricular areas.
- Evaluate the effectiveness of reforms in the education system.
- Provide information on variables which affect learning achievement.
- Suggest measures for the improvement of teaching and learning in schools.
- Provide data for planning and research.

1.4   THE IMPACT OF NAPE ON THE EDUCATION SYSTEM IN UGANDA

Since its inception in 1996, NAPE has produced reports with findings which have been used in different ways by different stakeholders and organizations to foster the development of education in the country. NAPE findings and recommendations have helped policy makers and stake holders in education to come up with strategies to help improve teacher and classroom instruction. A case in point is the intervention in the area of Local Languages by Literacy and Adult Basic Education (LABE) in some districts in the North and West Nile. ARK-PEAS on the other side is using the recommendations to identify areas to set up schools that provide affordable quality secondary education in the remotest areas of the country. At school level, during feedback seminars, UNEB through NAPE has advised schools to come together and plan for short training programmes in assessment for learning. Indeed, through this arrangement, assessment for learning workshops have been organized. For example at Bishop Willis Core PTC and others in different districts in Central, North and West Nile zones in 2012 and 2013.

1.5   THE 2013 NAPE STUDY

This volume presents the results of the 2013 NAPE survey. The objectives of the study are presented in the sequel. The description of the instruments and the procedures for selecting the sample and administering the instruments is contained in Chapter 2.   Results of students' achievement in Mathematics are presented in Chapter 3.   This is followed by the results of English Language in Chapter 4 and Biology in Chapter 5. Chapter 6 presents findings about the assessment knowledge and practice of S 2 teachers of Mathematics, English Language and Biology.   The conclusions, discussions and recommendations drawn from students' achievement in Mathematics, English Language, Biology, and the teachers' interview schedule, are presented in Chapter 7.

The results are presented in terms of the mean scores and percentages of students achieving the defined levels of proficiency. Statistics are also provided by: students' gender, age, school USE status (Universal Secondary Education or not), programme (single or double-session), ownership (government or private), school location (urban if situated within a municipality, or the major town of a district; and rural if situated outside the main town) and zones of the country.

The 2013 survey had the following objectives:

1. Determine students' level of achievement in Mathematics, English Language and Biology.

2. Examine students' patterns of performance in the competencies, skill areas and topical areas of Mathematics, English Language and Biology.

3. Examine the relationship between achievement and students' gender, age and school USE status, programme, ownership, school location, and zones of the country.

4. Compare achievement of students in Mathematics, English Language and Biology from 2008 to 2013.

5. Determine the level of assessment knowledge and practice of S 2 teachers of Mathematics, English Language and Biology.

Chapter 2

SURVEY PROCEDURES

2.1   INTRODUCTION

This chapter gives a description of the survey design. In particular, it details the instruments as well as the procedures that were used in selecting the sample and collecting, capturing and analyzing the data.

2.2   INSTRUMENTS

2.2.1 STUDENT TESTS

There were written tests of Mathematics, English Language and Biology. The tests were based on the Uganda Secondary School Curriculum and were developed at a central workshop by a team of experts comprising secondary school teachers, personnel from the National Curriculum Development Centre (NCDC), Universities and Uganda National Examinations Board (UNEB). The tests consisted of restricted and free response items. The compositions of the tests are given in Tables 2.01–2.03

TABLE 2.01:   RELATIVE WEIGHTS ALLOCATED TO EACH SKILL AND SUB-SKILL AREA OF THE ENGLISH   LANGUAGE TEST

SKILL AREA	SUB - SKILL AREA	SUB-TOTAL	(WEIGHT)
Reading	Passage	10	37
	Dialogue	8	
	Poetry	9	
	Cartoons	10	
Writing	Announcement	10	34
	Formal letter	12	
	Composition	12	
Grammar	Tenses	5	30
	Punctuation	4	
	Structural patterns	7	
	Articles and words of quantity	4	
	Parts of speech.	10	
TOTAL			101

TABLE 2.02:   RELATIVE WEIGHTS ALLOCATED TO EACH TOPICAL AREA AND ABILITY LEVEL OF THE MATHEMATICS TEST

TOPICAL AREA	ABILITY LEVELS			Total (Weight)
	Basic	Adequate	Advanced	
Set theory, probability, relations and mappings.	4	3	3	10
Numerical concepts (including estimation and number patterns and sequences)	7	9	9	25
Cartesian coordinates and graphs.	1	5	4	10
Geometry	4	5	5	14
Measures	5	8	6	19
Transformations and functions.	5	3	4	12
Statistics	2	5	6	13
TOTAL	28	38	37	103

TABLE 2.03:   RELATIVE WEIGHTS ALLOCATED TO EACH TOPICAL AREA AND ABILITY LEVEL OF THE BIOLOGY TEST

TOPICAL AREA	ABILITY LEVEL			TOTAL (Weight)
	Basic	Adequate	Advanced	
Introduction to Biology.	3	3	0	6
Diversity of living things.	3	7	8	18
Microscopes and hand lenses.	2	8	0	10
Animal and plant cells.	3	4	0	7
External features and internal structures of flowering plants.	6	18	10	34
External features, life cycles and economic importance of insects.	6	5	5	16
Soil	10	9	10	29
TOTAL	33	54	33	120

2.2.2 INTERVIEW SCHEDULE FOR S 2 TEACHERS

There was an interview schedule for teachers of Mathematics, English Language and Biology, from each of the schools visited, which sought to share their experiences and practice in assessment. The instrument was structured and categorized into three: school information, teacher information and assessment knowledge and practice.

The analysis describing the distribution of S 2 teachers by selected factors and their assessment knowledge and practice is presented in Chapter 7.

2.3 SURVEY DESIGN

2.3.1 *SURVEY POPULATION*

The target population consisted of students in senior two (S 2) in all the secondary schools (both government and private) in Uganda in July 2013.

2.3.2 *SAMPLING DESIGN*

A two-stage stratified cluster sampling design was used. The first stage involved selecting a random sample of schools, stratified by zone. Within a zone, it was ensured that schools were selected from each of the districts in the zone. Hence, the sample consisted of schools from all the 112 districts of Uganda. In the second stage, a random sample of 30 students was selected from among those who were present in the school on the day of the survey.

2.3.3 *SELECTION OF SCHOOLS*

A list of secondary schools from the Education Management Information System (EMIS), showing the total school enrolment and the number of S 2 students provided the sampling frame.

The number of schools selected from a particular zone was proportional to the S 2 enrolment in the zone. However, a minimum of three schools were sampled from each of the districts within the zone. The districts of Amudat, Buvuma, Kalangala and Kotido could not raise the required minimum number of schools, so all their schools were included in the sample.

As in the previous surveys, Kampala District was considered as a separate stratum because of its uniqueness. Being the capital city of the country, it is the most urbanized district with a population that has highly competitive socio-economic characteristics, which are likely to enhance the achievement of learners.

Schools for the Blind and the Deaf were included in the sample, but were not considered as part of the zonal quota.

2.3.4 *SELECTION OF STUDENTS*

A simple random sample of 30[*] students was selected from each school according to established guidelines which guaranteed the random nature of the selection procedure. The sample size of 30 was maintained as in the previous surveys because increasing the number to more than 30 raises the accuracy level only by a negligible amount, and yet the cost of instrument production and administration gets much higher. Secondly, most secondary school classrooms in Uganda take up to about 30 test-takers when sat with appropriate spacing and one test administrator can effectively supervise about 30 students.

2.3.5 *SAMPLE SIZE*

The national sample consisted of 524 schools, which was 18.54% of the schools in Uganda, and 21,647 students, representing 7.9% of the S 2 students in the country.

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[*] In schools for the Deaf and Blind all the S 2 students were included in the sample.

Of the 524 schools, 329 were government and 195 private. The total number of schools in the urban and rural areas was 145 and 379, respectively.

The number of schools sampled from each district as well as the number in the sample frame is shown in Table 2.04.

TABLE 2.04:   NUMBER OF SCHOOLS IN THE SAMPLE AND IN THE ZONES AND DISTRICTS

REGION	ZONE	DISTRICTS
Central [133 ; 870]	Central I (69; 470[+])	Buikwe (9; 56[+]), Butambala (5; 25) Buvuma, (2; 2) Gomba (3; 18), Kayunga (6; 49), Mpigi (8; 42), Mukono (13; 88), Wakiso[*] (23; 190)
	Central II (35; 235)	Kiboga (3; 18), Kyankwanzi (3; 12), Luweero (10; 74), Mityana (6; 38) Mubende (5; 45), Nakaseke (4; 26), Nakasongola (4; 22)
	Central III (29; 165)	Bukomansimbi (3; 16), Kalangala (2; 2), Kalungu (3; 23), Lwengo (3; 17), Lyantonde (3; 7), Masaka (6; 34) , Rakai (5; 45), Sembabule (4; 21)
East [145 ; 686]	Far East (26; 109)	Amuria (3; 12), Bukedea (3; 11), Kaberamaido (3; 16), Katakwi (3; 11), Kumi (3; 11), Ngora (3; 10), Serere (3; 13), Soroti[•] (5; 25)
	Mid East I (37; 160)	Bududa (3; 7), Bukwo (3; 10), Bulambuli (3; 13), Kapchorwa (4; 11), Kween (3; 11), Manafwa (6; 33), Mbale[•] (9; 54), Sironko (6; 21)
	Mid East II (29; 152)	Budaka (3; 14), Busia (6; 31), Butaleja (4; 18), Kibuku (3;11), Pallisa (4; 26), Tororo (9; 52)
	Near East (53; 265)	Bugiri (7; 36), Buyende (3; 12), Iganga (8; 34), Jinja (10; 57), Kaliro (3; 18), Kamuli (8; 39), Luuka (3; 18), Mayuge (4; 26), Namayingo (3; 9), Namutumba (4; 16),
North [99 ; 356]	Mid North I (27; 81)	Alebtong (3; 8), Amolatar (3; 6), Apac (3; 12), Dokolo (3; 7), Kole (3; 10) Lira[•] (6; 25), Otuke (3; 4), Oyam (3;9)
	Mid North II (22; 79)	Agago (3;8), Amuru (3; 7), Gulu (4; 24), Kitgum (3; 17), Lamwo (3; 5), Nwoya (3; 4), Pader (3; 14).
	North East (19; 22)	Abim (3; 4), Amudat (2; 2), Kaabong (3; 3), Kotido (2; 2), Moroto (3; 5), Nakapiripirit (3; 3), Napak (3; 3).
	West Nile (31; 174)	Adjumani (3; 15), Arua (8; 67), Koboko (3; 13), Maracha (3; 12), Moyo (3; 13), Nebbi (4; 23), Yumbe (4; 22), Zombo (3; 9)
West [130 ; 773]	Far West (28; 165)	Kabale (12; 74), Kanungu (5; 27), Kisoro (4; 27), Rukungiri (7; 37)
	Mid West (32; 192)	Bundibugyo (3;14), Kabarole (7; 42), Kamwenge (3; 26), Kasese (10; 77), Kyegegwa (3; 10), Kyenjojo (4;21), Ntoroko (2; 2)
	North West (24; 144)	Buliisa (3; 6), Hoima (6; 38), Kibaale (8; 59), Kiryandongo (2; 15) Masindi (5; 26)
	South West (46; 272)	Buhweju (3; 5), Bushenyi (7; 30), Ibanda (4; 15), Isingiro (3; 32), Kiruhura (3; 25), Mbarara (9; 55), Mitooma (4; 32), Ntungamo (7; 44), Rubirizi (3; 8), Sheema (3; 26)
Kampala		Kampala (17; 141)
Uganda		(524; 2826)

2.3.6 DISTRIBUTION OF SAMPLED STUDENTS BY SELECTED FACTORS

In this section, the distribution of S 2 students who actually participated in the survey according to gender, age, school ownership, location and zone is presented.

The distribution of S 2 students in the achieved sample according to gender, age, school USE Status, programme, ownership, school location and zone is given in Tables 2.05 to 2.10.

TABLE 2.05:   THE DISTRIBUTION OF S 2 STUDENTS IN THE ACHIEVED SAMPLE BY AGE AND GENDER

AGE (years)	BOYS (N, Percent)		GIRLS (N, Percent)		ALL (N, Percent)	
10 – 13	131	(1.11)	190	(1.93)	321	(1.48)
14	969	(8.19)	1,463	(14.90)	2,432	(11.23)
15	2,371	(20.05)	3,036	(30.00)	5,407	(24.98)
16	3,510	(29.68)	3,232	(32.91)	6,742	(31.15)
17	2,944	(24.90)	1,456	(14.82)	4,400	(20.33)
18	1,268	(10.72)	341	(3.47)	1,609	(7.43)
18+[β]	632	(5.34)	104	(1.06)	736	(3.40)
Total	11,825	(54.63)	9,822	(45.37)	21,647	(100.00)

TABLE 2.06:   DISTRIBUTION OF S 2 STUDENTS IN THE ACHIEVED SAMPLE BY SCHOOL USE STATUS AND GENDER

SCHOOL USE STATUS	BOYS (N, Percent)		GIRLS (N, Percent)		ALL (N, Percent)	
USE	10,163	(85.95)	8,178	(83.26)	18,341	(84.73)
Non–USE	1,662	(14.05)	1,644	(16.74)	3,306	(15.27)
Total	11,825	(54.63)	9,822	(45.37)	21,647	(100.00)

[β]Above 18 years old.

TABLE 2.07: DISTRIBUTION OF S 2 STUDENTS IN THE ACHIEVED
SAMPLE BY SCHOOL OWNERSHIP AND GENDER

SCHOOL OWNERSHIP	BOYS (N, Percent)		GIRLS (N, Percent)		ALL (N, Percent)	
Government	9,079	(76.78)	7,122	(72.51)	16,201	(74.84)
Private	2,746	(23.22)	2,700	(27.49)	5,446	(25.16)
Total	11,825	(54.63)	9,822	(45.37)	21,647	(100.00)

TABLE 2.08: DISTRIBUTION OF S 2 STUDENTS IN THE ACHIEVED SAMPLE BY
SCHOOL OWNERSHIP, USE STATUS AND GENDER

SCHOOL OWNERSHIP AND USE STATUS		BOYS (N, Percent)		GIRLS (N, Percent)		ALL (N, Percent	
Government	USE	8,626	(95.01)	6,773	(95.10)	15,399	(95.05)
	Non-USE	453	(4.99)	349	(4.90)	802	(4.95)
	TOTAL	9,079	(56.04)	7,122	(43.96)	16,201	(100.0)
Private	USE	1,537	(55.97)	1,405	(52.04)	2,942	(54.02)
	Non-USE	1,209	(44.03)	1,295	(47.96)	2,504	(45.98)
	TOTAL	2,746	(50.42)	2,700	(49.58)	5,446	(100.0)

TABLE 2.09: DISTRIBUTION OF S 2 STUDENTS IN THE ACHIEVED SAMPLE
BY SCHOOL PROGRAMME AND GENDER

SCHOOL PROGRAMME	BOYS (N, Percent)		GIRLS (N, Percent)		ALL (N, Percent)	
Single–session	8,648	(73.13)	7,351	(74.84)	15,999	(73.91)
Double–session	3,177	(26.87)	2,471	(25.16)	5,648	(26.09)
Total	11,825	(54.63)	9,822	(45.37)	21,647	(100.00)

TABLE 2.10: DISTRIBUTION OF S 2 STUDENTS IN THE ACHIEVED SAMPLE BY SCHOOL LOCATION AND GENDER

SCHOOL LOCATION	BOYS (N, Percent)		GIRLS (N, Percent)		ALL (N, Percent)	
Urban	3,878	(32.79)	3,174	(32.32)	7,052	(32.58)
Rural	7,947	(67.21)	6,648	(67.68)	14,595	(67.42)
Total	11,825	(54.63)	9,822	(45.37)	21,647	(100.00)

TABLE 2.11: DISTRIBUTION OF S 2 STUDENTS IN THE ACHIEVED SAMPLE BY ZONE AND GENDER

REGION	ZONE	BOYS (N, Percent)		GIRLS (N, Percent)		ALL (N, Percent)	
Central	Central I	1,129	(9.55)	1,233	(12.55)	2,362	(10.91)
	Central II	705	(5.96)	610	(6.21)	1,315	(6.07)
	Central III	525	(4.44)	588	(5.99)	1,113	(5.14)
East	Far East	733	(6.20)	507	(5.16)	1,240	(5.73)
	Mid East I	788	(6.66)	664	(6.76)	1,452	(6.71)
	Mid East II	901	(7.62)	660	(6.72)	1,561	(7.21)
	Near East	1,471	(12.44)	1,226	(12.48)	2,697	(12.46)
Kampala	Kampala	374	(3.16)	400	(4.07)	774	(3.58)
North	Mid North I	665	(5.62)	403	(4.10)	1,068	(4.93)
	Mid North II	568	(4.80)	331	(3.37)	899	(4.15)
	North East	351	(2.97)	280	(2.85)	631	(2.91)
	West Nile	681	(5.76)	386	(3.93)	1,067	(4.93)
West	Far West	630	(5.33)	627	(6.38)	1,257	(5.81)
	Mid West	878	(7.42)	641	(6.53)	1,519	(7.02)
	North West	608	(5.14)	492	(5.01)	1,100	(5.08)
	South West	818	(6.92)	774	(7.88)	1,592	(7.35)
Uganda		11,825	(54.63)	9,822	(45.37)	21,647	(100.00)

2.3.7 *SURVEY WEIGHTS*

Survey weights for the data were computed in order to make adjustments for the estimates. This was done by making adjustments for the probability of being sampled, non-response as well as post stratification. This would allow for un-biased estimates of the levels of proficiency and mean scores in English Language, Mathematics and Biology.

2.4   DATA COLLECTION

A total of 744 officers were appointed from UNEB, DES, NCDC, Kyambogo University, Gulu University, Nkumba University and the Headquarters of the Ministry of Education and Sports, secondary school teachers and retired senior educationists to work as Zonal Coordinators (ZC) and Team Leaders (TLs) of the data collection process in the schools.

The ZCs and TLs had a one–day training in Kampala facilitated by senior NAPE officers. They were guided by a Test Administrator's Manual (2013), which detailed the procedures to be followed. The officers discussed fully what was outlined in the Manual, which included, among other things, how to obtain a random sample of 30 students, how to conduct the tests as well as how to follow the timetable for each day of assessment. Each TL was given a copy of the Manual to use in the field.

In a school, each TL worked with one test administrator, selected from among secondary school teachers. Double-session schools had two test administrators each. The test administrators had a one–day training in the zone, facilitated by the ZC. Thereafter, the two (or three in a double-session school) conducted assessments in one school for two consecutive days, following the timetable.

2.5   SCORING WORKSHOP

The tests were scored by secondary school teachers in a central venue in Kampala. The scored tests were checked by a team of checkers before being forwarded for data entry. The checkers focused on discrepancies such as unmarked pieces of work and out-of-the-range scores awarded.

2.6   DATA MANAGEMENT AND QUALITY ASSURANCE

The test scores were captured using EpiDATA (version 3.02) from a central computer laboratory set up in Kampala. Double entry system, where two different data entrants capture the scores from the same scripts, was implemented as a quality assurance measure to ensure the reliability of the scores captured. It is more effective in reducing data entry errors than entering the data just once.

Data editing and coding was done to check and adjust data for omissions, consistency, and legibility on questionnaires or other data collection forms. With this,

the data becomes more complete, consistent, or readable and hence, ready for analysis by a computer.

2.7   STATISTICAL DATA ANALYSIS

Data analysis was done using the STATA (version 12.0) statistical package. The analysis was done at three levels. Firstly, the analysis involved determining the overall achievement level in each subject in terms of mean scores and the percentages of students reaching the desired levels of proficiency. Secondly, the proportion of students rated proficient in each competency of a subject was determined. Finally, performance was analyzed by students' gender and age, school USE status, programme, ownership, location and zone.

Students' achievement in each of the tests was described using one of three levels: 'Advanced', 'Adequate', and 'Basic'. This criterion was set at the time of preparing the tests. Detailed description of the categorization of the competencies, by performance levels is given in Section 2 of Chapters 3 – 5. The performance levels were defined as follows:

Advanced level: Indicates superior performance. A student with this rating is considered to have demonstrated complete mastery of the subject matter.

Adequate level: Demonstrates competence in the subject matter. This is the minimum performance level that was desired of the students.

Basic level: Demonstrates the ability to understand only elementary concepts and skills. A student at this level is performing below his/her class level.

NOTE: A student is rated proficient if he/she has reached 'Advanced' or 'Adequate' level of proficiency.

Chapter 3

ACHIEVEMENT OF S 2 STUDENTS IN MATHEMATICS

3.1 INTRODUCTION

The achievement of S 2 students in Mathematics is presented in this chapter. The presentation begins with the overall mean score and percentages of students reaching the different levels of proficiency in different topical areas and competencies. Secondly, the mean scores and percentages of students reaching the desired rating are given by gender, age, school ownership and school USE status, school programme, location and zone. The competencies assessed in the test are described in section 3.2.

3.2 DESCRIPTION OF THE COMPETENCIES ASSESSED BY PROFICIENCY LEVELS.

The description of the competencies assessed in the test is given below.

NOTE: A student at any proficiency level is assumed to have mastered all the competencies specified at or below his/her level.

BASIC LEVEL	ADEQUATE LEVEL	ADVANCED LEVEL
A student is able to:	A student is able to:	A student is able to:
• List elements of members of a set. • State the type of mapping. • Represent sets on a Venn diagram.	• Describe a set. • Complete a papygram.	• Apply the knowledge of sets in daily life.
• Perform the four basic operations on whole numbers. • List factors of a number. • Convert a decimal number into a percentage.	• Perform the four basic operations on decimal numbers. • Find the LCM of two numbers. • Round off a number to a specified number of decimal places. • Complete a number sequence.	• Compute the sum of a series. • Apply LCM in daily life.
• Plot a point on a cartesian plane.	• Show a region represented by an inequality. • Find the equation of a line passing through a set of points. • Draw a line graph.	
• Measure an angle.	• Compute the area of a triangle.	• Construct a triangle whose dimensions are

BASIC LEVEL	ADEQUATE LEVEL	ADVANCED LEVEL
		stated.
• Measure a length.	• Find the number of sides of a regular polygon.	
• Identify the hypotenuse. • Draw a line of symmentry of a regular shape.	• Draw a circle.	
• Work out values of linear functions. • State the equation of a mirror line.		• Determine the image of a point under a reflection in a mirror.
	• Carry out currency conversion. • Compute a commission. • Solve a problem involving money. • Find the curved surface area of a cone. • Solve a problem involving time. • Compute problems involving simple interest. • Find the number of sides o f a regular polygon.	
• Compute the median of ungrouped data.		• Draw a pie-chart. • Interpret a line graph or bar graph.

NOTE : A student is rated proficient if he/she has reached 'Advanced' or 'Adequate' level of proficiency.

3.3   OVERALL ACHIEVEMENT LEVEL OF S 2 STUDENTS IN MATHEMATICS

This section outlines the overall level of achievement of S 2 students in Mathematics.

The mean score was 44.1% with a standard error (S.E) of 0.37. The respective mean scores of boys and girls were 46.7% (S.E 0.45) and 41.6% (S.E 0.40). This implies that the boys performed significantly better than the girls.

Table 3.01 shows the percentage of students meeting or exceeding the proficiency thresholds in Mathematics.

TABLE 3.01:   PERCENTAGE OF STUDENTS REACHING VARIOUS LEVELS OF PROFICIENCY IN MATHEMATICS, BY GENDER.
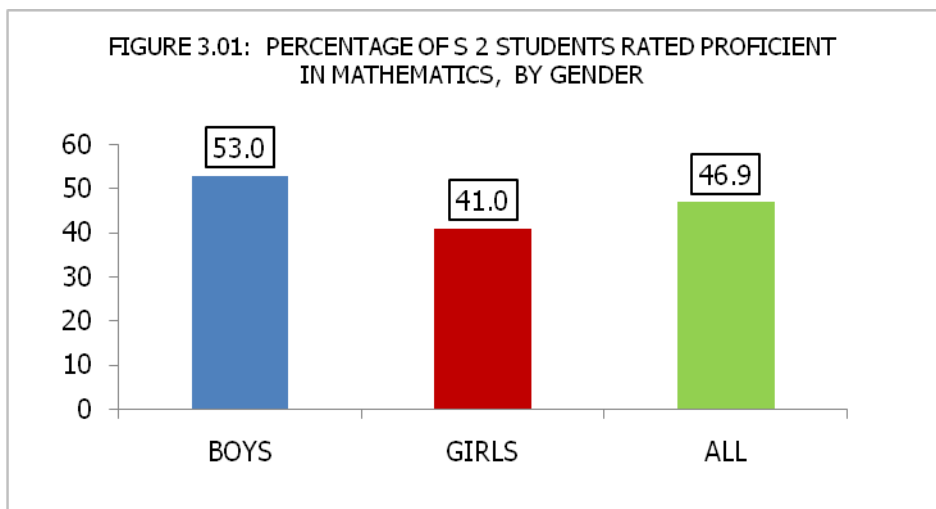
PROFICIENCY LEVELS	BOYS	GIRLS	ALL
Advanced	5.8	2.6	4.2
Adequate	47.2	38.4	42.7
Basic	47.0	59.0	53.1

Only 4.2% of the students met or exceeded the 'Advanced' level of proficiency in Mathematics. These were the students who demonstrated a thorough understanding of Mathematics concepts as well as an exemplary display of the associated skills.

The second category of students rated 'Adequate' comprised 42.7%. These were students who demonstrated satisfactory display of Mathematical skills with an average understanding of the associated concepts.

The last category of students rated 'basic' comprised 53.1%. These were the students who had a limited display of the Mathematical skills. For instance, they were able to plot points on a cartesian plane, perform the four basic operations on whole numbers as well as measure lengths and angles accurately.
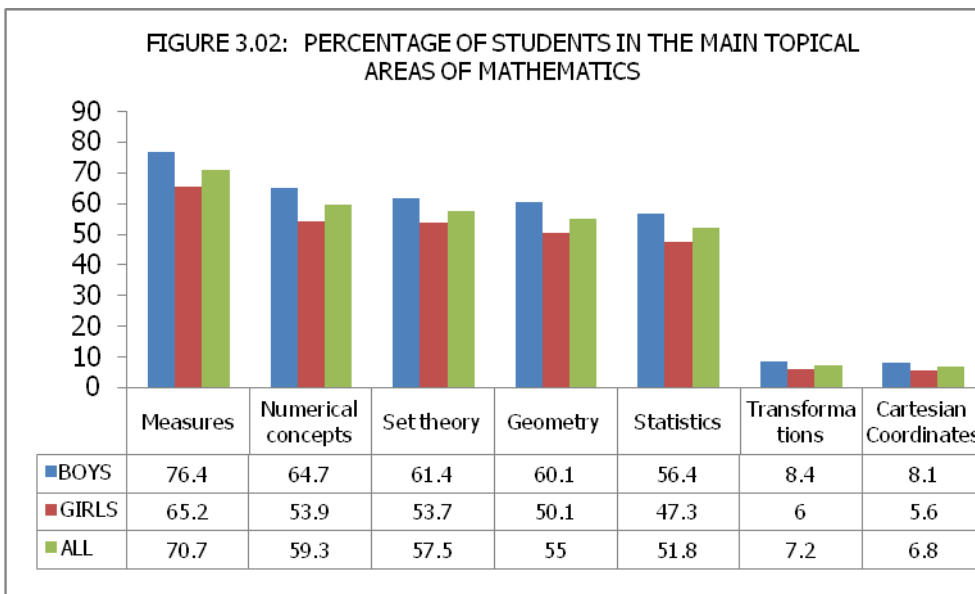
Figure 3.01 shows the percentage of S 2 students rated proficient in Mathematics by gender.

FIGURE 3.01: PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN MATHEMATICS, BY GENDER

About a half of the students (46.9%) met or exceeded the threshold proficiency level in Mathematics. The respective proportions of the boys and girls rated proficient were 53.0% and 41.0%. This shows that there was a significant difference in the proportion of boys and girls rated proficient.

3.4 ACHIEVEMENT OF S 2 STUDENTS IN MATHEMATICS BY TOPICAL AREAS

In this section, an outline of the achievement of students in the main topical areas of Mathematics is provided. Figure 3.02 shows the proportions of students meeting or exceeding the proficiency threshold in various topics in Mathematics.

FIGURE 3.02: PERCENTAGE OF STUDENTS IN THE MAIN TOPICAL AREAS OF MATHEMATICS

	Measures	Numerical concepts	Set theory	Geometry	Statistics	Transformations	Cartesian Coordinates
BOYS	76.4	64.7	61.4	60.1	56.4	8.4	8.1
GIRLS	65.2	53.9	53.7	50.1	47.3	6	5.6
ALL	70.7	59.3	57.5	55	51.8	7.2	6.8

Majority of the students (70.7%) met or exceeded the threshold proficiency level in the topic of Measures. This was the most well done topic in Mathematics followed by Numerical Concepts in which 59.3% of the students attained a similar rating. About 1 in 2 students were rated proficient in: Statistics, Geometry and Set theory. The worst done topics were 'Cartesian Coordinates' and 'Transformations' where the respective proportions attaining the desired proficiency were 6.8% and 7.2%. There was a significant difference between the proportion of boys and girls reaching the desired rating in all the topical areas of Mathematics.

3.5 ACHIEVEMENT OF STUDENTS IN SELECTED COMPETENCIES OF MATHEMATICS

This section presents the performance of students in the selected competencies of Mathematics grouped in topical areas. The flags on each competence were assigned one of the colours 'Green', 'Yellow' or 'Red' where 'Green' represents a competence in which at least three quarters of the students were rated proficient. 'Yellow' represents competencies in which at least a half, but less than three quarters of the students attained the desired rating.

Lastly, 'Red' depicts the competencies in which less than a half of the students met or exceeded the proficiency threshold. Tables 3.02 – 3.08 show the proportion of students rated proficient in the competencies of Mathematics grouped in topical areas.

PERCENTAGE OF STUDENTS RATED PROFICIENT IN SELECTED COMPETENCIES OF 'MEASURES'.

COMPETENCIES	BOYS	GIRLS	ALL
Carrying out currency conversions.	94.2	90.0	92.1
Computing the perimeter of a triangle.	77.9	73.9	75.9
Computing the time to carry out an activity.	81.1	69.4	75.2
Solving problems involving shopping.	75.7	68.0	71.8
Computing the curved surface area of a cone.	58.0	53.4	55.7
Computing a commission.	40.6	31.6	36.1
Simple interest.	19.9	14.7	17.3

'Currency conversion' was done best in the topic of 'Measures' where the proportion of students reaching the desired proficiency was 92.1%. Whereas over 3 in 4 students (75.9%) were able to compute the perimeter of a triangle, about a half of the students (55.7%) could compute the curved surface area of a cone. Fewer than 20% of the students were able to compute the initial amount of money deposited in a bank so as to earn an interest at a given rate.

There were more boys than girls rated proficient in all the competencies of 'Measures'. The difference in the proportions of boys and girls attaining the desired rating was more significant in the competencies of 'solving problems involving shopping' and 'computing the time taken to carry out an activity', the disparity being widest in the competence of everyday shopping.

3.03   PERCENTAGE OF STUDENTS RATED PROFICIENT IN SELECTED COMPETENCIES OF 'NUMERICAL CONCEPTS'

COMPETENCIES	BOYS	GIRLS	ALL
Subtracting a 2-digit number from a 3-digit number.	96.7	95.6	96.2
Finding the LCM of two numbers.	72.4	68.4	70.4
Converting a decimal to a percentage.	65.0	57.8	61.4
Completing a sequence.	56.2	44.2	50.1
Listing multiples and factors of numbers.	45.2	37.6	41.4
Using the concept of LCM in novel situations.	23.8	14.5	19.1
Correcting a number to a specified decimal place.	12.3	8.8	10.5

A majority of the students (96.2%) were able to subtract a two digit number from a three digit number horizontally. This was the best demonstrated competence in the topic of 'Numerical concepts'. Whereas nearly three quarters of the students (70.4%) were able to find the LCM of two numbers, only 19.1% demonstrated

competence in application of the LCM in daily life problems. The least established competence among the students (3.2%) was finding the sum of a given series. More boys than girls reached the desired proficiency level in all the competencies of 'Numerical Concepts'.

TABLE 3.04:   *PERCENTAGE OF STUDENTS RATED PROFICIENT IN SELECTED COMPETENCIES OF 'SET-THEORY'.*

COMPETENCIES	BOYS	GIRLS	ALL
Representing a relationship using set symbols.	91.8	91.6	91.7
Applying set theory in novel situations.	55.6	49.9	52.7
Describing a set.	46.7	46.4	46.6
Completing a diagram showing a relationship.	46.1	37.9	41.9
Identifying a type of mapping.	2.6	2.9	2.7

A majority of students (91.7%) demonstrated mastery in the knowledge and use of set symbols.

Whereas nearly 1 in 2 students (52.7%) were able to apply set theory in real life situations, less than a half could either describe a set or complete a diagram showing a relation. Further, very few students (2.7%) showed that they had knowledge of 'identifying a type of mapping'. The proportions of boys and girls reaching the desired rating in each of the competencies of 'Set Theory' were comparable.

TABLE 3.05:   *PERCENTAGE OF STUDENTS RATED PROFICIENT IN SELECTED COMPETENCIES OF 'GEOMETRY'.*

COMPETENCIES	BOYS	GIRLS	ALL
Measuring lengths accurately.	77.2	71.8	74.5
Measuring angles accurately.	64.2	51.4	57.7
Identifying the hypotenuse of a triangle.	60.2	54.9	57.5
Constructing a triangle.	56	47.8	51.8
Finding the number of sides of a regular polygon.	31.2	26.5	28.8
Drawing a circle accurately.	31.2	26.5	28.8

Whereas about 3 in 4 students (74.5%) demonstrated adequate skills in measuring and stating the unit of measurement of a given length, about 1 in 2 attained a similar rating in 'constructing a triangle' whose dimensions are given.

Nearly equal proportions of students ($\approx$57.5%) demonstrated competence in measuring of angles accurately and identifying the hypotenuse of a right-angled triangle. More boys than girls were rated proficient in the selected competencies of 'Geometry'.

TABLE 3.06:   PERCENTAGE OF STUDENTS RATED PROFICIENT IN SELECTED COMPETENCIES OF 'STATISTICS'

COMPETENCIES	BOYS	GIRLS	ALL
Interpreting bar graphs.	81.3	72.8	77.0
Computing the median for non-grouped data.	65.3	63.3	64.3
Interpreting a line graph.	43.6	37.8	40.7
Presenting information in pie chart.	34.5	26.9	30.7

Whereas over three quarters of the students (77.0%) could interprete the bar graph, only 40.7% attained a similar rating in 'interpretating a line graph'. Further, nearly 2 in every 3 students were able to 'compute the median of ungrouped data'. Students demonstrated the least competence in 'presentating information in a pie chart'. The boys performed significantly better than the girls in the selected competencies of statistics.

TABLE 3.07:   PERCENTAGE OF STUDENTS RATED PROFICIENT IN SELECTED COMPETENCIES OF 'TRANSFORMATIONS AND FUNCTIONS'.

COMPETENCIES	BOY	GIRLS	ALL
Working out values of a linear function.	55.7	52.6	54.1
Drawing a graph of linear functions.	10.1	7.6	8.9
Determining the image of a point under a reflection.	1.5	1.1	1.3
Stating the equation for a mirror line.	0.6	0.3	0.4

A satisfactory percentage of students (54.1%) worked out values of linear functions. However, less than 10% of the students could draw a graph of a linear function and could also determine the image of a point under a reflection. Only 0.4% of the students could state the equation of the mirror line. More boys than girls were rated proficient in the selected competencies of 'transformations and functions'.

TABLE 3.08:   PERCENTAGE OF STUDENTS RATED PROFICIENT IN SELECTED COMPETENCIES OF 'CARTESIAN COORDINATES AND GRAPHS'

COMPETENCIES	BOYS	GIRLS	ALL
Plotting points on a cartesian plane.	54.7	52.1	53.4
Drawing a straight line graph from a set of points.	13.0	10.3	11.6
Showing a region represented by an inequality.	12.6	9.9	11.2
Finding equation of a line passing through points.	7.0	4.3	5.6

Nearly a half of the students (53.4%) could plot a point on a cartesian plane. Less than 15% of the students were competent in other concepts of coordinates and graphs. More boys than girls were rated proficient in 'cartesian coordinates and graphs'.

3.6 ACHIEVEMENT OF S 2 STUDENTS IN MATHEMATICS BY AGE AND GENDER
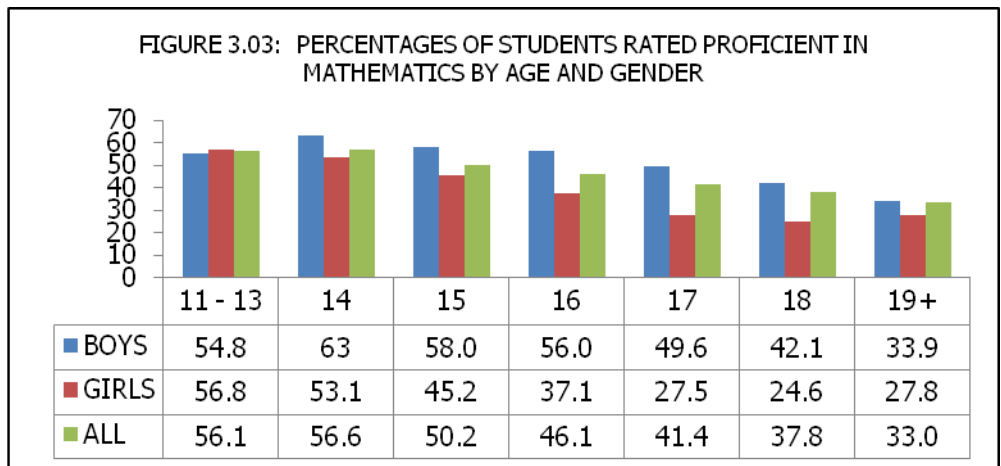
This section outlines the performance of S 2 students in Mathematics by age and gender. Table 3.09 shows the mean scores of students in Mathematics by age and gender.

TABLE 3.09: MEAN SCORES (PERCENTAGE) OF S 2 STUDENTS IN MATHEMATICS BY AGE AND GENDER

AGE (years)	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
11 – 13	47.9	1.75	47.3	2.0	47.5	1.46
14	51.7	1.08	46.5	0.79	48.3	0.75
15	49.0	0.70	42.8	0.50	45.3	0.47
16	47.4	0.47	40.2	0.43	43.6	0.40
17	45.0	0.46	36.9	0.55	42.0	0.42
18	42.2	0.58	36.4	0.89	40.8	0.53
19^+	39.8	0.89	36.1	1.60	39.3	0.80

The mean score of students in Mathematics, increased from 47.5% for the 11-13 year olds to 48.3% for the 14 year olds. Then it decreased with increase in age from 48.3% for the 14 year olds to 39.3% for the 19+ year olds. In each age category, the boys obtained higher mean scores than the girls.

Figure 3.03 shows the percentage of students rated proficient in Mathematics by age and gender.

FIGURE 3.03: PERCENTAGES OF STUDENTS RATED PROFICIENT IN MATHEMATICS BY AGE AND GENDER

	11 - 13	14	15	16	17	18	19+
■ BOYS	54.8	63	58.0	56.0	49.6	42.1	33.9
■ GIRLS	56.8	53.1	45.2	37.1	27.5	24.6	27.8
■ ALL	56.1	56.6	50.2	46.1	41.4	37.8	33.0

The proportiton of students rated proficient in Mathematics increased from 56.1% for the 11-13 year olds to 56.6% for the 14 year olds and then decreased with increase in age to 33.0% for the 19+ year olds.

With the exception of the 11-13 year olds where more girls than boys attained the desired rating in Mathematics, the converse was true in all of the other age categories.

3.7   ACHIEVEMENT OF S 2 STUDENTS IN MATHEMATICS BY SCHOOL OWNERSHIP AND GENDER

In this section, the performance of students in Mathematics by school ownership and USE status is presented separately. Secondly a description of the achievement of students by school ownership and USE status is given.

3.7.1 Achievement of S 2 Students in Mathematics by School Ownership and Gender

In this sub section a presentation of the achievement of students in Mathematics by school ownership and gender is made. Table 3.10 shows the mean scores of students in Mathematics by school ownership and gender.

TABLE 3.10:   MEAN SCORES (PERCENTAGE) OF STUDENTS IN MATHEMATICS BY SCHOOL OWNERSHIP AND GENDER

OWNERSHIP	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
Government	46.6	0.58	41.7	0.50	44.2	0.48
Private	46.9	0.72	41.6	0.77	44.0	0.64

The mean scores of students from the government and private schools were 44.2% and 44.0% respectively; implying that they obtained comparable means. The boys performed significantly better than the girls in each type of school set up. Figure 3.04 shows the percentages of students meeting or exceeding the proficiency threshold in Mathematics by school ownership and gender.

FIGURE 3.04: PERCENTAGES OF STUDENTS RATED PROFICIENT IN MATHEMATICS BY SCHOOL OWNERSHIP
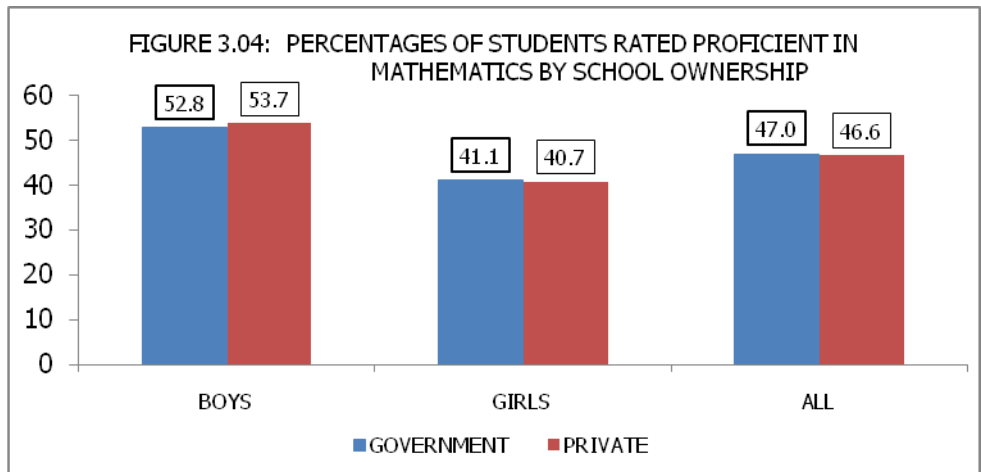
There was approximately an equal number of students rated proficient in Mathematics in both government and private schools, i.e. about 1 in 2 students in either government or private schools attained the desired rating in Mathematics. More boys than girls reached the desired proficiency in each category of the school ownership.

3.7.2 Achievement of Students in Mathematics by School USE Status and Gender

This sub section describes the performance of the students by school USE status and gender. Table 3.11 shows the mean scores of students in Mathematics by school USE status and gender.

TABLE 3.11:   MEAN SCORES (PERCENTAGE) OF STUDENTS IN MATHEMATICS BY SCHOOL USE STATUS AND GENDER

SCHOOL USE STATUS	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
USE	45.0	0.44	39.8	0.40	42.4	0.37
Non–USE	54.8	1.51	48.8	1.23	51.8	1.20

Students from non-USE schools obtained a mean score, 51.8% which was significantly higher than that of the USE students (42.4%). Boys performed better than the girls in each school status. Figure 3.05 shows the proportions of students attaining the desired rating in Mathematics by school USE status.
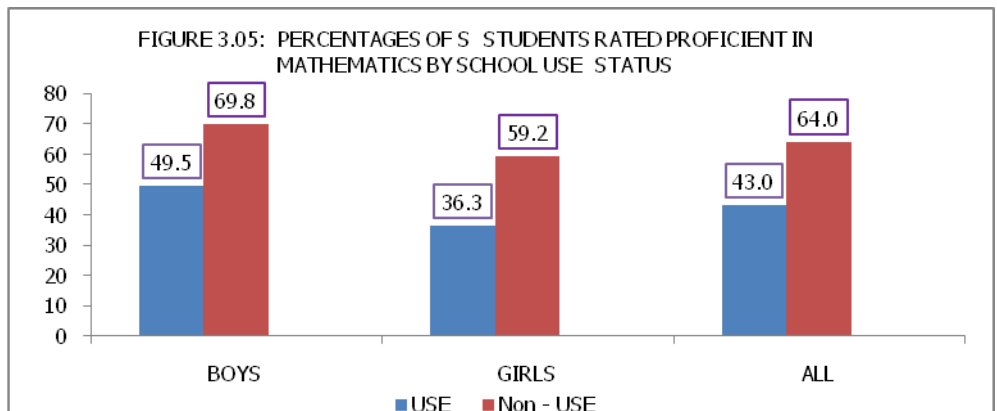
The proportions of students rated proficient from the non-USE and USE schools were 64.0% and 43.0% respectively, implying that there were more students from the non-USE schools than the USE schools reaching the desired proficiency. More boys than girls attained the desired rating in each school category.

3.7.3 Achievement of Students in Mathematics by School Ownership, USE Status and Gender

In this sub-section an outline of students' performance in Mathematics by school ownership, USE status and gender is given. Table 3.12 shows the mean scores of students in Mathematics by school ownership, USE status and gender.

TABLE 3.12:   MEAN SCORES (PERCENTAGE) OF STUDENTS IN MATHEMATICS BY SCHOOL OWNERSHIP, USE STATUS AND GENDER.

SCHOOL OWNERSHIP AND USE STATUS	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
Government USE	45.4	0.51	40.6	0.45	43.0	0.43
Government Non–USE	63.8	2.54	57.0	1.90	60.4	1.85
Private USE*	42.8	0.74	36.3	0.73	39.4	0.62
Private Non–USE	51.2	1.28	46.4	1.19	48.5	1.09

Students from the government non-USE schools obtained a significantly higher mean score of 60.4% than the mean score of 43.0% their counter parts from the government USE schools.

The respective mean scores of students from government non-USE and private non-USE were 60.4% and 48.5%. Further, the mean score of students (48.5%) from private non-USE schools was significantly higher than the mean score of their counter parts (39.4%) from private USE schools. Boys performed better than the girls in all school categories. Figure 3.06 shows the percentages of students in Mathematics by school ownership, USE status and gender.

FIGURE 3.06: PERCENTAGES OF S 2 STUDENTS RATED PROFICIENCT IN MATHEMATICS BY SCHOOL OWNERSHIP, USE STATUS AND GENDER

	GOVERNMENT USE	GOVERNMENT Non - USE	PRIVATE USE	PRIVATE Non - USE
BOYS	50.4	87.4	44.7	63
GIRLS	38.3	80.8	27.3	52.8
ALL	44.4	84.1	35.5	57.2
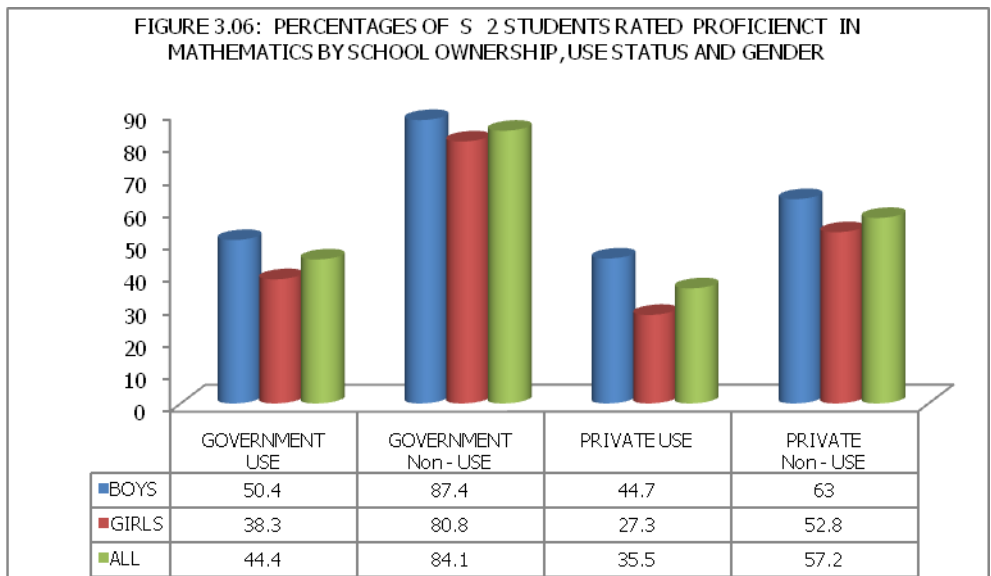
Over three quarters of the students (84.1%) from the government non-USE schools were rated proficient in Mathematics compared to only 44.4% of the students from government USE schools who attained a similar rating.

Whereas over a half of the students (57.2%) from the private non-USE schools reached the desired proficiency in Mathematics, only about a third reached a similar

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* Commonly referred to as PPP schools: Public Private Partnership Schools

rating from the private USE schools. More boys than girls met or exceeded the threshold proficiency in each school type.

3.8 ACHIEVEMENT OF S 2 STUDENTS IN MATHEMATICS BY SCHOOL PROGRAMME AND GENDER

In this section, a description of students achievement in Mathematics by school programme and gender is made. Table 3.13 shows the mean scores of students in Mathematics by school programme and gender.

TABLE 3.13:   MEAN SCORES (PERCENTAGE) OF STUDENTS IN MATHEMATICS BY SCHOOL PROGRAMME

SCHOOL PROGRAMME	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
Single – session	47.4	0.51	42.0	0.49	44.7	0.43
Double – session	44.3	0.95	40.3	0.73	42.3	0.75

The mean scores of students from single-session and double-session schools were 44.7% and 42.3% respectively, implying that they were comparable. Boys obtained significantly higher mean scores than the girls in each school set up. Figure 3.07 shows the proportions of students attaining the desired proficiency level in Mathematics by school programme.

FIGURE 3.07: PERCENTAGES OF S 2 STUDENTS RATED PROFICIENT BY SCHOOL PROGRAMME
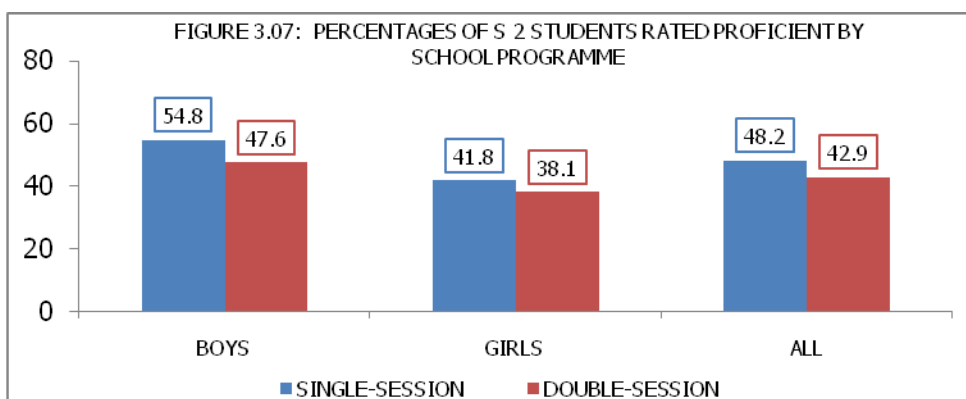
Slightly more students (48.2%) from single-session schools reached the desired proficiency rating as compared to the students from double-session schools. More boys than girls were rated proficient in each school programme.

3.9 ACHIEVEMENT OF S 2 STUDENTS IN MATHEMATICS BY SCHOOL LOCATION AND GENDER

In this section, a presentation of the performance of students in Mathematics by school location and gender is made. Table 3.14 gives the mean scores of students in Mathematics by school location and gender.

TABLE 3.14:   MEAN SCORES (PERCENTAGE) OF STUDENTS IN SCHOOL LOCATION AND GENDER

SCHOOL LOCATION	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
Urban	48.3	1.10	43.2	0.78	45.7	0.85
Rural	45.7	0.42	40.8	0.48	43.2	0.39

The respective mean scores of students from urban and rural schools were 45.7% and 43.2%, indicating that the students' performance in either school category of location were comparable. Boys performed significantly better than the girls in each school category. Figure 3.08 shows the proportions of students rated proficient in Mathematics by school location.

FIGURE 3.08: PERCENTAGE OF S 2 STUDENTS RATED PROFICENT IN MATHEMATICS BY SCHOOL LOCATION AND GENDER
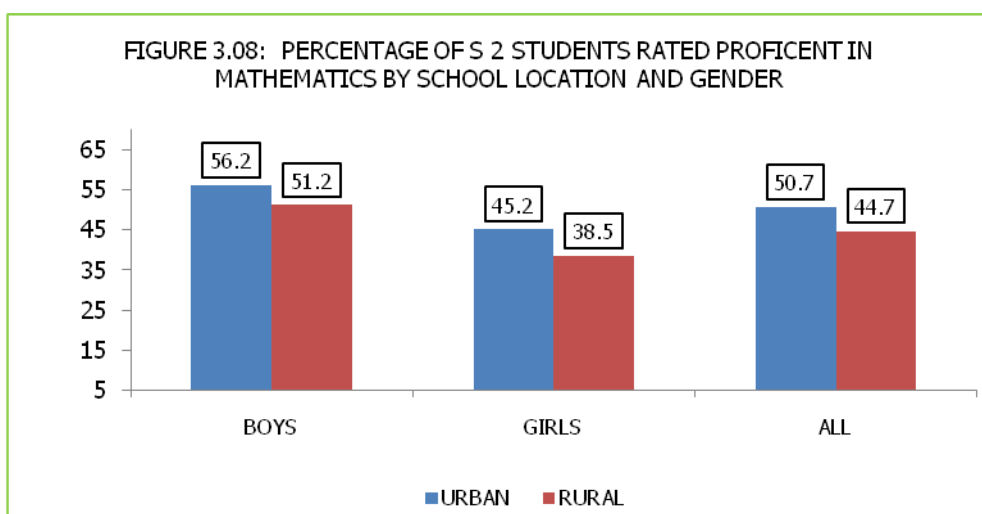
Whereas 1 in 2 students from the urban schools attained the desired proficiency level, less than 45% of students from the rural schools attained a similar rating. Boys performed significantly better than the girls in each school category.

3.10 ACHIEVEMENT OF STUDENTS IN MATHEMATICS BY ZONE AND GENDER

A description of the achievement of students in Mathematics by zone and gender is given in this section. Table 3.15 shows the mean scores of students in Mathematics by zone and gender.

TABLE 3.15:   MEAN SCORES (PERCENTAGE) OF S 2 STUDENTS IN MATHEMATICS BY ZONE

REGION	ZONE	BOYS		GIRLS		ALL	
		Mean	S.E	Mean	S.E	Mean	S.E
Central	Central I	48.9	1.40	44.3	1.10	46.3	1.08
	Central II	43.1	1.32	37.4	1.70	40.3	1.43
	Central III	43.6	0.88	41.0	1.07	42.1	0.78
East	Far East	44.8	1.62	38.2	0.80	41.9	1.02
	Mid East I	40.5	1.82	36.1	1.72	38.2	1.00
	Mid East II	43.7	1.56	36.3	1.24	40.3	1.22
	Near East	42.4	0.89	40.1	1.23	41.2	0.88
Kampala	Kampala	50.6	2.07	47.8	1.96	49.1	1.91
North	Mid North I	49.0	1.84	39.2	1.68	44.9	1.61
	Mid North II	49.1	1.73	40.3	1.17	45.4	1.31
	North East	47.7	1.86	38.0	2.42	42.7	1.41
	West Nile	48.7	1.54	39.0	1.22	44.7	1.45
West	Far West	54.5	2.39	48.6	2.00	51.2	2.01
	Mid West	43.9	1.51	38.9	1.56	41.6	1.47
	North West	42.8	1.25	38.8	0.78	40.8	0.99
	South West	58.9	1.65	51.4	1.25	54.9	1.21
Uganda		46.7	0.45	41.6	0.40	44.1	0.37

Students from South West obtained the highest mean score of 54.9%. They were followed by students from Far West who obtained a mean score of 51.2%. In the rest of the zones the mean scores of students ranged from 38.2% for Mid East I to 49.1% for Kampala, showing that the mean scores were clustered together, i.e the performance of the students in Mathematics across the country has small variations by zone. Boys obtained higher mean scores than girls in each zone. The highest disparity in the achievement of boys and girls was in the zone of Mid North I.

Table 3.16 shows the percentage of S 2 boys and girls rated proficient in Mathematics by zone and gender.

PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN MATHEMATICS BY ZONE

REGION	ZONE	BOYS	GIRLS	ALL
Central	Central I	57.9	47.8	52.2
	Central II	45.2	28.9	37.2
	Central III	44.3	42.8	43.4
East	Far East	48.9	31.1	40.9
	Mid East I	35.7	26.9	31.2
	Mid East II	45.5	25.9	36.6
	Near East	41.3	36.2	38.7
Kampala	Kampala	63.6	58.4	60.8
North	Mid North I	61.7	35.4	50.5
	Mid North II	64.6	35.0	52.3
	North East	53.8	30.0	41.3
	West Nile	63.3	33.4	50.8
West	Far West	72.9	59.5	65.6
	Mid West	46.5	33.4	40.4
	North West	42.7	31.1	37.0
	South West	80.3	68.9	74.2
Uganda		53.0	41.0	46.9

Nearly 3 in 4 students (74.2%) from South West attained the desired proficiency level in Mathematics, giving the highest proportion of students rated proficient in Mathematics followed by Far West (65.6%) then Kampala (60.8%).

Seven zones: South West, Far West, Kampala, Mid North II, Central I, West Nile and Mid North I had at least 50% of their students meeting or exceeding the threshold for proficiency level. The proportions of students attaining the desired rating in the rest of the zones ranged from 31.2% for Mid East I to 43.4% for Central III.

More boys than girls were rated proficient in Mathematics in each zone.

3.11   ACHIEVEMENT OF S 2 STUDENTS IN MATHEMATICS OVER THE YEARS 2008 – 2013

This section outlines the performance of S 2 students in Mathematics over the period 2008 – 2013. Figure 3.09 shows the trends in achievement of S 2 students in Mathematics over a period of six years.

FIGURE 3.09: PERCENTAGE OF S 2 STUDENTS RATED PRROFICIENT IN MATHEMATICS: 2008-2013, BY GENDER

	2008	2009	2010	2011	2012	2013
BOYS	74.4	60.8	54.7	44	50.8	53.0
GIRLS	63.3	56.6	44.7	32.2	34.3	41.0
ALL	69.4	58.8	49.7	38.2	43.3	46.9
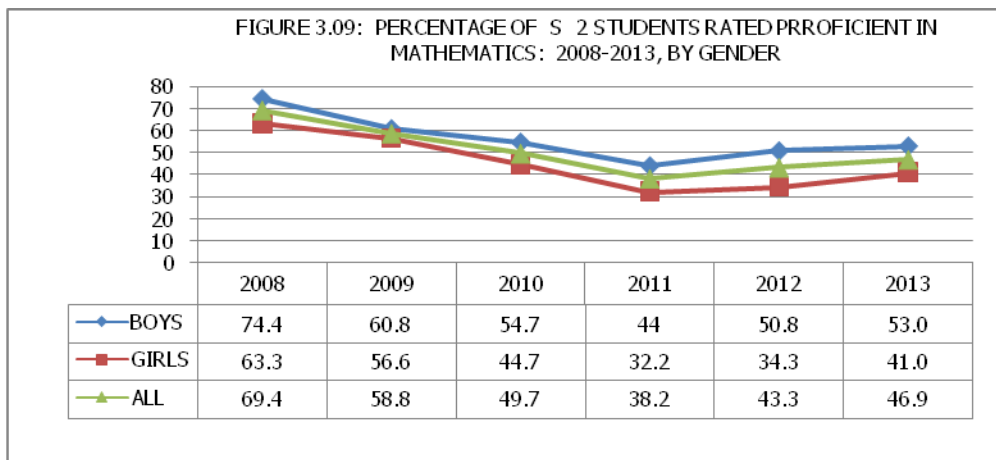
There was a steady (10 point) decrease in the percentage of S 2 students rated proficient in Mathematics from 2008 to 2011. However, an increase of 5% occured in 2012 and a further increase of about 4% in 2013. More boys than girls attained the desired rating in Mathematics throughout the six years.

3.12   CONCLUSIONS

It was in the topic of 'Measures' where the highest proportion of students (70.7%) were rated proficient. Lowest performance was registered in the topic of 'Cartesian coordinates'. In 'Measures', the majority of the students (92.1%) were able to carry out currency conversions. Although many students had difficulty in manipulating the simple interest formular, fewer girls were able to handle problems involving shopping as compared to the boys.

In 'Numerical concepts', majority of the students (96.9%) were competent in operation on numbers, but only a small proportion (3.2%) demonstrated competence in finding the sum of a series.

In 'Set theory', majority of the students (91.7%) showed that not only had they acquired the knowledge of set symbols but could also use them in novel situations. Teachers need to put more emphasis on types of mappings as this was the competence where very few students (2.7%) reached the desired rating in this topic.

In 'Statistics', over three quarters of the students had good mastery of interpretation of the bar graph. They were able to extract the required data accurately, as well as make reasonable inferences about the information extracted. Some of the students (30.7%) still have difficulty in computing the percentages to be used in constructing a pie chart.

In 'Transformations and functions', students had difficulty in nearly all the assessed competencies apart from plotting a point on the cartesian plane.

Higher proportions of students from non-USE schools met or exceeded the threshold proficiency level in Mathematics as compared to students from USE schools.

There was a small gender disparity in the achievement of students in Mathematics with regards to school location, ownership and school programme.

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Chapter 4

ACHIEVEMENT OF S 2 STUDENTS IN ENGLISH LANGUAGE

4.1   INTRODUCTION

The achievement of S 2 students in English Language is presented in this chapter. The presentation begins with the overall mean score and the proportions of students reaching different levels of proficiency. This is followed by a description of the proportions of students rated proficient in the different language sub-skills and competencies. Later, the mean scores and percentages of students rated proficient are given according to gender and age, school ownership, school USE status, school programme, location and zone. The competencies assessed in the test are described in section 4.2.

4.2   DESCRIPTION OF THE COMPETENCIES ASSESSED BY PROFICIENCY LEVELS

The description of the competencies assessed in the test is given below:

NOTE: A student at any proficiency level is assumed to have mastered all the competencies at his/her own level and below.

Skill Area	Competencies by performance levels		
	BASIC LEVEL	ADEQUATE LEVEL	ADVANCED LEVEL
Reading Comprehension	A student is able to: • Read a text and answer direct questions about it.	A student is able to: • Read a text, derive meaning of words used and interpret the message in the text.	A student is able to: • Read a text and answer questions on it by making predictions, inferences and applying information in new situations.
Writing	• Write a composition, but makes errors in spelling, punctuation, sentence construction and tenses. • Write an announcement, but makes errors in content, format and leaves out either time or date or both.	• Write a well sequenced composition, but makes a few errors in spelling, punctuation and tenses. • Write an announcement, but with a few errors in the format and leaves out either date or time.	• Write a coherent composition, relevant to the topic with correct spelling, punctuation and tenses. • Write an announcement with the correct language, content, format and other attributes.
	• Write a formal letter with some errors in the format, punctuation, spelling	• Write a formal letter, but makes some errors in the format.	• Write a formal letter with the correct format and sentence construction.

Skill Area	Competencies by performance levels		
	BASIC LEVEL	ADEQUATE LEVEL	ADVANCED LEVEL
	and sentence construction.		
Grammar	• Identify the present and past simple tenses.	• Identify the present continuous tense.	• Identify the future tense.
	• Use the present and past simple tenses.	• Use most parts of speech correctly.	• Use the past continuous and future tenses correctly.
	• Use a few parts of speech correctly.		• Use parts of speech correctly.
	• Use a few punctuation marks and capital letters correctly.	• Use most punctuation marks and capital letters correctly.	• Use punctuation marks and capital letters correctly.
	• Use a few familiar structures correctly.	• Use most structures correctly.	• Use given structures correctly.
	• Use a few words of quantity and articles correctly.	• Use words of quantity and articles correctly.	

NOTE: *A student is rated proficient if he/she has reached 'Advanced' or 'Adequate' level of proficiency.*

4.3   OVERALL LEVEL OF ACHIEVEMENT OF S 2 STUDENTS IN ENGLISH LANGUAGE

The S 2 students obtained the overall mean score of 45.5%, standard error (S.E: 0.45). The mean scores of the boys and girls were 44.6% (S.E: 0.48) and 46.4% (S.E: 0.51) respectively, which were not significantly different. Table 4.01 shows the proportions of students reaching the various proficiency levels in English Language.

TABLE 4.01:   PERCENTAGE OF S 2 STUDENTS REACHING VARIOUS LEVELS OF PROFICIENCY IN ENGLISH LANGUAGE, BY GENDER

PROFICIENCY LEVELS	BOYS	GIRLS	ALL
Advanced	2.6	2.6	2.6
Adequate	38.4	42.7	40.5
Basic	59.1	54.7	56.9

The S 2 students categorised as 'Advanced' were 2.6%. These are the students who exhibited complete mastery of the competencies in English Language at this level. A proportion of 40.5% of the students were rated 'Adequate'. The students in this category had acquired the desired minimum proficiency in English Language at the S

2 level. The majority, 56.9%, of the S 2 students were rated as 'Basic'. These are students who had acquired only the basic competencies of English Language. They are performing below the level expected of them as S 2 students.

Figure 4.01 shows the percentage of S 2 students rated proficient in English Language by gender.

FIGURE 4.01: PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN ENGLISH LANGUAGE, BY GENDER
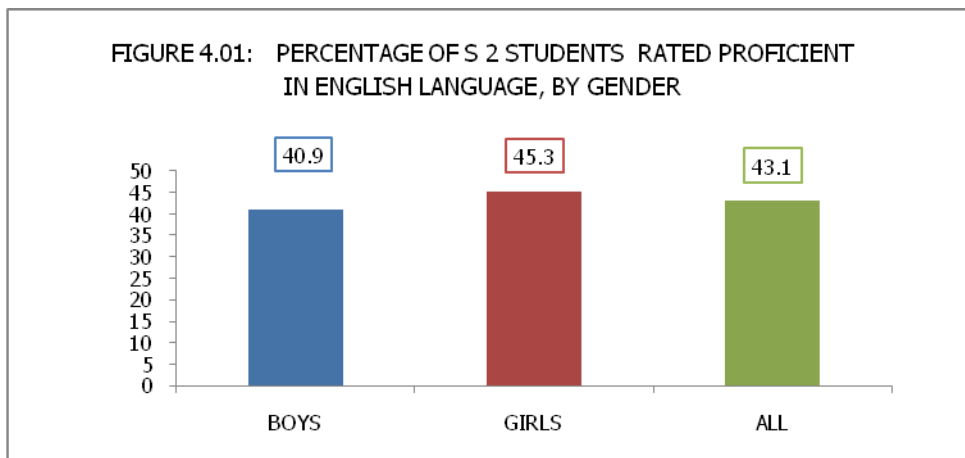
Overall, less than a half of the students 43.1% were rated proficient in English Language. The proportions for boys and girls were 40.9% and 45.3% respectively, indicating that the girls performed significantly better than the boys.

4.4 ACHIEVEMENT OF S 2 STUDENTS IN ENGLISH LANGUAGE BY SKILL AREAS

The achievement of S 2 students in English Language by skill areas is presented in this section. The flags on each competence were assigned one of the colours: 'Green', 'Yellow', or 'Red', where, 'Green' signifies a competence in which at least three quarters of the students were rated proficient. 'Yellow' denotes competencies in which at least a half, but less than three quarters of the students reached the desired proficiency level. Then, 'Red' represents the competencies in which less than a half of the students attained the desired rating.

4.4.1 Achievement of S 2 Students in the Sub-Skill Areas and Competencies of Reading Comprehension

This subsection describes the achievement of students in the sub-skill areas and competencies of Reading Comprehension

Figure 4.02 shows the percentages of S 2 students rated proficient in the sub-skill areas of Reading Compehension. Table 4.02 shows the proportion of S 2 students rated proficient in selected competencies of Reading Compehension.

FIGURE 4.02: PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN SUB-SKILL AREAS OF READING COMPREHENSION

	POEM	CONVERSATION	PASSAGE	CARTOON
BOYS	75.9	73.0	63.9	30.2
GIRLS	79.9	74.3	63.4	32.1
ALL	77.9	73.7	63.6	31.2
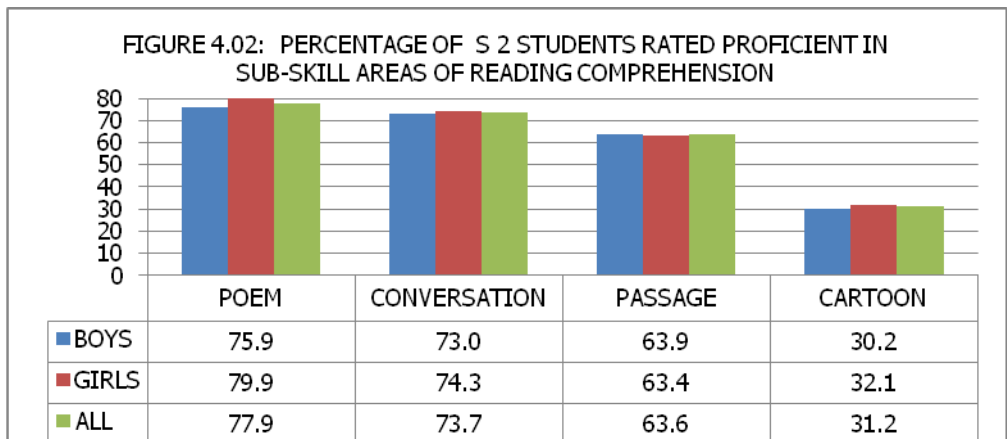
Students' performance in different sub-skill areas of Reading Comprehension varied. More than three-quarters of the students, 77.9%, were rated proficient in 'reading a poem', while slightly less than three quarters, 73.7%, reached the same level in 'reading a conversation'. 'Reading a passage' registered 63.6% of the students rated proficient. At the extreme bottom end was 'reading a cartoon' with less than a third of the students, 31.2%, rated proficient. The gender difference in performance in each sub-skill area was not significant.

Table 4.02 shows the percentages of students rated proficient in selected competencies of Reading Comprehension.

TABLE 4.02:   PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN SELECTED COMPETENCIES OF READING COMPREHENSION

COMPETENCIES	BOYS	GIRLS	ALL
Passage			
Reading a passage and answering questions which require direct response from the text.	81.3	81.4	81.4
Reading a passage and making conclusions by reasoning based on information in the text.	57.0	54.6	55.8
Reading a passage and deriving the contextual meaning of a statement.	32.9	33.2	33.0
Poetry			
Reading a poem and answering questions which require direct responses from the text.	76.4	76.5	76.4
Reading a poem and giving it a suitable title.	48.6	51.0	49.8
Reading a poem and making conclusions by reasoning based on information in the text.	21.7	18.5	20.1
Cartoon			
Reading a cartoon and selecting appropriate information directly from the cartoon strip to answer	54.6	57.8	56.2
Reading a cartoon and making conclusions by reasoning based on information in the cartoon strip.	40.7	45.4	43.1
Reading a cartoon and answering questions requiring to form own opinion.	13.9	15.4	14.6

For all skill areas of Reading Comprehension, most of the students were proficient in competencies that required picking direct information from the text to respond to a question. However, their ability to do this also varied from area to area. Whereas 81.4% were able to select direct appropriate information from a passage, 76.4% and 56.2% could do the same from a poem and cartoon, respectively.

On the other hand, fewer students were rated proficient in competencies requiring higher order thinking abilities such as, making conclusions based on the text and answering questions requiring to form their own opinion based on the text. However, there were no significant gender differences in performance for all competencies.

4.4.2 Achievement of S 2 Students in Sub-Skill Areas and Competencies of Writing

This section presents the achievement of students in writing.
Figure 4.03 shows the percentages of students rated proficient in the sub-skill areas of Writing.

FIGURE 4.03: PERCENTAGE OF S 2 STUDENTS REACHING THE DESIRED LEVEL OF PROFICIENCY IN ENGLISH LANGUAGE BY SUB-SKILL AREAS OF WRITING

	FORMAL LETTER	ANNOUNCEMENT	COMPOSITION
BOYS	62.3	43.9	39.1
GIRLS	65.6	43.9	47.8
ALL	63.9	43.9	43.5
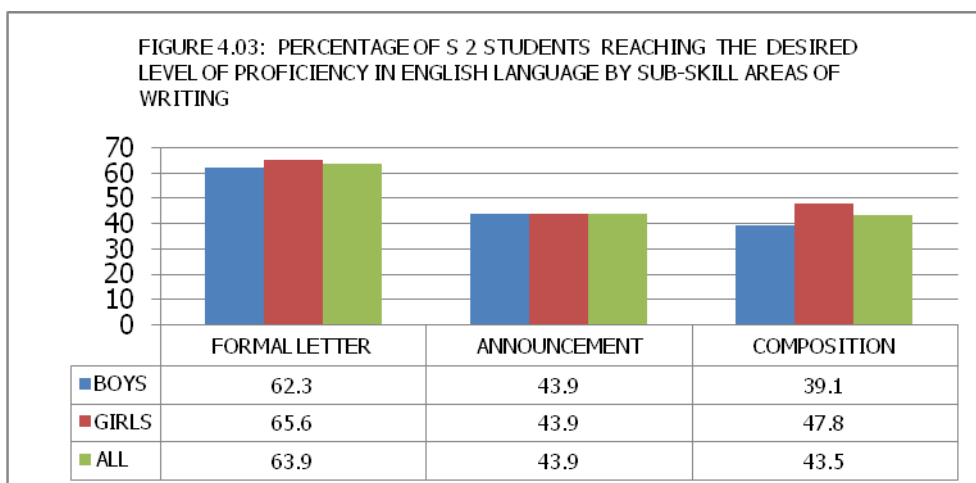
More than a half of the students, 63.9%, were rated proficient in formal letter writing. Less than a half, 43.9% and 43.5%, reached the desired level of proficiency in 'writing an announcement' and a 'composition', respectively. The gender difference was significant in 'composition writing' with the girls performing better than the boys.

Table 4.03 shows the percentages of S 2 students rated proficient in selected attributes of formal letter writing and writing an announcement.

TABLE 4.03:   PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN SELECTED
COMPETENCIES OF WRITING

COMPETENCIES	BOYS	GIRLS	ALL
Formal letter			
Writer's address	79.8	84.3	82.1
Date	75.1	78.9	77
Content	63.6	65.9	64.8
Salutation	59	61.7	60.4
Signature	53.4	54.3	53.9
Subject	51.7	51.7	51.7
Name in block	47.4	51.7	49.6
Signing off	45.3	47.6	46.5
Addressee's address	45.7	45.1	45.4
Format	16.1	16.7	16.4
Announcement			
Target audience	64.3	66.1	65.2
Announcer	57	59	58
Title of announcer	57.3	55.1	56.2
Message	45.2	45.2	45.2
Date	33.1	34.2	33.7
Language	30.2	30.2	30.2
Place	18.8	17.4	18.1
Time	9.2	7.9	8.5

More than a half of the students could write a formal letter with the correct writer's address (82.1%), date (77.0%), relevant content (64.8%), salutation (60.4%), signature (53.9%) and subject indicated (51.7%). Fewer students, 16.4%, were able to write a formal letter with the correct format.

Less than half of the students could write an announcement with a clear message, date, clear appropriate language as required by a given announcement. The other proportion could write an announcement with at least three attributes, i.e. target audience, announcer and title of announcer. The gender differences were not significant.

4.4.3 Achievement of S 2 Students in Grammar

The S 2 students' achievement in Grammar is presented in this section.

Table 4.04 shows the percentages of students rated proficient in the competencies of Grammar.

*TABLE 4.04:   PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN
SELECTED COMPETENCIES OF GRAMMAR*

COMPETENCIES	BOYS	GIRLS	ALL
Using conjuctions	74.1	73.1	73.6
Using the correct tenses.	59.7	58.6	59.1
Using given sentence structure.	53.8	55.8	54.8
Using articles.	51.6	51.5	51.6
Using nouns	32.7	30.0	31.3
Applying the correct punctuation.	21.5	24.8	23.2
Using adjectives.	21.3	24.0	22.7

About three quarters of the students (73.6%) could correctly 'use conjuctions' while more than a half of them could 'use the correct tenses', 'structures' and 'articles'. On the other hand, less than a third of the students (22.7% and 23.2%) could 'use adjectives' and 'apply the correct punctuation', respectively. The gender differences were not significant.

4.5   ACHIEVEMENT OF S 2 STUDENTS IN THE COMPETENCIES OF LISTENING COMPREHENSION

This section presents the performance of S 2 students in Listening Comprehension. The Listening Comprehension test was divided into two parts. Dictation and Listening Comprehension. Dictation consisted of a set of twenty words. The words were read aloud to the students, one at a time, as the students wrote them down. The Listening Comprehension comprised a passage and questions on the passage. The passage and questions were read twice to the students who were required to respond to the questions, in writing, as they were being read. Table 4.05 shows the percentages of S 2 students who wrote each of the words correctly.

TABLE 4.05: PERCENTAGE OF S 2 STUDENTS WHO WROTE EACH WORD CORRECTLY

WORD	BOYS	GIRLS	ALL
Thursday	75.9	77.1	76.5
Marriage	69.0	74.1	71.6
Physics	68.8	68.9	68.8
Supper	49.0	54.0	51.5
Suspension	50.6	46.1	48.3
Loose	48.4	48.3	48.3
Dodging	45.9	44.0	44.9
Acquire	43.0	46.7	44.8
Necessary	40.6	43.6	42.1
Immediate	40.1	42.7	41.4
Qualification	44.4	36.8	40.5
Committed	36.3	42.3	39.4
Suddenly	36.4	40.2	38.3
Biscuit	33.4	36.4	35.0
Honour	32.8	36.7	34.8
Fortunately	34.0	35.4	34.7
Hygiene	27.2	33.6	30.4
Received	26.5	27.5	27.0
Latter	23.3	24.4	23.8
Familiar	16.8	17.3	17.1

More than three quarters of the students could write the words 'Thursday' (76.5%), 'marriage' (71.6%) and 'Physics' (68.8%) correctly. Slightly more than a half of the students (51.5%) could write the word 'supper' correctly. For all the remaining sixteen words, less than a half of the students could write them correctly. The words: 'received', 'latter' and 'familiar' registered the least proportions of students, 27.0%, 23.8% and 17.1%, respectively, who could write them correctly.

The girls did better than the boys in the writing of most of the words, and significantly so in the words: 'committed', 'hygiene', 'marriage' and 'supper'. The boys performed significantly better in correctly writing the word 'qualifications'.

Table 4.06 shows the percentages of students rated correct on selected competencies of Listening Comprehension.

TABLE 4.06:   PERCENTAGE OF S 2 STUDENTS RATED CORRECT ON SELECTED
COMPETENCIES OF LISTENING COMPREHENSION

COMPETENCIES	BOYS	GIRLS	ALL
Listen to a story and answer questions requiring direct responses from the text.	62	62.8	62.4
Listen to a story and explain the contextual meaning of a statement.	27.8	29.7	28.8
Listen to a story, decipher meaning and make inference.	17.6	21.4	19.5
Listen to a story and explain an episode in the story.	18.4	19.8	19.1

Nearly two thirds of the students (62.4%) were able to listen to a story and answer questions that required direct responses from the story.   Only 28.8% exhibited competence in listening to a story and show that they understood the contextual meaning of selected statements. Less than a fifth, 19.1%, could listen to a story and explain an episode in the story.   The gender differences in performance were not significant.

4.6   ACHIEVEMENT OF S 2 STUDENTS IN ENGLISH LANGUAGE BY STUDENTS' AGE AND GENDER

The achievement of S 2 students in English Language by age is presented in this section.

Table 4.07 shows the mean scores of students in English Language by age and gender.

TABLE 4:07:   MEAN SCORES (PERCENTAGE) OF S 2 STUDENTS IN ENGLISH
LANGUAGE BY STUDENTS' AGE AND GENDER

AGE (YEARS)	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
13	49.9	2.05	54.8	1.84	53.0	1.50
14	52.9	1.00	54.1	0.78	53.7	0.73
15	49.1	0.69	48.1	0.55	48.5	0.51
16	44.8	0.46	43.8	0.55	48.5	0.51
17	41.8	0.48	39.8	0.61	41.1	0.45
18	37.7	0.57	37.3	1.30	37.6	0.63
18^+	36.6	0.77	38.8	1.57	36.9	0.73

Students aged 13 and 14 years obtained nearly the same mean scores of 53.0% and 53.7%, respectively. Similarly, the students aged 15 and 16 years scored the same mean of 48.5%. From age 14 years, the mean begins to decline from 53.7% to 36.9% for the 18^+ year – olds.

Figure 4.04 shows the percentages of S 2 students rated proficient in English Language by students' age and gender.

FIGURE 4.04: PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN ENGLISH LANGUAGE BY STUDENTS' AGE AND GENDER

	13	14	15	16	17	18	18+
BOYS	51.3	62.9	52.4	41.3	32.8	23.5	20.5
GIRLS	68.7	68.3	51.1	36.9	26.5	20	24.3
ALL	62.3	66.3	51.6	39	30.4	22.7	21
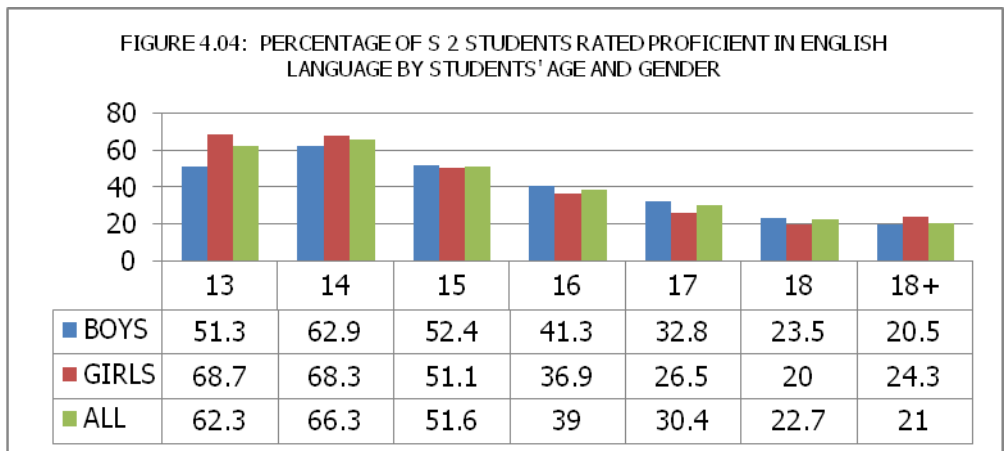
More than a half of the students aged between 13 – 15 years were rated proficient in English Language. The proportions of students rated proficient begin to decline at age 15 years from 51.6% to 30.4% for the 17 year olds and to 21.0% for the 18^{+} year olds.

Girls aged 13 and 14 years performed significantly better than the boys, while boys aged 16 and 17 years performed significantly better than the girls.

4.7 ACHIEVEMENT OF S 2 STUDENTS IN ENGLISH LANGUAGE BY SCHOOL OWNERSHIP AND USE STATUS

This section is a description of the students' achievement in English Language by school ownership and USE status. Achievement of students in English Language by school ownership is presented first. The achievement of students by school USE status follows. Lastly, a description of the achievement of students according to both school ownership and USE status is given.

4.7.1 Achievement of S 2 Students in English Language by School Ownership

Students' achievement by school ownership is presented in this sub-section. The mean scores of students in English Language by school ownership are shown in Table 4.08.

TABLE 4.08: MEAN SCORES (PERCENTAGE) OF STUDENTS IN ENGLISH LANGUAGE BY SCHOOL OWNERSHIP AND GENDER

SCHOOL OWNERSHIP	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
Government	44.0	0.61	45.6	0.65	44.8	0.58
Private	46.6	0.74	48.2	0.89	47.5	0.75

The students from the private schools scored a slightly higher mean score (47.5%) than 44.8% scored by those from the government schools. There were no significant gender differences. Figure 4.05 presents the percentage of students reaching the desired level of proficiency.

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FIGURE 4.05: PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN ENGLISH LANGUAGE BY SCHOOL OWNERSHIP
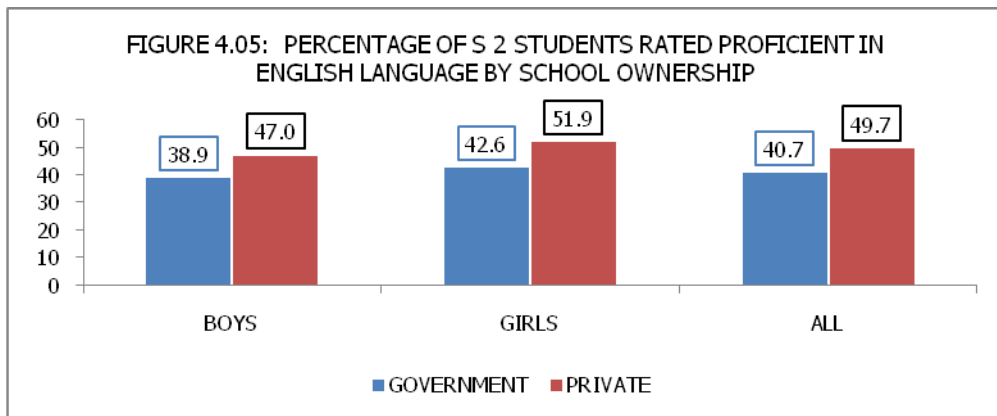
Nearly a half of the students, 49.7%, from the private schools were rated proficient in English Language. This is a significantly higher proportion compared to 40.7% of the students from government schools. There was significant gender difference in the performance of students in the private schools with more girls than boys rated proficient.

4.7.2 Achievement of S 2 Students in English Language by School USE Status

This sub-section is a description of the achievement of S 2 students in English Language by school USE status.

Table 4.09 shows the mean scores of students in English Language by school USE status.

TABLE 4.09: MEAN SCORES (PERCENTAGE) OF S 2 STUDENTS IN ENGLISH LANGUAGE BY SCHOOL USE STATUS

SCHOOL USE STATUS	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
USE	42.6	0.46	44.0	0.53	43.3	0.46
Non-USE	54.7	1.35	55.7	1.35	55.2	1.25

Students in the non–USE schools obtained a higher mean score of 55.2% compared to 43.3% of their counterparts in USE schools. There were no significant gender differences in either case. Figure 4.06 shows the percentage of students rated proficient in English Language by school USE status.

FIGURE 4.06: PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN ENGLISH LANGUAGE BY SCHOOL USE STATUS
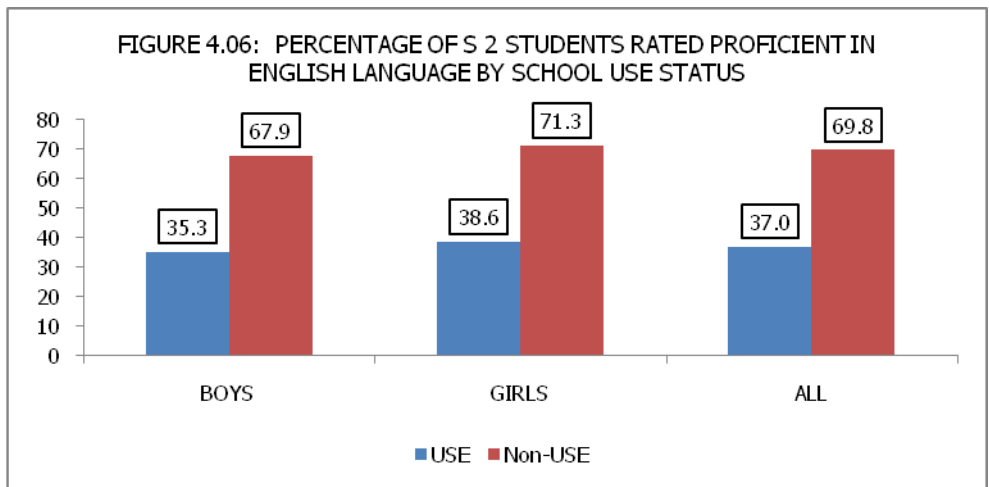
More than two thirds of the students (69.8%) in non–USE schools were rated proficient in English Language. On the other hand, less than a half of the students (37.0%) attained the same level of proficiency in the USE schools. The gender differences in performance were not significant.

4.7.3 Achievement of Students in English Language by School Ownership and USE Status

This sub-section describes the achievement of S 2 students in English Language by school ownership and USE status. Table 4.10 shows the mean scores of students in English Language by school ownership and USE status.

TABLE 4.10:   MEAN SCORES (PERCENTAGE) OF S 2 STUDENTS IN ENGLISH LANGUAGE BY SCHOOL OWNERSHIP AND USE STATUS

SCHOOL OWNERSHIP AND USE STATUS	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
Government USE	42.8	0.54	44.4	0.62	43.6	0.54
Government Non–USE	62.4	2.44	61.9	2.16	62.2	1.96
Private USE[*]	41.8	0.76	41.9	0.89	41.8	0.73
Private Non–USE	51.7	1.14	53.9	1.45	53.0	1.26

Students in the government non–USE schools obtained the highest mean score of 62.2%, followed by the private non–USE schools with a mean score of 53.0%. The difference between the mean score of the government non-USE and private non-USE students is significant. The government USE and private USE students attained slightly different means of 43.6% and 41.8%, respectively. The gender differences in mean scores were not significant.

Figure 4.07 shows the proportions of S 2 students rated proficient in English Language by school onwership and USE status.

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[*] Commonly referred to as PPP schools: Public Private Partnership Schools

FIGURE 4.07: PERCENTAGE OF STUDENTS RATED PROFICIENT IN ENGLISH LANGUAGE BY SCHOOL OWNERSHIP AND USE STATUS

	GOVERNMENT USE	GOVERNMENT Non-USE	PRIVATE USE	PRIVATE Non-USE
■BOYS	35.7	84.8	33.2	61.5
■GIRLS	39.6	83.5	33.9	67.9
■ALL	37.6	84.1	33.5	65.1
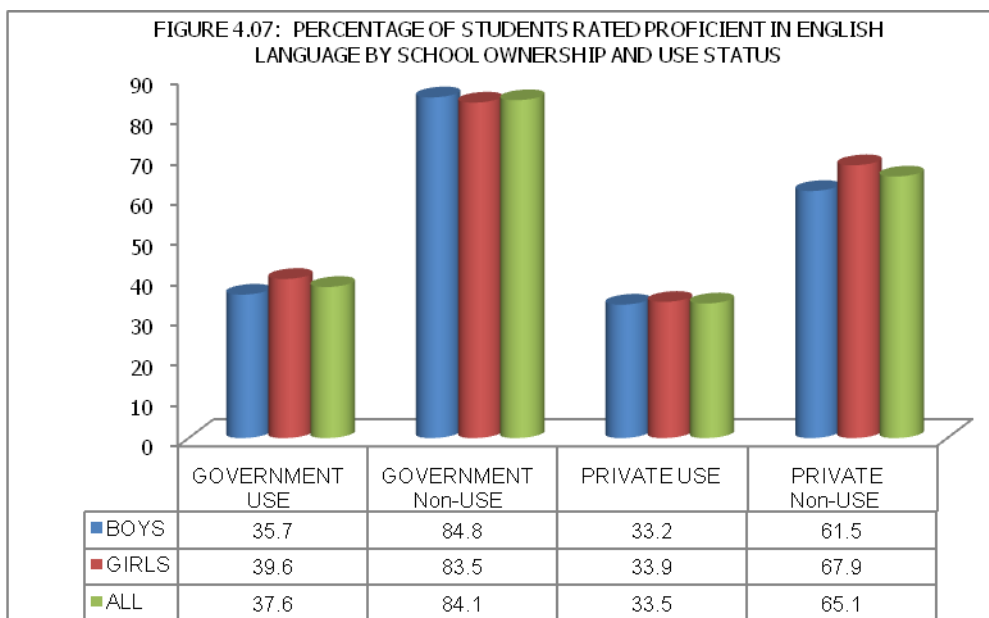
More than three quarters of the students (84.1%) in government non–USE schools were rated proficient in English Language. The corresponding proportion from the private non–USE schools is just about two thirds of the students (65.1%). Less than a half of the students 37.6% and 33.5%, from government and private USE schools, respectively, were rated proficient in English Language.

4.8 ACHIEVEMENT OF S 2 STUDENTS IN ENGLISH LANGUAGE BY SCHOOL PROGRAMME AND GENDER

This section presents the achievement of students in English Language by school programme and gender. Table 4.11 shows the mean scores of students in English Language by school programme.

TABLE 4.11: MEAN SCORES (PERCENTAGE) OF STUDENTS IN ENGLISH LANGUAGE BY SCHOOL PROGRAMME AND GENDER

SCHOOL PROGRAMME	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
Single–session	45.5	0.57	46.7	0.58	46.1	0.52
Double – session	42.2	0.96	45.1	1.23	43.6	1.08

Students from single–session schools obtained a slightly higher mean score of 46.1% compared to their counterparts from the Double–session schools with a mean score of 43.6%. However, the difference between the two means is not significant. Similarly, there were no significant gender differences in the performance of boys and girls in either school programme.

Figure 4.08 presents the percentages of students rated proficient in English Language by school programme and gender.

FIGURE 4.08: PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN ENGLISH LANGUAGE BY SCHOOL PROGRAMME AND GENDER
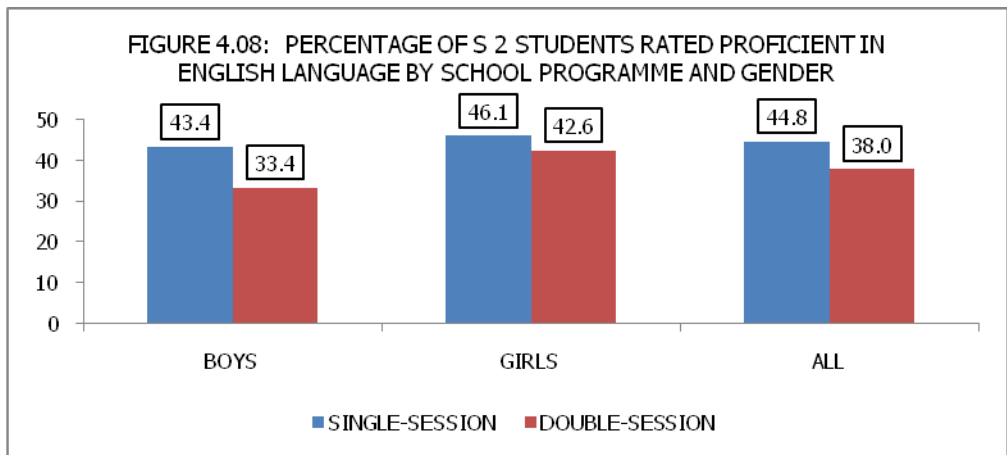
Less than half of the students (44.8%) in single–session schools were rated proficient in English Language, and slightly more than a third (38.0%) of the students in double-session schools reached the same level of proficiency. The gender difference was significant in the double-session schools with girls performing better than boys.

4.9 ACHIEVEMENT OF S 2 STUDENTS IN ENGLISH LANGUAGE BY SCHOOL LOCATION AND GENDER

The achievement of S 2 students in English Language by school location and gender is described in this section. Table 4.12 shows the mean scores of students in English Language by school location and gender.

TABLE 4.12:   MEAN SCORES (PERCENTAGE) OF S 2 STUDENTS IN ENGLISH LANGUAGE BY SCHOOL LOCATION AND GENDER

SCHOOL LOCATION	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
Urban	47.8	1.01	49.9	0.92	48.8	0.93
Rural	42.9	0.47	44.4	0.58	43.7	0.48

Students from urban schools obtained a significantly higher mean (48.8%) than (43.7%) of the students from the rural schools. The gender differences were not significant.

Figure 4.09 presents the percentages of S 2 students rated proficient in English Language by school location and gender.

FIGURE 4.09: PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN ENGLISH LANGUAGE BY SCHOOL LOCATION AND STUDENTS' GENDER
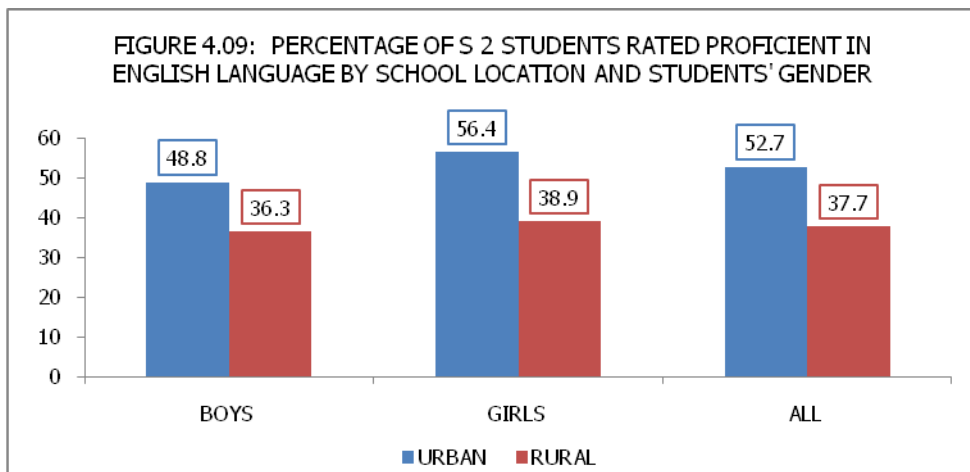
More than half of the students (52.7%) from the urban schools were rated proficient in English Language. Fewer students (37.7%) from the rural schools reached that same level of proficiency in English Language. There were significant gender differencs in achievement of students from the urban schools, with the girls performing better than the boys.

4.10 ACHIEVEMENT OF S 2 STUDENTS IN ENGLISH LANGUAGE BY ZONE

This section presents the achievement of S 2 students in English Language by zone. Table 4.13 shows the mean scores of students in English Language by zone.

TABLE 4.13:   MEAN SCORES (PERCENTAGE) OF S 2 BOYS AND GIRLS IN ENGLISH LANGUAGE BY ZONE AND GENDER

REGION	ZONE	BOYS		GIRLS		ALL	
		Mean	S.E	Mean	S.E	Mean	S.E
Central	Central I	49.3	1.54	52.1	1.46	50.9	1.38
	Central II	44.0	1.45	43.4	1.48	43.7	1.39
	Central III	42.6	1.34	44.5	1.76	43.7	1.41
East	Far East	44.7	2.37	44.5	1.24	44.6	1.60
	Mid East I	40.0	1.15	42.7	1.35	41.4	1.10
	Mid East II	40.4	2.36	41.2	2.39	40.8	2.18
	Near East	39.7	1.07	42.5	1.55	41.1	1.14
Kampala	Kampala	52.7	2.96	56.6	1.84	54.9	2.26
North	Mid North I	48.6	1.66	47.2	1.65	48.0	1.43
	Mid North II	44.6	1.63	44.8	1.81	44.7	1.63
	North East	46.8	1.60	47.4	2.97	47.1	1.94
	West Nile	43.3	1.33	43.3	1.65	42.9	1.26
West	Far West	48.8	2.07	49.6	2.23	49.2	2.04
	Mid West	39.1	1.99	40.8	2.14	39.9	2.04
	North West	41.8	1.22	42.4	1.75	42.1	1.42
	South West	52.9	1.51	50.8	1.47	51.8	1.27
Uganda		44.6	0.48	46.4	0.51	45.5	0.45

Kampala, South West and Central I obtained respective mean scores of 54.9%, 51.8% and 50.9% which were more than half the total percentage score. The rest of the zones had mean scores of less than 50%. The lowest mean score (39.9%) was obtained by students from Mid West zone. There were no significant gender differences in mean scores in all the zones.

Table 4.14 shows the percentages of students rated proficient in English Language by zone.

TABLE 4.14:   PERCENTAGE OF S 2 STUDENTS REACHING THE DESIRED LEVEL OF PROFICIENCY IN ENGLISH LANGUAGE BY ZONE AND GENDER

REGION	ZONE	BOYS	GIRLS	ALL
Central	Central I	53.7	63.3	59.1
	Central II	41.8	38.4	40.2
	Central III	35.1	41.8	40.0
East	Far East	36.3	37.9	37.0
	Mid East I	28.1	36.6	32.5
	Mid East II	30.9	29.4	30.2
	Near East	28.5	34.1	31.4
Kampala	Kampala	66.1	74.8	70.8
North	Mid North I	52.1	48.5	50.6
	Mid North II	36.2	38.3	37.1
	North East	46.8	43.9	45.3
	West Nile	34.1	31.2	32.9
West	Far West	51.3	55.2	53.4
	Mid West	29.1	28.2	28.7
	North West	28.2	32.6	30.4
	South West	62.7	57.4	59.9
Uganda		40.9	45.3	43.1

Nearly three quarters of the students (70.8%) from Kampala schools were rated proficient in English Language. South West and Central I had nearly the same proportion of students, 59.9% and 59.1% respectively, reaching the desired minimum level of proficiency. Far West and Mid North I had slightly more than half of their students rated proficient in English Language. The rest of the zones had less than a half of their students attaining the desired level of proficiency. In Mid West zone, for example, only 28.7% of the students were rated proficient in English Language.

4.11   ACHIEVEMENT OF S 2 STUDENTS IN ENGLISH LANGUAGE OVER THE YEARS 2008 – 2013

In this section, a description of the achievement of the S 2 students in English Language in the years 2008 – 2013 is given. The percentages of students rated proficient in English Language in 2008 – 2013 is shown in Figure 4.10.

FIGURE 4.10: PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN ENGLISH LANGUAGE: 2008 - 2013, BY GENDER

	2008	2009	2010	2011	2012	2013
BOYS	81.3	73.5	65.6	65	50	40.9
GIRLS	82.5	78.8	69.4	67.9	46.3	45.3
ALL	81.9	76	67.5	66.4	48.3	43.1
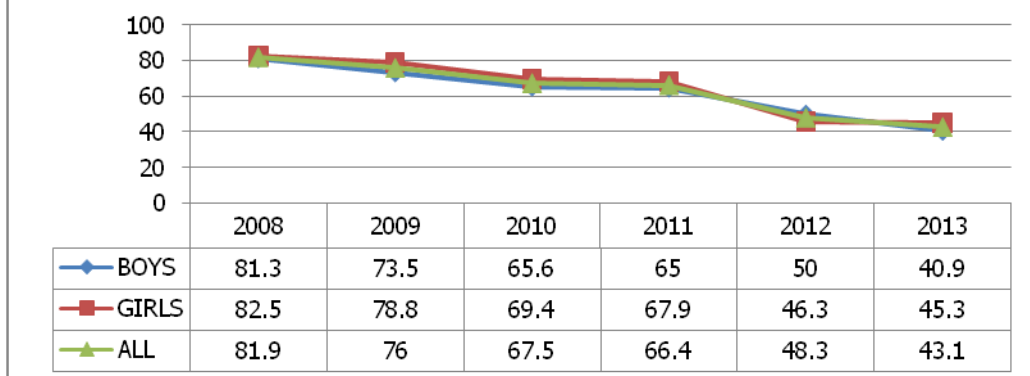
The proportion of students rated proficient in English Language has continued to follow a downward trend from 81.9% in the year 2008 to 66.4% in the year 2011. Then it dropped steeply from that level to 48.3% in the year 2012, and further still to 43.1% in 2013.

4.12 CONCLUSION

'Reading Comprehension' registered more students rated proficient compared to other skill areas. The competencies that had more students rated proficient, in all 'Reading Comprehension' sub skill areas, are ones which required the students to use their ability to recall information as is presented in the texts. Students exhibited deficiency in higher order thinking skills.

In 'Writing', the students were at their best in writing a formal letter, though they still have difficulty in presenting some of the attributes of such type of letter. Similarly, composition writing and other areas of functional writing were not well done.

In 'Grammar', the students could ably use some aspects of grammar correctly. They, however, had difficulty in applying the correct punctuation and using adjectives.

Chapter 5

ACHIEVEMENT OF S 2 STUDENTS IN BIOLOGY

5.1   INTRODUCTION

In this chapter a presentation of the achievement of S 2 students in Biology is made. Firstly, the overall mean score and the percentages of students reaching various levels of proficiency are given, followed by the percentages of students rated proficient in the different topical areas and competencies. Lastly, the mean scores and proportions of students rated proficient in the topical areas and competencies of Biology are presented by gender and age, school ownership, school USE status, school programme, location and zone.

The competencies assessed in the test are described in section 5.2.

5.2   DESCRIPTION OF THE COMPETENCIES ASSESSED BY PROFICIENCY LEVELS.

The description of the competencies assessed in the test is given below:

<u>NOTE:</u> A student at any proficiency level is assumed to have mastered all competencies specified at his/her level and the competencies below the level.

BASIC LEVEL	ADEQUATE LEVEL	ADVANCED LEVEL
A student is able to:	A student is able to:	A student is able to:
• Associate the characteristics of living and non-living organisms with the living or non-living things. • List the kingdoms used in classifying a living organism. • Name the two types of microscopes. • State the functions of specialised cells.	• Explain the importance of Biology. • Describe how living things are collected. • Estimate the number of organisms in a given area. • Describe the functions of the parts of a microscope. • Describe the care of hand lens. • Compute the magnification of a specimen. • Explain what an organ is.	• Classify a living organism into its taxonomic group. • Construct an identification key.
• State the functions of the parts of a plant. • Identify the drawn compound leaf.	• Describe leaf arrangement on a stem. • Label the internal structure of a fruit. • Explain the functions of the parts of a flower.	• Draw and label the external parts of a flower. • Draw and label the internal structure of

BASIC LEVEL	ADEQUATE LEVEL	ADVANCED LEVEL
		a maize fruit.
• State an example of a leaf modified for a specific purpose, e.g. reproduction.	• Explain how a leaf is modified for reproduction.	
• Label the external parts of a worker bee. • State ways of controlling the spread of malaria.	• Describe the life cycle of a cockroach. • Draw and label the external parts of a housefly.	• Draw and label the external parts of a housefly.
• State the components of soil.	• Describe an experiment to show that soil contains living organisms. • Explain how a plant root leads to formation of soil. • Explain the importance of sulphur for plant growth. • Explain how leaching affects the fertility of soil. • Describe how mulching conserves soil. • Complete the water cycle.	• Explain the importance of soil water.
• Name the parts of a flowering plant.		

<u>NOTE</u>: *A student is rated proficient if he/she has reached 'Advanced' or 'Adequate' level of proficieny.*

5.3   OVERALL ACHIEVEMENT OF S 2 STUDENTS IN BIOLOGY

In this section the outline of the overall achievement of S 2 students in Biology is presented. The overall mean score was 25.7% with a standard error (S.E) of 0.22. The respective mean scores of the boys and girls were 27.6% (S.E: 0.27) and 23.8% (S.E 0.25); showing that the boys performed significantly better than the girls.

Table 5.01 shows the proportions of students attaining the different levels of proficiency in Biology by gender.

TABLE 5.01:   PERCENTAGE OF S 2 STUDENTS REACHING VARIOUS LEVELS OF PROFICIENCY IN BIOLOGY BY GENDER

PROFICIENCY LEVELS	BOYS	GIRLS	ALL
Advanced	00.0	00.0	00.0
Adequate	19.9	9.2	14.5
Basic	80.1	90.8	85.5

No student reached the 'Advanced' proficiency level. This shows that none of the students had acquired an indepth understanding of Biological concepts and the display of skills to be applied in non-routine and complex real world problem-solving.

The second level of proficiency was 'Adequate' where 14.5% of the students were rated proficient. These are the students who demonstrated a satisfactory understanding of Biological concepts and an adequate display of the competences. They were able to provide relevant information, make and analyse text features such as the longitudinal section of a maize fruit.

The last category of students was the 'Basic' level. They constituted 85.5% of the students, who demonstrated marginal academic performance with inconsistent understanding of concepts and limited display of associated Biological skills. For instance. Whereas they could tell that a lion respires, they could not describe an experiment to show that soil contains living organisms.

Figure 5.01 shows the percentage of students rated proficient in Biology by gender.

FIGURE 5.01: PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN BIOLOGY BY GENDER
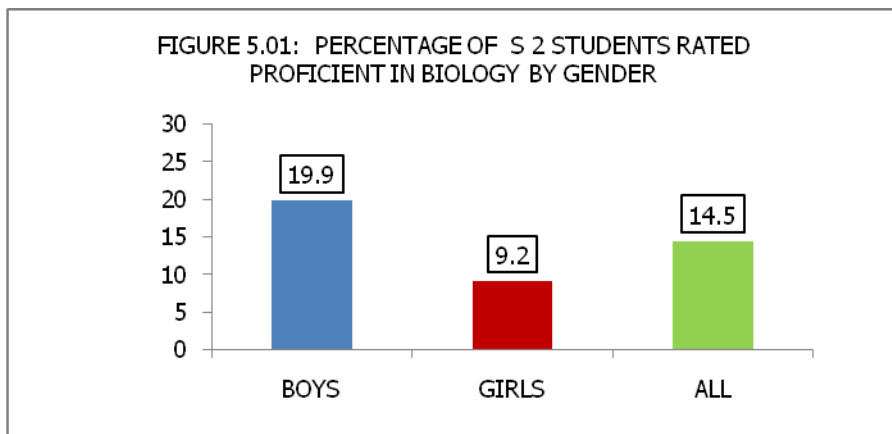
The proportion of students who reached the desired proficiency level was about 3 in 20. More (19.9%) boys than girls (9.2%) attained the desired rating in Biology.

5.4   ACHIEVEMENT OF S 2 STUDENTS IN BIOLOGY BY TOPICAL AREAS

This section presents the achievement of S 2 students in topical areas of Biology.

Figure 5.02 shows the percentage of S 2 boys and girls attaining the desired proficiency levels by topical areas.

FIGURE 5.02 PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN TOPICAL AREAS OF BIOLOGY

	Insects	Microscopes and hand lenses	Diversity of living things	Flowering plants	Soil
■ BOYS	85.7	21	10.6	9.2	8.3
■ GIRLS	78.7	11.3	4.8	4	3.4
■ ALL	82.2	16.1	7.7	6.6	5.8
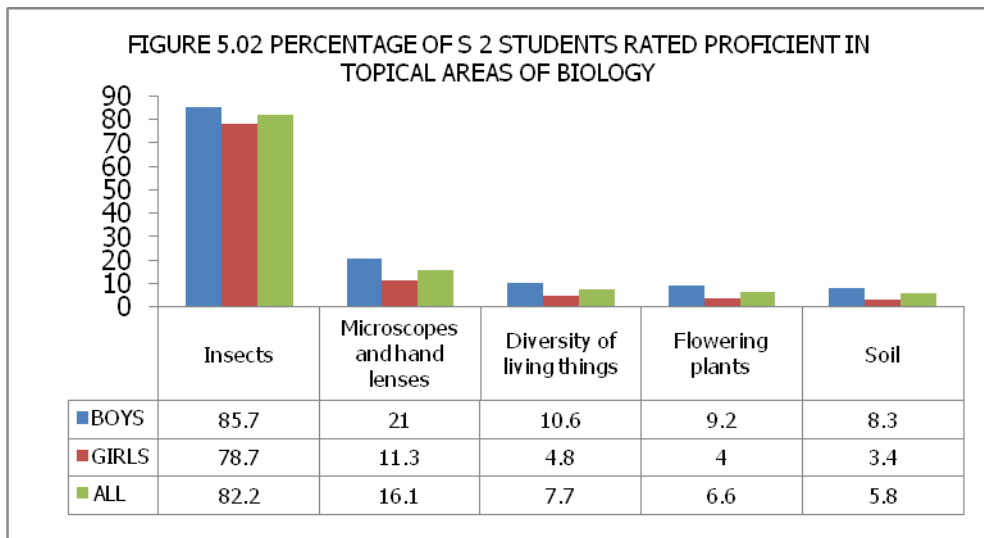
S 2 students exhibited the best performance (82.2%) in the topic of 'insects'. Fewer than 1 in 5 students reached the desired proficiency level in the rest of the topics assessed as opposed to over 80% of the students meeting or exceeding the threshold proficiency level in the topic of 'insects'.

The worst done topic was soil where less than 10% of the students attained the desired rating. The boys performed significantly better than the girls in all the various topical areas.

5.5 ACHIEVEMENT OF S 2 STUDENTS IN THE SELECTED COMPETENCIES OF BIOLOGY

A description of the achievement of S 2 students in selected competencies of Biology is made in this section. The flags against the competencies were assigned one of the colours: 'Green', 'Yellow' and 'Red' where 'Green' represents the competencies in which at least three-quarters of the students were rated proficient. 'Yellow' represents the competencies in which at least half, but less than three-quarters of the students reached the desired proficiency. Lastly, 'Red' represents the competencies in which less than a half of the students attained the desired rating. Tables 5.02 – 5.06 show the percentage of students rated proficient in the competencies of Biology grouped in topical areas.

TABLE 5.02: PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN SELECTED COMPETENCIES OF 'INSECTS'.

COMPETENCIES	BOYS	GIRLS	ALL
Stating ways by which the spread of malaria can be controlled.	⚑ 95.8	⚑ 94.4	⚑ 95
Labelling the external features of a vector.	⚑ 92.4	⚑ 88.7	⚑ 91
Drawing and labelling the external feature of a housefly.	⚑ 71.8	⚑ 68.6	⚑ 70
Describing the life cycle of a cockroach.	⚑ 56.6	⚑ 49.5	⚑ 53

Nearly 19 in every 20 students, met or exceeded the proficiency thresholds in stating the ways by which the spread of malaria can be controlled. Even more impressive, 9 in every 10 students could label the external features of a worker bee.

Whereas about 70% of the students could draw and label the external features of a housefly, only 53% were able to describe the life cycle of a cockroach. Fewer girls than boys reached the desired proficiency level in all the competencies of 'insects'.

TABLE 5.03:   PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN SELECTED COMPETENCIES OF 'MICROSCOPES AND HAND LENSES'

COMPETENCIES	BOYS	GIRLS	ALL
Microscopes and hand lenses.			
Stating the functions of parts of a plant cell.	57.2	45.0	51.0
Computing the magnification of a specimen.	48.1	45.3	46.7
Naming two types of microscopes.	38.6	29.5	34.0
Stating the functions of parts of a microscope.	38.4	22.5	30.4
Stating the functions of specialised cells.	29.7	20.9	25.2
Describing the care of hand lenses and microscopes.	20.1	16.8	18.4
Plant and animal cells.			
Explaining why a muscle is a tissue.	4.0	2.8	3.4

Nearly a half of the students (46.7%) could compute the magnification of a specimen. Whereas about a third of the students could either state the functions of parts of a microscope or name the two types of microscopes, only 18.4% could describe the care of hand lenses and microscopes.

In plant and animal cells, over half of the students (51.0%) were able to state the functions of parts of a plant cell as compared to only 25.2% who could state the functions of specialsed cells. Even then, a lesser proportion (3.4%) of the S 2 students were able to explain why a muscle is a tissue.

The boys performed significantly better than the girls in all the competencies of 'microscopes and hand lenses'.

TABLE 5.04:   PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN SELECTED
COMPETENCIES OF 'CLASSIFICATION OF LIVING THINGS'.

COMPETENCIES	BOYS	GIRLS	ALL
Associating the characteristics of a living/non living thing with itself.	90.9	88.4	89.7
Estimating the number of organisms in an area.	75.2	72.9	74.0
Importance of biology.	71.0	71.8	71.4
List of kingdoms.	65.8	63.0	64.4
Classifying organisms into their taxonomic groups up to class level.	52.0	49.3	50.6
Describing how living things can be collected.	2.0	1.2	1.6
Constructing an identification key.	1.3	0.8	1.1

Nearly all of the students (89.7%) could match the characteristics of a lion to a lion and those of a stone to a stone. Further, a majority of the students could estimate the number of organisms in an area and state the importance of Biology.

Whereas about a half of the students (50.6%) could classify a cow into its taxonomic group, a mere 1.1% were able to construct a dichotomous key to identify a banana, bean, mango, grass or cassava leaf.

TABLE 5.05:   PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN SELECTED
COMPETENCIES OF 'FLOWERING PLANTS'.

COMPETENCIES	BOYS	GIRLS	ALL
Naming parts of a flowering plant.	88.9	87	87.9
Stating the functions of parts of a plant.	83.4	72.8	78
Explaining the functions of the parts of a flower.	63.7	53.2	58.4
Stating a leaf modified for a purpose.	48.6	38.9	43.7
Identifying leaf types.	39.8	38.8	39.3
Drawing and labelling the external parts of a flower.	36.6	28.6	32.5
Expaining the leaf arrangement of a stem.	2.5	1.8	2.1

Over three-quarters of the students could name the parts of a flowering plant and state the functions of the parts of a plant. Whereas about a half of the students could explain the functions of the parts of a flower, less than a third of them could draw and label the external parts of a flower or a maize fruit.

Further, a paltry 2.1% could explain a leaf arrangement of a stem.

TABLE 5.06:   PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN SELECTED COMPETENCIES OF 'SOIL'

COMPETENCIES	BOYS	GIRLS	ALL
Completing a water cycle.	67.9	54.7	61.2
Describing a method for soil conservation.	59.8	49.3	54.5
Explaining the importance of soil water.	17.5	12.0	14.7
Explaining how a named factor affects the quality of soil.	17.1	10.5	13.7
Describing how a plant root leads to soil formation.	7.8	3.9	5.8
Describing how a soil profile determines the type of crop to be grown in the soil.	7.1	3.7	5.4
Describing an experiment to show soil contains living organisms.	3.0	2.2	2.6

A satisfactory proportion of students (61.2%) could complete a water cycle. About half (54.5%) of the students were able to describe a method for soil conservation.

However, the majority of the students could not describe how a soil profile determines the type of crop to be planted in the soil, or explain how a plant root leads to formation of soil. Less than 15% of the students could explain the importance of soil water to plants and living organisms in the soil.

5.6   ACHIEVEMENT OF STUDENTS IN BIOLOGY BY AGE AND GENDER

In this section, a presentation of the achievement of S 2 students in Biology by age and gender is made. Table 5.07 shows the mean scores of S 2 students in Biology by age and gender.

TABLE 5.07:   MEAN SCORES (PERCENTAGE) OF S 2 STUDENTS IN BIOLOGY BY AGE AND GENDER

AGE (YEARS)	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
11 – 13	28.4	1.37	27.6	1.19	27.9	0.87
14	31.1	0.60	26.6	0.40	28.2	0.38
15	29.2	0.42	24.4	0.32	26.3	0.29
16	28.0	0.31	23.1	0.27	25.4	0.25
17	26.3	0.26	21.3	0.31	24.5	0.24
18	24.7	0.35	20.7	0.59	23.7	0.36
19$^+$	24.0	0.47	20.3	0.85	23.5	0.42

The mean scores of S 2 students first increased from 27.9% for the 11-13 year olds to 28.2% for the 14 year olds. It then decreased from 28.2% to 23.5% for the 19+ year olds. The boys obtained significantly higher mean scores than the girls in each

age category. Figure 5.03 shows the proportions of boys and girls who met or exceeded the threshold proficiencies.

FIGURE 5.03: PERCENTAGE OF S 2 STUDENTS RATED PROFICINT IN BIOLOGY, BY AGE AND GENDER

AGE (Years)	11-13	14	15	16	17	18	19+
BOYS	19.3	32.7	24.9	21.4	14.3	11.5	10.5
GIRLS	22.8	14.5	10.5	7	4.3	3.6	3
ALL	21.5	21	16.1	13.8	10.6	9.6	9.4
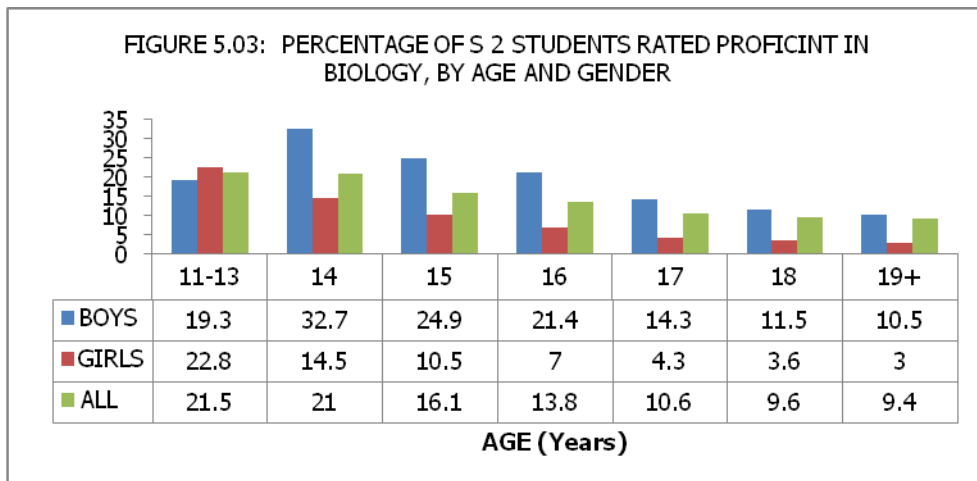
The proportions of students reaching the desired proficiency levels in Biology decreased with increase in age from 21.5% for 11-13 year olds to 9.4% for the 19+ year olds. More boys than girls attained the desired rating in each age catergory. The differences in the proportions were highly significant.

5.7   ACHIEVEMENT OF S 2 STUDENTS IN BIOLOGY BY SCHOOL OWNERSHIP AND USE STATUS

In this section, first of all, the performance of students in Biology by school ownership and USE Status is presented separately. Secondly a description of the achievement of students by school ownership and status is made.

5.7.1 Achievement of S 2 students in Biology by School Ownership and Gender.

A description of the achievement of S 2 students in Biology by school ownership is made in this section. Table 5.08 shows the mean scores of students in Biology by school ownership and gender.

TABLE 5.08:   MEAN SCORES (PERCENTAGE) OF S 2 STUDENTS IN BIOLOGY BY SCHOOL OWNERSHIP

OWNERSHIP	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
Government	27.4	0.34	23.7	0.31	25.6	0.28
Private	28.0	0.42	24.3	0.46	26.0	0.39

S 2 students from government and private schools obtained mean scores of 25.6% and 26.0% respectively, indicating that the difference in mean scores of students from either category of school ownership were insignificant. However, the boys obtained mean scores that were significantly higher than the girls' in either school

category. Figure 5.04 shows the proportions of S 2 boys and girls who performed at or above the threshold proficiency level in Biology by school ownership.

FIGURE 5.04: PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN BIOLOGY BY SCHOOL OWNERSHIP

	BOYS	GIRLS	ALL
GOVERNMENT	19.2	8	13.7
PRIVATE	22	12.1	16.6
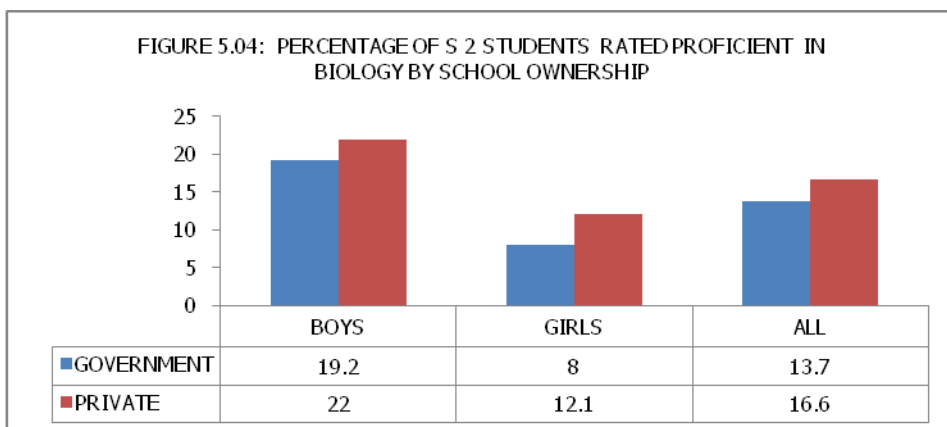
There were slightly more students (16.6%) in private schools than government schools (13.7%) attaining the desired proficiency in Biology. In either school ownership, more boys than girls were rated proficient.

5.7.2 Achievement of S 2 students in Biology by School USE Status

In this section a description of the achievement of S 2 students in Biology by school USE status and gender is given. Table 5.09 shows the mean scores of students in Biology by school USE status.

TABLE 5.09: MEAN SCORES (PERCENTAGE) OF STUDENTS IN BIOLOGY BY SCHOOL USE STATUS

SCHOOL USE STATUS	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
USE	26.7	0.26	22.8	0.26	24.7	0.22
Non–USE	32.1	0.85	28.1	0.68	29.9	0.68

The mean scores of students from the USE and non-USE schools were 24.7% and 29.9%, respectively. The difference in the mean scores was significant. The students from non-USE schools obtained higher mean scores than those from USE schools. The boys performed better than the girls in either school status. Figure 5.05 shows the percentage of students at or above the desired proficiency level in Biology by school USE status.

FIGURE 5.05: PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN BIOLOGY, BY SCHOOL USE STATUS

	BOYS	GIRLS	ALL
USE	16.4	5.8	11.2
Non-USE	36.8	22.6	29.1
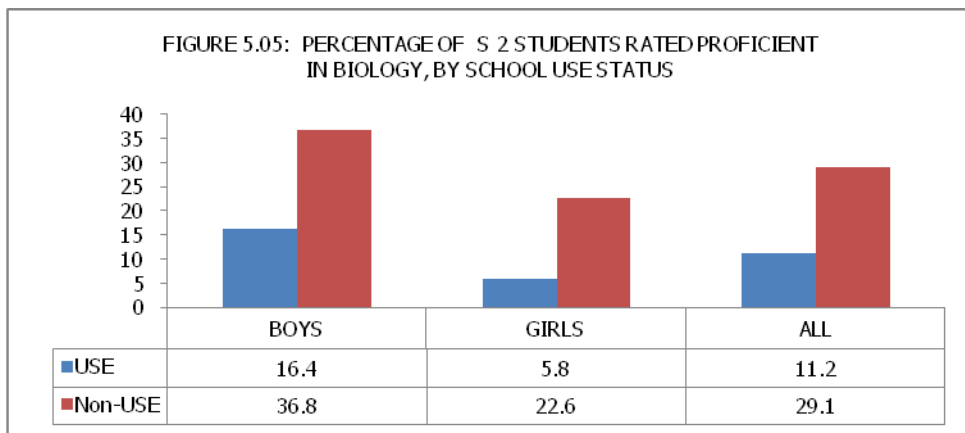
The proportion of students (29.1%) from non-USE schools rated proficient in Biology was significantly higher than that of students (11.2%) from USE schools. Boys from either category of school USE status were at least 10 points more proficient than the girls from the same school status.

5.7.3 Achievement of S 2 Students in Biology by School Ownership and USE Status.

The achievement of S 2 boys and girls in Biology by both school ownership and USE status is presented in this section. Table 5.10 shows the mean scores of students in Biology by school ownership and USE status.

TABLE 5.10:   MEAN SCORES (PERCENTAGE) OF STUDENTS IN BIOLOGY BY SCHOOL OWNERSHIP AND USE STATUS.

SCHOOL OWNERSHIP AND USE STATUS	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
Government USE	26.8	0.31	23.1	0.29	25.0	0.26
Government Non–USE	37.1	1.58	31.8	1.19	34.5	1.17
Private USE*	26.0	0.47	21.4	0.44	23.5	0.39
Private Non-USE	30.2	0.73	26.9	0.70	28.4	0.65

The mean scores of students from government non-USE and government USE schools were 34.5% and 25.0%, respectively. The difference in the mean scores obtained by the two categories of students was significant.

Students from private non-USE and private USE schools obtained mean scores of 28.4% and 23.5% respectively.   The students from private non-USE schools performed better than their counterparts from private USE schools.   The boys obtained mean scores which were higher than the girls in all categories of school ownership and USE status. Figure 5.06 shows the percentages of students attaining the desired proficiency in Biology by school ownership and USE status.

Figure 5.06 shows the proportions of students rated proficient in Biology by school ownership and USE status.

FIGURE 5.06: PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN BIOLOGY BY SCHOOL OWNERSHIP AND USE STATUS

	GOVERNMENT USE	GOVERNMENT NON-USE	PRIVATE USE	PRIVATE NON-USE
BOYS	16.8	54.3	14.3	30.1
GIRLS	6.2	34.7	4.4	19.0
ALL	11.6	44.5	9.1	23.8
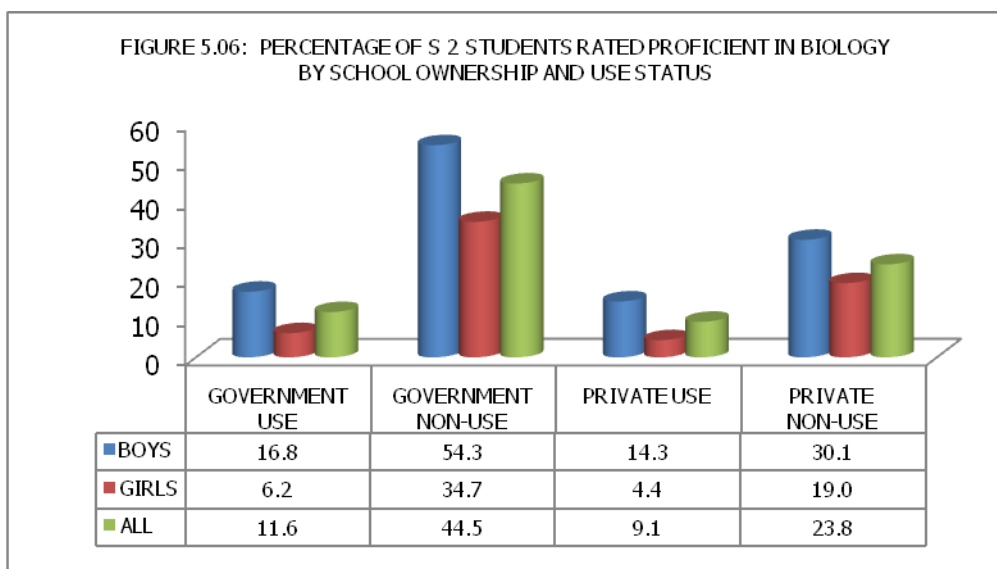
Students from government non-USE schools performed best in Biology, followed by those from private non-USE then government USE and lastly by those from private USE schools.

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* Commonly referred to as PPP schools: Public Private Partnership Schools

The proportion of students rated proficient in Biology in the government non-USE schools was approximately four times that of their counter parts from the government USE schools.

The proportion of students (23.8%) from private non-USE schools rated proficient in Biology was more than double that of their counter parts (9.1%) from private USE schools.

The government non-USE schools registered the highest proportion of students (44.5%) at or above the proficiency level in Biology, followed by students (23.8%) from private non-USE. The private USE schools registered the least proportion of students (9.1%) attaining the desired proficiency in Biology.

5.8   ACHIEVEMENT OF STUDENTS IN BIOLOGY BY SCHOOL PROGRAMME

This section outlines the performance of S 2 students in Biology by school programme. Table 5.11 shows the mean scores of students in Biology by school session.

TABLE 5.11:   MEAN SCORES (PERCENTAGE) OF STUDENTS IN BIOLOGY BY SCHOOL PROGRAMME AND GENDER

SCHOOL PROGRAMME	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
Single-session	28.1	0.31	24.1	0.29	26.1	0.25
Double –session	26.1	0.56	23.1	0.60	24.6	0.53

The students from single–session and double–session obtained respective mean scores of 26.1% and 24.6% in Biology. The boys performed significanty better than the girls in either category of school programme. Figure 5.07 shows the proportions of students rated proficient in Biology by school programme.

FIGURE 5.07: PERCENTAGE OF STUDENTS RATED PROFICIENT IN BIOLOGY BY SCHOOL PROGRAM

	BOYS	GIRLS	ALL
SINGLE-SESSION	4.3	2.5	3.5
DOUBLE-SESSION	2.4	4.4	1.8
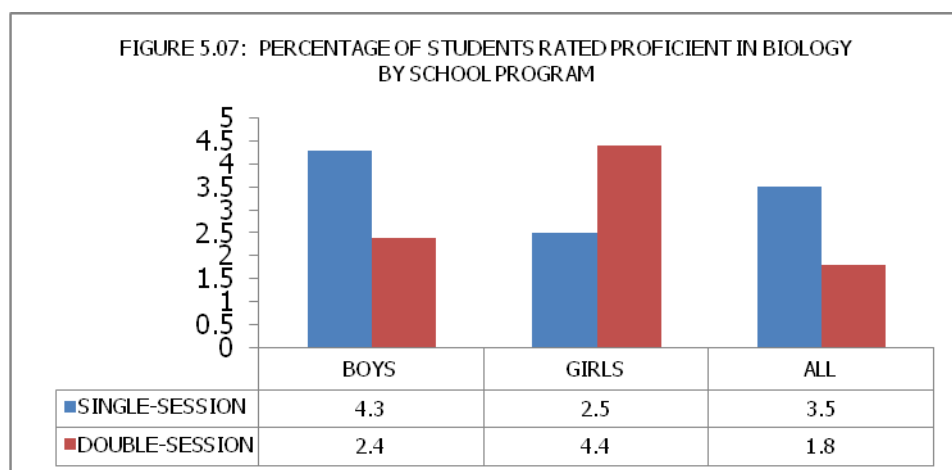
Slightly more students (15.8%) from single–session schools than their counter parts (10.1%) from double–session schools reached the desired proficiency level in Biology. More boys than girls were rated proficient in Biology in either school category.

5.9 ACHIEVEMENT OF S 2 STUDENTS IN BIOLOGY BY SCHOOL LOCATION

In this section, a description of the achievement of S 2 boys and girls in Biology by school location is given. Table 5.12 shows the mean scores of students in Biology by school location.

TABLE 5.12: MEAN SCORES (PERCENTAGE) OF S 2 STUDENTS IN BIOLOGY BY SCHOOL LOCATION

SCHOOL LOCATION	BOYS		GIRLS		ALL	
	Mean	S.E	Mean	S.E	Mean	S.E
Urban	28.9	0.58	25.0	0.40	26.9	0.43
Rural	26.8	0.29	23.2	0.32	25.0	0.27

The mean scores of students from urban and rural schools were 26.9% and 25.0%, respectively. The difference in the students' mean scores was insignificant. However, there was a significant difference between the mean scores of the boys and girls within the same school location. The boys performed better than the girls. Figure 5.08 shows the percentages of students rated proficient in Biology by school location and gender.

FIGURE 5.08 PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN BIOLGY BY SCHOOL LOCATION AND GENDER

	BOYS	GIRLS	ALL
URBAN	24.7	11.8	18.2
RURAL	17.1	7.8	12.4
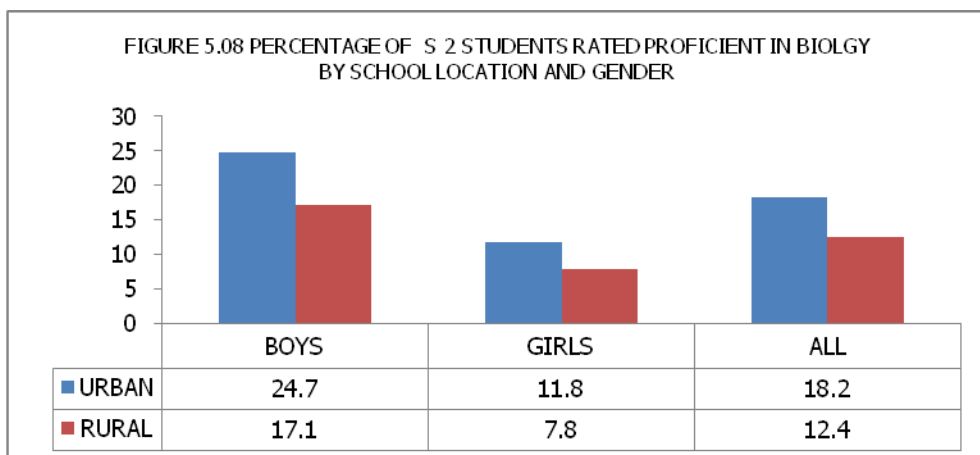
More students from the urban schools (18.2%) than their counter parts from the rural schools (12.4%) reached the desired proficiency level in Biology. The proportion of boys attaining the desired rating was more than double that of the girls in the same school location who attained a similar rating.

5.10 ACHIEVEMENT OF STUDENTS IN BIOLOGY BY ZONE AND GENDER.

In this section, an outline of the achievement of students in Biology by zone and gender is made. Table 5.13 shows the mean scores of S 2 boys and girls in Biology by zone and gender.

TABLE 5.13:   MEAN SCORES (PERCENTAGE) OF STUDENTS IN BIOLOGY BY ZONE

REGION	ZONE	BOYS		GIRLS		ALL	
		Mean	S.E	Mean	S.E	Mean	S.E
Central	Central I	29.5	0.88	26.1	0.73	27.6	0.70
	Central II	25.2	0.91	21.2	0.74	23.2	0.74
	Central III	26.6	0.70	23.7	0.59	24.9	0.54
East	Far East	28.4	1.38	24.1	0.97	26.5	1.05
	Mid East I	24.3	0.93	21.6	1.37	22.9	0.87
	Mid East II	25.0	1.30	21.1	1.11	23.2	1.09
	Near East	25.4	0.56	22.4	0.75	23.9	0.58
Kampala	Kampala	28.8	1.56	26.6	1.31	27.6	1.38
North	Mid North I	31.2	0.97	23.7	0.94	28.0	0.85
	Mid North II	31.7	1.11	25.1	0.93	28.9	0.99
	North East	29.9	1.10	23.9	2.02	26.8	1.16
	West Nile	29.2	0.97	23.4	0.64	26.8	0.71
West	Far West	30.6	1.21	25.9	1.05	28.0	1.07
	Mid West	25.0	0.41	21.6	0.44	23.4	0.33
	North West	24.6	0.85	21.3	0.99	23.0	0.87
	South West	32.4	0.99	27.5	0.81	27.6	1.38
Uganda		27.6	0.27	23.8	0.25	25.7	0.22

No zone had its students obtain a mean score of at least 30% in Biology. Students from Mid-North II obtained the highest Mean score, 28.9% followed by Mid-North I and Far West which obtained a mean score of 28.0%. While students from Mid East I obtained the lowest mean score of 22.9%. The boys performed significantly better than the girls in Biology in all the zones of the country. Table 5.14 shows the percentage of students rated proficient in Biology by zone and gender.

PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN BIOLOGY BY ZONE AND GENDER.

REGION	ZONE	BOYS	GIRLS	ALL
Central	Central I	26.6	15.7	20.4
	Central II	12.9	5.3	9.2
	Central III	16.7	7.4	11.3
East	Far East	20.3	8.1	14.8
	Mid East I	11.2	6.8	9.0
	Mid East II	13.9	4.9	9.8
	Near East	12.9	6.3	9.5
Kampala	Kampala	27.5	17.5	22.1
North	Mid North I	31.7	5.2	20.5
	Mid North II	30.5	9.8	21.9
	North East	22.6	10.1	16.2
	West Nile	21.7	4.7	14.6
West	Far West	28.5	11.6	19.2
	Mid West	11.8	2.5	7.4
	North West	8.2	3.9	6.1
	South West	36.8	15.2	25.3
Uganda		19.9	9.2	14.5

South West had the highest proportion of students (25.3%) reaching the desired proficiency level in Biology. It was followed by Kampala where 22.1% of the students attained a similar rating, and then Mid North II with 21.9% of the students rated proficient. The other zones had the percentage of the students rated proficient ranging from 20.5% for Mid North I to 6.1% for North West. The proportion of boys reaching the desired proficiency was more than double that of the girls attaining a similar rating in all zones.

5.11 ACHIEVEMENT OF STUDENTS IN BIOLOGY OVER THE YEARS 2008 – 2013

This section compares the performance of students in Biology over the period 2008 – 2013.

The percentages of S 2 students reaching the desired proficiency level is given in figure 5.09.

FIGURE 5.09: PERCENTAGE OF S 2 STUDENTS RATED PROFICIENT IN BIOLOGY IN 2008 - 2013 BY GENDER

	2008	2009	2010	2011	2012	2013
BOYS	43.2	41.4	36.1	24.2	23.6	19.9
GIRLS	28.8	30.6	24.6	14.9	10.7	9.2
ALL	36.7	36.3	30.4	19.6	17.7	14.5
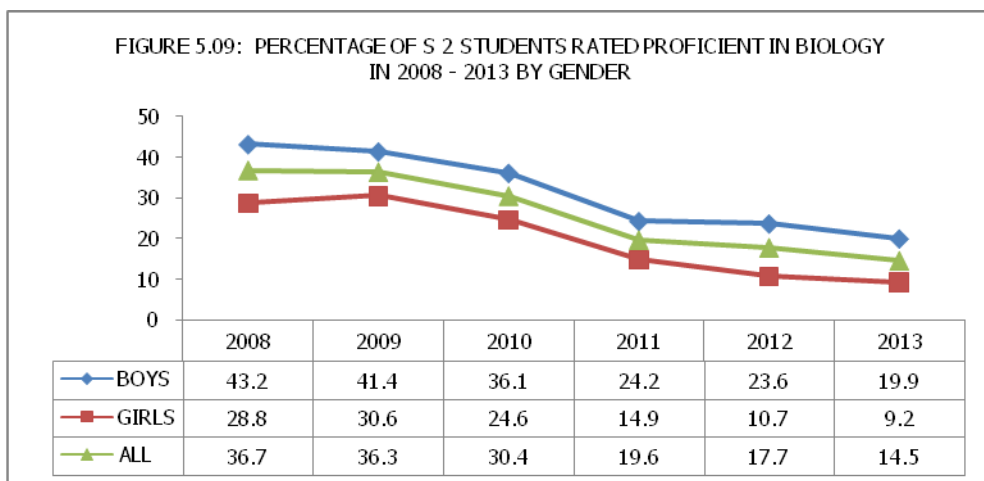
Whereas the percentages of students rated proficient in Biology remained nearly constant in 2008 and 2009, there was in a non-systematic way in the years 2009 to 2013.

Although the overall proficiency rates continue to decrease, there are still more boys than girls attaining the desired rating every year.

5.12   CONCLUSIONS

S 2 students demonstrated the best performance in the topic of 'insects' where over 80% of the students were rated proficient. 'Soil' seems to be a neglected topic during normal instruction since that is the area where students have demonstrated the least competence over the years.

In the topic of 'insects', 19 in 20 students had mastered the ways by which the spread of malaria can be controlled. Majority of the students (90%) demonstrated familiarity with the worker bee as they accurately labelled its external features. A relatively lower percentage of students (53%) were able to describe the life cycle of a cockroach.

In 'microscopes and hand lenses', the students exhibited inadequate knowledge and skills in nearly all the assessed competencies. For instance, 46.7% of the students were able to compute the magnification of a specimen while only 18.4% could describe the care of hand lenses and microscopes.

In 'plant and animal cells', whereas 1 in 2 students could state the functions of the parts of a plant cell, a paltry 3.4% were able to explain why a muscle is a tissue.

In 'classification of living things', students have continued to experience difficulty in the construction of a dichotomous key. For instance, less than 2% of the students were able to construct a dichotomous key to identify common plants like banana, bean, mango, grass or cassava.

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In 'flowering plants' the majority of students demonstrated familiarity with the external features of a plant. However, nearly all the students could not explain a leaf arrangement of a stem.

In 'soil', most of the students demonstrated complete ignorance on the relationship between the soil profile and the crop which matches it since they failed to describe how a soil profile is a determinant of the crop to be grown.

Boys continued to perform significantly better than the girls in all competencies of Biology.

In all the zones of the country, the mean score of the students was less than 30%.

Chapter 6

S 2 TEACHERS' ASSESSMENT KNOWLEDGE AND PRACTICE

6.1   INTRODUCTION

This chapter presents the findings of the interview schedule for the S 2 teachers of English Language, Mathematics and Biology on assessment knowledge and practice. Three teachers were interviewed in each school, one for each subject.   Each teacher was required to respond to items related to his or her assessment knowledge and practice.

The first part comprises a description of the distribution of teachers by the following factors: gender, age and highest teaching qualification. This is followed by, a description of their assessment knowledge and practice in relation to other factors.

6.2   DISTRIBUTION OF TEACHERS BY SELECTED FACTORS

This section describes the distribution of S 2 teachers by subject, age, gender and highest teaching qualification.

6.2.1   Distribution of Teachers by Subject and Gender

The distribtuion of teachers by the subject they teach and gender is shown in Table 6.01.

TABLE 6.01:   DISTRIBUTION OF TEACHERS BY SUBJECT THEY TEACH AND GENDER

GENDER	ENGLISH LANGUAGE		MATHEMATICS		BIOLOGY		TOTAL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
Male	323	58.2	554	92.8	525	89.1	1,402	80.5
Female	232	41.8	43	7.2	64	10.9	339	19.5
Total	555	31.9	597	34.3	589	33.8	1,741	100.0

English Language had the greatest proportion of female teachers, 41.8%, and Mathematics the least, only 7.2%. Only a tenth (10.9%) of teachers of Biology are female.

6.2.2   Distribution of Teachers by Subjectand Age

The distribution of teachers by age group and subject taught is presented in Table 6.02.

TABLE 6.02:   DISTRIBUTION OF TEACHERS BY SUBJECT THEY TEACH AND AGE

AGE GROUP (YEARS)	ENGLISH LANGUAGE		MATHEMATICS		BIOLOGY		TOTAL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
20 - 25	102	17.7	164	27.2	130	21.8	396	22.3
26 - 35	314	54.5	267	44.3	291	48.7	872	49.1
36 - 45	89	15.5	122	20.3	119	19.9	330	18.6
46 and above	71	12.3	49	8.2	57	9.6	177	10.0
Total	576	100.0	602	100.0	597	100.0	1,775	100.0

For each subject, the majority of the teachers were less than 45 years old and nearly a half of these(49.1%) were within the 26 – 35 years range.

6.2.3 Distribution of Teachers by Highest Teaching Qualification

The distribution of teachers by subject and highest teaching qualification is presented in Table 6.03.

TABLE 6.03:   DISTRIBUTION OF TEACHERS BY HIGHEST QUALIFICATION AND SUBJECT THEY TEACH

HIGHEST TEACHING QUALIFICATION	ENGLISH LANGUAGE		MATHEMATICS		BIOLOGY		TOTAL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
Bachelors in Education	248	43.9	189	32.0	179	30.9	616	35.5
Grade V Secondary	275	48.7	289	49.0	327	56.5	891	51.4
Grade V Primary	3	0.5	4	0.7	3	0.5	10	0.6
Grade III	2	0.3	3	0.5	3	0.5	8	0.5
Others	37	6.6	105	17.8	67	11.6	209	12.0
	565	100.0	590	100.0	579	100.0	1,734	100.0

Over half of the teachers (51.4%) were holders of Grade V (Secondary) teaching certificates. About a third, 35.5%, had Bachelorof Education degrees. However, there were small proportions with Grade V (Primary) and Grade III teaching certificates, which are qualifications for teaching in primary schools. The 'Others' category (12.0%) comprised licensed teachers who were holders of the Uganda Advanced Certificate of Education (UACE) or other non-teaching qualifications.

6.3   TEACHERS' ASSESSMENT KNOWLDEGE

This section provides a description of what the teachers know about achievement tests and test development.

6.3.1 Teachers Training in Setting a Test

The interview aimed to find out whether the teachers have ever been trained to set tests.

Table 6.04 presents the distribution of teachers who have ever been trained to set achievement tests, by school location.

TABLE 6.04: DISTRIBUTION OF TEACHERS WHO HAVE TRAINED TO SET A TEST, BY SCHOOL LOCATION

TRAINED TO SET A TEST	URBAN		RURAL		TOTAL	
	N	PERCENT	N	PERCENT	N	PERCENT
Yes	349	73.9	917	71.2	1,266	71.9
No	123	26.1	371	28.8	494	28.1
Total	472	100.0	1,288	100.0	1,760	100.0

Nearly three-quarters of the teachers(71.9%) indicated that they were trained to set tests. Rural (71.2%) and urban (73.9%) teachers were almost equally represented among teachers trained to set assessment tests. Slightly more than a quarter of the teachers (28.1%) in each locality have never received training in setting a test.

Table 6.05 shows theproportion of teachers according to where they received training in setting a test.

TABLE 6.05: PERCENTAGE OF TEACHERS BY WHERE THEY WERE TRAINED TO SET A TEST

PLACE OF TRAINING TO SET A TEST	PERCENTAGE
Teacher Training Institution	63.7
SESEMAT Workshops	33.6
UNEB Setters' Workshop	12.9
District Examination Boards	10.1
UNEB-NAPE Scoring Workshops	5.4
School-Organised Workshops	3.9
In-Step Workshops	3.8
Others (NGOs, Teachers Resource Centres, e.t.c)	2.1

The majority of teachers (63.7%) were trained to set a test at Teacher Training Institutions, followed by SESEMAT workshops (33.6%), UNEB setters' workshops (12.9%) and District Examination Boards at 10.1%. Others got some training at NAPE Item Development workshops, In-Step workshops, Teachers' Resource Centres and by NGOs, among others.

6.3.2 Teachers Training in Marking a Test

Teachers were asked whether they had ever received any training in marking tests.

Table 6.06 presents the distribution of teachers who have ever been trained to mark tests by location.

TABLE 6.06:   DISTRIBUTION OF TEACHERS WHO WERE TRAINED TO MARK TESTS, BY SCHOOL LOCATION

TRAINED TO	URBAN		RURAL		TOTAL	
SET A TEST	N	PERCENT	N	PERCENT	N	PERCENT
Yes	325	69.7	867	67.2	1,192	67.9
No	141	30.3	423	32.8	564	32.1
Total	466	100.0	1,290	100.0	1,756	100.0

About two-thirds of the teachers (67.9%) declared that they were trained to mark tests. Of these, an almost equal proportion of teachers from both locations, 69.7% (rural) and 67.2% (Urban) had been trained to mark tests. However, about a third of the teachers have never acquired any training in marking tests. Table 6.07 shows the proportions of teachers according to where they were trainined to mark tests.

TABLE 6.07:   PERCENTAGE OF TEACHERS BY WHERE THEY WERE TRAINED TO MARK TESTS

PLACE OF TRAINING TO MARK TESTS	PERCENTAGE
Teacher Training Institution	42.6
UNEB Examiners' Training Workshop	33.1
SESEMAT Workshops	22.8
District Examination Boards	16.6
School Organised Workshops	5.1
In-Step Workshops	3.4
UNEB-NAPE Scoring Workshops	2.8
Others (NGOs, Teachers Resource Centres, e.t.c)	2.4

The majority of the teachers received their training to mark tests at Teacher Training Institutions (42.6%). These are followed by those trained at UNEB Examiners' workshops (33.1%) and SESEMAT workshops (22.8%). Other trainings mentioned were carried out by District Examination Boards, School Organised workshops, In-Step, Teachers' Resource Centres and NGOs, among others.

6.3.2.1Teachers' Knowledge of the Principles of Test Development

This section is a description of some basic knowledge required by teachers in test development. This information is correlated with exposure to training as setters and examiners. Table 6.08 shows the proportions of teachers' responses according to the attributes required to prepare a test.

TABLE 6.08:   PERCENTAGE OF TEACHERS RESPONSES, BY ATTRIBUTES
                NEEDED TO PREPARE A TEST

TEACHERS RESPONSE	PERCENTAGE
Incorrect response or No Response at all	82.2
Knowledge of the Learner	36.5
Mastery of Subject Content	22.7
Knowledge of the Curriculum	20.0
Experience and Training in Assessment	4.6
Knowledge of Teaching Methods	3.4

Most of the teachers (82.2%) could not provide a correct description of the attributes required to prepare a standard test. Those who responded appropriately mentioned 'knowledge of learner' (36.5%), 'mastery of subject content' (22.7%), and 'knowledge of curriculum' (20.0%) among others.'Experience and training in assessment' (4.6%) and 'knowledge of teaching methods' (3.4%) were considered less.

Table 6.09 and 6.10 provide cross tabulations between exposure to training as setter/examiner and knowledge of Test Blueprint.

TABLE 6.09:   DISTRIBUTION OF TRAINED SETTER TEACHERS WHO IDENTIFIED A
                TEST BLUEPRINT

KNOWS TEST BLUEPRINT	TRAINED TO SET A TEST				TOTAL	
	YES		NO			
	N	PERCENT	N	PERCENT	N	PERCENT
Yes	57	4.7	19	4.0	76	4.5
No	1,148	95.3	459	96.0	1,607	95.5
Total	1,205	100.0	478	100.0	1,683	100.0

TABLE 6.10:   DISTRIBUTION OF TRAINED EXAMINER TEACHERS WHO
                IDENTIFIED A TEST BLUEPRINT

KNOWS TEST BLUEPRINT	TRAINED TO MARK A TEST				TOTAL	
	YES		NO			
	N	PERCENT	N	PERCENT	N	PERCENT
Yes	56	4.9	20	3.7	76	4.5
No	1,089	95.1	517	96.3	1,606	95.5
Total	1,145	100.0	537	100.0	1,682	100.0

Only 5 in 100 of those who ever had some training in either setting or marking a test could identify the basic tool, a test blueprint, used in test item-writing.

6.4   TEACHERS' ASSESSMENT PRACTICE

In this section, we have a description of selected practice indicators of classroom assessment. First, we have teaching-learning preparatory tools e.g the curriculum, schemes of work and lesson plans, followed by the ways in which tests are commonly administered and what the teachers consider as reasons for testing.

6.4.1   Teaching-Learning Preparatory Tools

Teachers were required to mention whether they had basic preparatory tools for teaching-learning. Table 6.11 shows the distribution of teachers whose schools had a copy of the curriculum.

TABLE 6.11:   DISTRIBUTION OF TEACHERS WHOSE SCHOOL HAD A COPY OF THE CURRICULUM, BY SCHOOL LOCATION

HAVE SUBJECT CURRICULUM	URBAN		RURAL		TOTAL	
	N	PERCENT	N	PERCENT	N	PERCENT
Yes	424	90.6	1,159	90.1	1,583	90.3
No	44	9.4	127	9.9	171	9.7
Total	1,145	100.0	537	100.0	1,754	100.0

The majority, 90.3%, of teachers said the school has a copy of the subject curriculum. The proportions were nearly equal for the urban (90.6%) and rural (90.1%) teachers. Table 6.12 shows the proportion of teachers by indicated use of the curriculum.

TABLE 6.12:   PERCENTAGE OF TEACHERS BY INDICATED USE OF CURRICULUM

USE OF CURRICULUM	PERCENTAGE
Preparing Scheme of Work	91.0
Preparing Lesson Plan	50.6
Setting Tests	29.7
Others (Identify Appropriate Text books)	8.6

Teachers who consider preparation of schemes of work as the predominant use of the subject curriculum, (91.0%) followed by lesson plan preparation (50.6%), setting tests (29.7%) and 'Others' (8.6%) which include identifying relevant text books.

Table 6.13 shows the distribution of teachers who prepare schemes of work, by teacher gender.

TABLE 6.13:   DISTRIBUTION OF TEACHERS WHO PREPARE SCHEME OF WORK,
               BY TEACHER GENDER

PREPARES SCHEME OF WORK	MALE		FEMALE		TOTAL	
	N	PERCENT	N	PERCENT	N	PERCENT
Yes	1,306	93.8	330	97.4	1,636	94.5
No	87	6.2	9	2.6	96	5.5
Total	1,393	100.0	339	100.0	1,754	100.0

A large proportion of the teachers (94.5%), claimed that they prepare schemes of work. However, only 62.6% presented their schemes of work to the interviewers. Those who do not prepare schemes of work cited reasons such as not knowing how to prepare them (40.6%), being cumbersome (31.3%) and lack of preparatory materials among others. Table 6.14 shows the proportion of teachers who prepare schemes of work, by age group.

TABLE 6.14:   DISTRIBUTION OF TEACHERS WHO PREPARE SCHEME OF WORK, BY
               AGE GROUP

PREPARES SCHEME OF WORK	25 and less		26 - 35		36 - 45		46 AND ABOVE		TOTAL	
	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT	N	PERCENT
Yes	346	20.7	836	50.0	321	19.2	171	10.2	1,674	94.6
No	47	49.5	34	35.8	8	8.4	6	6.3	95	5.4
Total	393	22.2	870	49.2	329	18.6	177	10.0	1,769	100.0

Half of the teachers (50.0%) who also happen to fall within the age group 26 – 35 years mentioned that they prepare schemes of work, while those of 46 years and above were the least   active (10.2%) in this regard. Table 6.15 presents the proportion of teachers by when they prepare schemes of work.

TABLE 6.15:   PERCENTAGES OF TEACHERS ACCORDING TO WHEN THEY PREPARE
               SCHEMES OF WORK

WHEN THEY PREPARE SCHEME OF WORK	PERCENTAGE
Start of Term	59.4
During Holidays	48.9
On Demand by e.g., Headteacher, DOS, etc.	3.6
Others (Monthly, Fortnightly, etc)	3.5

More than half of the teachers(59.4%) prepare their schemes of work at the start of the school term, and only 3.5% prepare them monthly, fortnightly, weekly, daily or when expecting an external inspector.

Table 6.16 shows the proportion of teachers by use of scheme of work.

TABLE 6.16: PERCENTAGES OF TEACHERS BY USE OF SCHEME OF WORK

USE OF SCHEME OF WORK	PERCENTAGE
Preparation of Lesson Plan	87.3
Setting Tests	33.4
For the Head teacher, DOS, Inspector etc.	12.9
Others (Self Evaluation, etc)	14.3

Almost 9 in 10 teachers interviewed indicated that they use a scheme of work for preparing lesson plans. A third of the teachers (33.4%)use it for setting tests and 12.9% make schemes of work only for the head teacher, among others. Table 6.17 shows the proportion of teachers according to why they do not prepare lesson plans.

TABLE 6.17:   PERCENTAGES OF TEACHERS BY WHY THEY DO NOT PREPARE LESSON PLANS

WHY NOT PREPARE LESSON PLAN	PERCENTAGE
Cumbersome	74.8
Does not Use/Need it	18.8
Lack of Preparatory Materials	9.4
Others (Doesn't know how to prepare it, etc)	8.4

Two thirds of the S 2 teachers stated that they construct lesson plans, but three quarters (74.8%) of those who do not make them consider lesson preparation as cumbersome, among other reasons. During the interview time, lesson plans of only one third (33.6%) of the teachers were seen by the interviewers.

6.4.2 Test Administration and Use

S 2 teachers were interviewed on the methods they use to administer tests and the use they put to the tests.

Table 6.18 shows how the teachers obtained tests they administer to students.

TABLE 6.18:   PERCENTAGES OF TEACHERS' RESPONSES, BY THE SOURCES OF TESTS

SOURCES OF TESTS	PERCENTAGE
Teacher Sets own Test	93.5
Gets Tests from Other Schools	31.6
School or Teacher Buys from say Commercial test publishers	12.7
Obtains Tests from District or Local Examinations Board	10.7
Others (Text books, Online Sources, etc)	9.4
UNEB Past Papers	6.6

The bulk of teachers(93.5%) stated that the tests they administer are constructed by them. About one third, 31.6%, source their tests from other schools, and more than one eighth buy the tests from commercial publishers. Assessment tests are, also, obtained from local examination bodies, UNEB past papers, as well as text books.

Table 6.19 presents information regarding the frequency of test administration.

TABLE 6.19:   *PERCENTAGES OF TEACHERS' RESPONSES, BY TEST ADMINISTRATION SCHEDULE*

WHEN TESTS ARE ADMINISTERED	PERCENTAGE
End of Term	83.4
Middle of Term	67.5
Beginning of Term	64.9
Weekly	16.2
End of a Topic	12.7
Others (Monthly, When convenient, e.t.c)	10.5

Tests are mainly administered at the end of the school term (83.4%). In about two thirds of the cases tests are given at the beginning of term (64.9%) and in the middle of term. Tests are rarely given at the end of a topic or weekly.

On average, three tests were given in a term in each of the studied subjects, although the teachers would have wished to give five tests in a term.

Teachers were required to provide the use they make of assessment tests they administered to students. Table 6.19 provides the reasons the teachers consider for testing.

TABLE 6.20:   *PERCENTAGE OF TEACHERS' RESPONSES, BY REASONS WHY THEY GIVE TESTS TO LEARNERS*

REASONS FOR TESTING	PERCENTAGE
Measure what students know.	79.1
Provide Feedback to Teacher.	32.9
Others (e.g., Keep students busy, fulfil school obligation, etc).	30.1
Provide Feedback/motivation to students.	23.2
Enable students prepare for national examinations.	21.7
Promote students to the next class.	15.1
Inform Teaching.	10.1
Promote a reading culture among learners.	7.1
Compare students' performance.	6.6
Monitor Standards over time.	6.2
To provide feedback to parents.	4.0

Teachers indicated 'measure of what students know' (79.1%) as the common reason for testing. Nearly a third mentioned 'provision of feedback to the teacher' or 'keeping students busy' as well as 'fulfilment of school obligation' as the purpose for test administration. Other reasons included are promotion of students to the next class (15.1%), comparison of students' performance (6.6%) and provision of feedback to parents (4.0%) *inter alia*.

Conclusion

Most of the teachers could not provide a correct description of the key attributes required to prepare a standard test. Whereas almost all teachers interviewed claimed that they had ever been trained on how to set a test, only a very small proportion could identify a test blueprint (test specification table) which is a fundamental tool used in test item-writing. Furthermore, the low ranking of *testing to inform teaching* among the reasons for testing cited by teachers demonstrates inappropriate use of tests. Therefore, most of the teachers have inadequate skills in test construction and predominantly engage in assessment *of* learning and not assessment *for* learning.

Chapter 7

7.0 CONCLUSIONS, DISCUSSIONS AND RECOMMENDATIONS

This chapter represents a discussion of the main findings, probable causes of the performance pattern, conclusions and recommendations.

7.1 OVERALL LEVEL OF ACHIEVEMENT

Results: About a half of the students (46.9%) reached or exceeded the threshold proficiency level in Mathematics, while 43.1% reached the same level in English Language, and a much smaller proportion (14.5%) attained a similar rating in Biology.

Reasons:

- Lack of mastery of Biological terms for instance the term 'organ' was misunderstood.
- Many spelling errors changed the meaning of words: this is a consequence of dictation of notes by teachers.
- Insufficient coverage of some concepts such as 'roots modified for' by the teachers.

Recommendations:

- Teachers should stop dictating notes to learners.
- Use of Biological terms should be emphasized throughout the learning process.
- NAPE recommendations should be incorporated into the teaching/learning process and implemented by all parties.

7.2 ACHIEVEMENT BY COMPETENCIES

7.2.1 Achievement of Students in various Competencies of Mathematics

Results:

Students were able to:

- Solve problems involving shopping.
- Carry out currency conversions.
- Perform the four basic operations on whole numbers
- Find the LCM of two numbers
- Interpret bar graphs
- Represent a relationship using set symbols.

Students had difficulty in:

- Computing a commission in a business transaction.
- Finding the sum of a series.
- Applying the knowledge of LCM in novel situations.
- Correcting a number to a specified number of decimal places.
- Finding the equation of a line passing through 3 or more given points.
- Presenting information in a pie chart.
- Stating the equation of a mirror line.
- Identifying a type of a mirror line.
- Identifying a type of mapping represented in a papygram.

Reasons:

- Lack of a systematic methodological approach in teaching.
- Insufficient knowledge of some of the concepts by the teachers e.g. 'sum of a series'.
- Teaching in an abstract manner without giving life experiences.
- Teaching without following the curriculum and instead follow textbooks.
- Lack of an indepth practice in taught concepts.

Recommendation:

- Teachers should use appropriate methods for the level: In-service training necessary.
- Teachers should follow the prescribed national curriculum.
- Square boards should be used during teaching of coordinates
- Teachers should diversify text books used during teaching.
- A progressive development of the concepts in the students' minds should be encouraged across the ability levels.
- An assessment component should be embedded in the teacher training institutions.

7.2.2 *Achievement of Students in various Competencies of English Language*

Results:

Students were able to:

- Read a text and respond to questions which required direct response from the text.
- Write a formal letter with the correct writer's address, date, salutation and relevant content.
- Write a composition relevant to a given topic.
- Listen to a story and respond to questions which require direct responses picked from the story.

Students had difficulty in:

- Reading a text and responding to questions requiring higher order thinking skills.
- Writing a formal letter with the correct addressee's address, signing off and correct format. For example some students wrote letters which looked like prose compositions.
- Writing an announcement with the necessary attributes for effective message delivery.
- Applying the correct punctuation.

Reasons:

- Inadequate English Language teaching methods among some teachers.
- Lack of effective in-service teacher refresher courses.
- Inadequacy of some teachers' English Language.
- Indifference of other subject teachers to the language mistakes of the students.
- Poor English Language background from primary level.
- Incomprehensive class by class syllabus coverage.
- Teaching focused on the examination.

Recommendation:

Teachers should:

- Vary teaching methods.
- Teach focusing on developing competencies.
- Guide students in functional writing.
- Teach following the curriculum.

7.2.3 Achievement of S 2 Students in various Competencies of Biology

Results:

Students were able to:

- State ways by which the spread of malaria is controlled.
- Label the external features of a vector.
- Associate a living thing with its characteristics.
- Complete a water cycle.
- Name parts of a flowering plant.
- State functions of parts of a plant.

Students had difficulty in:

- Describing how living things can be collected.
- Explaining the leaf arrangement of a stem.
- Drawing and labelling the external structure of a housefly.
- Explaining why a muscle is a tissue
- Describing the care of hand lenses and microscopes
- Describing how a plant root leads to soil formation
- Describing how a soil profile determines the type of crop grown on it.

- Constructing an identification key.

Reasons:
- Poor coverage of the syllabus.
- Mother tongue interference, leading to a lot of spelling errors.
- Lack of biological skills in drawing.
- Insufficient knowledge of assessment.

Recommendations:
- Train teachers in the most appropriate methods for a particular topic.
- Change most of the teaching approaches to enhance interest in learners.
- Increase the contact hours in Biology instruction.
- Encourage trips to places of Biological interest such as environment centres, forests.
- Intensify the monitoring of Biology instruction.

7.3 IMPLICATION OF FINDINGS ON TEACHERS' ASSESSMENT KNOWLEDGE AND PRACTICE

Finding 1:	• The distribution of teachers by subject and gender shows that there are very few female teachers teaching Mathematics and Biology.
Observation:	• Girls have few role models as women teachers of science subjects.
Implication:	• Such a situation could be having an impact on the low percentage of girls reaching the desired levels of proficiency in these subjects.
Finding 2:	• Teachers' distribution by age and subject taught reveals that the majority of teachers of Mathematics, English Language and Biology in S 2 are between 26 – 35 years of age.
Observation:	• These are a youthful group of people with very many varied interests, needs and demands of life especially for galvanising their foundation for their future.
Implication:	• There is a likelihood that if their employers (the schools) cannot satisfactorily attend to their interests, needs and demands through improved welfare, their reaction could have remarkable adverse effect to teaching-learning; and therefore students' achievement.
Finding 3:	• The distribution of teachers by highest professional qualification indicated that there are some primary school teachers (1.1%) who are teachers in secondary school.
	• Likewise, 12% of the teachers were licensed teachers who are S.6 leavers or with other non-teaching qualifications. For example, 17.8% and 11.6% of the teachers offering lessons in Mathematics and Biology, respectively, are non-professional teachers.

Observation:	• Usually the qualification of a teacher determines the level at which a teacher is best suited and expected to teach.
Implication:	• The continued use of untrained teachers or teachers not qualified to teach secondary level could be having a negative impact on the quality of learning and students' achievement.
Finding 4:	• Most of the teachers reported having received their training in setting tests from teacher training institutions.
	• However, the standard of teachers' assessment skills is low as evidenced by their ratings of the attributes needed to prepare a test. For example, only 22.7% and 20.0% thought that 'mastery of subject content' and 'knowledge of curriculum', respectively, were relevant enough in the preparation process of a test.
Observation:	• This portrays the likely kind of training achieved in the training institutions.
Implication:	• It is an indicator of the need to review and strengthen the teaching of the assessment component in teacher training institutions to make it relevant to the classroom teaching-learning.
Finding 5:	• Only less than a third (32.9% and 23.2%) of the teachers thought testing at a classroom or school level, respectively, is to provide feedback to the teacher and students.
Observation:	• One of the basic and most important reasons for testing at a classroom or school level is to provide feedback to the teacher and student.
Implication:	• This implies that the tests which are frequently administered in schools **could** be having little benefit to the teaching-learning process; they are mostly for reflection of pass or failure levels.

7.4   GENERAL OBSERVATIONS

1. Reference is made to the conclusions, discussion and recommendations presented in the NAPE reports of the years 2011 and 2012. These are still valid and applicable to the findings of the year 2013.

Recommendation

- Effort should be made by all stakeholders to implement the recommendations of NAPE for all the years, if a reversal of the declining trend of performance over the years is to be realized.

2. Teachers are inadequate in the area of curriculum interpretation. They find it difficult to discern what to teach, how much of it, how to teach it, when to teach it and to who? Many do not understand or appreciate the reason behind the

progressive nature of the curriculum and the significance of following such progression.

Recommendation
- Curriculum interpretation be introduced as a course unit in all teacher training institutions.
- In-service teachers should be introduced to curriculum interpretation skills through refresher courses.

3. Teachers are lacking the skills of assessment especially formative assessment. Teachers use summative assessment instead of formative assessment for classroom-based assessment.

Recommendation
- Teachers be introduced to assessment for learning (formative assessment) techniques which are appropriate for classroom based assessment.
- Comprehensive education assessment needs to be introduced in all teacher-training institutions.
- In-service teachers and head teachers be introduced to appropriate techniques of assessment for learning.
- Government should expedite the process of introducing the effective criterion- referenced assessment in all public examinations from primary to secondary i.e. PLE, UCE and UACE.

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