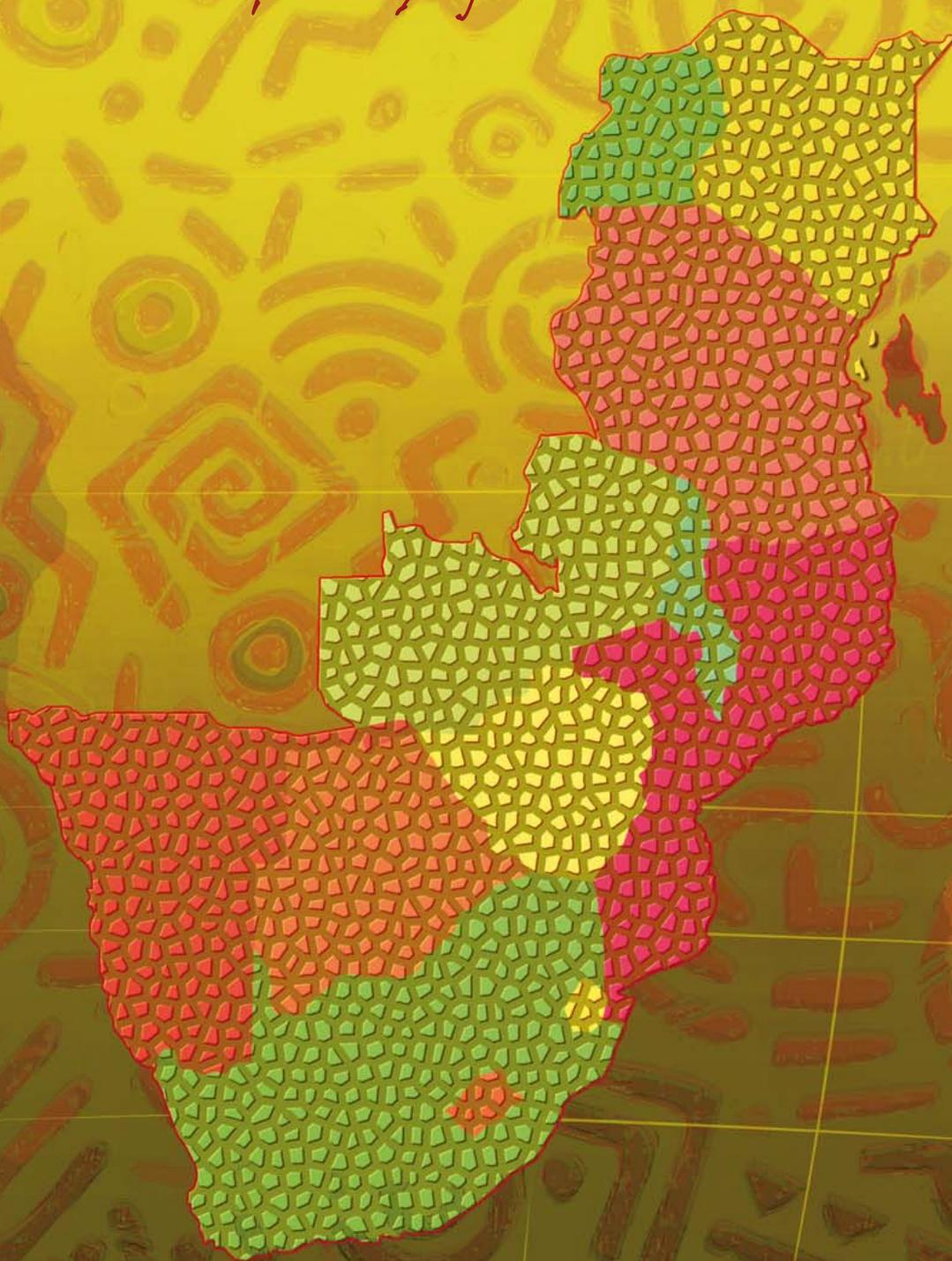


The SACMEQ III project in

KENYA

*A study of the conditions of schooling
and the quality of education*



Southern and Eastern Africa Consortium for Monitoring Educational Quality

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PAUL M. WASANGA, MBS
COUNCIL SECRETARY/CHIEF EXECUTIVE
KENYA NATIONAL EXAMINATIONS COUNCIL

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ABBREVIATIONS AND ACCRONYMS

ASALs	Arid and Semi-Arid Lands
CEMASTE	Centre for Mathematics, Science and Technology in Africa
CHE	Commission for Higher Education
DfID	Department for International Development
DQAS	Directorate of Quality Assurance and Standards
ECD	Early Childhood Development
ECDE	Early Childhood Development Education
EFA	Education for All
EMIS	Education Management Information System
ERS	Economic Recovery Strategy
ERSWC	Economic Recovery Strategy for Wealth and Employment Creation
FPE	Free Primary Education
GER	Gross Enrolment Ratio
GOK	Government of Kenya
GPA	Grade Point Average
GPI	Gender Parity Index
HAKT	HIV and AIDS Knowledge Test
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immunodeficiency Deficiency Syndrome
ICT	Information and Communication Technology
INSET	In-service Teacher Training
INSTEP	In-Service Training and Education Programmes
IIEP	International Institute for Educational Planning
KAIS	Kenya AIDS Indicator Survey
KEAC	Kenya Education Assessment Council
KEMI	Kenya Education Management Institute
KESI	Kenya Education Staff Institute
KESSP	Kenya Education Sector Support Programme
KCPE	Kenya Certificate of Primary Education
KCSE	Kenya Certificate of Secondary Education
KDHS	Kenya AIDS Demographic Health Survey
KICD	Kenya Institute of Curriculum Development
KIE	Kenya Institute of Education
KISE	Kenya Institute of Special Education
KISNE	Kenya Institute of Special Needs Education
KNBS	Kenya National Bureau of Statistics
KNEC	Kenya National Examinations Council
KTTC	Kenya Technical Teachers College
LCB	Low Cost Boarding
MDG's	Millennium Development Goals
MOE	Ministry of Education
MOH	Ministry of Health
MPET	Master Plan for Education and Training
MVC	Most Vulnerable Children
NAC	National Assessment Centre
NACADA	National Agency for Campaign Against Drug Abuse
NACONEK	National Commission for Nomadic Education in Kenya
NASMLA	National Assessment System for Monitoring Learner Achievement
NER	Net Enrolment Ratio

NFE	Non- Formal Education
NGOs	Non Governmental Organisations
P1	Primary Teacher One
PE	Physical Education
QASO's	Quality Assurance and Standards Officers
SACMEQ	South and Eastern Africa Consortium for Monitoring Educational Quality
SAGAs	Semi Autonomous Government Agencies
SE	Sampling Error
SES	Social Economic Status
SMCs	School Management Committees
SMASSE	Strengthening of Mathematics and Science in Secondary Education
SIMBA	School Instructional Materials Bank Account
STI	Science Technology and Innovation
SWAP	Sector Wide Approach
TIVET	Technical Industrial Vocational and Entrepreneurial Training
TPR	Teacher Pupil Ratio
TSC	Teachers Service Commission
TTCs	Teacher Training Colleges
UPE	Universal Primary Education
UNESCO	United Nations Educational, Scientific and Cultural Organization
VCR	Video Cassette Recorder

STATEMENT FROM THE MINISTER

Kenya, like other countries in the region is keen to achieve middle income country status, and one of the fundamentals for the success of this vision is education and training. The government has therefore put in place policies and actions to improve access, equity and quality of education. Subsequently, a lot of gains have been made in this respect especially in the basic education sector. A clear example is the 30 percent increase in enrolment in public primary schools that took place between the years 2002 and 2008, after the introduction of Free Primary Education. This increased enrolment however challenged the available provisions for infrastructure, teaching and learning facilities and teaching personnel. Thus the government has been keen to ensure that the scarce budgetary allocation for education is efficiently utilised in targeted areas of need and growth. Such decisions have therefore to be policies derived from empirical evidence.

I am very pleased that through the participation of Kenya in the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) since 1995, such information has been made available for this purpose. Results of the SACMEQ I Project which was the first such policy research study, was partly instrumental in informing the development of the Sessional Paper No. 1 of 2005. Through this policy, my Ministry revolutionized its approach to the management of education and the optimization of resources intended for the education sector.

The SACMEQ III Report has provided us with a very comprehensive evaluation of these inputs in education and gives us suggestions on ways to improve the quality of education, particularly at the primary school level. The thorough objectiveness of this study enables us to see both the gains and concerns of the recent past, and resultant reflections on the course and direction of our action. There is urgent need for an effective dissemination of this report to ensure that all stakeholders in education have the opportunity to interact with its findings, to discuss and implement plausible courses of action.

HON. MUTULA KILONZO, EGH, EBS, MCI Arb, SC, MP
MINISTER FOR EDUCATION

PREFACE

In response to our development goals and commitments to Education for All, the government launched the Free Primary Education initiative in 2003. To manage this initiative as well as the others in the education sector, the Ministry of Education developed the Kenya Education Sector Support Programme (KESSP) whose main aim was to actualize the aspirations of the Sessional Paper No. 1 of 2005 on Education and Training. Under the KESSP, the Ministry of Education set up the National Assessment System of Monitoring Learner Achievement (NASMLA) whose main aim was to provide a structure for the monitoring educational quality especially in basic education.

While recognizing that national examinations are not able to provide the status of pupil achievement as they progress up the education system, NASMLA was tasked with conducting monitoring of learner achievement (MLA) at Standards 3 and 6, and Form 2 levels. The assessment at the Standard 3 is carried out to assess the level of achievement at the end of lower primary and the first such Report was released in June 2010. The Form 2 level corresponds to the end of basic education and this study is expected to be carried out soon. The SACMEQ initiative provided the opportunity to conduct MLA at the Standard 6 level which represents entry to the upper primary level. Thus, the SACMEQ III is the second Report to be released under NASMLA.

The Kenya National Examinations Council which is the NASMLA implementing agency coordinate the conduct of this study that provides us with data on the impacts of policies and actions that were put in place between 2000 and 2007. The SACMEQ III Project also gives us results of the first comprehensive HIV and AIDS survey conducted in primary schools.

The SACMEQ IV Project is underway and the National Research Coordinators are currently involved in the Instrument Development and Piloting phase. I urge all stakeholders to provide every support required to ensure that this project is completed by 2015 so as to provide us with a timely estimate of our attainment of the Education for All (EFA) goal.

PROF. GEORGE GODIA, EBS
PERMANENT SECRETARY
MINISTRY OF EDUCATION

FOREWORD

Since 1995 Kenya has been involved SACMEQ activities as a member country. The milestones of this involvement are successive policy research studies namely SACMEQ I (1998-2000), SACMEQ II (2000-2005), and SACMEQ III (2005 – 2011). In these studies data on a variety of issues such as achievement, personal, home and school characteristics, was collected from Standard 6 pupils, teachers and head teachers.

This study provides us with very encouraging feedback on some major inputs in the education sector. The results indicate that the achievement of pupils from the poorest backgrounds had improved drastically. This tells us that FPE is an effective pro-poor policy. There was a reduction in repetition rates and incidences of extra-tuition. Both practices have been erroneously assumed to improve academic achievement. There were more female headteachers which is an indicator of the success of affirmative action in gender representation in educational management. The report also shows areas of poor performance such as parental involvement in school activities and pupil behaviour problems.

The immediate challenge is the dissemination of this report to ensure that all stakeholders benefit from the information presented. This is a cooperative activity requiring the participation of the entire education fraternity. We are looking upon the Ministry of Education through its key directorates, at the headquarters and also at the county and field offices, to play a central role in mobilization and implementation of the project's findings. The Kenya Institute of Education will find that the report presents a number of issues relating to curriculum development and implementation. The Kenya Education Management Institute will benefit from information on the impacts of management training provided to school heads and school management committees. A large portion of the report concerns teachers and the Teachers Service Commission may find this information useful in improving services to its clients.

The parents will find this report a useful reference for ways of improving parenting of their children. I am calling upon stakeholders from among the development partners in the education sector to use this report in the formulation of intervention strategies so as to benefit the pupils.

MR. ENOS OYAYA, OGW
EDUCATION SECRETARY, MINISTRY OF EDUCATION

EXECUTIVE SUMMARY

The third Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) aims at assessing and monitoring the quality of education and learning achievements in member countries. The broad areas of assessment are; pupils' characteristics and their learning environments, teacher characteristics, head teacher characteristics and their views on school infrastructure and management. A unique aspect of the SACMEQ III was the assessment of the HIV and AIDS knowledge and attitudes of pupils and their teachers.

The sample comprised of 4436 standard six pupils in 193 public and private schools, 733 teachers and 193 head teachers in Kenya's eight provinces. English, Mathematics, and HIV and AIDS knowledge tests, and questionnaires were administered to the pupils and their teachers. School heads filled the questionnaires about themselves and the school. A school observation schedule was also administered.

On average, standard 6 pupils were slightly younger (14 years) than those in SACMEQ II, but older than the expected national mean of 12 years. The number of pupils from homes where English was regularly used increased. However, on average, there was a decrease in the number of books available at home, days of absenteeism, class repetition, pupils receiving extra tuition and frequency of written tests in reading and mathematics. Parents' participation in raising the pupils' achievement levels was low since teachers did not ask parents to sign their pupils' homework.

While there was gender balance in reading, more male teachers taught mathematics. Overall there was improvement in the provision of teaching-learning equipment attributed to the FPE funding. Female head teachers accounted for only 14.7 percent of all primary head teachers. The frequency of school assessment increased considerably and the most reported teachers' behavioral problems were associated with health and class attendance issues.

Girls from lower SES and rural schools had the lowest level of knowledge concerning HIV and AIDS. Although majority of pupils had negative attitudes towards those infected with HIV and AIDS, more school heads and teachers had a favourable attitude towards infected persons. The main source of knowledge about HIV and AIDS for both pupils and teachers was videos and films. Teachers further preferred talks from HIV infected persons unlike the pupils. Majority of pupils, teachers and school heads did not have HIV and AIDS testing services within walking distance of their homes. Approximately, half of the teachers perceived themselves as being at no, low or medium risk of infection and this was lower than that of head teachers at 64.7%.

Pupils from high SES and urban schools achieved higher mean scores for reading and mathematics. Pupils in Nairobi performed the best while those from Western province had the lowest achievement. Overall, there was a decline in national scores compared to SACMEQ II.

There is need to improve sanitation facilities especially toilets in marginalized areas of the country. Teachers need to focus on methods of teaching that facilitate the acquisition of higher order thinking skills of pupils in Reading and Mathematics. Concerning knowledge of HIV and AIDS, it is critical to use multiple media in teaching, and to focus especially on female pupils in poorer rural areas. There is need for further research to determine factors contributing to low academic achievement especially among Pupils in Western Province, which is largely a high potential area.

ALL BOOKS ALLOTTED
ARE STAMPED
ARE ENTERED INTO THE
RECORDS.
ARE ISSUED TO CLASSTEACHERS
THE TEXTBOOKS TO PUPILS
THE PARENTS TO SIGN FOR
TEXTBOOKS.

2010(MAY)	510,045
2010(DEC)	510,045
2011(JAN)	538,350
2011(JUNE)	423,423
2011(SEPT)	538,350
2012(JAN)	705,705

2010(MAY)	510,045
2010(DEC)	510,045
2011(JAN)	538,350
2011(JUNE)	423,423
2011(SEPT)	538,350
2012(JAN)	705,705

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AVAILABLE TO ALL CIVIL SERVANTS
TSC MEMBERS AND SELECTED COMPANIES

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CHAPTER 1

1.0 SETTING THE SCENE

1.1 INTRODUCTION

The Southern and Eastern Africa Consortium for Monitoring Education Quality (SACMEQ) III research project is a regional initiative involving 15 Ministries of Education in the following countries; Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania (Mainland), Tanzania (Zanzibar), Uganda, Zambia, Zimbabwe and Kenya. The main objective of SACMEQ is to monitor learning achievements at primary school level. To achieve this objective, SACMEQ has carried out three cross-national studies on quality of education: SACMEQ I (1995 – 2000) focused on Reading and was done by seven ministries; SACMEQ II (2000 – 2005) focused on reading and mathematics and was done by 14 ministries and; SACMEQ III (2005 – 2011) focused on reading, mathematics and HIV and AIDS knowledge. So far SACMEQ studies have clearly played a critical role in educational reform process by informing educational policies in these countries.

Kenya participated in SACMEQ I and SACMEQ II, where 3,233 and 3,299 Standard 6 pupils in 185 primary schools participated in the respective studies. These two educational policy research projects were designed to provide information that guided planning decisions aimed at improving the quality of education. The SACMEQ III study anticipated to play an evaluative role of FPE policy which came after the implementation of policy suggestions of SACMEQ I and II; further the study sought to determine knowledge levels of HIV/AIDS among teachers and pupils in Kenyan primary schools as well as to establish standard six pupils' achievement levels in reading and mathematics.

1.2 COUNTRY PROFILE OF KENYA

Kenya is situated in East Africa and is bordered by Uganda to the west, Tanzania to the south, the Indian Ocean to the south-east, Somalia to the east, Ethiopia to the north-east and South Sudan to the north-west. It has a landmass of approximately 582,366 square kilometres and a population of approximately 39 million people. The population comprises 42 African communities (each with its own distinct mother tongue), making up approximately 97 percent of the population. The remaining 3 percent consists of immigrants from Asia and Europe among other continents.

English and Kiswahili are both official languages. Kiswahili which is widely spoken in Eastern Africa is Kenya's national language. It is taught and examined as a compulsory subject at primary and secondary school levels. English is the medium of instruction in Kenya's education system, except in the first three years of primary school where the language of the school catchment area is used for instruction.

At the time of SACMEQ III Project, Kenya comprised of eight administrative regions or provinces: Coast, Central, Eastern, Nairobi, Rift Valley, Western, Nyanza, and North Eastern. Profiles of these provinces are shown in the following **table 1.1**

Table 1.1: Educational and Socio-economic Profiles of Kenya's Provinces, 2007

Province	Number of primary schools	Primary schools GPI	Primary schools GER		Poverty Level (%)	Unique characteristics
			Boys	Girls		
Coast	1698	0.91	100.8	91.3	59.0	Tourism is the Province's economic forte and has some negative impacts on education
Central	3189	0.96	97.4	93.4	30.9	Densely populated. High rainfall throughout the year and well endowed with cash crops
Eastern	5028	0.99	129.7	127.8	50.5	Arid northern sector, densely populated and fertile middle and semi-arid southern sector
Nairobi	1235	1.02	49.5	51.8	22.0	Capital city with high wealth gap
Rift Valley	7165	0.96	118.7	109.6	48.7	High potential farmlands, bustling urban centres and nomadic pastoralists in districts in the arid areas.
Western	2566	1.0	151.5	135.6	53.1	Densely populated and fertile plateau with strong trade links with Eastern Uganda
Nyanza	4818	1.0	131.6	128.1	46.5	Strong agricultural and fishing industry
North Eastern	405	0.63	37.7	30.5	74.0	Arid land with large nomadic population holding traditional cultures hindering education of girls
National	26,104	0.94	111.7	104.4	46.0	

GPI = Gender Parity Index, GER = Gross Enrolment ratio. Source: Republic of Kenya, 2008a, 2008b.

Table 1.1 shows the educational and socio-economic conditions in 2007 which was the year data was collected for SACMEQ III. While recognizing that there is a near perfect gender parity in Eastern, Rift Valley and Nyanza provinces, it should be realized that this may be misleading as some regions in the same provinces will have high levels of disparities. Girls are highly marginalized in the marginal North Eastern Province. Nairobi presents a unique situation where there are slightly more girls than boys.

Gross enrolment ratio (GER) is the proportion of the number of all pupils enrolled in primary school with the number of pupils of appropriate primary school age (6 – 14 years), and is expressed as a percentage. A high value indicates that there are many pupils who are over-age because they entered school late or have repeated their classes. Eastern, Western and Nyanza have high GER rates while Nairobi and North eastern Provinces have the lowest rates.

Poverty in this case was defined as a single person living on less than KShs 1,562 per month. From the **table 1.1** there were higher incidences of poverty

in North Eastern and Coast Provinces. The lowest incidences of poverty in Kenya were in Nairobi and Central Province.

The need to devolve government and make it more responsive to the needs of Kenyans has led to decentralisation of administration. At the time of writing this Report, 47 Counties were being set up to replace Provinces as the centres of devolved government according to the new constitution of the year 2010.

1.3 THE STRUCTURE OF KENYA'S EDUCATION SYSTEM

The system of Education in Kenya is broadly referred to as 8-4-4, which translates to 8 years in primary, 4 years in secondary, and 4 years in university level. Education transition is pegged on the performance in the National Examinations namely the Kenya Certificate of Primary Education (KCPE) and the Kenya Certificate of Secondary Education (KCSE). These examinations are used as criteria for selection to fill in the limited chances available at secondary and university/tertiary levels. Primary to

Secondary transition rates have improved over the years, from 48 percent in 2000 to 59.6 percent in 2007.

*Transition rate from Secondary to University Education is lower compared to that of Primary to Secondary Education. For example in 2007, the transition rate from Secondary to University Education stood at 26.9%.

1.3.1 Primary Education

The official school week for the primary level is five days with duration of six learning hours in a day. The school year comprises three school terms lasting 39 weeks, giving a total of 180 days in a calendar year. The introduction of Free Primary Education in 2003 is a key milestone in the provision of Education in Kenya. The key provisions of the FPE initiative are:

- Abolishing of tuition fees,
- Relaxed conditions for accessing education. For example school uniforms is not compulsory,
- Sensitization of communities on importance of primary education,
- Relaxed age-limit requirements for primary school pupils,
- Availability of teaching/learning materials through the school instructional materials fund,
- Banning of forced grade repetition,
- Availability of government funds for Most Vulnerable Children (MVC) grant, and
- Provision of sanitary towels to girls in primary schools.

One of the immediate impacts of this initiative is an improvement in the completion rates at primary school level which increased from 68.2 percent to 81 percent between 2003 and 2007.

1.3.2 Secondary and Higher Education

In the Secondary Education the curriculum emphasizes both compulsory and elective subjects. In the first and second year, the students study twelve subjects whereas in the third and the fourth year they specialize and study between seven and a maximum of nine subjects. Mathematics, English and Kiswahili are however compulsory at all levels of Secondary Education. Performance of students in Mathematics and English influences their admission to various specialized courses at University level and technical, industrial, vocational, education and

training (TIVET) institutions, therefore determining their career path. The main purpose of TIVET is to provide skills for middle-level manpower for the rapidly changing and diverse economy.

University education is at the apex of the educational ladder and provides high levels skills. In the year 2007 there were 8 public universities with over 50,000 enrolled students, and 18 private universities with 10,000 students. This number has grown over the last five years. The government achieved this by increasing the number of public universities and admitted privately sponsored students in various courses. The government has also awarded more charters to private institutions.

1.4 OBJECTIVES AND POLICY PRIORITIES

The overall objectives of the education sector are to:

- Ensure equitable access, participation, quality, retention, attainment, and learning achievement in education, science, research and technology,
- Ensure provision of affordable and quality education services,
- Mobilize resources for sustainable and efficient delivery of relevant Education, research, and other education services,
- Ensure effective coordination of the provision of education and training for effective delivery of services among all providers including the government, development partners, NGOs, and communities, and
- Promote and popularize a science and technology culture.

The specific targets for the set priorities for the Ministry of Education (MoE) include:

- Attaining Education for All (EFA) by 2015 (100% Net Enrolment Ratios at primary level ,
- In partnership with Teachers Service Commission (TSC), revise teachers ' conditions of service and institute performance based management for all teachers by 2013, to enforce regulations that require teachers to be on duty to cover the syllabus within the stipulated period,
- Ensure access, equity and quality across all levels of basic education and training by 2020,
- Eliminate gender and regional disparities in basic education and training by 2017,

- Improve the quality of education and training so that Kenya's measureable learning outcomes in literacy, numeracy, scientific and communication skills are in the upper quartile on recognized International Standardized Tests by 2017,
- Equip schools to ensure that all pre-primary, primary, and secondary schools meet minimum quality standards of teaching and learning by 2017,
- Ensure that the design, implementation and assessment of the system of education is aligned to the Constitution of Kenya (2010) and the national development goals, including Kenya Vision 2030,
- Create the conditions necessary to ensure that effective teaching of science, technology and ICT takes place in all schools by 2015, and
- Strengthen quality assurance services in schools.

1.5 TEACHER EDUCATION AND TRAINING

By 2007, Kenya had seven public universities offering initial teacher training courses. There were also 29 primary teacher training colleges (PTTCs) comprising of 21 public and 8 private colleges. In addition there were 3 diploma teacher training colleges; Kenya Science Teachers College, Kagumo Teachers College and Kenya Technical Teachers College (KTTC). The annual output of qualified teachers increased from 10,000 in 2000 to about 12,000 in 2007. To enhance performance in science and mathematics a programme for Strengthening of Mathematics and Science in Secondary Education (SMASSE) was cascaded to primary school teachers.

The number of teachers in public primary schools decreased from 178,900 in 2000 to 173,153 in 2007. This decrease was associated with natural teacher attrition and the freeze on teacher recruitment effected by the government in 1998. The national pupil teacher ratio (PTR) rose from 33:1 in 2000 to 42.9:1 in 2007. The increase in PTR was occasioned by the introduction of free primary education in 2003 in addition to the continued freeze on teacher recruitment.

1.6 MANAGEMENT AND ADMINISTRATION OF EDUCATION AND TRAINING

The MoE has the overall responsibility to manage all aspects of education and training. Other partner ministries include Higher Education, Local

Government, Home Affairs and Labour and Human Resource Development. These and others provide education and training although they constitute a comparatively small proportion of the overall education and training service providers.

The MoE is responsible for the education sector policy, planning, and development of sector strategies and regulation of the provision of education and training services by other providers. The management structure at the ministry headquarters includes the Minister, two Assistant Ministers, the Permanent Secretary as the accounting officer, Education Secretary and five Directors. The structure also includes a number of Semi Autonomous Government Agencies (SAGAs) responsible for the development and management of the various aspects of education and training. The Education Secretary oversees the operations of the directorates and the SAGAs and reports to the Permanent Secretary. This arrangement remained unchanged between SACMEQ II & III studies. However with aligning education, research and training to the Kenya Constitution 2010, it is expected that new structural arrangements and reporting systems will be put in place.

1.7 FINANCING OF EDUCATION

According to Sessional Paper No.1 of 2005, financing of education and training encompasses all financial outlays by central and local government, the private sector, NGOs, households, communities and external partners. The average government spending on education and training, excluding the share by households, has ranged between 5 and 7 percent of the GDP.

A necessary precondition for free primary education to have a positive impact is that central budgets are large enough to fund the influx of new learners. Education spending in Kenya since the introduction free of primary education has certainly been impressive. Table 1.2 shows public expenditure from 2000/01 to 2003/04, spanning the period before and after the implementation of FPE in 2003. As seen in Table 1.2, in absolute terms the primary education budget rose roughly nine-fold over this period, and increased roughly seven-fold as a share of public expenditure. While these increases have been impressive, it is important to ascertain

how these funds have been distributed among the general populace. Overall, the introduction of Free Primary Education was intended to be a pro-poor policy.

Table 1.2: Public Spending and Aid for Primary Education (Millions of KSh)

		2000/01	2001/02	2002/03	2003/04
Primary Education	Actual Expenditure	941	933	3,423	8,661
	Aid Receipts	207	319	231	1,262
Total MoE	Actual Expenditure	48,499	53,992	63,715	74,066
	Aid Receipts	288	559	272	1,529
Total National Budget	Actual Expenditure	181,667	186,845	203,635	229,392
	Aid Receipts	34,116	35,072	32,658	33,244

Source: MoE EMIS 2003-2007 Figures in the table represent the sum of the recurrent expenditure and development accounts.

The actual public expenditure on education and training has steadily increased over the last seven years rising from Ksh 48,499 million in 2000 to Ksh 104,686 million in 2007. Unlike in the previous years, with the onset of FPE in 2003, the child capitation grant of Ksh 1,020 per child for each school has been disbursed each year. This accounts for the increase. The funds are disbursed into two accounts: Schools Instructional Materials Bank Account (SIMBA) for the purchase of learning and teaching materials and General Purpose Account (GPA) that caters for repairs, maintenance, water sanitation and conservancy expenses. The government and development partners have been able to fund educational programmes in an effort to achieve access, equity, quality and retention at primary school level. However, there have been a number of challenges in financing education such as;

- Inadequate budgetary allocations and lack of accountability in the utilization of devolved funds at school and constituency levels,
- Lack of effective monitoring and evaluation of programs and projects,
- Delays in completion of infrastructural projects due to design and procurement challenges, leading to under-expenditure, and

- Failure by education partners to meet their commitments and pledges.

1.8 EDUCATIONAL POLICY REVIEWS AND REFORMS 2003 TO 2012

Over the years, education sector in Kenya has focused on promoting access, retention, equity, quality and relevance, which have implications for the sector's efficiency. The Ministry of Education has therefore initiated key reforms to make education more responsive to the needs of the country and in alignment to international declarations of Education for All (EFA) and Millennium Development Goals (MDGs).

1.8.1

In January 2003, the Government of Kenya introduced Free Primary Education to give equal opportunities for access to basic education. In November the same year, a national stakeholders' conference deliberating on challenges for education and training in Kenya in the 21st Century made recommendations that were consolidated into Sessional Paper Number 1 of 2005 on Policy

Framework on Education, Training and Research. This policy has been guiding the education sector since then.

1.8.2

The Kenya Education Sector Support Programme (KESSP) 2005-2010 was developed as an implementation plan for the Policy Framework on Education, Training and Research. KESSP was designed through a Sector Wide Approach to Planning (SWAP) as a pro-poor programme aimed at reducing the household cost burden of financing education previously borne by parents.

KESSP consisted of 23 investment programmes including some targeted interventions to address equitable and inclusive basic education. The targeted interventions include: School Health and Nutrition, School Infrastructure Improvement, Primary School Instructional Materials, Gender in Education, Expanding Education Opportunities in ASAL, Special Needs Education, HIV and AIDS in Education, Non Formal Education and Guidance and Counselling. Among the achievements of these interventions is the increased access to primary education. Enrolment at primary school level at the end of 2010 stood at 9.4 million compared to 6.1 million in 2002, while GER and NER stood at 109.8% and 91.4% in 2010 up from 88.2% and 77.3% respectively in 2002. However, the increased enrolment led to overstretched physical facilities and increased Teacher/Pupil Ratio (TPR). Meanwhile Gender Parity Index (GPI) stood at 0.94 in 2003 and increased to 0.97 in 2010, showing near gender parity, though regional disparities still persist. In collaboration with Development Partners, Civil Society, NGOs and other well-wishers, the GoK has undertaken deliberate efforts to address the needs of marginalized groups with a view to bringing them into the mainstream education system for sustainable development.

1.8.3

As the government continues to commit more resources to the education sector, it is imperative that feasible policies and strategies are implemented, to ensure that expected outcomes and outputs are achieved. Recent policy documents that focus on the attainment of EFA and MDGs include: Economic

Recovery Strategy for Wealth and Employment Creation (ERSWC) 2003-2007; the Sessional Paper No. 1 of 2005 on Education Training and Research; Education Sector policy on HIV and AIDS (2004); Gender in Education (2007); the Non-Formal Education sub-sector Policy (2008); Special Needs Education Policy (2008); and the Nomadic Education sub-sector policy (2010).

1.8.4

The Kenya Vision 2030 is an economic blue print for accelerating Kenya's transformation into a rapidly industrialising middle income nation by 2030. It was developed after the successful implementation of the "Economic Recovery Strategy for Wealth and Employment Creation" over the period of 2003-2007. The education sector is one component in the social pillar that is expected to provide skills required to steer Kenyans to the economic and social goals of Vision 2030. The vision also aims at creating a cohesive, equitable and just society based on democratic principles.

1.8.5

The Constitution of Kenya that was promulgated in August 2010 affirms the right to education for every person including persons with disabilities, the minorities and marginalized groups as affirmed in Chapter Four (Bill of Rights), Article 43 Sec.1 (f) & Article 54 Sec.1 (b). Further, Article 55 (a) commits the state to take measures including affirmative action to ensure citizens access relevant education and training. In addition, the Constitution, introduces major reforms on decentralisation across all sectors.

1.8.6

For the purposes of reviewing and re-aligning the education, training and research sector to the Constitution, a "Task Force on the Re-alignment of the Education Sector to the Constitution of Kenya (2010)" was commissioned in January 2011. The task force was also mandated to review the education system in relations to: relevance and responsiveness of the curriculum to the new constitution and Vision 2030, improving access, equity, quality and transitional issues, suggesting a new structure of education (Kenya Gazette No. 1063). The Taskforce compiled a comprehensive report, proposed Sessional Paper,

draft Education Bill and Cabinet Memorandum and Policy Brief. Since the submission of the Task force Report, the following draft papers and draft bills have been developed and are undergoing consultative processes:

- Joint Education and Training Sessional Paper, 2012
- Science, Technology and Innovation, 2012 as a stand-alone policy to address science and innovation issues

Based on the policies and strategies the following Education Bills have been developed:

- i. Basic Education Bill, 2012
- ii. Kenya National Examination Bill, 2012
- iii. Technical, Vocational Education and Training Bill, 2012
- iv. University Bill, 2012
- v. Science, Technology and Innovation Bill (STI), 2012
- vi. Kenya National Qualification Framework Bill (KNQF), 2012
- vii. Kenya Institute of Curriculum Development Bill, 2012
- viii. The Teachers Service Commission Bill, 2012

These bills seek to provide a modern perspective to the conduct of Education and equip the respective institutions with greater strength and flexibility to deal with emerging issues in Education.

1.8.7

Educational Review and Reform activities are informed by the work of earlier education commissions, task forces and working groups including: the Kenya Education Commission (Ominde Commission, 1964), the National Commission on Educational Objectives and Policies (Gachathi report, 1976), the Presidential Working Party on the Second University in Kenya (Mackay Commission, 1981), the Presidential Commission on Development and Employment in Kenya: A Strategy for the Transformation of the Economy (Kamunge Report, 1988), Totally Integrated Quality Education and Training: Commission of Inquiry into the Education System of Kenya (Koech Report, 1999).

1.9 THE MAIN POLICY CONCERNS OF THE MINISTRY OF EDUCATION

The overriding policy concern of the Ministry of Education is to provide Education For All (EFA) by

2015 and Universal Primary Education (UPE) of a good quality. The medium and long term policy measures include;

1.9.1

Supporting provision of education through alternative approaches, the task force recommended operationalisation of the Nomadic Education Policy framework and the establishment of the National Council for Nomadic Education in Kenya (NACONEK); expand and adequately finance feeder, mobile and low cost boarding primary schools as well as provide qualified, experienced and motivated teachers to these schools, among others,

1.9.2

Developing responses to social problems affecting learners and teachers, such as HIV/AIDS, drug abuse, and other anti-social practices. This may include review of the 2004 Education Sector Policy on HIV and AIDS to address stigma and discrimination, support mechanisms that address the needs of teachers and learners affected. In addition, there is need to develop and strengthen local mechanisms for resource mobilization to support HIV and AIDS programmes for orphans and vulnerable children,

1.9.3

Closing the gender gap and elimination of gender biases in the education sector. In order to deepen the gains of FPE, there is a need to continue expanding gender-friendly physical facilities in all primary schools, especially in slums, ASALs and pockets of poverty. Distribution of sanitary towels, Most Vulnerable Children,

1.9.4

Ensuring that children with special needs fully participate and are treated equally in learning activities at all levels. A National Special Needs Education Policy framework (2009) was developed. The government has embraced inclusive education whereby learners with disabilities and special needs are provided with appropriate education within regular schools. However, special needs education has not been fully mainstreamed across

the education sector. Clear guidelines and resources are required to implement the policy on inclusive education in schools.

1.9.5

Strengthen the capacity of semi-autonomous agencies (SAGAs) in the education sector.

1.10 THE SACMEQ CONSORTIUM AND ITS PERCEIVED IMPORTANCE AND BENEFITS WITH RESPECT TO EDUCATIONAL POLICY RESEARCH AND TRAINING IN KENYA

Since 1995 when Kenya began involvements in SACMEQ, there are a number of benefits that have been derived from this participation. The most important is the entrenchment of the monitoring and evaluation culture in Kenya's education system. The results of this activity have become an integral part of policy-making in the education sector.

Through mentoring and exposure to international standards as provided by IIEP/SACMEQ, Kenya has built an effective capacity to manage national assessments. Participation in successive studies has built the capacity of the country's researchers and planners in the use of modern logistical, sampling and data processing techniques. Another key component of this engagement is the development of capacity in data analysis, report writing, policy development and dissemination. Thus SACMEQ Reports have been valued for their robust findings and policy suggestions.

The implementation of Free Primary Education (FPE) Policy adopted some key policy suggestions of SACMEQ I which included: Non Formal Education Programme, provision of instructional materials and in-service teacher training (INSET) development. The outcome of this has been the provision of an all-inclusive quality education that is accessible and relevant to all including the most vulnerable and marginalized groups. The policy research findings of SACMEQ II sought to address policy issues related to quality of education. Direct policy interventions informed by SACMEQ II findings include provisions for overage children, reduction of the curriculum load and the promotion of a gender sensitive curriculum.

SACMEQ is an international activity in which standardized tests are administered in different education systems. Thus, Kenya has been able to benchmark its performance with those of other countries and make an estimate of its relative progress in the achievement of quality education for all.

1.11 THE SACMEQ III GENERAL POLICY CONCERNS

The starting point of the SACMEQ research project is the consultations held between the National Research Coordinator (NRC) and key decision makers in the Ministry of Education where the country-specific educational research agenda were defined. The information gathered here is debated and refined by the SACMEQ NRCs, the outcome of which is the respective Project's General Policy Concerns. The SACMEQ III Project sought to respond to the following 21 General Policy Concerns.

General Policy Concern 1: What are the individual (for example, age and gender) and home background characteristics (for example, parent education, regularity of meals, home language, etc.) of Standard 6 pupils that might have implications for monitoring equity, and/or that might impact upon teaching and learning?

General Policy Concern 2: What are the school context factors experienced by Standard 6 pupils (such as location, absenteeism (regularity and reasons), Standard repetition, and homework (frequency, amount, correction, and family involvement)) that might impact upon teaching/learning and the general functioning of schools?

General Policy Concern 3: Do Standard 6 pupils have sufficient access to classroom materials (for example, textbooks, readers, and stationery) in order to participate fully in their lessons?

General Policy Concern 4: Do Standard 6 pupils have access to library books within their schools, and if they have access, is the use of these books being maximized by allowing pupils to take them home to read?

General Policy Concern 5: Has the practice of Standard 6 pupils receiving extra lessons in school subjects outside school hours become widespread, and are these paid lessons?

General Policy Concern 6: What are the personal characteristics of Standard 6 teachers (for example, age, gender, and socio-economic level), and what was the condition of their housing?

General Policy Concern 7: What are the professional characteristics of Standard 6 teachers (in terms of academic, professional, and in-service training), and did they consider in-service training to be effective in improving their teaching?

General Policy Concern 8: How do Standard 6 teachers allocate their time among responsibilities concerned with teaching, preparing lessons, and marking?

General Policy Concern 9: What are Standard 6 teachers' viewpoints on (a) pupil activities within the classroom (for example, reading aloud, pronouncing, etc.), (b) teaching goals (for example, making learning enjoyable, word attack skills, etc.) (c) teaching approaches/strategies (for example, questioning, whole class teaching, etc.), (d) assessment procedures, and (e) meeting and communicating with parents?

General Policy Concern 10: What is the availability of classroom furniture (for example, sitting/writing places, teacher table, teacher chair, and bookshelves) and classroom equipment (for example, chalkboard, dictionary, maps, book corner, and teacher guides) in Standard 6 classrooms?

General Policy Concern 11: What professional support (in terms of education resource centres, inspections, advisory visits, and school head inputs) are given to Standard 6 teachers?

General Policy Concern 12: What factors have most impact upon teacher job satisfaction?

General Policy Concern 13: What are the personal characteristics of school heads (for example, age and gender)?

General Policy Concern 14: What are the professional characteristics of school heads (in terms of academic, professional, experience, and specialized training)?

General Policy Concern 15: What are the school heads' viewpoints on general school infrastructure (for example, electrical and other equipment, water, and basic sanitation) and the condition of school buildings?

General Policy Concern 16: What are the school heads' viewpoints on (a) daily activities (for example, teaching, school-community relations, and monitoring pupil progress), (b) organizational policies (for example school magazine, open days, and formal debates), (c) inspections, (d) community input, (e) problems with pupils and staff (for example, pupil lateness, teacher absenteeism, and lost days of school)?

General Policy Concern 17: What are the pupils' (a) knowledge levels about HIV and AIDS? (b) sources of information about HIV and AIDS? (c) attitudes towards HIV and AIDS?

General Policy Concern 18: What are the teachers' (a) knowledge levels about HIV and AIDS? (b) sources of information about HIV and AIDS? (c) attitudes towards HIV and AIDS?

General Policy Concern 19: What are the school head attitudes towards HIV and AIDS? (b) What were the school policies regarding teachers with HIV and AIDS?

General Policy Concern 20: What are the levels (according to Rasch scores and descriptive levels of competence) and variations (among schools and regions) in the achievement levels of Standard 6 pupils and their teachers in reading and mathematics – for my country and for all other SACMEQ countries?

General Policy Concern 21: What are the reading and mathematics achievement levels of important sub-groups of Standard 6 pupils and their teachers (for example, pupils and teachers of different genders, socio-economic levels, and locations)?

1.12 THE STRUCTURE AND CONTENT OF THIS REPORT

The first two chapters are introductory in nature while the next 5 present the findings of the research. The last two chapters are analytic in nature and it

is from here that the policy suggestions are derived and presented.

Chapter 1 discussed the socio-economic environment, and the structure and content of Education in Kenya. **Chapter 2** is concerned with methods used in this study. The chapter looks in particular at sampling techniques, tools and data collection processes. **Chapter 3** deals with the pupils' characteristics and the quality of their learning environment. **Chapter 4** looks at the characteristics of teachers and their views of their work environment and professional issues. In **chapter 5**, data on the characteristics of school heads and their views on educational infrastructure, the organization and operations of schools are discussed. A unique feature of this report is **Chapter 6** that looks at knowledge, attitudes and practices concerning HIV and AIDS among pupils, their teachers and headteachers. **Chapter 7** presents achievement of pupils in Reading and Mathematics, while further analyses of factors that affect achievement are presented in **Chapter 8**. The concluding **Chapter 9** synthesizes all key recommendations and structures them further as policy suggestions.



MATHEMATICS CORNER

CONVERSION TABLES AND FORMULAE IN PPM

Volume, Area and Perimeter

Conversion

Mass/Weight

1000 milligrams	=1 gram (g)
1000 grams	=1 kilogram (kg)
1000 kilograms	=1 tonne (t)
1000 000g	=1 tonne

Length

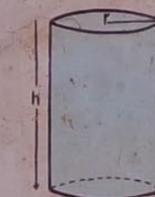
10 millimetres	=1 centimetre (cm)
10 centimetres	=1 decimetre (dm)
10 decimetres	=1 metre (m)
10 metres	=1 decametre (Dm)
10 decametres	=1 hectometre (hm)
10 hectometres	=1 kilometre (km)
100 000 cm	=1 km
1000 m	=1 km

Capacity

10 millilitres	=1 centilitre (cl)
1000 millilitres	=1 litre (l)
1000 litres	=1 m ³
1000 cm ³	=1 litre
1 millilitre	=1 cm ³

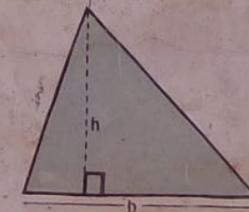
Time

60 seconds	=1 minute
60 minutes	=1 hour
24 hours	=1 day
7 days	=1 week
1 year	=365 days
1 leap year	=366 days

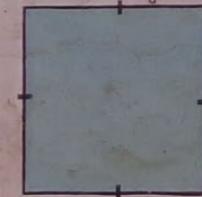


$$S \text{ Area} = 2\pi r^2 + 2\pi r \cdot h$$

or $2\pi r^2 + \pi \cdot DH$
or $\pi(r+h)^2$



$$\text{Area} = \frac{1}{2} \times b \times h$$

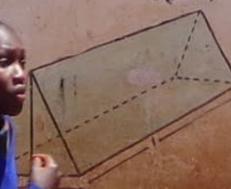


$$\text{Area} = (a \times a) = a^2$$



$$C = 2\pi r \text{ or } \pi D$$

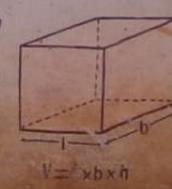
$$A = \pi r^2$$



$$V = l \times b \times h$$



$$\text{Area} = a \times b$$



$$V = s \times s \times s$$



$$\text{Area} = \frac{1}{2}(a+b)h$$

CHAPTER 2

2.0 CONDUCT OF THE SACMEQ III PROJECT

2.1 INTRODUCTION

Since the entry of Kenya into SACMEQ in 1995, a lot of strides have been made in entrenching empirical evidence in the Ministry of Education's decision-making process. The SACMEQ projects have become the most important research activities that encompass a wide area of primary education and involve all major stakeholders. The eclectic approach of SACMEQ has led to the capture of a wide array of variables which include those in the pupils' home background, class and school environments. In 2007 SACMEQ for the first time added an important health dimension that touched on HIV and AIDS issues in the school.

The SACMEQ initiative contains a capacity development component that has been equipping researchers, educationists and planners who have been trained in the use of the latest research design, data analysis and processing tools and software. This component also includes writing skills aimed at policy formulation and dissemination. These skills have served both the SACMEQ and the wider Ministry of Education's research agenda very well.

The first two educational policy research projects undertaken by SACMEQ (widely known as "SACMEQ I" and "SACMEQ II") were designed to provide detailed information that could be used to guide planning decisions aimed at improving the quality of education in primary school systems in member countries. From 1995 to 1998, Kenya was among seven Ministries of Education that participated in the SACMEQ I Project and the results of this research were reported in the first such national policy report (Nzomo, Kariuki & Guantai, 2001). The SACMEQ II Project commenced in 1998 and involved 15 ministries of Education. It was more complex as it involved a larger sample, included more variables such as Numeracy skills (Onsomu, Nzomo, & Obiero, 2005). Technical information about the sampling, instrument construction, and field work for the SACMEQ I & II Projects may be found in these reports.

The focus of the SACMEQ III Project was on conditions of schooling and the quality of education in fifteen school systems: Botswana, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania (Mainland), Tanzania (Zanzibar) Uganda, Zambia and Zimbabwe. The purpose of the project was to gather information on:-

a) the general conditions of schooling, b) the reading and mathematics achievement levels of Grade 6 learners and their teachers, and c) the knowledge that learners and their teachers have about HIV and AIDS. The main data collection for the project took place in 2007 and covered a total of around 60,000 pupils, 8000 teachers, and 2800 school heads. Data collection in Kenya covered 193 primary schools from which 4,436 pupils, 733 teachers and their headteachers were sampled.

The main purpose of this chapter is to provide a detailed account of the key technical procedures that were involved in the design and implementation of the SACMEQ III Project.

The chapter provides a detailed explanation of the procedures involved in the selection of samples of schools and pupils for the Project. The sampling procedures were evaluated through an examination of response rates and the calculation of design effects, effective sample sizes, and standard errors of sampling. Other aspects of the methodology followed in the SACMEQ III Project that have been outlined in this chapter include a description of data collection, cleaning and analysis.

It is instructive to note that the methodology and instruments that were used in the SACMEQ III Project in 2007 were, therefore, the same as in SACMEQ II. For a detailed account of the study design, sampling techniques and the development of the instruments, reference should be made to the second chapter of the SACMEQ II Report. A unique feature of the SACMEQ III Project was the inclusion of the HIV and AIDS Knowledge Test (HAKT) for Standard 6 pupils and their teachers. The addition of new variables such as HIV and AIDS knowledge and attitudes resulted in a major increase in the scale and complexity of SACMEQ's research and training programmes.

2.2 POPULATION AND SAMPLE

2.2.1 The Specification of the Target Population

The target population for both the SACMEQ I and SACMEQ II Projects was focussed on the Standard 6 level for three main reasons.

First, Standard 6 identified a point near the end of primary schooling where school participation rates were reasonably high for most of the seven countries that participated in the SACMEQ I data collection during 1995-1997, and also reasonably high for most of the fourteen countries that participated in the SACMEQ II data collection during 2000-2002. For this reason, Standard 6 represented a point that was suitable for making an assessment of the contribution of primary schooling towards the literacy and numeracy levels of a broad cross-section of the society.

Second, the NRCs considered that testing pupils at grade levels lower than Grade 6 was problematic because in some SACMEQ countries the lower grades were too close to the transition point between the use of local and national languages by teachers in the classroom. This transition point generally occurred at around Grade 3 level – but in some rural areas of some countries it was thought to be as high as the Grade 4 level.

Third, the NRCs were of the opinion that the collection of home background information from pupils at grade levels lower than Grade 6 was likely to lack validity for certain key "explanatory" variables. For example, the NRCs felt that children at lower

grade levels did not know how many years of education their parents had received. They also had difficulty in accurately describing the socioeconomic environment of their own homes (for example, the number of books at home).

2.2.2 Desired Target Population

The desired target population definition for the SACMEQ III Project was exactly the same (except for the year) as was employed for the SACMEQ I & II Projects. This consistency was maintained in order to be able to make valid cross-national and cross-time estimates of "change" in the conditions of schooling and the quality of education.

The desired target population definition for the SACMEQ III Project was as follows.

"All pupils at Standard 6 level in 2007 (at the first week of the eighth month of the school year) who were attending registered mainstream primary schools."

It is important to note that while the emphasis in the definition of the desired target population was placed on pupils, the three SACMEQ Projects were also concerned with reporting estimates that described schools and teachers. When the data files were prepared for analysis, the information collected about schools and teachers was disaggregated over pupils - so as to provide estimates of teacher and school characteristics "for the average pupil" – rather than estimates for teachers and schools as distinct target populations in themselves.

2.2.3 Excluded and Defined Target Populations

The use of the word "mainstream" in the definition of the desired target population automatically indicated that special schools for the handicapped should be excluded from the SACMEQ II data collection.

In addition, a decision was taken to exclude small schools – based on the definition of having less than either 15 or 20 pupils in the desired target population. Small schools were excluded because it was known that they represented a very small component of the total population of pupils, and were known to be mostly located in very isolated areas that were associated with high data collection

costs. That is, it was understood that the allocation of these small schools to the excluded population had the potential to reduce data collection costs – without the risk of leading to major distortions in the study population. The exclusion rule that was applied in Kenya was schools with less than 15 Standard 6 pupils and Special Schools. The

“defined target population” was constructed by removing the “excluded target population” from the “desired target population”. In Table 2.1 the number of schools and pupils in the desired, defined and excluded populations for the SACMEQ III Project have been presented.

Table 2.1: Desired, Defined, and Excluded Populations for Kenya

	Desired		Defined		Excluded		Pupils %
	Schools	Pupils	Schools	Pupils	Schools	Pupils	
Kenya	19045	712153	15539	678207	3506	33946	4.77%

The last column of the **Table 2.1** summarizes the percentage of SACMEQ III pupil desired target population for Kenya that had been excluded in order to form the desired target population. In this case the percentage excluded was less than 5 percent, which satisfied the technical requirements that had been set down for the SACMEQ sampling procedures.

2.2.4 The Stratification Procedures

i) The Province

The explicit stratification variable, “Province”, was applied by separating each sampling frame into separate regional lists of schools prior to undertaking the sampling.

The main reason for choosing Province as the explicit stratification variable was that the Ministry of Education wanted to have education administration regions as “domains” for the study so as to have reasonably accurate sample estimates of population characteristics for each province. At the time of conducting of this study, the Province was the second tier of the administrative structure and thus sufficient data differentiation was possible to allow specific actions and follow-up in the respective regions.

ii) The Selection of Schools

In order to obtain greater control over the total sample size, stratification of the schools according to size was done, after which samples of schools were selected within each stratum. This technique

is known as Probability Proportional to Size (PPS) sampling which also involved the selection of a simple random sample of a fixed number of pupils within selected schools.

iii) The Selection of Pupils within Schools

A critical component of the sample design for the SACMEQ III Project was concerned with the selection of pupils within selected schools. It was decided that these selections should be placed under the control of trained data collectors – after they were provided with materials that would ensure that a simple random sample of pupils was selected in each school.

Class registers for all Standard 6 pupils that attended regular classes were obtained by the data collectors. In the register, each pupil would be assigned a number after which the numbers were selected using a random number table that had been prepared for this purpose. The names of sampled pupils who totalled 20 in each school were written. The sampled pupils were thus called out to participate in the data collection process.

2.3 EVALUATION OF THE SACMEQ SAMPLE DESIGNS

Response rates, design effects, and effective sample sizes

The size and the quality of the sample are critical to the accuracy of the research. The response rate, the design effect and the effective sample size are

some of the characteristics that SACMEQ monitors in all the projects.

The response rates, design effects and effective sample sizes for the SACMEQ III project in Kenya have been presented in Table 2.2. The figures in the first two columns under the heading “Response Rate %” are the response rates for schools and learners, respectively. The third, fourth and fifth columns under the heading “Design Effects” are numbers

(ratios) that indicate the amount of “sampling error” associated with the two-stage sample for each of Reading, Mathematics and HAKT estimates. Columns six, seven and eight under the heading “Effective Sample Sizes” are numbers of sample units (learners) in a simple random sample that would give the same level of accuracy as the two-stage sample that was used in the study for each of Reading, Mathematics and HAKT.

Table 2.2: Response Rates, Design Effects, Effective Sample Sizes for Kenya in SACMEQ III

	Response Rate (%)		Design Effect			Effective Sample Size		
	Schools	Pupils	Reading	Maths	HAKT	Reading	Maths	HAKT
Kenya	98	91	11.5	9.4	10.2	385	470	433

a) Response Rates

The technical requirement for the SACMEQ research programme was that all countries should seek to achieve overall response rates of 90 percent for schools and 80 percent for pupils. The SACMEQ III response rates presented in Table 2.2 indicates that Kenya satisfied the required response rate for schools and pupils, at 98 and 91 percent, respectively.

b) The Design Effect

Design effect is a proportion (ratio) which indicates the amount of “sampling error” that is introduced by the use of a clustered (two-stage) sampling method in relation to the “sampling error” that would result if a simple random sample of the same size had been used. Alternatively, the “design effect” is the ratio of the variance (of the sample mean) for a multi-stage sample to the variance for a simple random sample of the same size. Applied to SACMEQ III, this means that for Reading the achieved two-stage sample of 4,436 had a variance (of the sample mean) which was 11.5 times the variance that would be realized if a simple random sample of the same size was used. For Mathematics this ratio was 9.4 while for HAKT it was 10.2. Generally, the inaccuracy associated with a multi-stage sample was many times greater than the inaccuracy associated with a simple random sample of the same size.

c) Effective Sample Size

Effective sample size is calculated from the design effect. It is the size of a simple random sample that would be required to give the same level of accuracy as the given multi-stage sample. For Reading in this case, a simple random sample of 385 learners would have given the same level of accuracy as the two-stage sample of 4,436. The “Effective Sample Size” for Reading = $4436/11.5 = 385$ learners. Possible (small) inaccuracies in this calculation may be due to the fact that not all 4,436 pupils took all three tests. The “Effective Sample Sizes” of each of Mathematics and HAKT can be calculated in the same way provided care is taken to use the correct values. Generally, the “Effective Sample Size” will be smaller than the given actual multi-stage sample.

The sample designs used in the SACMEQ III Project were selected so as to meet the standards set down by the International Association for the Evaluation of Educational Achievement (IEA).

These standards require that sample estimates of important learner population parameters in multi-stage designs should have sampling accuracy that was at least equivalent to a simple random sample of 400 learners (thereby guaranteeing 95 percent confidence limits for sample means of plus or minus one tenth of a learner standard deviation unit). In SACMEQ III, Kenya attained effective sample size values in both Mathematics and HAKT that exceeded

the threshold (470 and 433, respectively). However Kenya did not fulfil this parameter for English (385).

2.4 DATA COLLECTION

Data collection procedures included instrument review, communication to schools, printing and distribution of instruments and training of data collectors.

a) Instrument Review

As soon as the SACMEQ Assembly of Ministers took a decision to conduct the SACMEQ III project in 2007 the National Research Teams (NRTs), under the auspices of the SACMEQ Coordinating Centre in Paris, set out to prepare and update the instruments (tests and questionnaires). Between 2005 and 2006 the SACMEQ Coordinating Centre hosted at least three working sessions for the NRTs in Cape Town, Paris and Botswana, that were focused on reviewing existing test items and ensuring that, where there had been curriculum changes, the items were still relevant. Invariably, there were no significant changes on the Reading and Mathematics test items. The HIV and Aids items, which were new, were piloted, first in a few primary schools in Botswana and then in individual member countries. The pilot study was intended to ensure that the language in the HAKT was accessible to learners, that there were no cultural biases in the items and learners could follow how to write their responses.

The final statistical and content validity and reliability checks of the instruments were carried out by specialists at the SACMEQ Coordinating Centre who then declared the instruments ready to print and administer.

(b) Communication to schools

The Permanent Secretary, Ministry of Education notified the sampled schools through the District Education Officers at the beginning of 2007. In addition, the Kenya National Examinations Council (KNEC) which was in charge of the data collection activity identified regional coordinators from among Education officials, who were responsible for data collection and teams of data collectors. The data collection teams would be responsible for distributing the data collection schedules, follow-up and monitoring communication to schools in their

respective provinces and districts.

(c) Printing and distribution of data collection instruments

Data collection instruments included a) School Head Booklets, b) School Information Forms, c) Teacher Booklets, d) Learner Booklets and e) Learner Name Forms. Each participating country received print-ready copies from the Coordinating Centre and was responsible for printing correct numbers of copies for their respective schools. In Kenya, the KNEC printed the instruments in its printing factory.

When all instruments were printed, the NRTs conducted a “hand check” of all materials so as to verify that there were no missing pages or misprints or omissions. All work related to the printing and packaging of the data collection instruments was undertaken under strict security arrangements – so that there was no possibility of a “leakage” of information about the content of the learner and teacher Reading and Mathematics tests.

The printed materials were distributed to leaders of teams that were assigned to collect data in each province. The Team leaders were responsible for checking the accuracy of the instruments in terms of correctness of numbers and languages, before carrying the instruments to the schools. The first level of checking was during the data collection training sessions and the data collectors were charged to do further and final checks a day before the data collection.

d) Training of data collectors

The data collectors were trained in a five-day workshop. On the first day of training the NRC presented a “simulated” data collection exercise in which he/she acted as a data collector and the trainees took the roles of learners, teachers, and School Heads. The second day involved an intensive study of the Manual for Data Collectors. This document set down, in sequential order, all of the actions to be taken by the data collector from the time of receiving packages of data collection instruments from the KNEC to the time when the data collector had completed the data collection and was preparing all materials for return. The third day involved a second “simulated” data collection

whereby the trainees supervised a full-fledged data collection in several schools that were not involved in the main data collection. The experiences gathered during these exercises were shared and discussed during a later meeting so that all data collectors understood the procedures to be completed within schools.

d) Main Data Collection

“Main Data Collection” in this report refers to the actual field work. Three trained data collectors were assigned to each sampled school to administer the instruments. Special effort was made to ensure that the data collections were conducted according to explicit and fully-scripted steps so that the same verbal instructions were used (for learners, teachers, and School Heads) by the data collectors in all sample schools in all countries for each aspect of the data collection. This was a very important feature of the study because the validity of cross-national comparisons arising from the data analyses depended largely, on achieving carefully structured and standardized data collection environments.

The main SACMEQ III data collection occurred for most SACMEQ Ministries of Education in the period September to December 2007. In Kenya, data was collected in September 2007 in 193 sample schools that were involved.

Two days of data collection were required for each sample school. On the first day the data collectors had to sample learners from all the Standard 6 classes in the sampled schools, using a list of provided random numbers. The sampled learners were then given the learner questionnaire, the HAKT and the Reading test. On the second day they were given the Mathematics test. Part of the learner questionnaire required learners to get confirmation of the accuracy of the information from their parents and so the questionnaire was taken home and returned the following day.

In addition to completing a questionnaire, one teacher who taught the majority of the sampled learners for each of Reading, Mathematics and Life Skills (for the HIV and Aids test) also completed the relevant tests.

The data collectors were provided with a 40-point

checklist in order to ensure that they completed all important tasks that were required before, during, and after their visits to schools. Each task was cross-referenced to specific pages of instructions in the data collectors’ manual. The data collectors also checked all completed questionnaires (learner, teacher, and School Head) and, if necessary, obtained any missing or incomplete information on the second day before they left the school. The materials were then handed over to the provincial coordinator for safekeeping, “hand editing” and dispatching to the National Research Coordinator (NRC) in Nairobi as soon as all data collection was completed.

2.5 DATA ENTRY, DATA CHECKING AND DATA CLEANING

In this section the processes that were followed at national level to check, enter and clean the data have been described.

a) Data Checking and Data Entry

The Kenyan NRT received the completed materials from the provincial coordinators and kept these safely while they were being checked, entered into computers, and then “cleaned” to remove errors prior to data analysis. Data-checking involved the “hand editing” of data collection instruments by a team of trained staff. The staff checked that: (i) all expected questionnaires, tests, and forms had been received, (ii) the identification numbers on all instruments were complete and accurate, and (iii) certain logical linkages between questions made sense (for example, they had to verify if the two questions to School Heads concerning “Do you have a school library?” and “How many books do you have in your school library?” were answered consistently).

Trained data capturers, supervised by the NRT, entered data into computers using the WINDEM software that was supplied by the SACMEQ Coordinating Centre. Data was “double entered” in order to monitor accuracy. Individual data capturers worked for a maximum of six hours per day, and the whole data entry operation for Kenya was estimated to involve around 75 person days of data entry.

b) Data Cleaning

During December 2007 the SACMEQ Coordinating Centre organized a training programme for all NRTs. The teams were led step-by-step through the required data cleaning procedures that they were to follow in their respective countries.

At individual country level, NRTs followed a “cyclical” process whereby data files were cleaned by the NRT and then emailed to the Coordinating Centre for checking and then emailed back to the NRC for further cleaning. The entire data cleaning process in Kenya lasted ten months, from May 2008 to February 2009.

To clean the data, using the WINDEM software, the NRTs followed specific directions to (i) identify major errors in the sequence of identification numbers, (ii) cross-check identification numbers across files (for example, to ensure that all learners were linked with their own Life Skills, Reading and Mathematics teachers), (iii) ensure that all schools listed on the original sampling frame also had valid data collection instruments and vice-versa, (iv) check for “wild codes” that occurred when some variables had values that fell outside pre-specified reasonable limits, and (v) validate that variables used as linkage devices in later file merges were available and accurate.

2.6 DATA ANALYSIS

a) Merging and Weighting

When data cleaning was complete, the NRT merged the data from all the sources. The merging process required the construction of a single data file in which learners were the units of analysis and the rest of the data from the other respondents and linked to the learner data. That is, each record of the final data file for the country consisted of the following four components: (a) the questionnaire and test data for an individual learner, (b) the questionnaire and test data for his/her Life Skills, Mathematics and Reading teacher, (c) the questionnaire data for his/her School Head, and (d) school and learner “tracking forms” that were required for data cleaning purposes.

To illustrate, with the merged file it was possible to

examine questions of the following kind: “What are the average Reading and Mathematics test scores (based on information taken from the learner tests) for groups of learners who attend urban or rural schools (based on information taken from the School Head questionnaire), and who are taught by male or female teachers (based on information taken from the teacher questionnaire)?”

The calculation of sampling weights could only be conducted after all files had been cleaned and merged. Sampling weights were used to adjust for missing data and for variations in probabilities of selection that arose from the application of stratified multi-stage sample designs. There were also certain country-specific aspects of the sampling procedures, and these had to be reflected in the calculation of sampling weights.

Two forms of sampling weights were prepared for the SACMEQ III Project. The first sampling weight (RF2) was the inverse of the probability of selecting a learner into the sample. These “raising factors” were equal to the number of learners in the defined target population that were “represented by a single learner” in the sample. The second sampling weight (pweight2) was obtained by multiplying the raising factors by a constant so that the sum of the sampling weights was equal to the achieved sample size. A detailed account of weighting procedures can be found in Ross et al (2003).

b) Analysing the data

The data analyses for the SACMEQ III Project were very clearly defined because they were focussed specifically on generating results that could be used to “fill in the blank entries” in given Dummy Tables. There were two main tasks in this area. First, SPSS software was used to construct new variables (often referred to as “indices”) or to re-code existing variables. For example, an index of “socioeconomic level” was constructed by combining re-coded data on learners’ homes, and the number of possessions in learners’ homes. Second, the Coordinating Centre’s specialized data analysis software, IIEPJACK, was used to “fill” the Dummy Tables with appropriate estimates and corresponding sampling errors.

2.7 WRITING THE SACMEQ III POLICY REPORTS

The NRT commenced the process of drafting their national educational policy reports during 2009. Two workshops held in Paris during September 2009 and September 2010 were organized to support the NRT in this work. These workshops permitted the NRT to work together and exchange ideas concerning the policy implications of the research results.

2.8 CONCLUSION

The aim of this Chapter was to describe the research procedures that were applied for the execution of the SACMEQ III project. The Chapter was prepared to give an overview of how the study was conducted in Kenya. The sample design procedures and the construction of the Reading and Mathematics tests for learners and their teachers were to a large extent modelled on the SACMEQ II project.

Following the trend started in the SACMEQ II Project, the third SACMEQ Project moved away from traditional approaches to the calculation of test scores (based on numbers of correct responses to test items) towards the use of Modern Item Response Theory to generate descriptions of “levels of increasing learner competence”. This approach to describing learner Reading and Mathematics achievement offered a mechanism for describing the performance of learners in a manner that was more meaningful within a teaching and learning context.

One of the important messages that emerged from this part of the Project was that the speed at which a cross-national research project proceeds is strongly influenced by the speed with which the slowest country can complete all aspects of its data collection and data preparation.



CHAPTER 3

3.0 PUPILS' CHARACTERISTICS AND THEIR LEARNING ENVIRONMENTS

3.1 INTRODUCTION

In this chapter, selected information about personal characteristics of Standard 6 pupils in Kenya, their home background and learning environment is presented. Home and school environment, access to and use of teaching and learning materials are important variables for understanding learning outcome trends. These factors are considered important because research studies have consistently linked them with pupil academic achievement. Wasanga et al. (2010) showed that these factors are important in explaining educational achievements in Kenya. Knowledge and awareness of these factors is central to making informed policy decisions at different levels of the educational sector. Further, this information could inform strategies and approaches addressing contextual issues of access, equity and quality of education.

The personal characteristics analysed were age and gender. The home background characteristics included parental education, number of meals eaten by pupils per day, speaking English language at home, pupil's place of residence during the school week, availability of reading materials at home and pupil's socio-economic status, as measured by the number of possessions at home. English language was selected because of the language policy in Kenya which stipulates that pupils in upper primary (Standards 4 and above) are instructed in English which is also the language of examination at the end of the primary cycle.

With regard to school learning environment, the analysis focused on the distance covered by the pupil between home and school, which took into account: the urban and rural settings; frequency and reasons of absenteeism; grade repetition; frequency of homework assignments; family involvement in assisting pupils with the homework and the extent to which teachers correct it. In addition, pupils' access to classroom and library materials as well as their participation in extra tuition and its cost was analysed.

3.2 A NOTE ON THE INTERPRETATION OF THE DATA ANALYSES

In the interpretation of the results in this chapter on Standard 6 Pupils' Characteristics and their Learning Environments and subsequent chapters, it is imperative to stress that the variables discussed are based on the responses from a sample of pupils, parents, teachers and school heads where data was collected, and this was taken as a representative sample of Kenya's pupils', teachers' and school head teachers' attitudes, perceptions and behaviours. In some tables, the Standard/Sampling Errors (SE) are provided. Where SE is provided, it should be noted that error distribution is multinomial, approximating normality across the dataset, that is, the distribution of each error term is binomial, because only two outcomes are possible for each observation, but when the error terms are accumulated across all the observations (as they are for estimation), the binomial errors approximate normality. The sampling errors for means are also given in some tables and a principle applies for limits of two standard errors of sampling.

Kenya's data is presented as a subgroup of a larger dataset because the entire population sample involved participants from all the SACMEQ III participating countries. As such, percentages and means presented for a sub-group of pupils has a greater standard error than one presented for the sample as a whole. This occurs, in part, because the sample sizes for sub-groups are smaller than the total sample sizes. To gain a smaller SE, the Kenyan sample of participants would have had to be increased, incurring a higher budget in order

to undertake much larger field data collections and data analyses.

This chapter addresses five general policy concerns:

1. What were the personal characteristics (for example, age and gender) and home background characteristics (for example, parent education, regularity of meals, home language, etc.) of Standard 6 pupils that might have implications for monitoring equity, and/or that might impact upon teaching and learning?
2. What were the school context factors experienced by Standard 6 pupils – such as location, absenteeism and reasons for it, grade repetition, and homework (frequency, amount, correction, and family involvement) that might have impacted upon teaching, learning and the general functioning of schools?
3. Did Standard 6 pupils have sufficient access to classroom materials (for example, textbooks and stationery) in order to be able to participate fully in their lessons?
4. Did Standard 6 pupils have access to library books in their schools, and (if they did have access) was the use of these books maximised by allowing pupils to take them home to read?
5. Was the practice of Standard 6 pupils receiving extra lessons in school subjects outside school hours

becoming widespread, and were these paid lessons?

3.3 PERSONAL CHARACTERISTICS OF PUPILS

General Policy Concern 3.1:

What were the personal and home background characteristics of Standard 6 pupils that might impact upon teaching and learning?

The major personal characteristic variables analysed in this section were age and gender. Home background characteristics were the parents' levels of education, frequency of meals served per day, use of English language at home, pupil's place of residence during the school week, availability of reading materials at home and the pupil's socio-economic status as measured by the number of possessions at home.

Pupil age and gender

What were the age and gender distribution of pupils?

Table 3.1 shows data on age and gender characteristics of pupils for SACMEQ II and SACMEQ III, respectively.

The official age for primary school entry in Kenya is 72 months (6 years). Assuming that the pupil does not repeat subsequent classes then by the time they are in Standard 6 they should be at least 132 months old (11 years). This means that by the

Table 3.1: Age and Gender distribution in SACMEQ II and SACMEQ III

	Pupil age in months				Pupil sex (%Female)			
	SACMEQ II		SACMEQ III		SACMEQ II		SACMEQ III	
	Mean	SE	Mean	SE	%	SE	%	SE
Central	164.9	1.55	155.4	1.29	51.2	1.82	48.2	1.43
Coast	167.0	2.16	174.8	3.11	46.7	4.21	45.2	2.82
Eastern	167.5	2.06	167.5	1.69	54.5	2.67	52.9	2.10
Nairobi	154.4	1.11	155.1	2.75	53.3	1.47	49.7	1.71
North-Eastern	172.7	1.39	179.5	3.04	27.8	3.31	25.9	3.84
Nyanza	170.8	1.58	163.7	1.63	48.8	2.99	47.4	1.75
Rift Valley	168.9	1.96	164.9	1.58	49.4	2.99	53.1	2.43
Western	174.2	1.71	171.6	1.48	49.6	3.56	45.2	2.97
Kenya	168.4	0.76	165.1	0.70	50.3	1.19	49.3	0.93

time of the SACMEQ data collection (i.e. the month of September), their expected age would be 141 months (11.8 years). The national mean age during SACMEQ III, was 165.1 months (13.7 years). This represented a difference of 24.1 months (2 years) above the expected Standard 6 age. This is a slight improvement in comparison to SACMEQ II where the national average age was 168.4 months (14 years).

There were notable provincial disparities in Standard 6 ages against the expected age of 141 months (11.8 years). During SACMEQ III, the province with the oldest pupil in Standard 6 was North-Eastern with the age of 179.5 months (15.0 years), up from 172.7 months (14.4 years) during SACMEQ II. This was followed by Coast province whose mean age for Standard 6 was 174.8 months (14.4 years) up from 167.0 months (13.9 years) in SACMEQ II; then Western province with a mean age of 171.6 months (14.3 years), which was an improvement from the previous 174.2 months (14.5 years) during SACMEQ II. Finally, Eastern province had a Standard 6 mean age of 167.5 months (14 years), which remained constant with SACMEQ II. As it can be seen from these descriptions, Western province recorded a slight improvement in the mean age for Standard 6 during SACMEQ III, even though it still remained in the category of provinces with the oldest pupil in Standard 6.

It is likely that factors such as grade repetition, poverty, HIV and AIDS challenges, and late entry to primary school, were responsible for the noticeable over-age pupils in Standard 6 across these provinces (UNESCO 2010).

On the other hand, the province with the youngest pupils in Standard 6 was Nairobi with a mean age of 155.1 months (12.9 years), nearly the same as the one recorded during SACMEQ II, that is, 154.4 months (12.9 years). The other provinces in this category recorded a marked improvement in the pupil mean age in Standard 6, that is, Central province 155.4 months (12.9 years) down from 164.9 months (13.7 years) in SACMEQ II, Nyanza province 163.7 months (13.6 years) down from 170.8 months (14.2 years) in SACMEQ II and Rift Valley province down to 164.9 months (13.6 years) from 168.8 months (14.1 years) in SACMEQ II.

Policy Suggestion 3.1:

There is a need for the Ministry of Education and other stakeholders to carry out independent and focused action research on incidences of over-age pupil enrolment, and formulate appropriate interventions to mitigate the situation.

Concerning the distribution of pupils by gender, the national figures indicate a minor drop in the enrolment of girls from 50.3 percent in SACMEQ II, to 49.3 percent in SACMEQ III. North-Eastern province still remained the lowest in girl enrolment in Standard 6 with 25.9 percent in SACMEQ III and 27.8 percent in SACMEQ II. Eastern and Rift Valley provinces recorded the highest percentage girl enrolment in SACMEQ III, 52.9 percent and 53.1 percent, respectively. The rest of the provinces recorded girl enrolment percentages of 45 percent to 50 percent in Standard 6, but with some slight drops compared to the ones recorded during SACMEQ II.

Policy Suggestion 3.2:

There is a need for action by all stakeholders to address gender disparities in enrolment particularly in the North-Eastern Province and marginalized regions.

Parental education

What were the levels of parents' education?

Parental educational status has some bearing on their children's education. Children whose parents have attained some education are likely to benefit from greater parental support in education than those whose parents do not have education. The findings on parents' education levels are presented in **Table 3.2** and **Table 3.3**.

From these tables, it can be seen that the most common level of a mother's education was all primary, this accounted for 24 percent of Standard 6 pupils in 2000 and also 24 percent in 2007. Overall the pattern in the levels of mothers' education has remained fairly constant between the two studies with the majority of mothers never reaching secondary school.

Policy Suggestion 3.3:

The Ministry of Education, in collaboration with the Department of Adult Education, should carry out an evaluation of adult education programmes, especially for mothers, with a view to assessing its effectiveness and impact on pupils' education and learning outcomes.

Table 3.2: Cross-tabulation of father's and mother's level of education (SACMEQ II)

		Mother's Education							All Mothers
		No School	Some Primary	All Primary	Some Secondary	All Secondary	Some Post-Sec.	Completed Univ.	
Father's Education	No School	55	22	13	3	4	1	1	100
	Some Primary	21	42	18	7	9	2	2	100
	All Primary	6	27	47	8	8	2	1	100
	Some Secondary	4	21	30	26	11	4	3	100
	All Secondary	3	10	22	11	44	8	2	100
	Some Post-Sec.	2	11	11	13	25	32	5	100
	Completed Univ.	3	5	10	9	17	16	40	100
	All Fathers	9	19	24	12	19	10	6	100

Table 3.3: Cross-tabulation of father's and mother's level of education (SACMEQ III)

		Mother's Education							All Mothers
		No School	Some Primary	All Primary	Some Secondary	All Secondary	Some Post-Sec.	Completed Univ.	
Father's Education	No School	67	20	7	5	1	0	0	100
	Some Primary	11	62	14	7	3	2	1	100
	All Primary	7	25	53	5	8	1	1	100
	Some Secondary	3	23	28	31	8	5	1	100
	All Secondary	3	8	24	17	42	5	1	100
	Some Post-Sec.	2	9	13	18	22	34	2	100
	Completed Univ.	2	5	5	5	18	12	53	100
	All Fathers	9	23	24	13	17	8	6	100

Pupil meals per week

How often did pupils eat meals each week?

Pupils were asked the number of meals they had per day. The nutritional value of the meals was not considered. In many cases, poor nutrition may lead to lack of concentration and reduced effort and attendance at school. Hence, the regularity of meals is among other factors that promote learning at school. **Table 3.4** gives a summary of the regularity of meals per day for pupils in Standard 6 during SACMEQ II and III.

Table 3.4: Means for meals per week.

	SACMEQ II		SACMEQ III	
	Mean	SE	Mean	SE
Central	11.3	0.11	11.6	0.11
Coast	11.3	0.14	10.6	0.21
Eastern	11.3	0.18	11.2	0.14
Nairobi	11.7	0.12	11.3	0.13
North-Eastern	11.5	0.11	9.6	0.67
Nyanza	10.9	0.16	10.6	0.14
Rift Valley	11.1	0.14	11.6	0.08
Western	11.0	0.14	10.2	0.24
Kenya	11.2	0.06	11.1	0.06

As shown in **Table 3.4**, the national average of meals per week for Standard 6 pupils was around 11.1 for SACMEQ III, which was a slight decline compared to the results of SACMEQ II (11.2). The mean number of meals per week improved slightly in Central and Rift Valley provinces. However, there was some decline in Coast, Eastern North-Eastern and Western provinces with North-Eastern recording the largest decline of 1.9. The decline in the aforementioned provinces could be attributed to adverse weather conditions and poverty situations.

Speaking English at home

What percentage of pupils spoke the language of instruction at home?

The government policy stipulates that English should be used as the language of instruction in schools for pupils in Standard 4 upwards. However, in some provinces local languages are used for instruction due to inadequate competence in English. Pupils were asked how often they spoke English outside school. For the purposes of reporting in Table 3.5, if pupils reported that they spoke the language 'sometimes', 'most of the time', or 'all the time', they were considered as having spoken the language of instruction at home.

Table 3.5: Means for pupils' use of English language outside school

Province	SACMEQ II		SACMEQ III	
	mean	SE	Mean	SE
Central	80.9	2.59	88.0	2.75
Coast	95.8	0.90	93.1	1.16
Eastern	85.1	2.68	88.6	2.89
Nairobi	93.2	1.18	95.3	1.85
North-Eastern	96.4	1.53	97.8	0.89
Nyanza	89.8	3.96	94.8	1.48
Rift Valley	84.4	2.81	89.5	2.52
Western	88.1	2.03	90.9	1.84
Kenya	86.4	1.21	90.9	0.96

From **Table 3.5** the national percentage of pupils using English at home improved from 86.4 percent in SACMEQ II to 90.9 percent in SACMEQ III. In regional comparisons, North-Eastern province had the highest percentage of pupils who spoke English at home in both cases with 96.4 percent in SACMEQ II and 97.8 percent in SACMEQ III. This was followed by Nairobi province with 95.3 percent, then Nyanza

province with 94.8 percent. Coast province had 93.1. The high percentages in North-Eastern are notable and need further investigation in view of the fact that North-Eastern Province has the lowest adult literacy levels for men (64%) and women (21%) in the country (KNBS, 2010).

Pupil living places

Where did pupils live during the school week?

The information concerning places of pupil residence while in school is important in order to assess the level of caregiver's support including moral, material and intellectual in determining pupils' levels of achievement. **Table 3.6** and **Table 3.7** give a summary of the places where pupils reside during school week.

Table 3.6: Place where pupils stayed during the school week (SACMEQ II)

Province	Place where pupils stay during the school week							
	Parent/Guardian		Relatives/Family		Hostel/Board		Self/Children	
	%	SE	%	SE	%	SE	%	SE
Central	82.4	4.33	8.9	1.70	5.7	4.00	3.0	1.07
Coast	86.7	3.87	7.5	2.42	2.5	0.91	3.4	1.69
Eastern	87.8	4.01	6.0	1.09	5.0	3.92	1.3	0.64
Nairobi	88.2	2.97	5.2	1.02	2.6	1.38	4.0	1.30
North-Eastern	78.4	2.95	12.2	2.07	8.9	3.20	0.5	0.36
Nyanza	80.9	4.55	8.1	1.99	6.6	4.20	4.4	2.05
Rift Valley	70.5	4.08	11.5	2.39	10.1	3.22	7.9	1.82
Western	85.3	2.07	10.3	1.23	1.4	0.62	2.9	1.21
Kenya	81.0	1.65	8.9	0.78	6.0	1.46	4.2	0.64

As shown in **Table 3.7** the vast majority (92.2%) of pupils stay at home with their families across the nation which is an increase of 11.2 percentage points from SACMEQ II. Nairobi, Western, Coast, Nyanza and Central provinces had over 90 percent of their pupils staying home with their families. Only 4.6 percent nationally are in hostel/boarding schools. The Coast province had 3.3 percent of pupils staying with other people, while North-Eastern had 14.9 percent of pupils staying in hostel and boarding schools and Eastern province had 1.6 percent of pupils residing in orphanages.

Table 3.7: Place where pupils stayed during the school week (SACMEQ III)

Province	Home with Family		Home with Other People		Hostel/Boarding Sch.		Orphanage		Others	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	90.0	4.86	1.4	0.43	7.6	4.92	0.2	0.18	0.9	0.44
Coast	94.9	1.62	3.3	1.07	1.0	0.71	0.3	0.27	0.5	0.54
Eastern	89.2	4.98	2.1	0.87	6.6	4.37	1.6	1.39	0.5	0.36
Nairobi	97.2	0.85	1.1	0.63	0.4	0.27	0.8	0.45	0.5	0.33
North-Eastern	81.6	5.15	1.4	0.72	14.9	4.93	0.0	0.00	2.0	0.76
Nyanza	95.0	0.89	3.2	0.65	0.8	0.35	0.7	0.31	0.3	0.24
Rift Valley	89.7	4.50	1.6	0.53	8.3	4.62	0.1	0.11	0.3	0.20
Western	96.2	1.13	2.4	1.08	0.6	0.40	0.0	0.00	0.8	0.34
Kenya	92.2	1.58	2.1	0.29	4.6	1.55	0.5	0.22	0.5	0.12

Books at home

How many books did pupils have at home?

Books at home are essential to improve levels of reading (Duru-Bellat, 2004). Access to and use of reading materials beyond school is a critical input for learning. The results on the number of books at home are presented in **Table 3.8**.

Table 3.8: Means for pupils' books at home (SACMEQ II and III)

Province	SACMEQ II		SACMEQ III	
	Mean	SE	Mean	SE
Central	33.7	10.37	20.5	10.05
Coast	27.6	4.06	9.8	2.17
Eastern	33.0	9.41	10.2	2.40
Nairobi	36.7	5.03	35.4	7.46
North-Eastern	28.6	9.08	6.3	2.44
Nyanza	32.7	10.88	14.0	3.07
Rift Valley	18.0	2.16	10.1	1.73
Western	20.6	3.62	7.9	1.35
Kenya	27.6	3.25	13.1	1.67

Table 3.8 shows that pupils reported having access to more reading materials at home during SACMEQ II compared to SACMEQ III (27.6 and 13.1, respectively). All provinces recorded a decrease in the number of books at home. With the introduction of the Free Primary Education program, many parents may have stopped buying new books for child use at home.

Policy Suggestion 3.4:

To support reading and learning, parents/guardians should be encouraged to provide

learning materials at home for their children. They should also be guided on what to buy as well as being told its importance.

Pupil home possessions

What was the socioeconomic background of the pupils in terms of home possessions?

Pupils were asked what sort of possessions were present in their homes, which included, a daily newspaper, weekly or monthly magazine, radio, TV set, video cassette recorder (VCR), cassette player, telephone, car, motorcycle, bicycle, piped water, electricity (mains, generator, solar), and a table to write on. The number of possessions owned in the home was summed for each pupil. The lowest score possible was zero and the highest 13. The summary of results is presented in **Table 3.9**.

Table 3.9: Means for pupils' home possessions

Province	SACMEQ II		SACMEQ III	
	Mean	SE	Mean	SE
Central	4.6	0.42	5.8	0.22
Coast	5.2	0.42	5.0	0.22
Eastern	4.3	0.34	4.5	0.31
Nairobi	6.4	0.36	8.1	0.45
North-Eastern	4.4	0.51	3.2	0.40
Nyanza	4.0	0.31	4.8	0.23
Rift Valley	4.3	0.30	5.0	0.25
Western	3.7	0.20	4.7	0.26
Kenya	4.3	0.14	5.1	0.10

The overall average number of possessions nationally increased from 4.3 in SACMEQ II to 5.1 in SACMEQ III. This increase could be seen as signs of improving economy however there was considerable

variation among the provinces from a high of 8.1 to a low of 3.2. In each province there was a slight improvement in possessions with the exception of North-Eastern province where there was a decline from 4.4 to 3.2 in average possessions recording the lowest number of family possessions nationally. The National Demographic and Health Survey 2008-2009 (KNBS, 2010) depicts the North-Eastern as the least wealthy of the provinces with 75.9 percent of its population falling within the lowest wealth quintile thus corroborating these findings. Nairobi province had the highest number of possessions in both studies (6.4 in SACMEQ II and 8.1 in SACMEQ III).

Preschool attendance

How long did pupils attend preschool before Standard 1?

Some studies have linked preschool exposure with better later academic achievement, especially at primary school level. For example, Hungi (2011) analysing data from the SACMEQ III study found that pupils who had attended preschool for two or three years generally achieved better in reading and mathematics than pupils who had attended preschool for shorter durations of time, or who never attended preschool before joining Standard 1. The percentages for various durations of preschool exposure are depicted in **Figures 3.1** and **3.2**.

From **Figure 3.1**, it can be seen that 42 percent of the Standard 6 pupils in Kenya had attended preschool for at least two years. It can also be seen that there were large variations among the provinces in pupil preschool attendance. Nairobi was the province with the highest percentage of pupils attending preschool for at least two years (68%) while North Eastern had the lowest percentage of pupils in this category (16%).

From **Figure 3.2**, it is evident that the percentages of preschool attendance for boys and girls were about the same. Pupils in urban schools were slightly more exposed to preschool than their rural counterparts. As expected, pupils from rich home backgrounds were considerably more exposed to preschool than pupils from poor home backgrounds. This could also be due to differences in distance to schools.

Figure 3.1: Percentages of Standard 6 pupils attending preschool by provinces

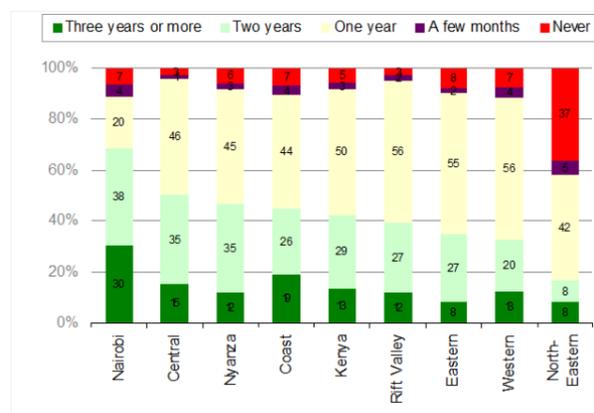
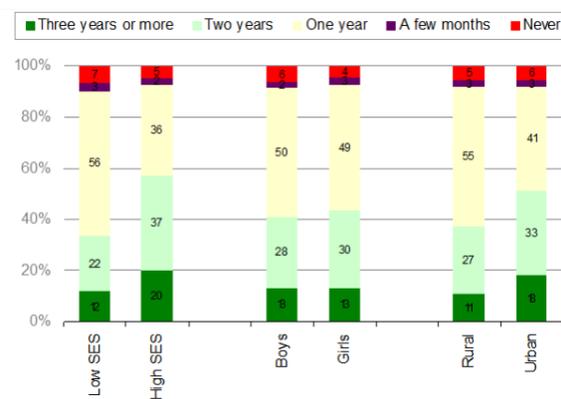


Figure 3.2: Percentages of Standard 6 pupils attending preschool by socioeconomic status, gender and school location



3.4 SCHOOL CONTEXT FACTORS EXPERIENCED BY PUPILS

General Policy Concern 3.2:

What were the school context factors experienced by Standard 6 pupils – such as location, absenteeism, grade repetition, and homework – that might have impacted upon teaching, learning and the general functioning of schools?

In this section, the findings about school context factors experienced by pupils that might impact upon the teaching and learning process, and the general functioning of schools are presented. Some of these factors are school location, absenteeism (regularity and reasons for absence), grade repetition and homework (frequency, amount, correction, and family involvement) among others. Comparisons were made between the findings of

SACMEQ II and III on these school context factors.

Travel distance to school

How far did the pupils have to travel to school each day?

The distance covered by the pupil to school is an important variable in educational achievement. This is because the time and energy spent on accessing school directly affects learning, and in extreme situations the dangers encountered on the way to school such as wild animals and bandits may completely prevent pupils from going to school. This subsection presents the findings on the distance covered by pupils to school in rural and urban areas as seen in **Table 3.10** and **Table 3.11**.

Table 3.10: Distance to school in rural areas (SACMEQ III)

Province	Rural				
	<1km	1km-2km	2km-3km	3km-4km	>4km
Central	52.4	26.2	11.2	5.5	4.7
Coast	45.9	20.8	14.4	3.0	15.9
Eastern	48.9	25.8	13.6	5.9	5.8
Nairobi	0.0	0.0	0.0	0.0	0.0
North-Eastern	75.4	12.8	2.7	1.4	7.6
Nyanza	46.0	27.7	13.1	6.6	6.6
Rift Valley	42.7	30.0	13.2	7.0	7.1
Western	45.7	28.2	13.1	4.3	8.7
Kenya	46.8	27.3	12.9	5.9	7.1

In the rural areas, nationally, 46.8 percent of the pupils live within less than a kilometre of the school they attend, while 53.2 percent living beyond a kilometre from their school. With the exception of Nairobi which does not have rural areas. Regionally, North-Eastern province had the highest percentage of pupils (75.4%) living within less than a kilometre of their school with only 24.5 percent living beyond a kilometre. This scenario may be as a result of most of the schools that were visited in North-Eastern being in mobile or boarding schools that are generally set up near pastoralist communities as they migrate in search of pasture for their livestock. On the other hand, Rift Valley had the lowest percentage of pupils living within less than a kilometre from their school: 42.7 percent, which means that 57.3 percent reside more than a kilometre away from the school

in the rural areas.

Table 3.11: Distance to school in urban areas (SACMEQ III)

Province	Urban				
	<1km	1km-2km	2km-3km	3km-4km	>4km
Central	55.8	24.0	8.7	3.9	7.6
Coast	40.7	23.2	13.2	9.7	13.1
Eastern	60.4	19.0	11.4	1.8	7.3
Nairobi	40.2	16.4	11.3	5.0	27.2
North-Eastern	49.2	23.7	10.9	4.4	11.8
Nyanza	38.7	30.9	19.0	5.2	6.3
Rift Valley	49.9	19.7	13.4	10.3	6.7
Western	36.9	31.0	15.5	5.0	11.6
Kenya	45.8	23.2	13.5	6.4	11.1

As for the urban areas, nationally, 45.8 percent of the pupils live within less than a kilometre of their school while 54.2 percent live beyond a kilometre from the school they attend. Regionally, Eastern province has the largest percentage of pupils, 60.4 percent, living within less than a kilometre from their school with Western province the lowest percentage of 36.9. Rather surprisingly Nairobi had by far the highest percentage of pupils who travelled more than 4 kilometres to school, 27.2 percent, while Nyanza had the lowest of 6.3 percent.

Absenteeism

How many days were pupils absent from school in the previous month?

Absenteeism has a disruptive impact on the academic life and success of pupils and as such it was important for SACMEQ studies to measure the mean number of absent days per month. The results from SACMEQ II and SACMEQ III are given in **Table 3.12** below.

In SACMEQ III the national mean for absenteeism was 1.3 days per month which was a great improvement from SACMEQ II. Regionally, Nairobi province recorded the lowest level of absenteeism with a mean of 0.8 days per month whereas North-Eastern had the highest mean of 1.5 days per month above the national mean.

Table 3.12: Days absent and repetition (SACMEQ II and SACMEQ III)

Province	SACMEQ II				SACMEQ III			
	Days absent		Repetition		Days absent		Repetition	
	Mean	SE	%	SE	Mean	SE	%	SE
Central	1.5	0.22	63.3	3.80	1.0	0.20	49.3	4.92
Coast	1.9	0.33	54.1	5.48	1.2	0.16	42.4	4.43
Eastern	1.6	0.22	68.5	4.67	1.2	0.14	52.8	2.98
Nairobi	1.4	0.21	35.3	3.46	0.8	0.16	30.7	4.95
North-Eastern	1.6	0.23	24.2	4.51	1.5	0.32	21.3	5.31
Nyanza	2.0	0.25	67.7	3.45	1.0	0.13	50.3	3.08
Rift Valley	2.5	0.26	64.0	4.10	1.6	0.22	45.8	2.91
Western	2.3	0.21	68.3	3.79	1.6	0.61	54.3	3.51
Kenya	2.0	0.10	64.1	1.67	1.3	0.11	48.2	1.42

In comparison to SACMEQ II, all the provinces had a drop in the rate of absenteeism. North-Eastern recorded the lowest decrease in absenteeism of 0.1, (from 1.6 to 1.5). Nyanza province recorded the highest drop in the mean absent days of 1.0 (from a high of 2.0 to 1.0.). The national average dropped from 2.0 to 1.3.

What were the reasons for absenteeism?

This study further examined the reasons for absenteeism by province. The reasons given by pupils for absenteeism were that either the pupil was ill, caring for an ill family member, caring for a sibling and other varied reasons as indicated in **Table 3.13** and **Table 3.14**.

Table 3.13: Reasons for pupil absenteeism (SACMEQ II)

Province	Illness		Family reasons		Fees		Work	
	%	SE	%	SE	%	SE	%	SE
Central	15.7	3.40	4.3	1.09	18.5	3.23	1.5	0.55
Coast	27.7	4.71	6.0	1.78	8.4	2.39	3.6	3.58
Eastern	22.5	3.12	5.6	1.48	14.4	2.42	0.7	0.38
Nairobi	22.8	2.87	8.2	1.44	16.0	3.53	0.8	0.44
North-Eastern	37.7	6.55	2.3	1.05	11.8	2.11	3.0	0.92
Nyanza	22.7	2.77	6.4	1.39	21.8	3.19	2.9	1.31
Rift Valley	27.5	3.70	8.6	1.33	25.3	3.78	3.5	0.90
Western	21.0	3.15	16.5	2.92	21.4	3.69	6.1	1.20
Kenya	22.7	1.39	7.8	0.67	19.6	1.38	2.8	0.44

Table 3.14: Reasons for pupil absenteeism (SACMEQ III)

Province	Was ill		Family Member ill		Was Taking Care of Brothers & Sisters		Other Reasons	
	%	SE	%	SE	%	SE	%	SE
Central	70.4	4016	8.1	1.69	6.7	2.19	15.7	3.15
Coast	64.9	4.14	8.1	2.28	7.7	2.14	25.3	3.25
Eastern	68.0	3.19	13.6	2.94	9.9	2.27	24.2	4.04
Nairobi	66.9	5.30	8.5	2.61	8.5	2.04	32.6	5.73
North-Eastern	78.0	5.14	16.2	3.90	10.5	3.42	17.5	3.63
Nyanza	67.2	4.42	18.7	3.28	11.2	1.98	24.9	3.77
Rift Valley	69.9	3.91	19.0	2.64	13.0	2.38	23.7	3.81
Western	61.6	3.86	24.3	6.33	18.6	3.90	28.6	2.90
KENYA	67.7	1.71	16.2	1.51	11.6	1.10	23.9	1.59

Illness was the most common reason for absenteeism in 2007 and accounted for 67.7 percent of the total, the least common reason was taking care of brothers and sisters, 11.6 nationally. North-Eastern province reported the highest percentage of pupils providing illness as a reason, at 78.0 percent, while Western province recorded the lowest at 61.6 percent. These results reflect that pupils' illness was a major cause of absenteeism from school. Western province registered the highest percentage, 18.6 percent, followed by North-Eastern province, 10.5 percent, for pupils who were absent due to taking care of their siblings. The lowest percentage of pupils in this category was recorded in Central Province with 6.7 percent.

Another reason provided for being absent from school by pupils was the illness of a family member. The national average for pupils was 16.2 percent. Regionally, Western province had the highest percentage (24.3%) of pupils citing this as the reason, in contrast Central and Coast provinces had the lowest percentage of pupils at 8.1 percent. Nationally 23.9 percent of pupils cited reasons other than the ones described above. The results show that 32.6 percent in Nairobi province were absent from school due to other reasons. This was followed by Western at 28.6 and Coast at 25.3 percent. Central province had the lowest percentage of pupil absenteeism due to other reasons.

Policy Suggestion 3.5:

There is need for additional policies and interventions pertaining pupil health as a means of increasing access to education.

Grade repetition

What percentage of pupils had repeated grades?

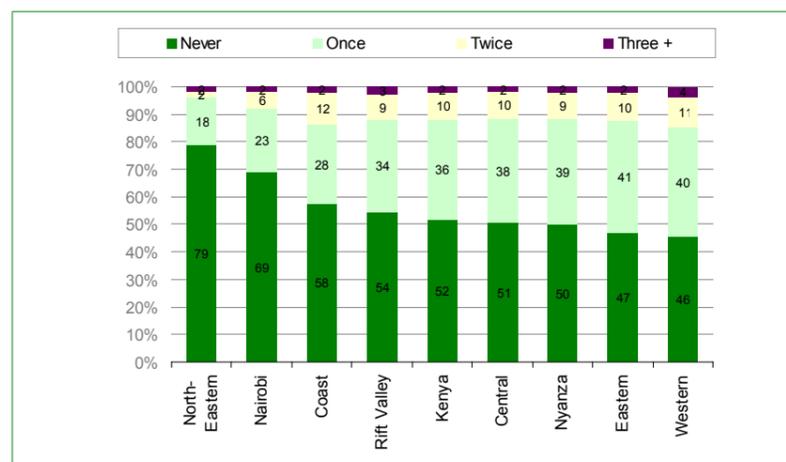
Grade repetition has been linked with poor pupil achievement in Kenya (see, for example, Hungi and Thuku, 2010a&b) and also in other countries. Others have linked grade repetition with low academic motivation in the repeating pupil (Brophy, 2006), and it is likely that low academic motivation could lead to other problems such as indiscipline and dropping out of school.

The Ministry of Education has a policy that discourages grade repetition as a remedial strategy in learning. This is because this strategy has been associated with inefficiency and inequity in the provision of education. It can also lead to poor performance and subsequent school drop-out (UNESCO, 2010). Due to this lack of a general consensus on the benefits and losses of repetition, it is likely that some educational practitioners still use it with the intention of improving achievement despite the government policy prohibiting it. This study therefore sought to establish the prevalence of this practice in Kenya.

The percentages of pupils who said they had repeated classes at least once since they joined Standard 1 are presented in **Table 3.12**. For SACMEQ III, nationally 48.2 percent of the pupils had repeated a class compared to 64.1 percent in SACMEQ II. This represents a 15.9 percentage point decline. Regionally, Western province had the highest percentage of those who repeated at least one class, 54.3 percent, with North-Eastern province posting the lowest percentage of 21.3 percent.

Generally, a high percentage of pupils seem to be affected by this practice (also see **Figure 3.3** which shows the percentages of pupils repeating grades multiple times).

Figure 3.3: Frequency of grade repetition (SACMEQ III)



Policy Suggestion 3.6:

There is need to involve stakeholders to both engage in research and discussion about the way forward with regard to repetition in educational practice.

Frequency of homework given

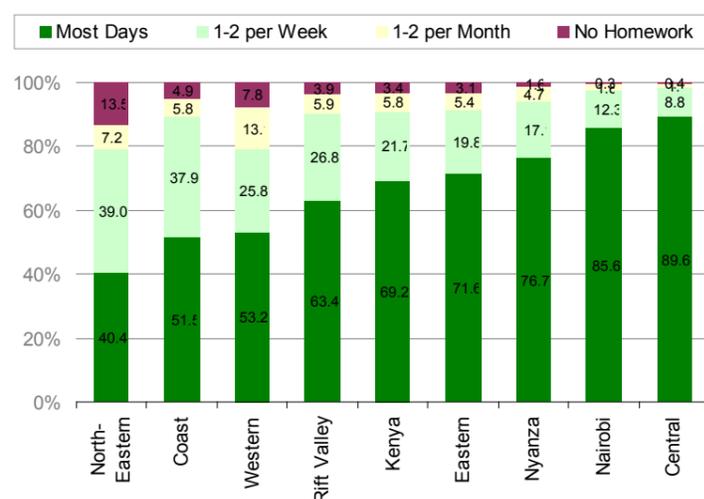
How often the pupils receive homework from their teachers?

Homework given to pupils helps them understand and accomplish most of the learning tasks in the syllabus and builds upon and reinforces learning done in the classroom, hence it is essentially good for teachers to give learners homework. It also

helps provide teachers with useful feedback on learners' progress. Pupils were asked about the frequency of homework given to them by teachers. Their responses are summarised in **Figure 3.4**.

Results of the analysis presented in **Figure 3.4** indicate that the majority of pupils in nearly all provinces said that they are given homework most of the days, with the leading provinces being Central (89.6% and Nairobi (85.6%) In addition, in Coast and North-Eastern provinces quite large percentages of pupils reported getting homework once or twice a week. Nationally 69.2 percent reported getting homework most days while only 3.4 percent reported that they never received homework.

Figure 3.4: Frequency of homework given (SACMEQ III)



Homework help at home

What percentage of pupils received help with their homework at home?

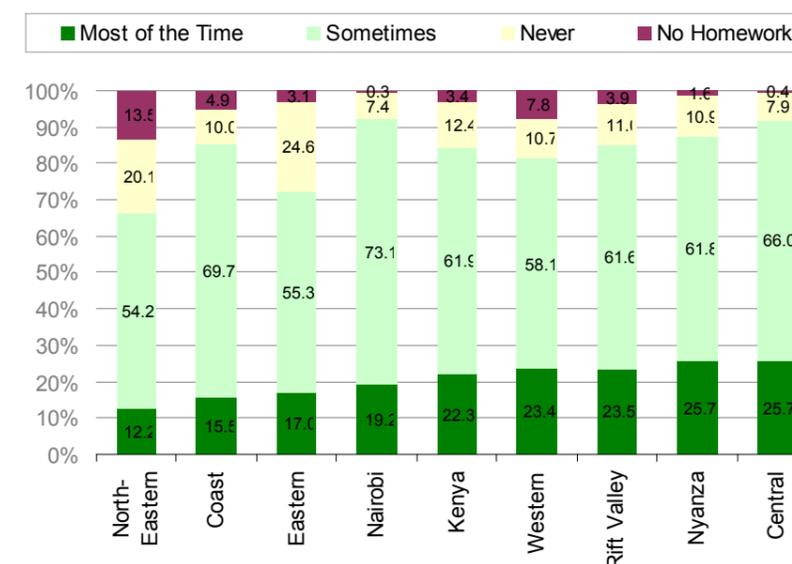
Assistance with homework is an important factor in determining a pupil's success in school. In addition to helping them with the actual learning of the activity, it also displays an interest in and gives importance to schoolwork and education in general. This is part of the intellectual milieu of the home. Indeed, education is a joint effort of the home and the school. Thus, pupils were asked whether they are given assistance in their homework and the summary of their responses is presented in **Figure 3.5**.

According to the findings in Figure 3.5, the response option of "sometimes" was chosen by the majority of pupils in all provinces. Hence, the national percentage for sometimes getting assistance was

61.9 percent, while most of the time was mentioned by 22.3 percent of pupils. The provinces which had the highest percentages of families assisting most of the time were: Central and Nyanza (both with 25.7%), followed by Rift Valley (23.5%), and Western (23.4%).

There were large regional disparities in the level of support received. For example, 66.4 percent of pupils in the North-Eastern province received help sometimes or most of the time while the same category for Nairobi was 92.3 percent. Eastern Province had the highest percentage of pupils that were never helped with their homework (24.4), closely followed by North-Eastern. In addition, North-Eastern Province reported the highest percentage of pupils who were not given homework (13.5%) compared to the very low levels in Nairobi and Central at 0.3 and 0.4 percent, respectively.

Figure 3.5: Percentage of pupils receiving homework help at home (SACMEQ III)



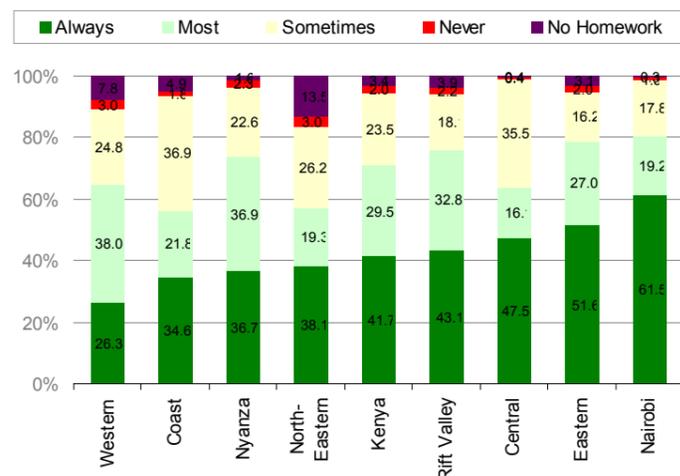
Homework corrected

How often did the teachers correct homework?

Teachers' correction of pupils' homework is vital as it enables them to provide feedback to both themselves and learners in order to identify areas of concern in the overall teaching-learning process. Hence, learners were asked how often their Reading and Mathematics homework was corrected by the teacher. These results are presented in **Figure 3.6**.

From **Figure 3.6**, nationally 41.7 percent of pupils said that teachers always corrected their homework, which is just less than half. Nairobi province recorded the highest percentage of pupils whose teachers always corrected homework (61.5%), followed by Eastern with 51.7 percent, Central with 47.5 percent and Rift Valley with 43.1 percent. On the other hand, in North-Eastern and Western provinces 3 percent of pupils never had their homework corrected. Interestingly, these were also the two provinces with the highest percentage of pupils reporting no homework being given.

Figure 3.6: Frequency of homework corrected by teacher



3.5 PUPIL ACCESS TO LEARNING MATERIALS

General Policy Concern 3.3

Did Standard 6 pupils have sufficient access to classroom materials, including textbooks and stationery, in order to be able to participate fully in the lessons?

In this section, the focus of the analysis was access to teaching and learning materials in the classroom. The aim was to establish whether pupils had access to textbooks and stationery. This is also viewed in the context of Free Primary Education in which the Government of Kenya has been funding the supply

of textbooks and stationery to pupils. The findings of SACMEQ III were as follows.

Pupil access to reading and mathematics textbooks

What percentage of pupils had reading and mathematics textbooks?

A marked decrease in material ownership can be seen from **Table 3.15** which compares the results of SACMEQ II (2000) with SACMEQ III (2007) in terms of the percentages of pupils who have access to reading and mathematics textbooks.

Table 3.15: Pupils having their own reading and mathematics textbooks

Provinces	SACMEQ II		SACMEQ III		SACMEQ II		SACMEQ III	
	Own reading textbook	Own mathematics textbook						
	%	SE	%	SE	%	SE	%	SE
Central	25.2	5.43	23.4	5.49	20.4	6.24	19.9	5.93
Coast	23.6	6.14	18.3	5.17	21.3	3.83	15.5	3.96
Eastern	35.0	8.20	32.4	8.35	17.8	5.21	18.5	5.53
Nairobi	43.7	6.04	44.1	6.48	43.4	7.43	46.8	8.36
North-Eastern	15.1	6.63	7.5	3.50	19.1	5.35	14.8	4.71
Nyanza	29.8	8.10	22.8	6.75	18.2	2.99	14.3	2.53
Rift Valley	24.5	4.95	21.2	4.68	14.5	4.60	9.4	3.63
Western	16.6	3.47	15.0	3.09	10.5	2.62	7.3	2.56
Kenya	26.8	2.63	23.4	2.47	17.8	1.87	15.1	1.71

Nationally there was a decline in the single ownership of reading textbooks from 26.8 percent in SACMEQ II to 17.8 percent in SACMEQ III. This is mirrored in mathematics which declined from 23.4 in 2000 to 15.1 in 2007. The national pattern of reduced textbook ownership was seen across most provinces for both subjects. North-Eastern province recorded the highest increase in the ownership of reading and mathematics textbooks at 4.0 and 7.3 percentage points respectively followed by Nairobi in ownership of Mathematics books at 2.7 percentage points. Eastern province recorded

the largest decline of 17.2 percent followed by Nyanza province with 11.6 percent, in reading textbook ownership. With regard to the ownership of Mathematics textbooks, six provinces registered a decline with Eastern province again registering the largest decline of 13.9 percent followed by Rift Valley with 11.8 percentage points.

For the SACMEQ III study, the percentages of pupils in various categories of textbook ownership in Kenya are depicted in **Figures 3.7** and **3.8**.

Figure 3.7: Percentages for ownership of reading textbooks (SACMEQ III)

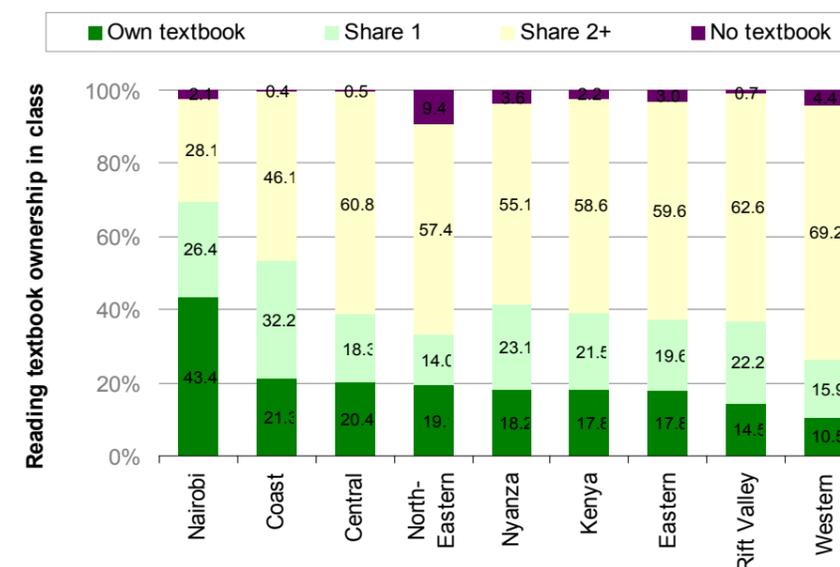
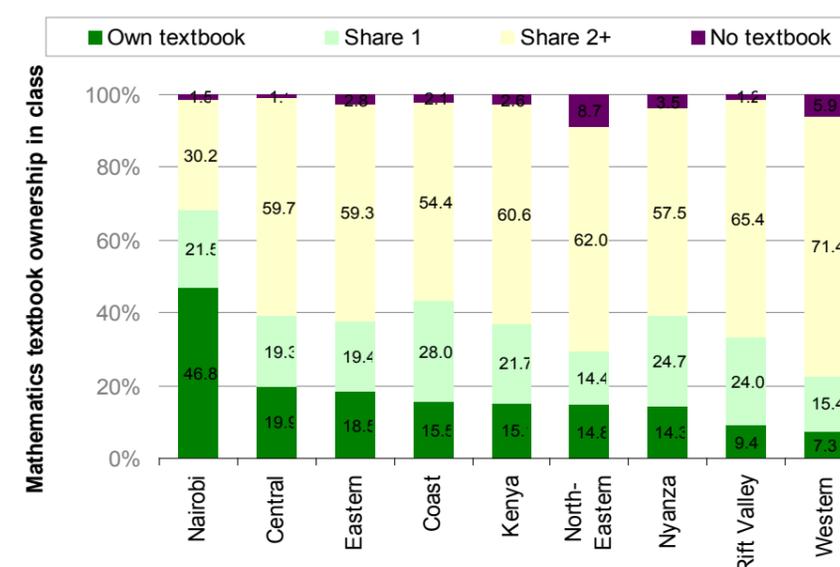


Figure 3.8: Percentages for ownership of mathematics textbooks (SACMEQ III)



It is likely that the impact of the Government's interventions to improve textbook allocation in public primary schools has been felt only in recent years. According to the KESSP Mid Term Evaluation report, the national Textbook-Pupil Ratio was 1:2 in the financial year 2007/2008 down from 1:5 in 2005/2006. The 2009 textbooks audit by the Ministry of Education and DfID shows that, "on average, 8.3 million primary school pupils have access to nearly five books covering the core seven subjects of Kiswahili, English, Mathematics, Science, Social Studies, Religious Education and Creative Arts" (Republic of Kenya, 2009, p.16). The national surveys also reveal persistence in regional disparities especially with regards to the North-Eastern province.

In addition, the textbook report also indicates that there is a wide variation in allocations of books in individual schools which may deviate from the national average. For instance, "nationally, there are 1,100 schools with less than three textbooks per pupil and some 1,300 with more than 10 textbooks per pupil" (Republic of Kenya, 2009 p16). The report also states that despite an improved supply of textbooks, there is a high rate of textbook losses due to wear and tear. The surveys also revealed an unfortunate tendency of schools to hoard textbooks for fear of losses, resulting in the textbooks being kept 'safely' in stores but rarely used by pupils.

Table 3.16: Availability of basic classroom material: exercise books, notebooks and pencils

Province	SACMEQ II						SACMEQ III					
	Exercise books		Notebooks		Pencils		Exercise books		Notebooks		Pencils	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Central	5.7	3.63	29.1	5.02	12.9	4.33	0.7	0.33	34.3	7.70	8.6	5.48
Coast	3.8	1.53	35.7	8.19	6.5	2.90	1.7	1.29	33.7	5.96	8.0	2.60
Eastern	2.1	1.38	31.6	6.85	5.6	1.90	2.6	1.01	44.6	7.78	9.8	3.88
Nairobi	1.9	0.96	34.4	4.67	3.2	1.14	7.5	1.40	42.4	4.66	8.5	2.08
North-Eastern	0.7	0.46	39.6	10.22	6.2	3.80	8.8	2.46	44.4	7.96	11.5	3.55
Nyanza	0.5	0.33	25.1	4.96	2.6	0.95	1.4	0.46	45.8	5.37	6.8	1.53
Rift Valley	6.1	2.27	21.7	3.85	8.1	2.08	2.0	0.63	36.9	6.29	7.7	3.26
Western	6.1	2.04	36.9	4.46	7.0	1.43	2.0	0.72	30.0	6.55	8.0	1.88
Kenya	4.0	0.93	28.7	2.13	7.2	1.03	2.1	0.30	38.4	2.67	8.1	1.35

Policy Suggestion 3.7:

The emphasis on access to reading materials should move beyond provision and maintenance of textbooks to pupils having the reading materials in their hands and using them. There should be a clear, monitoring and evaluation process to determine the utilisation of resources.

Pupil access to basic learning materials

What percentage of pupils had basic classroom stationery?

The data analysis also compared the percentage of the pupils who had access to basic stationery per province between SACMEQ II and SACMEQ III.

The results in **Table 3.16** indicate a decrease in the ownership of exercise books among pupils nationally from 4.0 percent to 2.1 percent. In comparison with SACMEQ II North-Eastern province recorded the highest increase of 8.1 percentage points followed by Nairobi province with 5.6 percentage points and Nyanza province with 0.9 percentage points. A decline in the ownership of exercise books by pupils was recorded in Central province which had the largest decline of 5 percentage points, followed by Western province with 4.1 percentage points, Rift Valley and Coast declined by 4.1 percentage points and 2.1 percentage points respectively.

The ownership of notebooks increased from 28.7 percent in SACMEQ II to 38.4 percent in SACMEQ III at the national level. There was a general increase in the ownership of notebooks by pupils in 6 provinces with the exceptions being Western and Coast province. Nyanza province recorded the highest increase of 20.7 percentage points while Western Province recorded the highest decline of 6.9 percentage points as shown in **Table 3.16**.

Nationally there was an increase in the ownership of pencils with results indicating an increase from 7.2 percent in SACMEQ II to 8.1 percent in SACMEQ III. However ownership of pencils decreased in Central and Rift Valley with a drop of 4.3 and 0.4 percentage points respectively. Although there was a general increase in the number of pupils who owned notebooks and pencils, there was a recorded decline in exercise book ownership. These results are consistent with the findings by Wasanga et al. (2010) who reported widespread inadequacies in the availability of learning materials. The study revealed that about 47 percent of Standard 3 teachers reported that pencils and exercise/notebooks were adequate, 30 percent reported

that they were inadequate while about 4 percent said that basic stationery were not available.

Policy Suggestion 3.8:

The Ministry of Education and other stakeholders in education should strengthen the monitoring of FPE funds in the acquisition of stationery for learners.

3.6 ACCESS TO BOOKS IN THE CLASS LIBRARY

General Policy Concern 3.4:

Did Standard 6 pupils have access to library books in their schools, and (if they did have access) was the use of these books maximised by allowing pupils to take them home to read?

This section aimed at establishing the proportion of pupils who have access to library reading, mathematics and health textbooks in their classrooms and whether their schools permit them to take those books home. The results of the analysis were as follows.

Table 3.17: Availability of library books to Standard 6 pupils in their classrooms (SACMEQ III)

Province	Pupil borrow from class library		Cupboard (Reading teacher)		Bookshelf (Reading teacher)		Cupboard (Mathematics Teacher)		Bookshelf (Mathematics Teacher)	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	29.0	10.45	20.3	8.27	11.8	6.94	9.6	5.15	6.2	4.44
Coast	25.8	11.82	10.1	7.19	0.0	0.00	3.2	3.24	2.3	2.40
Eastern	17.8	7.64	15.6	6.71	7.0	5.10	6.5	3.95	5.1	3.14
Nairobi	54.7	12.96	82.1	7.38	41.3	11.56	83.9	5.43	50.8	9.92
North-Eastern	5.5	5.69	10.0	5.87	7.0	4.90	15.9	7.42	11.5	6.77
Nyanza	0.0	0.00	5.6	3.54	0.8	0.77	5.4	4.06	3.4	2.32
Rift Valley	38.4	9.14	18.8	5.35	14.6	7.15	20.0	5.71	16.3	7.24
Western	21.5	8.45	23.6	10.16	17.4	9.68	29.9	10.84	26.0	10.52
Kenya	24.2	3.57	19.0	2.69	11.0	2.72	16.9	2.50	12.7	2.68

Nationally only 24.2 percent of pupils could borrow books from a class library. What is more, the results also show that classrooms were also severely under-resourced in terms of storage facilities for books (such as cupboards and bookshelves). Nairobi province recorded the highest percentage of pupils who had access to books in a classroom library at 54.7 percent followed by Rift Valley with 38.4 percent. No pupil from Nyanza had access to a

classroom library while North-Eastern province had a mere 5.5 percent of pupils having library access. Of those who had access to library books, all the provinces allowed their pupils to borrow books except Nyanza province where all pupils were not being allowed to borrow.

Nairobi province recorded the highest percentage of pupils in classes with cupboards for reading

(82.1%) and mathematics (83.9%) textbooks. Coast province had 10.1 percent of the pupils in classes with cupboards for reading textbooks.

3.7 EXTRA TUITION

General Policy Concern 5

Was the practice of Standard 6 pupils receiving extra lessons in school subjects outside school hours becoming widespread and were these paid lessons?

Bray (2003 & 2007) has strongly advocated against private tuition due to its effect in quality and equality in the education system. Extensive tuition has the capability of producing and enhancing social inequality and its continued use by teachers resulted to discrimination against those who cannot afford by offering quality private sessions compared to what they do in class on the same topic. This is likely to lead to a lower quality of education offered in schools and thereby lowering the standards altogether. However, a recent study by Wasanga et al. (2010) has reported that Kenyan teachers still offer out-of-school tuition for the purposes of getting an extra income.

This section reports the findings of the data analysed to establish whether there was change between SACMEQ II and SACMEQ III in the percentage of Standard 6 pupils who receive out-of-school tuition and whether they pay for it.

Levels of extra tuition

What percentage of pupils received extra tuition?

The study sought to establish the percentage of pupils receiving extra tuition outside school hours. The results are presented in **Table 3.18**.

Table 3.18: Pupils who receive extra tuition

Province	SACMEQ II		SACMEQ III	
	%	SE	%	SE
Central	86.7	6.00	50.5	9.35
Coast	78.1	6.69	66.5	10.33
Eastern	84.9	6.20	68.9	9.68
Nairobi	75.7	5.74	57.5	7.18
North-Eastern	86.2	3.93	32.9	9.33
Nyanza	87.8	4.34	97.0	1.60
Rift Valley	92.9	2.03	65.1	7.34
Western	90.4	4.05	74.5	10.06
Kenya	87.7	1.91	70.2	3.23

Nationally there was a drop in the percentage of pupils receiving extra tuition outside school hours from 87.7 percent in SACMEQ II to 70.2 percent in SACMEQ III. There was a dramatic drop in seven of the provinces with only Nyanza province recording an increase of 9.2 percentage points. North-Eastern province recorded the largest decline of 53.3 percentage points followed by Central province with a decline of 33.3 percentage points.

The above results show that although teachers still engage in out-of-school tuition, there is a remarkable decline in the number of pupils attending these classes with the exception of pupils in Nyanza province.

Policy Suggestion 3.9:

There is need for further research on incidences and levels of extra tuition with a view of formulating policy on the same.

Payment for extra tuition

Was there payment made for extra tuition?

Pupils were asked if any payments were made to the person who gave them extra tuition. The options provided for this question in the SACMEQ II study differed slightly from the options provided in the SACMEQ III study as explained in the paragraphs below.

For SACMEQ II, the options provided for this question were 'I do not take extra tuition', 'There is no payment', and 'There is payment'. For this report, a response of 'There is payment' was taken to mean that there was payment to the extra tuition taken.

A response of 'There is no payment' was taken as a negative.

For SACMEQ III, the options provided for this question were 'There is no payment of any kind', 'There is money payment', 'There is another kind of payment', and 'There is both money and another kind of payment'. The pupils who did not take extra tuition were asked to skip this question. For this report, a response of 'money payment', 'another kind of payment' or 'both money and another kind of payment' was taken to mean that there was payment to the extra tuition taken. A response of 'no payment of any kind' was taken as a negative.

Two things are worth noting when interpreting the results regarding extra tuition payment presented in the section, especially in **Table 3.19**. First, in the SACMEQ III study, the mode of payment for extra tuition was explicitly defined to include all types of payments (money and other kinds) while in the SACMEQ II study, the payment mode was not as clearly defined and might have included only money payment. It is likely that some Standard 6 pupils in the SACMEQ II study did not consider non-money (other kind) payment when responding to this question. Second, the percentages in **Table 3.19** were calculated taking into consideration the total samples of the Standard 6 pupils in the studies. In other words, these are the percentages of Standard 6 pupils in the total sample who reported that payment was made to the person who gave them extra tuition.

Table 3.19: Payment of extra tuition taken by pupils outside school hours

Province	SACMEQ II		SACMEQ III	
	Payment1 %	SE	Payment2 %	SE
Central	64.0	6.47	40.8	9.15
Coast	46.2	8.51	38.2	8.79
Eastern	65.4	7.68	59.8	8.83
Nairobi	74.6	5.14	43.4	6.63
North-Eastern	73.3	5.29	16.8	5.52
Nyanza	52.7	7.63	70.1	6.37
Rift Valley	54.4	4.68	49.4	7.72
Western	55.0	5.34	49.3	10.67
Kenya	57.9	2.65	52.1	3.40

Note:

1 For SACMEQ II, percentages of pupils who said 'There is payment'

2 For SACMEQ III, percentages of pupils who said 'There is money payment', 'There is another kind of payment', or 'There is both money and another kind of payment'

In comparison with SACMEQ II, nationally there was some decrease in the frequency of payment for tuition in SACMEQ III (down 5.8 percentage points). This decline is encouraging especially considering that other kinds of payments might not have been taken into considerations by some pupils in the SACMEQ II study. Regionally seven out of the eight provinces recorded a decline in the percentage of pupils who said that they paid for tuition. North-Eastern reported a dramatic decline of 56.5 percentage points followed by Nairobi with 31.2 percentage points. Interestingly Nyanza was again the only province that reported an increase, this time of 17.4 percentage points.

For SACMEQ III, the percentages of pupils in various categories of extra tuition are displayed in **Figures 3.9 and 3.10**.

From **Figure 3.9**, it can be seen that approximately one-half (52.1%) of the Standard 6 pupils in Kenya reported that they paid for extra tuition. On average, 18.1 percent of the pupils in all the SACMEQ countries paid for extra tuition. This implied that the situation in Kenya regarding paid extra tuition was much worse than the overall situation in SACMEQ nations. This should be troubling to the Ministry of Education because for many years the Ministry has been discouraging paid extra tuition. Instead of extra tuition, the Ministry has been promoting non-paid remedial teaching for learners with special learning needs.

Figure 3.9: Percentages for various categories of extra tuition by province (SACMEQ III)

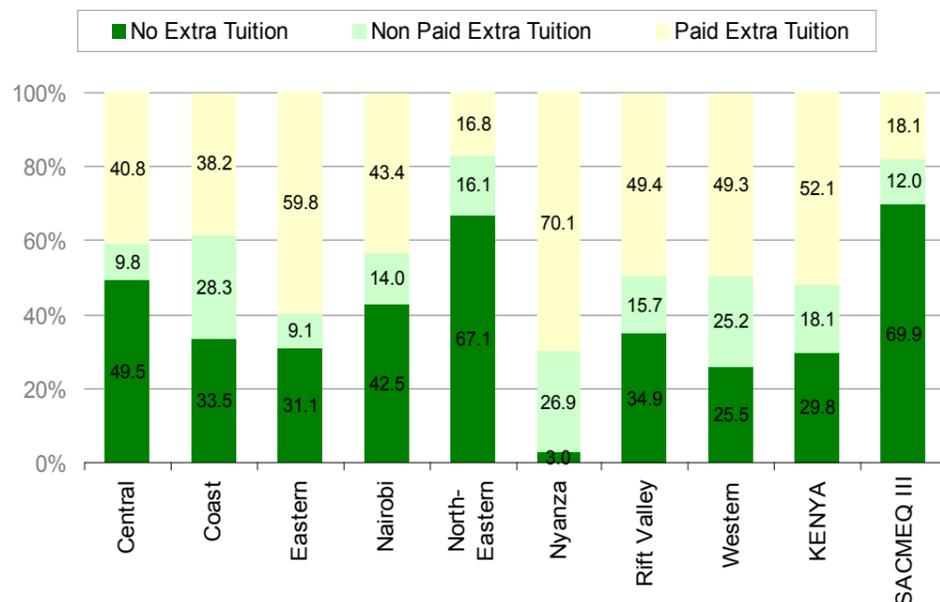
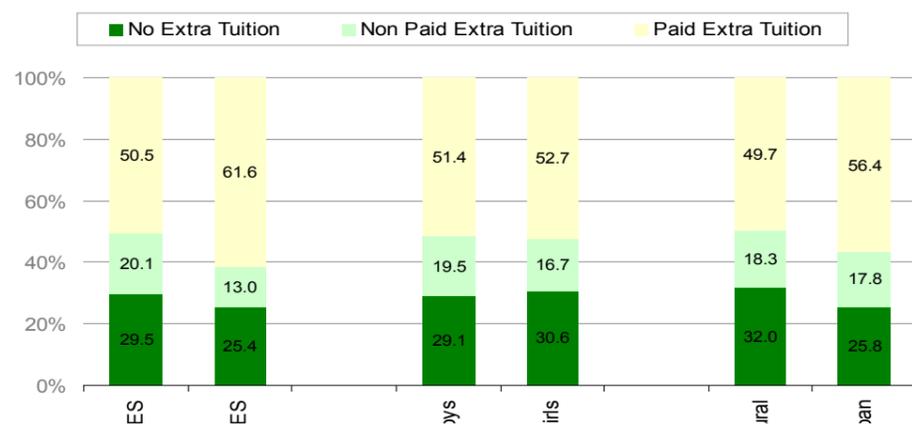


Figure 3.10: Percentages for various categories of extra tuition by socioeconomic status, gender and school location (SACMEQ III)



From **Figure 3.10**, it can be seen that the percentages of paid extra tuition for boys and for girls were more or less the same. It can further be seen that paid extra tuition was slightly more common among pupils in urban schools (56.4%) than among pupils in rural schools (49.7%). In addition, extra tuition was considerably more common among pupils from rich home backgrounds (61.6%) than among pupils from poor home backgrounds (50.5%). Nevertheless, it should be worrying to the Ministry of Education to note that about one-half of low SES pupils took paid extra tuition because these are children from poor families and of parents with little or no formal education.

3.8 CONCLUSION

The gender distribution of Standard 6 pupils in Kenya has remained constant at approximately 50 percent between SACMEQ II and SACMEQ III. Despite regional variations in the age distribution ranging between 155.1 to 179.5 months, on average, children still reached Standard 6 older (165.1 months) than the expected national mean age of 141 months.

With regard to the parents' level of education, it is most common for fathers and mothers to have very similar levels of education. There was some regional disparity in the percentage of pupils who got regular

meals in that some pupils got approximately 11.5 meals per week compared to approximately 9.5 meals per week for pupils in other provinces.

Although regional differences were noted, there was a general increase in the number of pupils who came from homes where English was regularly used. The study showed that the majority of the pupils resided at home with their parents during the school week with a small minority being either in boarding school, with other people or in an orphanage.

There was a considerable decrease in the mean number of books available to pupils in their homes. There was a remarkable regional disparity with pupils in some of the provinces having more books at their disposal while in other provinces their counterparts had very few. Similarly, the percentage of pupils with basic possessions at home increased nationally but again with some marked regional disparities. From these findings, pupils are experiencing decreased access to textbooks and this may lead to a decline in learning outcomes.

Over two thirds of the pupils lived within 2 kilometres of their schools with the rest residing over 2 kilometres from the school. However, there was a disparity between rural and urban areas. More rural pupils tend to live near their schools than their urban counterparts. The mean number of days of absenteeism had dropped both nationally and regionally. Similarly, the rate of class repetition by pupils had dropped remarkably.

Nationally, the majority of the pupils were given homework regularly. However, less than half of the pupils said their teachers always corrected their assignments. At the same time, only one in five pupils received assistance with their homework at home from their guardians and parents most of the time.

The percentage of pupils with their own reading and mathematics textbooks decreased at both the national and regional levels. With regard to basic stationery, the ownership of exercise books had declined while the ownership of notebooks and pencils had risen. If this trend continues, it is going to comprise the quality of education.

Most pupils did not have a classroom library from where they could borrow books. Even where

there was, a very small percentage was allowed to borrow books to read at home. Classrooms were also severely under-resourced in terms of storage facilities for books such as cupboards and bookshelves. With no access to reading facilities, it would be difficult to develop a reading culture among pupils. Out-of-school tuition is a common phenomenon both in rural and urban school. However, from the analysis, this type of tuition does not improve learning achievement among low socioeconomic status pupils.

Although there was some decline in the percentage of pupils receiving extra tuition as compared to the situation seven years ago both nationally and regionally, a sizeable majority of pupils were still attending extra tuition classes. About half of the pupils who attend extra tuition were paying for the teaching service rendered by teachers. There was, however, a regional disparity in provinces such as North-Eastern, Central and Nairobi where the percentage of those who were paying had dropped drastically, while for Nyanza province the proportion paying for extra tuition actually increased.



handling food

before you touch food, clean your hands.

before you eat any food Wash your hands.

come from the latrine

wash your hands.

hide your hands.

CHAPTER 4

4.0 CHARACTERISTICS OF TEACHERS AND THEIR VIEWS ABOUT CLASSROOM RESOURCES AND PROFESSIONAL SUPPORT

4.1 Introduction

Teachers as curriculum implementers are among the most important stakeholders in an educational system. Thus, it is important for any study investigating factors within an educational system to also highlight some of the important teacher characteristics and how they contribute to the achievement of educational goals. This chapter focuses on the description of personal and professional characteristics of Standard 6 teachers in Kenya. It also highlights teachers' viewpoints on teaching, classroom resources and professional support. The personal characteristics include age, gender and housing conditions; whereas professional characteristics include academic, professional and in-service training, their viewpoints on teaching concerning time spent on lesson preparation, actual teaching and marking of pupils' work. On classroom resources, the study dealt with classroom furniture and equipment. Last but not least, teachers' professional support was analysed in terms of educational resource centres, school assessments and school heads' input. The analyses of these sections are discussed and comparisons of the findings made with respect to SACMEQ II findings where relevant.

4.2 Teacher Personal Characteristics and Housing Conditions

General Policy Concern 4.1:

What were the personal characteristics of Standard 6 teachers and what were their housing conditions?

In this section, several characteristics of teachers are discussed. The analyses of the age; gender, and possessions of teachers are summarised below.

Teacher age

What was the age distribution of Standard 6 teachers?

Data analysis on age distribution for Standard 6 teachers is presented in **Tables 4.1** and **4.2**.

Table 4.1: Mean age of Standard 6 Reading teachers by province

Province	SACMEQ II		SACMEQ III	
	Years	SE	Years	SE
Central	36.7	1.38	43.1	1.48
Coast	35.3	1.50	35.7	2.69
Eastern	36.7	1.35	37.4	1.93
Nairobi	38.2	1.15	39.5	1.44
North-Eastern	32.2	1.79	29.7	0.98
Nyanza	40.1	1.66	34.2	1.44
Rift Valley	36.7	1.50	35.3	1.53
Western	37.5	1.69	39.0	1.95
KENYA	37.3	0.63	37.2	0.72

For Reading teachers SACMEQ II and III studies recorded generally the same national mean age of approximately 37 years. Central province had the highest mean age of Reading teachers at 43.1 years, closely followed by Nairobi province and Western Province at 39.5 years and 39.0 years respectively while North-Eastern Province had the lowest mean age of Reading teachers at 29.7 years. Central province recorded an increase in the mean age by 6.4 years while Nyanza recorded a decrease of 5.9 years. This could mean that younger Reading teachers were hired in Nyanza, North-Eastern and Rift Valley provinces in the period between years 2000 and 2007. It is likely that few new Reading teachers were hired in Central province.

Table 4.2: Mean age of Standard 6 Mathematics teachers by province

Province	SACMEQ II		SACMEQ III	
	Years	SE	Years	SE
Central	42.1	1.17	44.0	1.63
Coast	35.4	1.28	38.3	2.13
Eastern	36.1	1.64	37.4	1.80
Nairobi	36.7	1.44	41.1	1.30
North-Eastern	29.1	1.00	32.5	1.35
Nyanza	36.1	1.75	37.3	1.79
Rift Valley	36.4	1.32	36.7	1.41
Western	37.7	1.50	36.5	2.09
KENYA	37.4	0.61	38.2	0.71

Mathematics teachers had a national mean age of 38.2 years in SACMEQ III which is an increase of 0.8 years from 37.4 years in SACMEQ II. Central province had the highest mean age of Mathematics teachers at 44.0 years, followed by Nairobi at 41.0 years, while North-Eastern had the lowest mean age of Mathematics teachers at 32.5 years. In many provinces Mathematics teachers had slightly increased in mean age. For example Mathematics teachers' mean age in Nairobi increased the most, by 4.4 years. Conversely, the age of Mathematics teachers in Western province decreased by 1.2 years.

Policy Suggestion 4.1:

The Government should provide interventions based on teacher age profiles in the respective regions. For instance teaching how to read.

Teacher gender

What was the gender distribution of Standard 6 teachers?

Table 4.3: Gender distribution of Standard 6 Reading teachers by province

	SACMEQ II		SACMEQ III	
	%Female	SE	%Female	SE
Central	59.8	9.74	47.4	10.42
Coast	61.9	11.92	65.9	12.90
Eastern	56.9	9.64	53.5	10.54
Nairobi	93.5	5.02	64.0	10.24
North-Eastern	33.4	12.42	11.3	7.08
Nyanza	21.9	8.37	38.6	8.20
Rift Valley	40.8	9.76	45.6	7.90
Western	39.7	10.06	31.4	9.47
KENYA	46.0	3.99	46.0	3.77

In 2007, the percentage of sampled female Reading teachers was 46.0 percent which was the same as the proportion in the year 2000. Coast province had the highest percentage of pupils with female Reading teachers at 65.9 percent followed by Nairobi at 64.0 percent. Nairobi province had the greatest decline (29.5 percentage points) from SACMEQ II. North-Eastern province had the lowest percentage of pupils with female Reading teachers (11.3%), a decline of 21.1 percentage points from SACMEQ II. Though the proportion of Reading teachers was more or less gender balanced, there were sharp differences across the provinces.

Table 4.4: Gender distribution of Standard 6 Mathematics teachers by province

	SACMEQ II		SACMEQ III	
	%Female	SE	%Female	SE
Central	33.9	8.22	27.6	9.38
Coast	28.0	8.50	32.2	11.96
Eastern	22.4	8.33	44.2	10.83
Nairobi	70.4	9.49	47.5	11.61
North-Eastern	11.0	7.69	6.2	5.69
Nyanza	24.6	8.50	16.8	5.40
Rift Valley	20.7	6.95	21.4	5.85
Western	9.2	5.58	20.7	8.03
KENYA	24.4	3.19	26.7	3.20

Nationally the percentage of pupils with female Mathematics teachers was 26.7 percent which was a slight increase from 24.4 percent in SACMEQ II. Regionally Nairobi had the highest percentage of female Mathematics teachers at 47.5 percent, followed closely by Eastern province at 44.2 percent. North-Eastern had the lowest percentage of female Mathematics teachers (6.2%). In general there are more male than female Mathematics teachers with some provinces, e.g. North-Eastern, Nyanza and Western having a worryingly small proportion of female Mathematics teachers.

Table 4.5: General condition of teachers' housing

Province	SACMEQ II				SACMEQ III			
	Reading		Mathematics		Reading		Mathematics	
	%	SE	%	SE	%	SE	%	SE
Central	47.2	8.38	34.4	9.17	77.9	8.66	81.0	8.29
Coast	25.2	10.52	28.6	9.84	55.5	13.06	54.9	12.39
Eastern	23.1	9.28	37.6	9.56	61.0	9.52	60.4	10.29
Nairobi	53.8	10.49	48.5	10.91	77.9	9.51	79.4	9.03
North-Eastern	19.2	9.91	22.3	9.97	28.0	13.83	39.8	13.83
Nyanza	46.1	10.23	38.6	10.49	57.7	8.50	46.9	8.37
Rift Valley	46.6	9.70	55.7	9.12	61.8	7.87	70.1	7.03
Western	53.4	10.36	42.8	10.18	47.9	11.09	36.2	9.71
KENYA	42.4	4.01	42.1	4.00	61.2	3.71	60.2	3.65

Table 4.5 gives the percentages of Standard 6 pupils taught by Reading and Mathematics teachers who lived in houses with acceptable conditions in SACMEQ III and in SACMEQ II. Nationally, 61.2 percent of the pupils had Reading teachers and 60.2 percent had Mathematics teachers in SACMEQ III living in houses with acceptable conditions while SACMEQ II the percentages were 42.4 for Reading teachers and 42.1 for Mathematics teachers. In both studies, the percentages for Reading and Mathematics teachers with acceptable living conditions were almost the same and revealed a marked improvement over time of more than 18 percentage points. Central and Nairobi provinces recorded the highest percentage of pupils with Mathematics and Reading teachers living in houses with acceptable conditions. In contrast, North-Eastern province recorded the lowest percentages of pupils whose Reading teachers lived in acceptable conditions (28%) and Western province recorded the lowest percentage for Mathematics teachers who lived in houses with acceptable conditions (36.2%).

Policy Suggestion 4.2:

The Government should provide incentives for female Reading and Mathematics teachers in areas where there are serious gender imbalances.

Teacher housing condition

What were the general conditions of teachers' houses?

The data on teachers' housing conditions was analyzed and presented in **Table 4.5** below.

Policy Suggestion 4.3:

The Government and stakeholders should construct affordable housing and amenities for teachers in marginalized and rural areas.

4.3 Teacher Professional Characteristics

General Policy Concern 4.2:

What were the professional characteristics of Standard 6 teachers (in terms of academic qualification, pre-service training and in-service training), and did they consider in-service training to be effective in improving their teaching?

The analysis of results on Standard 6 teachers' characteristics, which included academic, professional and in-service training, is presented and discussed in the following sub-sections.

Academic education

What were the highest levels of academic education attained by the teachers?

Table 4.7 shows that the majority (63.2%) of pupils had Reading teachers who had completed senior secondary, while only 26.2 percent and 3.9 percent had teachers who had completed A-level and tertiary respectively. A small percentage of Reading teachers had completed only primary and junior secondary. Similar results were found for Mathematics teachers where 66.6 percent of pupils had Mathematics teachers who had completed senior secondary school followed by 27.1 percent who had completed A-Level and 4.1 who had tertiary education. Significant progress was made between SACMEQ II and SACMEQ III in terms of teachers completing A-Level and tertiary education. There was an increase of approximately 10 percentage

points in the percentage of pupils who had teachers who had completed A-Level, for both Mathematics and Reading. There was also a 3.8 percentage point increase in pupils whose Mathematics teacher had completed Tertiary education.

In SACMEQ III, Nairobi had the highest percentage of teachers with tertiary education for both Reading and Mathematics. Coast, Eastern and Rift Valley provinces had no teachers with tertiary qualifications in Mathematics while North-Eastern and Western provinces had no Reading teachers with tertiary qualifications.

Policy Suggestion 4.4:

The Government should develop a professional development policy for teachers in line with vision 2030.

Table 4.6: Academic education of Reading teachers (SACMEQ II)

	Primary		Junior secondary		Senior secondary		A-level		Tertiary/ First Degree	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	3.8	3.85	3.8	2.63	60.6	9.00	28.4	8.27	3.4	3.37
Coast	4.7	3.27	3.7	3.75	73.2	9.21	18.4	8.63	0.0	0.00
Eastern	0.0	0.00	0.0	0.00	92.2	5.78	7.8	5.78	0.0	0.00
Nairobi	0.0	0.00	0.0	0.00	65.2	11.04	34.8	11.04	0.0	0.00
North-Eastern	0.0	0.00	0.0	0.00	94.3	5.76	5.7	5.76	0.0	0.00
Nyanza	0.0	0.00	0.0	0.00	63.6	9.99	30.4	9.74	6.1	4.26
Rift Valley	0.0	0.00	3.0	2.99	82.4	6.52	7.9	3.90	6.7	4.70
Western	0.0	0.00	4.3	3.08	87.3	6.45	8.5	5.51	0.0	0.00
Kenya	1.0	0.70	2.2	0.99	76.6	3.25	16.9	2.85	3.3	1.49

Table 4.7: Academic education of Reading teachers (SACMEQ III)

	Primary		Junior secondary		Senior secondary		A-level		Tertiary/ First Degree	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	7.7	7.42	8.1	7.75	48.8	10.79	31.0	9.83	4.5	4.46
Coast	2.5	2.58	0.0	0.00	81.9	8.37	12.3	6.84	3.2	3.24
Eastern	0.0	0.00	9.9	7.59	55.3	10.76	28.5	9.67	6.3	6.16
Nairobi	0.0	0.00	0.0	0.00	60.1	11.18	28.3	10.00	11.6	7.01
North-Eastern	0.7	0.68	1.8	1.80	66.3	12.83	31.2	12.28	0.0	0.00
Nyanza	1.5	1.49	4.4	3.18	57.3	8.67	31.6	8.52	5.2	3.67
Rift Valley	3.2	3.04	3.6	2.81	65.3	7.75	25.7	6.48	2.3	2.30
Western	0.0	0.00	0.0	0.00	80.2	7.19	19.8	7.19	0.0	0.00
Kenya	2.3	1.36	4.4	1.86	63.2	3.70	26.2	3.29	3.9	1.49

Table 4.8: Academic education of Mathematics teachers (SACMEQ II)

	Primary		Junior secondary		Senior secondary		A-level		Tertiary/ First Degree	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	0.0	0.00	4.7	3.23	80.8	6.02	14.6	5.66	0.0	0.00
Coast	0.0	0.00	0.0	0.00	87.0	6.95	13.0	6.95	0.0	0.00
Eastern	0.0	0.00	0.0	0.00	79.5	7.99	20.5	7.99	0.0	0.00
Nairobi	0.0	0.00	6.1	4.43	74.4	8.05	19.5	6.70	0.0	0.00
North-Eastern	0.0	0.00	0.0	0.00	100.0	0.00	0.0	0.00	0.0	0.00
Nyanza	0.0	0.00	0.0	0.00	82.0	7.64	16.3	7.18	1.8	1.79
Rift Valley	0.0	0.00	1.4	1.44	75.1	7.59	23.5	7.29	0.0	0.00
Western	0.0	0.00	6.9	4.93	84.5	6.93	8.6	5.19	0.0	0.00
Kenya	0.0	0.00	2.3	0.96	80.1	3.04	17.3	2.88	0.3	0.29

Table 4.9: Academic education of Mathematics teachers (SACMEQ III)

	Primary		Junior secondary		Senior secondary		A-level		Tertiary/ First Degree	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	2.8	2.72	0.0	0.00	52.9	10.06	42.2	10.67	2.2	2.20
Coast	0.0	0.00	0.0	0.00	84.8	9.13	15.2	9.13	0.0	0.00
Eastern	0.0	0.00	0.0	0.00	82.9	7.57	17.1	7.57	0.0	0.00
Nairobi	0.0	0.00	0.0	0.00	44.5	9.80	21.4	8.67	34.2	8.75
North-Eastern	0.0	0.00	0.0	0.00	51.4	15.51	34.1	13.36	14.5	13.50
Nyanza	0.0	0.00	1.2	1.23	61.1	8.40	32.8	8.79	4.8	2.70
Rift Valley	2.8	2.74	3.5	2.51	73.8	6.30	19.9	5.84	0.0	0.00
Western	0.0	0.00	0.0	0.00	54.0	11.08	36.9	11.07	9.1	6.72
Kenya	1.1	0.82	1.1	0.67	66.6	3.46	27.1	3.46	4.1	1.19

Pre-service training and teaching experience

How many years of teaching experience and pre-service training had Standard 6 teachers completed?

The number of years of teaching and the amount of pre-service training are two of the variables that influence academic achievement of learners. The results for these indicators are presented in **Tables 4.10 and 4.11**.

Table 4.10: Years of training for Reading and Mathematics teachers (SACMEQ II and SACMEQ III)

Province	SACMEQ II (2000)				SACMEQ III (2007)			
	Reading		Mathematics		Reading		Mathematics	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Central	2.1	0.09	2.1	0.07	2.0	0.07	1.8	0.11
Coast	2.0	0.10	2.1	0.16	2.0	0.00	2.1	0.20
Eastern	2.1	0.07	1.8	0.13	2.0	0.21	2.2	0.21
Nairobi	1.9	0.16	2.2	0.15	2.6	0.16	2.1	0.11
North-Eastern	2.1	0.07	2.0	0.00	2.0	0.42	1.8	0.18
Nyanza	2.0	0.11	2.1	0.09	2.2	0.14	1.9	0.21
Rift Valley	2.2	0.11	2.2	0.09	1.9	0.11	2.1	0.14
Western	2.0	0.02	2.2	0.08	2.2	0.22	2.1	0.09
Kenya	2.1	0.04	2.1	0.04	2.0	0.07	2.0	0.07

Table 4.11: Means of the years of teaching experience (SACMEQ II and SACMEQ III)

Province	SACMEQ II				SACMEQ III			
	Reading		Mathematics		Reading		Mathematics	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Central	14.0	1.60	18.5	1.22	19.5	1.37	19.6	1.86
Coast	11.8	1.62	11.2	1.20	12.5	2.81	13.8	2.26
Eastern	13.0	1.40	12.9	1.37	13.0	1.98	12.5	1.97
Nairobi	15.9	1.45	13.7	1.50	15.0	1.67	17.0	1.27
North-Eastern	8.0	1.40	5.9	0.69	5.7	0.84	8.7	1.52
Nyanza	16.1	1.86	12.8	1.57	9.5	1.40	13.3	1.62
Rift Valley	13.8	1.33	12.7	1.20	12.4	1.46	12.3	1.41
Western	13.7	1.59	13.3	1.54	14.0	2.55	11.0	1.84
Kenya	14.0	0.64	13.8	0.56	13.3	0.73	13.6	0.71

According to **Table 4.10**, the average amount of training received by Mathematics and Reading teachers was 2.0 years. This compares very closely with the requisite 2 year pre-service teacher training for primary school teachers and with the results from SACMEQ II.

For SACMEQ III, at the national level, teachers had an average teaching experience of 13.3 years for Reading teachers and 13.6 years for Mathematics teachers. Central and Nairobi provinces had the most experienced teachers, 19.5 and 15.0 years in Reading and 19.6 and 17.0 in Mathematics respectively while North-Eastern had the least experienced teachers 5.7 in Reading and 8.7 years in Mathematics.

In comparison with SACMEQ II where the average experience of Mathematics and Reading teachers was 13.9 years, Central province had the most experienced teachers with an average of 16.25 years. While North-Eastern had the least experienced teachers (6.95 years). Five out of the eight provinces registered a slight decline in the years of experience.

In-service training

How many days were spent by Reading and Mathematics teachers on in-service courses?

The number of days spent on in-service courses by Reading and Mathematics teachers was of interest to this investigation. Results of the data analysis are presented in **Table 4.12**.

Table 4.12: Number of days spent on in-service courses (SACMEQ III)

Province	Days spent on in-service courses			
	Reading		Mathematics	
	Mean	SE	Mean	SE
Central	37.0	14.62	15.7	6.27
Coast	6.1	1.95	21.7	11.74
Eastern	26.1	18.12	18.3	7.57
Nairobi	5.8	1.25	18.1	9.02
North-Eastern	38.4	20.43	52.3	30.25
Nyanza	40.9	12.90	33.2	11.94
Rift Valley	14.9	7.34	14.5	5.64
Western	47.4	14.33	52.6	19.82
KENYA	28.0	4.96	24.9	4.20

Nationally, a Reading teacher spent on average 28.0 days on in-service courses compared to a Mathematics teacher who spent 24.9 days. In Western and North-Eastern provinces, Mathematics teachers spent the highest number of days on in-service courses, at 52.6 and 52.3 respectively. Rift Valley province's Mathematics teachers spent the least number of days on in-service course (14.5 days). Western province Reading teachers spent the highest number of days on in-service courses at 47.4 while Nairobi province Reading teachers spent the least number of days on in-service courses (5.8 days).

Effectiveness of in-service training

What percentage of teachers considers in-service training for Reading and Mathematics effective?

The study sought to establish the percentage of teachers that considered in-service training in Reading and Mathematics effective. The results are presented in **Table 4.13**.

Table 4.13: Effectiveness of in-service training for Reading and Mathematics teachers

Province	Effectiveness of in-service training (SACMEQ III)			
	Reading		Mathematics	
	%	SE	%	SE
Central	73.6	9.56	73.0	11.33
Coast	73.9	13.99	96.7	3.50
Eastern	45.0	13.55	100.0	0.00
Nairobi	77.1	8.07	75.7	10.41
North-Eastern	72.7	20.81	81.0	11.32
Nyanza	97.3	2.79	76.7	11.06
Rift Valley	75.6	9.23	80.0	8.30
Western	87.7	8.34	81.3	13.82
Kenya	76.2	3.92	82.9	3.82

Nationally, 76.2 percent of Reading teachers and 82.9 percent of Mathematics teachers considered in-service training to be effective. All the Eastern province Mathematics teachers in the sampled schools felt that in-service courses were effective followed by Reading teachers from Nyanza at 97.3 percent, Western at 87.7 percent and Coast Mathematics teachers at 96.7 percent. At 45.0 percent, Reading teachers from Eastern province

Table 4.14: Means of the number of periods per week taught by Reading and Mathematics teachers

Province	SACMEQ II				SACMEQ III			
	Reading		Mathematics		Reading		Mathematics	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Central	41.4	1.60	39.6	2.43	36.8	0.93	37.0	0.83
Coast	38.7	2.19	38.3	2.05	32.9	1.53	33.4	1.21
Eastern	35.0	2.66	37.8	2.44	33.2	1.75	36.1	1.12
Nairobi	35.2	2.90	40.6	1.02	32.2	1.22	32.3	1.37
North-Eastern	39.9	2.23	40.9	1.06	34.8	2.24	33.8	1.89
Nyanza	37.8	1.85	38.5	1.26	32.6	1.15	34.0	1.26
Rift Valley	36.5	2.13	35.6	2.27	33.8	0.81	33.5	0.83
Western	36.4	1.78	34.5	2.05	33.2	1.28	33.1	1.67
Kenya	37.4	0.86	37.4	0.90	33.7	0.48	34.3	0.46

In SACMEQ II the mean number of periods taught per week was 37.4 (21.8 hours) for both Reading and Mathematics teachers. For SACMEQ III, the mean number of periods taught by Reading teachers per week in Kenya was 33.7 (19.7 hours) compared to 34.3 (20.0 hours) for Mathematics teachers. This represents a decline in the mean number of periods taught per teacher per week. Both Reading and Mathematics teachers from Central province had the

constituted the least percentage of those who felt that the in-service courses were effective.

Policy Suggestion 4.5:

There is need for regular conduct of needs assessment to determine the areas that Reading and other subject teachers require for in-service.

4.4 Teacher Time Allocation

General Policy Concern 4.3:

How did Standard 6 teachers allocate their time among responsibilities concerned with teaching, preparing lessons, and marking?

Lessons taught per week

What was the mean number of periods taught by Reading and Mathematics teacher per week?

The study aimed at establishing the mean number of periods taught by the teachers per week. The results are presented below in **Table 4.14**.

highest mean number of periods per week at 36.8 (21.5 hours) and 37.0 (21.6 hours), respectively and down from 41.4 (24.2 hours) and 39.6 (23.1 hours) in SACMEQ II. It is notable from all other provinces that the average Reading and Mathematics teachers were far below the recommended 40 periods per week. Nairobi province had the lowest number of periods per week at 32.2 (18.8 hours) for Reading and 32.3 (18.8 hours) for Mathematics,

respectively. This suggests that teachers' workload had been reduced for some reason.

Policy Suggestion 4.6:

The current policy of a minimum 40 teaching periods per week is not realistic and the TSC should consider revising it downwards.

Time spent on lesson preparations

What was the mean number of hours per week spent by teachers on lesson preparations and marking? With regard to the mean number of hours that Reading and Mathematics teachers spent on preparing and marking, the results of the data analysis for SACMEQ II and III are presented in **Table 4.15** and **Table 4.16**.

Table 4.15: Means for time spent by teachers on lesson preparation and marking outside school hours (SACMEQ II)

Province	Reading lesson (hours)		Mathematics lesson (hours)	
	Mean	SE	Mean	SE
Central	17.5	3.22	16.1	2.84
Coast	17.6	3.01	15.6	3.65
Eastern	18.4	2.89	18.7	2.48
Nairobi	9.0	1.70	13.8	3.24
North-Eastern	24.5	5.10	25.0	4.98
Nyanza	17.5	2.72	14.9	2.25
Rift Valley	17.7	2.29	18.1	2.26
Western	23.0	3.88	21.7	3.73
Kenya	18.3	1.18	17.6	1.09

Table 4.16: Means for time spent by teachers on lesson preparation and marking outside school hours (SACMEQ III)

Province	Reading Teacher		Mathematics Teacher	
	Mean	SE	Mean	SE
Central	11.6	1.55	8.8	1.47
Coast	10.6	1.21	10.7	1.65
Eastern	10.9	1.81	12.3	1.73
Nairobi	12.1	1.52	11.9	1.16
North-Eastern	13.7	2.03	12.7	2.28
Nyanza	12.7	1.04	11.4	0.95
Rift Valley	10.7	0.79	10.6	0.94
Western	12.5	1.37	14.4	1.68
Kenya	11.6	0.50	11.4	0.53

The national mean number of hours spent on lesson preparation outside school hours by Reading teachers was 11.9 hours and by Mathematics teacher was 11.6. Reading teachers from North-Eastern province had the highest mean number of hours per week spent on preparation and marking, at 13.7 hours and Mathematics teachers from Western province spent the highest number of hours on preparation and marking at 14.4 hours. Reading teachers from Coast, Rift valley and Eastern province spent the lowest number of hours per week on preparation and marking at 10.6, 10.7 and 10.9 respectively whereas Central province's Mathematics teachers spent the lowest number of hours per week on preparation and marking at 8.8. In comparison to SACMEQ II, presented in Table 4.15 above, the mean number of hours spent on these tasks per week was 18.3 for Reading and 17.6 for Mathematics. This means that there had been a significant drop in the amount of time spent on preparation and marking over the past seven years. This could be attributed to the decline in teaching workload giving teachers fewer lessons to prepare for and more time in school to do preparation and marking.

Policy Suggestion 4.7:

- a) KIE should give guidelines on the average time to be spent on lesson preparation and marking.
- b) The MOE should provide training to teachers on effective utilization of official working hours.

4.5 Assessment and Communication with Parents

General Policy Concern 4.4:

What were Standard 6 teachers' views on (a) assessment procedures, and (b) meeting and communicating with parents?

This sub-section presents results of the data analysis with regard to Reading and Mathematics teachers' views on assessment procedures and communication with parents.

Frequency of giving written tests

What was the frequency with which Reading and Mathematics teachers gave written tests to pupils?

This study intended to find out the frequency with which Reading and Mathematics teachers gave written tests to the pupils. The results are presented in Tables 4.17 to Table 4.20.

There was a general decline between SACMEQ II and SACMEQ III in the frequency of giving Reading tests. Nationally, 46.2 percent of pupils had Reading teachers who gave written tests less often than 2/3 times a month, followed by those who gave such tests 2/3 times per month at 27.9 percent and finally 25.9 percent gave written tests once or more per week. Teachers from Eastern province had the highest percentage of teachers giving written tests less often at 58.1 percent. When compared with SACMEQ II, the results show that the percentage of Reading teachers who gave written tests 2/3 per month had increased by 6.9 percentage points. However, the percentage of teachers who gave written tests once or more per week dropped dramatically from 69.7 percent in 2000 to 25.9 percent in 2007.

Table 4.17: Frequency of Reading tests (SACMEQ II)

Province	Less often		2/3 per month		1+ per week	
	%	SE	%	SE	%	SE
Central	13.7	5.77	8.7	4.05	77.7	7.71
Coast	4.7	3.27	35.9	12.48	59.4	12.06
Eastern	0.0	0.00	8.7	5.29	91.3	5.29
Nairobi	2.8	2.82	31.6	10.23	65.6	10.91
North-Eastern	24.0	11.19	25.2	13.65	50.8	14.08
Nyanza	4.0	4.03	14.9	7.15	81.1	7.94
Rift Valley	18.4	8.41	27.4	9.37	54.2	9.75
Western	8.4	5.82	38.3	9.78	53.3	10.25
KENYA	9.3	2.56	21.0	3.29	69.7	3.73

Table 4.18: Frequency of Reading teacher giving written test (SACMEQ III)

Province	Less often		2/3 per month		1+ per week	
	%	SE	%	SE	%	SE
Central	40.6	9.82	35.9	9.47	23.5	9.09
Coast	57.0	13.55	21.4	12.23	21.6	10.03
Eastern	58.1	9.89	16.7	6.48	25.2	8.78
Nairobi	48.4	10.62	27.7	8.52	24.0	9.04
North-Eastern	54.4	12.88	19.1	7.37	26.5	13.89
Nyanza	35.1	7.75	29.2	8.11	35.6	8.44
Rift Valley	46.4	7.90	33.9	7.94	19.7	5.56
Western	45.4	11.07	23.4	9.02	31.1	10.52
KENYA	46.2	3.78	27.9	3.45	25.9	3.30

Table 4.19: Frequency of Mathematics teacher giving written test (SACMEQ II)

Province	Less Often		2-3 per month		1+ per week	
	%	SE	%	SE	%	SE
Central	25.2	8.5	49.7	9.5	25.1	8.1
Coast	23.9	7.3	44.0	11.5	32.1	9.3
Eastern	9.1	4.9	63.3	9.5	27.6	8.9
Nairobi	14.0	7.7	63.3	10.2	22.7	8.9
North-Eastern	23.9	11.0	42.9	13.9	33.1	12.7
Nyanza	19.2	8.9	46.0	11.0	34.8	10.7
Rift Valley	31.0	8.9	28.9	8.0	40.1	8.8
Western	25.6	8.9	41.9	9.5	32.4	9.4
Kenya	22.4	3.5	45.4	3.9	32.2	3.8

Table 4.20: Frequency of Mathematics teacher giving written test (SACMEQ III)

Province	Less Often		2-3 per month		1+ per week	
	%	SE	%	SE	%	SE
Central	31.2	41.00	45.2	10.37	23.6	9.65
Coast	47.4	12.58	34.8	12.91	17.8	9.11
Eastern	35.2	10.10	21.4	8.52	43.4	10.77
Nairobi	33.1	10.63	43.3	11.25	23.6	7.66
North-Eastern	31.4	11.59	54.6	13.41	13.9	8.04
Nyanza	47.0	8.73	29.3	7.69	23.6	7.92
Rift Valley	54.3	8.21	24.6	5.73	21.1	5.67
Western	36.3	11.05	39.1	10.64	24.7	10.15
Kenya	42.7	3.85	31.7	3.39	25.6	3.38

The expected common practice is a minimum of three times a term however each school has its own policy. From **Table 4.20** above it can be seen that there is a general decline in the frequency of tests given by Mathematics teachers. In SACMEQ III, 42.7 percent of Mathematics teachers gave written tests three times or less per term which is an increase of approximately 20 percentage points from SACMEQ II. Rift valley province had the highest number of teachers giving written tests less often than 2/3 times per month. Eastern province on the other hand had the lowest percentage of Mathematics teachers giving tests once or more per week at 21.4 percent.

Policy Suggestion 4.8:

- The MoE should come up with clear guidelines on pupil assessment,
- There is a need to rationalise and monitor the time spent on assessments.

Asking parents to sign homework

What percentage of Reading and Mathematics teachers asked parents to sign pupils' homework?

With regard to the question of whether Reading and Mathematics teachers asked parents to sign on their pupils' homework, the data analysis produced the results presented in **Table 4.21** and **Table 4.22**.

Table 4.21: Reading teachers who asked parents to sign on pupils' homework

Province	SACMEQ II		SACMEQ III	
	%	SE	%	SE
Central	21.6	8.33	38.9	10.57
Coast	31.9	10.18	23.2	12.43
Eastern	32.2	10.38	29.5	9.86
Nairobi	81.0	9.42	66.6	8.89
North-Eastern	10.1	7.39	25.6	9.90
Nyanza	27.5	9.35	43.7	8.91
Rift Valley	21.6	7.68	35.8	7.83
Western	35.3	9.42	48.1	11.12
Kenya	28.5	3.69	38.8	3.81

There was a national increase in the proportion of Reading teachers who asked parents to sign pupils' homework (38.8 percent in SACMEQ III and 28.5 percent in SACMEQ II), which was a 10.3 percentage point increase. In SACMEQ III the provinces with the lowest proportion of Reading teachers requiring parents to sign homework was Coast (23.2%) North-Eastern (25.6%) and Eastern (29.5%). Apart from Nairobi province, the majority of Reading teachers did not directly involve parents in the pupils' learning.

Table 4.22: Mathematics teachers who asked parents to sign on pupils' homework

Province	SACMEQ II		SACMEQ III	
	%	SE	%	SE
Central	29.9	9.28	36.0	10.86
Coast	44.1	11.04	32.1	13.22
Eastern	13.4	6.56	48.4	10.85
Nairobi	77.5	9.40	65.4	10.01
North-Eastern	20.5	10.02	34.6	13.61
Nyanza	35.2	10.00	39.4	8.53
Rift Valley	29.4	9.04	32.0	7.18
Western	48.6	10.33	52.9	10.99
Kenya	32.6	3.74	40.9	3.83

A trend similar to that of Reading, described above, was observed in Mathematics where teachers who asked parents to sign their children's homework increased from 32.6 percent in SACMEQ II to 40.9 percent in SACMEQ III. Mathematics teachers in Nairobi were most concerned (65.4%) while those in Coast (32.1%) and Rift Valley provinces (32.0%) showed least interest in involving parents directly in pupils' homework.

Policy Suggestion 4.9:

The school administration through the PTA and SMC should strengthen strategies on involvement of parents in the learning of pupils.

4.6 Availability of Teaching Aids, Teacher Chair and Teacher Table

General Policy Concern 4.5:

What was the availability of classroom furniture (for example, sitting/writing places, teacher table, teacher chair, and bookshelves) and classroom equipment (for example, chalkboard, dictionary, maps, book corner, and teacher guides) in Standard 6 classrooms?

This section provides a comparative data analysis of findings about classroom furniture and equipment by province.

Teaching aids

What percentage of pupils had teachers who had access to teaching aids in their schools?

The question of whether teachers had teaching aids in their schools was of interest to this study. This is because the FPE funds were meant to ensure schools had adequate teaching aids. The findings are presented in **Table 4.23** and **4.24**.

Table 4.23: Teachers with teaching aids in the school (SACMEQ II)

Province	For teaching Reading						For teaching Mathematics			
	Map		English dictionary		Teacher's guide		Geometrical instruments		Teacher's guide	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	79.4	7.00	94.3	5.67	94.6	3.86	93.1	4.95	93.5	3.62
Coast	46.2	11.6	67.8	11.59	93.4	6.59	53.7	12.32	72.3	9.36
Eastern	89.7	5.9	90.9	5.17	96.8	3.24	98.4	1.64	93.4	4.60
Nairobi	84.8	8.8	91.6	6.15	97.2	2.82	83.8	8.15	92.0	5.97
North-Eastern	44.9	14.4	80.2	10.32	98.6	1.36	74.0	12.53	72.6	12.42
Nyanza	72.0	9.5	72.8	9.27	92.9	5.02	70.8	10.34	79.2	9.53
Rift Valley	70.4	8.7	94.9	3.05	97.7	2.36	92.3	4.46	86.6	6.77
Western	58.9	10.4	74.6	8.83	86.2	6.09	88.5	6.45	84.4	7.52
KENYA	72.6	3.53	85.5	2.66	94.3	1.66	86.8	2.57	86.7	2.76

Table 4.24: Teachers with teaching aids in the school (SACMEQ III)

Province	For teaching Reading						For teaching Mathematics			
	Map		English dictionary		Teacher's guide		Teacher's guide		Geometrical instruments	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	92.5	4.17	92.5	4.17	94.1	3.37	93.1	3.51	93.1	3.51
Coast	95.1	3.49	100.0	0.00	100.0	0.00	82.7	9.99	77.5	10.81
Eastern	95.9	3.03	98.6	1.41	98.6	1.41	96.2	3.80	92.2	5.44
Nairobi	83.0	8.10	81.6	7.96	82.7	7.03	85.9	4.90	85.8	5.33
North-Eastern	98.2	1.28	99.1	0.90	99.1	0.90	92.2	5.04	92.3	4.28
Nyanza	86.5	5.29	89.9	4.63	90.7	4.50	94.0	3.86	94.0	3.86
Rift Valley	96.6	2.41	98.6	1.42	98.6	1.42	97.0	2.13	97.6	1.79
Western	95.8	4.20	93.4	4.82	100.0	0.00	98.0	2.01	98.0	2.01
KENYA	93.3	1.55	94.8	1.34	96.1	1.08	94.3	1.46	93.4	1.58

There was a general improvement in the provision of teaching aids for Reading and Mathematics teachers. As shown in **Table 4.24**, in Reading, 93.3 percent of pupils had teachers who had a map, 94.8 had an English dictionary while 96.1 had teacher's guidebooks. Nairobi province had the smallest percentage of teachers with teaching materials while their Coastal counterparts had the highest percentage of basic teaching aids. As for Mathematics, 94.3 percent of the teachers countrywide had a Mathematics teacher guide while 93.4 percent had a geometrical set. Regionally, Coast province had the smallest percentage of teachers with resources while their colleagues from Western province had the highest percentage of the selected teaching aids. On provincial comparison, all Reading teachers in Coast province reported having an English dictionary and teacher's guide (English). This finding is expected to reflect in relatively better scores in Reading achievement.

Policy Suggestions 4.10:

The government should ensure equitable provision and development of teaching aids in all provinces.

Teacher table and chair

What percentages of pupils had teachers with chairs and tables?

This question of whether teachers had necessary furniture in their classrooms was of interest to the study. The results are presented below in **Table 4.25**.

Table 4.25: Availability of classroom resources: Teacher tables and chairs

Province	Reading				Mathematics			
	Teacher table		Teacher chair		Teacher table		Teacher chair	
	%	SE	%	SE	%	SE	%	SE
Central	58.2	10.83	51.1	10.61	52.3	10.42	46.0	10.34
Coast	38.7	12.85	46.5	12.96	31.4	11.42	48.6	12.91
Eastern	38.2	10.63	54.3	10.81	50.9	10.80	57.5	10.71
Nairobi	83.5	7.11	85.5	7.21	87.3	5.01	87.3	5.01
North-Eastern	37.0	13.71	59.7	15.27	29.0	12.10	49.6	14.10
Nyanza	53.2	8.69	63.9	8.52	49.7	8.99	50.8	9.06
Rift Valley	59.5	7.65	56.7	7.91	67.5	6.95	65.6	6.86
Western	80.1	8.45	90	5.98	76.7	8.68	85.4	6.82
Kenya	57.2	3.74	62.1	3.69	58.8	3.66	61.3	3.60

Nationally, there was a higher percentage of chairs for teachers than tables, with 62.1 percent of Reading teachers having chairs and 57.2 percent had tables while 61.3 percent of Mathematics teachers had chairs and only 58.8 percent had tables. Regionally, Western province had the highest percentage of Reading teachers having teacher chairs (90%). However, Nairobi province had the highest percentage of Reading teachers with tables at 83.5 percent and Mathematics teachers with tables and chairs at 87.3 percent each. Western province had the highest percentage of Reading teachers with chairs at 90.0 percent. On the other hand, North-Eastern province had the lowest percentage of Reading and Mathematics teachers who had tables at 37.0 percent and 29.0 percent respectively. Coast province recorded the lowest percentage of Reading teachers with chairs and Central province Mathematics teachers with chairs at 46.5 and 46.0 percent respectively.

Policy Suggestions 4.11:

The government should ensure equitable and adequate provision of classroom resources in all schools and provinces.

4.7 Professional Support

General Policy Concern 4.6:

What professional support (in terms of education resource centres and school head inputs) was given to Standard 6 teachers?

The utilisation of educational resource centres by

teachers and the reasons for using them were of interest to this study. Below are the findings of the analysis with regard to the percentage of teachers who were using these services and the reasons for it.

Availability education resource centres

What was the percentage of pupils with teachers who (a) had access to educational resource centres, and (b) visited education resources centres?

It is important for teachers to visit resource centres so as to be informed of the new developments in their respective subject areas and referencing, among other reasons. This study aimed to find out how often and why teachers used the educational resources centres. The results of the data analysis are presented in **Table 4.26** and **Table 4.27**.

Table 4.26: Availability of education resource centres for teachers (SACMEQ II)

Province	Reading teachers						Mathematics teachers					
	None available		Have not visited		Have visited		None available		Have not visited		Have visited	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Central	17.9	8.44	34.8	9.83	47.3	10.56	17.1	8.08	31.3	9.12	51.7	10.11
Coast	7.0	6.99	27.5	10.26	65.5	11.30	6.9	6.89	24.1	8.71	69.1	9.85
Eastern	12.2	7.03	32.9	10.55	54.9	10.96	11.1	6.41	27.4	9.23	61.5	9.87
Nairobi	0.0	0.00	47.0	12.67	53.0	12.67	0.0	0.00	39.8	10.50	60.2	10.50
N. Eastern	17.4	11.93	25.9	11.55	56.6	14.16	17.4	11.93	37.1	12.91	45.5	14.06
Nyanza	1.8	1.82	7.7	5.35	90.5	5.52	0.0	0.00	25.8	10.19	74.2	10.19
Rift Valley	3.4	3.45	35.3	9.73	61.2	9.93	6.5	4.53	23.3	8.15	70.2	8.74
Western	6.8	4.84	40.9	10.25	52.3	10.55	6.8	4.84	33.2	9.56	60.0	9.99
Kenya	7.8	2.23	30.4	3.87	61.8	4.03	8.1	2.29	27.9	3.73	64.1	3.96

Table 4.27: Teachers using an educational resource centre (SACMEQ III)

	Reading teacher						Mathematics teacher					
	None available		Have not visited		Have used		None available		Have not visited		Have used	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Central	31.8	9.68	15.4	7.02	52.8	11.02	39.9	10.48	27.3	9.36	32.9	10.58
Coast	0.0	0.00	43.1	13.15	56.9	13.15	17.3	9.99	29.5	10.61	53.2	12.92
Eastern	43.9	10.91	23.1	9.16	33.0	9.91	44.7	10.50	19.1	7.74	36.2	10.75
Nairobi	14.5	7.21	40.0	9.50	45.5	11.39	16.8	5.84	41.5	9.27	41.6	9.37
N. Eastern	66.6	14.52	10.7	10.40	22.8	12.71	72.7	11.25	8.1	5.95	19.2	10.08
Nyanza	32.6	8.19	29.8	7.83	37.5	8.55	30.5	8.04	25.6	7.74	43.9	8.31
Rift Valley	3.1	2.27	49.0	8.18	48.0	8.27	6.4	3.68	46.5	8.47	47.1	8.38
Western	40.6	10.68	21.3	9.07	38.1	11.36	41.5	10.86	12.2	7.48	46.3	11.32
Kenya	24.6	3.08	31.9	3.48	43.5	3.95	27.9	3.27	29.3	3.43	42.8	3.94

Table 4.27 shows that the national percentage of pupils whose Reading teachers did not have access to a resource centre was 24.6 percent. However, extreme variations in the availability of resource centres were found among the provinces. In Coast, 100.0 percent of pupils had Reading teachers who had access to a resource centre compared to a low of 33.5 percent of pupils in North-Eastern. The Mathematics teachers in North-Eastern are similarly disadvantaged with 72.7 percent of pupils with Mathematics teachers who report that no resource centre is available. The percentage of Standard 6 pupils whose Reading and Mathematics teachers had not visited a resource centre was 31.9 and 29.3 percent respectively. Coast province had the highest percentage of Reading teachers at 43.1 percent who had not visited despite all the Reading teachers noting the availability of resource centres. In Rift Valley 46.5 percent of pupils had Mathematics teachers who had not visited despite

the province having highest percentage of teachers noting availability of resource centres.

A contradiction was noted whereby no Coast Reading teachers reported that resource centres are not available while 17.3 percent of the Mathematics teachers in the same province noted the resource centres were not available. These Mathematics teachers may be ignorant to the existence of the resource centres in their areas. This could be because most resource centres are equipped more with Reading materials and class readers and not Mathematics materials.

Nationally, 43.5 percent of Reading teachers and 42.8 percent of Mathematics teachers had used resource centres. Compared with SACMEQ II results, there was a slight drop in the use of resource centres for both Reading and Mathematics teachers. Regionally, the highest use of resource centres was

recorded in Coast province by Reading teachers at 56.9 percent and Central province by Mathematics teachers at 53.2 percent.

Policy Suggestions 4.12:

The government should establish functional educational resource centres in all provinces. There is also a need to encourage all teachers to visit and use the resource centres. There is a need to train teachers on the importance of ERC and how it can positively impact on quality education.

Use of educational resource centres

Why did teachers visit educational resource centres?

Table 4.29 shows that 34.7 percent of pupils had Reading teachers who went to resource centres to exchange ideas with teachers from other schools followed by 33.2 percent who went to attend training courses. These are low percentages compared to SACMEQ II, where 56 percent of Reading teachers, went to resource centres to exchange ideas and 40.2 percent went for training. The percentage borrowing materials was also lower in SACMEQ III down from 44.1 percent in SACMEQ II to just 24.8. Central province there was an increase in the percentage visiting resource centres to attend training courses, up from 34.2 to 46.4 percent. Rather worrying was a significant decline in all the purposes of use of the resource centres in North-Eastern province by Reading teachers.

Table 4.28: Reading teachers' purposes for using Resource centres (SACMEQ II)

Province	Don't use		Borrow material		Make material		Training		Speak with teachers/staff	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	42.3	11.37	24.2	8.50	33.0	9.92	34.2	10.16	38.8	10.39
Coast	29.6	10.89	57.6	11.61	30.3	10.41	56.6	11.89	59.4	11.32
Eastern	37.4	11.65	37.7	10.50	32.5	9.88	22.3	8.76	51.4	10.96
Nairobi	47.0	12.67	22.5	9.33	20.9	9.83	47.5	12.68	45.8	12.34
North-Eastern	31.4	13.70	49.9	13.69	28.9	12.92	32.5	13.38	48.6	13.63
Nyanza	7.7	5.35	75.6	8.96	58.9	10.44	63.3	10.20	82.4	7.47
Rift Valley	36.6	10.02	46.3	10.40	23.5	8.94	33.2	10.18	56.6	10.11
Western	43.9	10.88	29.8	9.81	20.2	8.48	43.2	10.68	48.3	10.66
Kenya	32.9	4.09	44.1	4.11	32.9	3.97	40.2	4.18	56.0	4.15

Table 4.29: Reasons given by Reading teachers for visiting a resource centre (SACMEQ III)

Province	Don't use		Borrow material		Make material		Training		Speak with teachers/staff	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	42.1	10.91	39.2	10.39	16.7	8.53	46.4	11.25	45.0	10.16
Coast	13.9	9.66	13.9	9.66	5.2	5.28	30.7	13.36	44.7	13.43
Eastern	11.8	5.82	10.5	6.41	17	7.27	22.8	8.25	27.3	8.87
Nairobi	33.7	11.23	15.6	7.64	17.9	8.41	37.8	10.07	30.3	9.66
North-Eastern	11.9	7.08	5.0	3.72	3.2	3.34	2.8	2.74	13.8	8.18
Nyanza	27.3	8.01	24.3	7.47	22.9	7.24	25.7	6.90	29.3	7.63
Rift Valley	28.2	8.05	28.6	7.97	19.7	7.46	42.8	8.38	38.1	8.26
Western	28.5	11.39	30.4	11.27	28.5	11.39	25.1	11.33	30.7	11.35
Kenya	26.6	3.60	24.8	3.54	19.4	3.33	33.2	3.78	34.7	3.80

Table 4.30: Mathematics teachers' purposes for using resource centres (SACMEQ II)

Province	Don't use		Borrow material		Make material		Training		Speak with teachers/staff	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	37.7	10.54	25.6	8.68	27.6	8.59	42.7	10.04	45.6	9.86
Coast	25.8	9.17	46.3	11.06	35.7	10.68	56.5	10.18	60.6	11.90
Eastern	30.8	10.13	28.8	9.14	28.4	9.39	30.1	8.78	55.0	9.98
Nairobi	39.8	10.50	22.7	7.79	12.4	7.27	55.5	10.71	52.1	10.79
N. Eastern	44.9	14.87	45.5	14.06	33.8	13.85	16.8	12.41	41.9	13.62
Nyanza	25.8	10.19	56.0	11.16	44.2	10.57	47.9	11.13	69.6	10.59
Rift Valley	24.9	8.65	49.4	9.46	43.2	9.41	37.2	9.68	61.6	9.35
Western	35.7	10.16	34.4	9.93	44.3	10.20	50.0	10.62	57.2	10.10
Kenya	30.3	3.98	39.5	4.02	36.6	3.95	42.0	4.11	57.8	4.10

Table 4.31: Reasons given by Mathematics teachers for visiting a resource centre (SACMEQ III)

Province	Look at Materials		Borrow Materials		Make Materials		Attend Courses		Exchange Ideas		Seek Advice	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Central	23.9	9.80	16.3	8.77	8.2	5.04	32.9	10.58	20.8	8.53	20.8	8.53
Coast	28.5	13.07	21.7	10.53	15.1	8.96	42.0	13.13	29.0	11.23	44.7	13.40
Eastern	15.2	8.71	8.4	6.41	8.4	6.41	26.2	9.89	30.4	10.25	25.4	10.17
Nairobi	23.4	8.61	22.7	8.42	20.1	8.40	38.3	9.59	29.6	9.51	26.3	8.86
North-Eastern	9.1	6.16	10.4	5.61	0.0	0.00	12.1	7.91	15.4	8.58	18.3	9.73
Nyanza	30.4	8.03	33.1	7.95	15.0	5.10	33.0	7.88	38.4	8.19	41.9	8.26
Rift Valley	25.6	6.31	22.2	7.54	26.0	7.71	33.7	8.32	35.4	8.17	37.4	8.31
Western	23.9	10.13	19.1	9.97	9.7	5.06	24.4	10.56	20.1	8.02	37.0	11.32
Kenya	24.4	3.39	20.7	3.32	15.2	2.77	31.7	3.80	30.1	3.60	33.9	3.81

As indicated in **Table 4.31**, 33.9 percent of pupils had Mathematics teachers who visited resource centres for the purpose of seeking advice. This was followed by 31.7 percent who visited resource centres to attend training courses. These percentages were considerably lower compared to those in SACMEQ II, where 57.8 percent of Mathematics teachers visited the resource centres to seek advice and 42.0 percent to attend training courses. Making materials as a reason for visiting the resource centres was the least popular recorded at 15.2 percent. Compared to other provinces, Mathematics teachers in North-Eastern province recorded the lowest use of resource centres for all the reasons, except borrowing materials.

Policy Suggestions 4.13:

There is a need to encourage more teachers to visit resource centres in order to improve their skill levels and to develop teaching and learning materials.

4.8 Conclusion

This chapter focused on the analysis and description of the personal and professional characteristics of Standard 6 teachers, in addition to their viewpoints on teaching, classroom resources and professional support.

The average age of Standard 6 teachers was 38.2 years for Mathematics and 37.2 years for Reading teachers. With regard to gender balance, the teaching profession was still male dominated especially for Mathematics while Reading was more gender balanced. There is a need to ensure gender balance in recruitment and distribution of teaching staff.

The national mean for years of experience for Standard 6 teachers was 13 years. However, regional comparisons puts North-Eastern province at approximately half the national mean (i.e. 6 years), thus indicating high attrition rates away from

the profession or migration to other provinces once they reach a certain level of experience. Therefore, the government must find ways of motivating these teachers like giving favorable allowances so as to stay in the profession (or in this province) and gather more experience.

The findings of the study also showed that on average there were some improvements in the percentages of teachers living in acceptable housing conditions, which was a positive indicator on the welfare of teachers. But there is need for the government to do more to ensure that all teachers have acceptable living conditions.

The findings of this study also indicated that the national mean of teaching periods per week per teacher is 34, far below the MoE recommended 40 periods per week per teacher. The study also found that the amount of time spent on preparation and marking by teachers outside school hours generally reduced between SACMEQ II and SACMEQ III.

With regard to the availability of teaching-learning equipment and the conditions of the school, the study showed that in most provinces, there was an improvement in the provision of teaching-learning equipment. This could be attributed to the FPE funds. In spite of this improvement, learning achievement has not significantly improved. It can be concluded that teaching aids may not be effectively utilized.

The study found out that majority of the teachers did not ask parents to sign their pupils' homework (60%). Parental involvement should be emphasized in all provinces in order to raise performance levels.

It was also found that there was a significant decrease in the frequency of written tests given in both Reading and Mathematics. Continuous self-evaluation on both the teacher and learners was lacking. There is need for further research on the factors associated with school based assessment.

A worrying trend was demonstrated in a significant increase in the percentage of pupils whose teachers reported the lack of an education resource centre. It was also shown that teachers visited the resource centres for a number of reasons. These included borrowing of books, attendance of training, talking with staff, exchange of ideas, development of

materials and seeking advice. However, there were a significant percentage of teachers who never used the resource centres. Since teachers seemed to use resource centres for their professional development, there is a need for more resource centres to be set up and teachers to be encouraged to use them for class preparation and for professional development in order to improve the quality of education in all provinces



CHAPTER 5

5.0 SCHOOL HEADS' CHARACTERISTICS AND THEIR VIEWS ON EDUCATIONAL INFRASTRUCTURE, THE ORGANIZATION AND OPERATION OF SCHOOLS

5.1 Introduction

School heads have major responsibilities that to a large extent impact on the instructional quality and the overall management of the school. These include; monitoring the acquisition of the teaching and learning materials, professional support and development for teachers, ensuring effective curriculum implementation at school level, and mutual support by school management committees – including strong school-community relationships. The reforms instituted in 2003 by the government in the education sector, the changes in education management, including the decentralisation of teacher deployment and primary school financing have entrusted school heads with an even greater managerial role. These measures require continuous improvement of school heads in management, as well as providing professional support to teachers, facilitating a conducive teaching and learning environment, and good resource utilisation.

This chapter examines the characteristics of school heads and their views on school facilities and infrastructure, and the organization and operation of their schools.

5.2 Characteristics of School Heads

General Policy Concern 5.1:

What were the personal characteristics of school heads?

The sample of school heads' characteristics, such as age, gender and years worked as head of their respective schools was investigated and analysed under policy concern 1.2. Analysis of the data is presented in tables and descriptions that follow.

What were the age and gender distributions of the school heads?

Data on the age distribution of school heads is useful for planning purposes, especially for employment agencies like the Teachers Service Commission, which require such information to work out succession plans for the replacement of school heads nearing retirement age. Likewise, data on the gender distribution is useful in ensuring gender equity in the deployment of school heads. Information on age and gender in both SACMEQ II and III (which are presented for comparison purposes) is summarised in Table 5.1 below.

Table 5.1: Female school heads' age and gender (SACMEQ II and SACMEQ III)

Province	SACMEQ II				SACMEQ III			
	Age		% Female		Age		% Female	
	Mean	SE	%	SE	Mean	SE	%	SE
Central	47.5	1.03	4.7	4.68	45.5	1.03	8.7	5.31
Coast	43.4	1.95	12.9	7.28	44.3	1.95	16.3	9.15
Eastern	42.4	1.20	12.4	6.85	46.1	1.20	10.4	7.76
Nairobi	46.7	1.56	41.2	11.42	47.4	1.56	57.5	13.23
North-Eastern	37.8	1.17	6.4	6.43	36.0	1.17	14.1	10.68
Nyanza	47.0	0.99	7.3	5.10	46.5	0.99	12.6	6.40
Rift Valley	41.1	0.90	3.7	3.65	43.7	0.90	15.0	6.09
Western	45.7	1.47	11.1	6.34	46.9	1.47	12.5	7.61
Kenya	44.4	0.46	8.7	2.17	45.4	0.46	14.7	2.79

Results in Table 5.1 show that the mean age for school heads in the SACMEQ III study was 45.4 years and this is an increase of 1.0 years from SACMEQ II. Nairobi, Nyanza and Western provinces had relatively older school heads with mean ages of 47.4, 46.5 and 46.9 years, respectively. The rest of the provinces had school heads with mean ages between 44 and 46 years, except North-Eastern, which had relatively young school heads with a mean age of 36.0 years.

As for gender distribution, the national female school heads' percentage obtained during SACMEQ III was 14.7 percent as compared to 8.7 percent during SACMEQ II, giving a marked improvement of 6.0 percentage points. Out of the eight provinces, Nairobi had the highest percentage of female school heads at 57.5 percent. All the other provinces recorded a score between 10 and 16 percent except Central province that had the lowest percentage of female school heads at 8.7 percent. Overall, with the exception of Eastern, the provinces showed an improvement in the percentage of female school heads from SACMEQ II to SACMEQ III.

Policy Suggestion 5.1:

There is a need for affirmative action on the appointment of female head teachers especially in marginalized regions.

5.3 Professional Characteristics of School Heads

General Policy Concern 5.2:

What were the professional characteristics of

school heads (in terms of academic, professional experience and specialised training)?

In this policy concern, the professional characteristics of school heads in terms of academic qualifications, teaching experience, teacher training and specialized training was analysed and results presented in tables.

Academic qualification

What level of academic qualifications had school heads completed?

The required academic qualification for primary school heads has changed over time, ranging from secondary education to university education. It is worth noting that in the past the system of education provided certification at Form 2 (Junior Secondary) and the current Form 4 was referred to as Ordinary secondary level which enabled candidates to proceed to either middle level colleges or to Advanced secondary level (A-Level or Form VI) and eventually to university. The current system enables candidates to proceed to university though a few may join private schools in or outside the country for A-level. Table 5.2 and Table 5.3 below show the percentages of school heads reaching each level in SACMEQ II and SACMEQ III.

Table 5.3 shows that nationally 67.6 percent of primary school heads had attained senior secondary (Form 4 / O level) education. The percentage of pupils with primary school heads who had attained A-Level education were 26.1 percent, while those with tertiary education was 5.1 percent. Regionally, the provinces that posted the highest percentage of

school heads with senior secondary education level were Eastern (84.5%), Rift Valley (75.3%), Western (70.8%), Central (66.5%) and Nyanza (62.6%). In the A-level category, Coast province recorded the highest percentage of 56.0 percent while in Nairobi 36.5 percent of pupils were in schools with a head teacher who had completed tertiary education.

Table 5.2: Highest academic education of school heads (SACMEQ II)

	Primary		Junior sec		Senior sec		A-level		Tertiary	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	0.0	0.00	2.6	2.65	53.5	10.30	43.9	10.26	0.0	0.00
Coast	0.0	0.00	0.0	0.00	59.5	12.06	37.3	12.08	3.2	3.24
Eastern	0.0	0.00	0.0	0.00	83.7	7.75	16.3	7.75	0.0	0.00
Nairobi	0.0	0.00	0.0	0.00	51.1	11.56	45.0	11.50	3.9	3.96
North-Eastern	0.0	0.00	1.4	1.47	73.3	11.77	25.3	11.69	0.0	0.00
Nyanza	0.0	0.00	3.9	3.87	75.3	9.10	20.9	8.62	0.0	0.00
Rift Valley	0.0	0.00	0.0	0.00	81.1	7.36	18.9	7.36	0.0	0.00
Western	0.0	0.00	0.0	0.00	64.3	10.41	35.7	10.41	0.0	0.00
Kenya	0.0	0.00	1.1	0.82	71.0	3.70	27.5	3.67	0.3	0.23

Table 5.3: Highest academic education of school heads (SACMEQ III)

	Primary		Junior sec		Senior sec		A-level		Tertiary	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	0.0	0.00	3.3	3.35	66.5	10.77	26.4	10.36	3.8	3.86
Coast	0.0	0.00	0.0	0.00	44.0	13.38	56.0	13.38	0.0	0.00
Eastern	0.0	0.00	0.0	0.00	84.5	8.49	15.5	8.49	0.0	0.00
Nairobi	0.0	0.00	0.0	0.00	25.7	10.81	37.8	13.00	36.5	13.50
North-Eastern	0.0	0.00	9.1	9.01	40.0	15.39	26.1	12.25	24.8	15.30
Nyanza	0.0	0.00	0.0	0.00	62.6	8.75	35.6	8.69	1.8	1.81
Rift Valley	2.6	2.56	0.0	0.00	75.3	7.09	16.7	6.21	5.4	3.17
Western	0.0	0.00	0.0	0.00	70.8	10.50	22.3	9.28	6.9	6.75
KENYA	0.7	0.66	0.5	0.46	67.6	3.67	26.1	3.47	5.1	1.57

Policy Suggestion 5.2:

The Ministry of Education in collaboration with the TSC should base the appointment of school heads and other management positions in the Ministry on relevant higher qualifications.

Professional training

This study sought to answer the question ‘How many years of teacher training had school heads completed?’

It is a government policy that all primary school teachers undergo a 2-year pre-service teacher

training programme before certification. Changes in the education system in 1984 led to the recruitment of untrained teachers to meet increased educational demands, and these had to undergo in-service training programmes that took place during school holidays. Since 1995, the government has recruited trained teachers who have completed the regular 2-year teacher training programme. Information on the number of years the school heads had undergone training was analysed and presented in **Table 5.4.**

Table 5.4: Number of years of teacher training that school heads have completed

	SACMEQ II		SACMEQ III	
	Mean	SE	Mean	SE
Central	2.2	0.13	2.1	0.07
Coast	2.0	0.09	2.2	0.23
Eastern	2.0	0.04	2.1	0.12
Nairobi	2.0	0.05	2.2	0.16
North-Eastern	2.0	0.10	2.0	0.38
Nyanza	2.2	0.14	2.0	0.07
Rift Valley	2.1	0.06	2.1	0.06
Western	2.1	0.08	2.0	0.02
KENYA	2.1	0.04	2.1	0.03

The results for levels of teacher training of school heads were remarkably consistent across time and among all provinces. This suggests that the Government norm of 2 years teacher training is being followed and adhered to.

Teaching experience

How many years of teaching experience did school heads have?

The data in **Table 5.5** shows the mean number of year's school heads had been teaching.

Table 5.5 shows that the national mean years for school heads' teaching experience was 21.3 years during SACMEQ III study, which is a slight increase compared to SACMEQ II at 20.2 years. The provinces which posted high mean years for school heads' teaching experience during SACMEQ III were Nairobi with 24.7 years, Western 23.1 years, Eastern 22.5 years and Central 21.5 years, whereas North-Eastern had the least with 11.7 years. The years of experience of a head teacher may have an implication on competence. It would be useful to establish the relationship between head teacher experience and the competence in leading a school or even school mean scores.

Table 5.5: Number of years of teaching experience school heads has completed

	SACMEQ II		SACMEQ III	
	Mean	SE	Mean	SE
Central	23.5	1.10	21.5	1.03
Coast	19.7	1.64	20.7	1.74
Eastern	19.4	1.20	22.5	1.32
Nairobi	23.9	1.44	24.7	1.97
North-Eastern	15.1	1.19	11.7	1.38
Nyanza	22.1	1.21	20.8	0.93
Rift Valley	16.6	1.26	19.7	0.95
Western	20.3	1.26	23.1	1.46
Kenya	20.2	0.53	21.3	0.47

Experience as a school head

How many years of experience did school heads have as school managers?

The aim of this study was to investigate the average number of years that one had served as school head in a particular school. The results are summarised in **Table 5.6** below.

Table 5.6: The mean number of years of teaching experience as a head teacher

Province	SACMEQ II		SACMEQ III	
	Mean	SE	Mean	SE
Central	7.9	1.25	7.3	1.31
Coast	7.2	2.31	6.9	1.04
Eastern	6.1	1.04	9.3	1.53
Nairobi	5.4	1.10	5.9	0.95
North-Eastern	8.0	1.19	4.3	0.92
Nyanza	7.6	1.31	5.3	0.63
Rift Valley	7.5	1.09	8.3	0.83
Western	7.6	1.46	8.8	1.18
Kenya	7.3	0.51	7.6	0.43

Table 5.6 shows that nationally, the average number of years school heads have been working in the position was 7.6 years in SACMEQ III study, compared to 7.3 years in SACMEQ II. The longest serving school heads were recorded in Eastern, Rift Valley and Western provinces, with a mean of over eight years in all cases while the least number of years school heads served was 4.3 years in North-Eastern. In addition, North-Eastern and Nyanza were the only provinces that recorded a large decline in the mean number of years teachers had served as school heads.

Specialized trainings on school management and health issues

What percentage of school heads had received (a) specialized training on school management, and (b) specialized training on HIV and AIDS issues?

Analysis was carried out on the amount of specialised training for school heads in school management, health, safety, life skills and HIV/AIDS teaching. The percentages of school heads who had received specialised training in school management and the percentages of those who had received specialized training in health issues (life skills or HIV and AIDS teaching) are presented in **Table 5.7**.

Table 5.7: School heads with special training (SACMEQ III)

Province	School management		Health issues	
	%	SE	%	SE
Central	77.3	8.73	76.2	8.94
Coast	80.9	10.36	73.1	11.46
Eastern	82.1	9.70	91.2	6.10
Nairobi	82.6	9.73	86.5	9.21
North-Eastern	87.3	9.62	65.6	15.12
Nyanza	76.3	7.63	71.1	8.18
Rift Valley	82.0	7.11	72.8	7.95
Western	90.4	5.65	92.3	5.57
Kenya	81.5	3.22	79.1	3.23

Results in **Table 5.7** show that nationally 81.5 percent of pupils had school heads who received specialised training in school management. In terms of a regional comparison, the highest percentage of school heads who received specialised training in school management were in Western province at 90.4 percent, while the lowest percentage was recorded in Nyanza province at 76.3 percent. In terms of specialised training in health, safety, life skills and HIV/AIDs teaching, the national mean percentage of school heads who received this form of special training was 79.1 percent. Western province again led in the percentage of head teachers who had received this form of special training at 92.3 percent, while North-Eastern province had the lowest percentage of 65.6 percent. In general, the vast majority of school heads had some specialised training in school management, health, safety, life skills and HIV/AIDs teaching.

5.4 School Resources

General Policy Concern 5.3:

What were the views of school heads about the general school infrastructure (for example, electrical and other equipment, water, and basic sanitation) and the conditions of school buildings?

The SACMEQ III study sought to examine the availability and conditions of school buildings, school grounds, general services and equipment. The school facilities surveyed were grouped in four categories (school buildings, school grounds, general services and equipment). The summary of their availability in percentages as reported by the school heads in SACMEQ III as compared to SACMEQ II is presented in **Table 5.8** below.

Table 5.8: Buildings, grounds and general services at school

	SACMEQ II		SACMEQ III	
	%	SE	%	SE
School buildings				
School library	26.7	3.59	38.9	3.50
School hall	19.3	3.47	16.9	3.00
Staff room	96.1	3.72	92.0	2.00
School head's office	85.3	2.98	79.0	3.10
Store room	70.0	1.70	64.9	3.70
Guidance & Counselling Area	-	-	13.6	2.60
Sick Room	-	-	3.7	1.60
Shop/Kiosk	-	-	4.3	1.50
School grounds				
Sports area/ playground	94.7	1.92	89.9	2.40
Fence	-	-	86.2	2.30
School garden	80.6	3.39	62.3	3.90
General services				
Piped water (well or bore-hole)	72.0	3.75	86.2	3.00
Electricity	16.8	2.92	22.7	3.00
Telephone	14.9	2.77	13.5	2.50

Note: The dash (-) indicates that no data was available

Table 5.8 shows the available school buildings during SACMEQ III. According to the school heads' reports, 92.0 percent of pupils were in schools with staff rooms, 79.0 percent with school head's office and 64.9 percent in schools with a store room. The percentage of schools' with staff rooms and school

head offices decreased between SACMEQ II and SACMEQ III. The least common school buildings included sick rooms, 3.7 percent, and shops/kiosks at 4.3 percent. In fact, these buildings, in addition to guidance and counselling rooms, were not available during SACMEQ II study while cafeteria was not available in all the sampled schools in SACMEQ III study. School grounds facilities were available in the following respective percentages; sports area/playground at 89.9 percent (down from 94.7 in SACMEQ II), fence 86.2 percent and school garden at 62.3 percent (down from 80.6 percent in SACMEQ III). Under general services, the majority (86.2%) of pupils were in schools with piped water (i.e. well or borehole), an improvement from SACMEQ II, where only 72 percent had this service.

There was also an improvement in electricity supply from 16.5 percent in SACMEQ II to 22.7 percent and a reduction in telephone from 14.9 percent in SACMEQ II to 13.5 percent in SACMEQ III. The reduction in telephone services provision may have been caused by non-prioritization of landline telephones after the advent of mobile telephones where head teachers use personal mobiles for communication. The other category of facilities surveyed was general equipment at school, and the summary of the results is presented in **Table 5.9**.

Policy Suggestion 5.3:

There is need for the schools to prioritize infrastructural development focusing on curriculum implementation needs.

Table 5.9: School equipment

Equipment	SACMEQ II		SACMEQ III	
	%	SE	%	SE
First-aid kit	35.4	3.84	33.9	3.70
Fax machine	0.9	0.85	1.1	0.70
Typewriter	25.9	3.33	19.8	3.0
Duplicator	9.9	2.20	14.7	2.70
Radio	63.1	4.07	89.4	2.30
Tape recorder	14.1	2.89	13.9	2.6
Overhead projector	0	0.00	0.6	0.40
Television set	4.3	1.83	8.0	2.10
Video-cassette recorder	1.7	1.20	4.5	1.5
Photocopier	1.3	0.91	3.5	1.20
Computer	3.2	1.46	11.4	2.10
Website	—	—	1.5	0.80
CD Player	—	—	2.1	0.80
Clock	—	—	91.0	2.20

Results in **Table 5.9**, show that 91.0 percent of pupils were in schools that had clocks and 89.4 percent had radios. Other common equipment included a first aid kit at 33.9 percent, typewriter (19.8%), duplicator (14.7%), tape recorder (13.9%) and computer (11.4%). Indeed, there was some improvement in many of categories in SACMEQ III when compared to SACMEQ II.

At least 1.5 percent of the sampled Grade 6 pupils were in primary schools with a website, which is an important development especially in the modern information based era.

Policy Suggestion 5.4:

There is need to prioritize the provision and supply of ICT facilities and equipment necessary for enhanced curriculum implementation.

Toilets are part of the basic and essential facilities of a school. The provision of appropriate sanitary facilities is critical to the process of learning in schools. A question was asked about the number of toilets available in a school and a pupil per toilet ratio was calculated. The results of the analysis are presented in **Table 5.10** below.

Table 5.10: Pupil-toilet ratios (SACMEQ II & SACMEQ III)

Province	SACMEQ II		SACMEQ III	
	Mean	SE	Mean	SE
Central	25.0	2.04	23.4	1.96
Coast	68.6	14.44	87.9	12.81
Eastern	39.7	8.04	46.9	8.03
Nairobi	35.4	4.30	50.1	6.01
North-Eastern	156.8	49.42	177.2	85.71
Nyanza	52.8	4.73	56.6	5.39
Rift Valley	41.7	3.98	47.2	3.57
Western	48.1	5.38	48.8	3.44
KENYA	43.3	2.25	50.4	2.35

The average number of pupils per toilet in SACMEQ III was 50.4 which is an increase compared to SACMEQ II where the pupils per toilet was 44.5. The provincial disparities are alarming with North-Eastern having the highest pupil:toilet ratio of 177.2 and Central having the smallest with 23.4 pupils toilet. This could be as a result of increased enrolment occasioned by the introduction of free primary education. It shows that efforts by the

schools to construct more toilets did not match the demand.

Policy Suggestion 5.5:

Education stakeholders should take urgent measures to construct enough toilets of good quality especially in the most marginalised areas.

5.5. School Operations and School Problems

General Policy Concern 5.4:

What were the school heads' views about a) daily activities (for example, teaching, school-community relations, and monitoring pupil progress), b) organizational policies, c) inspections, d) community input, and e) problems with pupils and staff (for example, pupil lateness, teacher absenteeism, and lost days of school)?

Table 5.11: School head periods per week and teaching hours per week

Province	SACMEQ II				SACMEQ III			
	Periods per week		Teaching hours per week		Periods per week		Teaching hours per week	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Central	23.4	1.21	13.7	0.71	25.3	2.25	14.8	1.31
Coast	24.8	2.25	14.4	1.29	22.4	2.87	13.1	1.67
Eastern	28.0	1.88	16.3	1.10	24.8	1.63	14.5	0.95
Nairobi	10.9	0.99	6.3	0.58	9.5	0.91	5.5	0.53
North-Eastern	27.6	2.21	16.1	1.29	22.8	3.44	13.5	2.00
Nyanza	31.5	2.31	18.1	1.27	27.6	1.33	16.1	0.78
Rift Valley	27.8	1.88	16.2	1.10	26.4	1.16	15.4	0.68
Western	28.3	1.35	16.5	0.81	25.1	1.92	14.5	1.10
KENYA	27.1	0.76	15.7	0.44	24.9	0.66	14.5	0.38

Table 5.11 above shows that the national mean of teaching periods per week for school heads was 24.9. This is close to the recommended 24 periods per week and is an increase of 2.2 percentage points compared to SACMEQ II. Nyanza and Rift Valley provinces recorded the highest school heads' teaching workload at 27.6 percent and 26.4 percent periods respectively while those in Nairobi province recorded a mean of just 9.5 periods per week which is well below the recommended 24 periods per week.

Policy Suggestion 5.6:

Head teachers especially in Nairobi province

A range of activities and undertakings at school define school heads' administrative and managerial roles. These include daily activities (such as, teaching, school-community relations and monitoring pupils' progress), inspections, community input, and problems with pupils and staff (pupil lateness, teacher absenteeism, and lost days of school). Hence, it is important to highlight some of their views on and involvement in these activities as summarised in the tables below.

School head teaching load

What was the school heads' teaching load?

The study sought to find out the teaching load in terms of periods per week and teaching hours per week. This was analysed as means per province as indicated in Table 5.11 below.

should be required to prioritize teaching as a core duty.

Important school activities

What school activities did school heads consider to be important?

The school heads were also asked to rate some of their daily activities in order of importance. This was done on a six point rating scale beginning with 1 as most important and 6 as the least important. Their responses are summarised in Table 5.12.

Table 5.12: Ratings of daily activities by school heads

School Head Activities that she or he considers important	1	2	3	4	5	6
Community Contact	1.1	4.5	7.9	18.6	19.9	48.0
Monitor Pupil Progress	30.8	27.8	25.5	8.3	5.5	2.2
Administration	51.0	21.9	14.6	9.1	2.2	1.3
Staff discussions	14.4	38.7	30.1	12.5	2.7	1.6
Staff professional development	0.0	5.0	15.8	38.9	31.8	8.4
Sch. head professional development	2.8	2.8	5.7	11.8	38.3	38.6

Notes: 1 was most important; 6 was least important Results in Table 5.12 show that 51.0 percent of school heads rated administrative activities, as most important followed by monitoring of pupils progress at 30.8 percent. 48.0 percent of pupils had school heads who considered community contact to be the least important and 38.6 percent had school heads who considered their own professional development to be the least important.

School inspections

What were the frequencies of school inspections?

The school heads oversee all activities in their schools, because they play supervisory roles at schools,

(which are part of the inspectional reports required by Quality Assurance and Standards department of the Ministry of Education). According to the MoE policy, Quality Assurance and Standards Officers (QASOs) are responsible for quality assurance, and should make regular visits to schools within their jurisdiction. The policy guidelines indicate that every school should have a full assessment at least once every three years. QASOs are deployed at every level i.e., national (MoE headquarters), provincial, district and zonal levels.

The percentage of inspections conducted in schools in each province were analysed and results summarised in Table 5.13.

Table 5.13: School inspection by province (SACMEQ III)

	NEVER		BEFORE 2003		2003		2004		2005		2006		2007	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Central	0.0	0.00	17.0	9.32	1.5	1.53	1.9	1.95	11.1	7.52	38.8	10.84	29.7	10.06
Coast	6.1	6.11	8.7	8.50	6.2	6.22	0.0	0.00	14.7	8.88	46.8	13.61	17.5	9.66
Eastern	4.9	4.86	3.4	3.43	3.1	3.17	0.0	0.00	9.7	6.89	41.8	10.67	37.1	10.95
Nairobi	0.0	0.00	0.0	0.00	13.2	9.05	0.0	0.00	21.4	11.45	39.1	13.37	26.2	10.98
North-Eastern	23.6	14.92	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	40.2	14.99	36.2	15.06
Nyanza	10.5	5.19	10.9	5.09	0.0	0.00	2.0	2.02	8.3	4.35	23.4	8.28	44.8	9.10
Rift Valley	11.6	7.22	0.0	0.00	7.8	4.74	12.0	6.03	13.4	5.54	25.9	7.67	29.3	7.50
Western	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	11.6	6.66	33.3	10.31	55.1	11.15
KENYA	6.3	2.30	5.5	1.83	3.8	1.48	3.7	1.64	11.7	2.54	33.0	3.81	36.0	3.89

Table 5.13 indicates that nationally, a high percentage (36.0%) of inspections was carried out in 2007, followed by 33.0 percent in 2006. The smallest percentage (3.7%) of inspections was carried out in 2004. Within the period of 2003 to 2007, the highest percentage of assessments occurred in Western in 2007 by 55.1 percent,

followed by Coast province in 2006 by 46.8 percent, and then Nyanza province in 2007 by 44.8 percent.

The least percentage of inspections occurred in Central province in 2003 (1.5%). Of concern was a lack of inspections in some provinces for up to

four consecutive years in Western (2002 to 2004) and North-Eastern (2002 to 2005). There were no inspections in Nairobi in 2004 or before 2003. Therefore, there is a need to increase the number of supervisors by the concerned department in the Ministry of Education.

Policy Suggestion 5.7:

There is a need for studies on the effectiveness of School Assessments.

Community contribution to school activities

What were the contributions of the surrounding community to the schools?

The surrounding community is one of the most important stakeholders in a school; it contributes to school development as a support mechanism. The school heads gave the range of activities and facilities that the parents/community contributed to the school and the percentages of the contributions, summarized in **Table 5.14**.

Table 5.14: Parent/community contributions to the school (SACMEQ II and III)

Type of contribution	SACMEQ II		SACMEQ III	
	%	SE	%	SE
Building of school facilities	87.7	2.95	60.9	3.00
Maintenance of school facilities	91.1	2.46	47.8	4.00
Construction/maintenance and repair of furniture/equipment	92.4	2.32	42.9	3.90
The purchase of textbooks	90.0	2.50	11.9	2.80
The purchase of stationery	88.8	2.75	10.2	2.70
The purchase of other school supplies	87.5	2.77	12.9	2.90
Payment of examination fees	94.3	1.97	86.0	2.70
Payment of the salaries of additional teachers	39.4	4.01	55.9	4.00
Payment of a supplement to the salary of teachers	7.1	2.04	3.2	1.60
Payment of the salaries of non-teaching staff	76.1	3.70	16.3	3.00
Payment of a supplement to the salary of non-teaching staff	13.1	2.67	5.8	2.00
Extra-curricular activities	85.2	3.02	60.2	3.80
Assisting teachers in teaching without pay	27.6	3.86	11.0	2.50
Provision of school meals	19.6	3.17	24.5	3.30

The most common (86.0%) form of parental/community support to schools was with the payment of exam fees, followed by building of school facilities at 60.9 percent. In addition, most pupils (60.2%) were in schools where parents/communities assisted in extra-curricular activities and contributed to the payment of additional teacher salaries (55.9%). The least common contribution from parents/community was payment of supplements to the salaries of teaching and non-teaching staff (3.2 percent and 5.8 percent respectively).

In comparison to SACMEQ II there was a major decline in parental/community contributions to the maintenance of school facilities, maintenance and repair of furniture/equipment, the purchase of

textbooks, stationery and other school supplies and the payment of the salaries of non-teaching staff. This may reflect the impact of the Free Primary Education (FPE) policy that was introduced in the year 2003. However there was a notable increase in the contribution towards school meals and the payment of the salaries of additional teachers. This may be due to the increased demand for teachers needed to cater for the increased pupil enrolment.

Policy Suggestion 5.8:

The Ministry of Education should set up systems to facilitate, monitor and evaluate the nature and quality of community participation in schools.

Pupil behavioural problems

What were the main behavioural problems of pupils?

Pupils' behavioural problems are common incidences in schools. It is therefore, essential that the school heads and the other teachers are aware of the common behavioural problems of their pupils. This will facilitate appropriate intervention and management of pupils' behaviour since these may negatively affect the school's learning environment for learners. The summary of the head teachers' responses is presented in **Table 5.15**.

Table 5.15: Pupil behavioural problems

Pupil behaviour problems	Indicating "Never" occurs			
	SACMEQ II		SACMEQ III	
	%	SE	%	SE
Arriving late at school	6.0	2.07	1.7	1.10
Absenteeism	5.9	2.04	4.1	1.50
Skipping classes	50.9	4.21	32.6	3.80
Dropping out of school	3.3	1.39	8.0	2.10
Classroom disturbance	42.6	4.02	23.8	3.50
Cheating	28.6	3.93	16.3	3.10
Use of abusive language	34.3	4.05	13.8	2.90
Vandalism	50.5	4.28	42.2	4.00
Theft	22.8	3.52	9.9	2.60
Intimidation of pupils	48.2	4.28	25.7	3.50
Intimidation of teachers/staff	78.7	3.42	66.9	3.80
Physical injury to staff	97.7	1.08	92.0	2.00
Sexual harassment of pupils by pupils	83.2	3.12	51.3	3.90
Sexual harassment of teachers by pupils	96.1	1.58	92.2	2.00
Drug abuse	73.1	3.59	55.7	4.00
Alcohol abuse	83.1	2.84	65.8	3.70
Fights	18.3	3.28	7.7	2.50
Health problems	2.6	1.31	0.6	0.60

Table 5.15 shows that the pupil health problem and classroom attendance (late arrival, absenteeism and skipping class) and delinquent activities (pupils' fights, theft and use of abusive language) are prevalent problems in schools and have worsened since 2000. There has been an apparent increase in sexual harassment of pupils and teachers and abuse of drug and alcohol. This may be symptomatic of the presence of older pupils who may be delinquent and also sexually mature. This factor may be

associated with the introduction of free primary education which prompted many out of school youth to enroll in primary schools.

Policy Suggestion 5.9:

The Ministry of Education should set up a mechanism to help schools manage behavioural problems especially those of delinquent nature among pupils.

Policy Suggestion 5.10:

As a matter of urgency, sex offenders, drug and alcohol abusers among pupils need to be identified and isolated for corrective action

Teacher behavioural problems

What were the main behavioural problems of teachers?

In the same way that school heads must handle pupils' behaviour problems, they must also deal with the behavioural problems of teachers, which may include absenteeism, alcoholism and drug abuse. The head teachers' responses to certain problems 'never' occurring have been presented in **Table 5.16**.

Table 5.16: Frequency of behaviour problems by teachers

Behaviour problems of teachers	H/T Indicating "Never" occurs			
	SACMEQ II		SACMEQ III	
	%	SE	%	SE
Arriving late at school	11.9	2.86	6.8	2.10
Absenteeism	46.6	4.24	31.0	3.80
Skipping classes	46.3	4.19	37.0	3.90
Intimidation or bullying of pupils	84.6	3.13	71.0	3.70
Sexual harassment of teachers by teachers	100.0	0.04	92.9	2.00
Sexual harassment of pupils by teachers	95.1	1.81	88.0	2.70
Use of abusive language	74.9	3.55	52.6	4.00
Drug abuse	93.8	1.95	76.1	3.50
Alcohol abuse	75.2	3.58	68.6	3.80
Health problems	20.9	3.58	15.1	3.00

According to **Table 5.16** above, there has been a general increase in teacher behaviour problems between SACMEQ II and SACMEQ III. The most outstanding of these is late arrival to schools, skipping of classes, absenteeism and health problems. Of special concern is also the marked increase in the percentage of pupils with teachers who abuse drugs and alcohol.

Policy Suggestion 5.11:

There is a need for TSC to put solid systems in place to manage teachers' behavioural problems such as guidance and counselling, psycho-social support and referrals.

Policy Suggestion 5.12:

Urgent intervention measures need to be put in place to deal with the rising cases of alcohol and drug abuse among teachers.

Policy Suggestion 5.13:

The TSC should enhance efforts in stemming sexual offences committed by teachers in primary schools

5.6 Conclusion

In summary, female head teachers account for only 14.7 percent of all primary head teachers. The national mean age of head teachers was approximately the same as in SACMEQ II, 45.4 years. Regionally, Nairobi and Western provinces had older school heads than the rest of the provinces while North-Eastern had the youngest school heads in the country at around 36 years. The same trend applied to the number of years of experience a head teacher had in that the national and regional mean number of years of experience had risen slightly.

The majority of school heads had Form 4 (senior secondary) level of education, with about a third of them having A-level qualifications and a small percentage holding tertiary, junior secondary and primary level education. With regards to the number of years of professional training, the mean remained the same at approximately 2.1 years whereas the mean amount of teaching experience

went up slightly.

Facilities and equipment in school had generally increased with the exception of some items deteriorated e.g. school hall, school garden. There is still urgency and great need to build more toilets especially in Kenya's more marginalised areas.

The frequency of school assessment had increased considerably over the last number of years. There has been a significant reduction in the level of parental/community contributions to schools e.g. in the building of new facilities, maintenance of the facilities. With regard to behavioural problems, the most reported regarded health and class attendance issues, with an alarming increase in delinquency. Concern has also been raised over increased drug and alcohol abuse among teachers.



CHAPTER 6

6.0 HIV AND AIDS KNOWLEDGE AND ATTITUDES OF PUPILS, TEACHERS AND HEAD TEACHERS

6.1 Introduction

The relationship between the HIV and AIDS pandemic and educational practice and management has taken centre stage in the education enterprise worldwide. Although the 2000 Dakar World Education Forum has set a target of achieving education for all by the year 2015, HIV and AIDS presents one of the biggest obstacles to this goal.

According to the Kenya AIDS Indicator Survey (KAIS 2009) there are about 1.4 million people living with HIV and AIDS between the ages of 15 to 64 years. It is estimated that there are about 1.2 million children who are orphans due to HIV and AIDS. KAIS showed that the prevalence among adults aged 15-64 years in urban areas was 8.4 percent compared to 6.7 percent in the rural areas. Research also observed that HIV prevalence was marginally greater among women in urban areas compared to those in rural areas (KAIS, 2009).

Both Kenya Aids Demographic Health Survey (KDHS) and KAIS identify the key factors associated with the infection and transmission of HIV as: the number of sexual partners, inconsistent condom use, young age at first sex, and lack of male circumcision (KDHS, 2009; KAIS, 2009). This has resulted in the adoption of new strategies such as male circumcision and using people who are infected with HIV and AIDS to talk and educate the public about how to avoid contracting the virus (i.e., teaching with positives strategy) and intensifying the testing and counselling services using multiple strategies such as HIV provider initiated testing and community out-reach, and mobile services.

Kenya developed an education sector policy response to HIV and AIDS in 2004. This policy targets safety in schools by focusing on issues of sexual abuse, harassment, stigma and discrimination, violence, alcohol and drug abuse as these were some of the ways by which HIV was spreading amongst the youth (Republic of Kenya, 2004). The policy largely concerned itself with HIV prevention, peer education, and training both at the teacher pre-service and in-service level, curriculum and co-curricular activities, and thus a measure of effective implementation of the policy was deemed necessary.

Pupils are to be considered as the units of analysis – even though some variables in this chapter refer to teachers and school heads. Where a percentage for a variable that describes teachers is presented, this percentage should be interpreted as “the stated percentage of pupils who were in schools with teachers having the particular HIV and AIDS characteristic”. Similarly, a percentage for a variable that describes school heads should be interpreted as “the stated percentage of pupils who were in schools with school heads with the particular HIV and AIDS characteristic”. Where a mean for teachers or school heads is presented, then the mean should be interpreted as “the average pupil in Kenya who had a teacher or school head with such and such characteristics”.

6.2 Pupils' Knowledge and Attitudes about HIV and AIDS

General Policy Concern 6.1:

- What were the pupil knowledge levels about HIV and AIDS?
- What were the pupil sources of information about HIV and AIDS?
- What were the pupil attitudes towards HIV and AIDS?

Pupil knowledge about HIV and AIDS

What were the pupils' knowledge levels about HIV and AIDS?

Table 6.1: Performance on the HIV and AIDS Knowledge Test of pupils and pupils reaching the minimum and desirable levels of knowledge about HIV and AIDS

Province	HAKT score		Pupils reaching minimum level		Pupils reaching desirable level	
	Mean	SE	%	SE	%	SE
Central	540.1	10.06	54.6	4.65	10.7	2.48
Coast	501.9	13.50	33.8	5.66	5.3	3.14
Eastern	515.6	11.97	41.9	6.16	5.2	2.00
Nairobi	579.2	19.07	67.5	6.08	25.7	7.08
North Eastern	543.0	34.10	52.3	11.33	23.8	9.80
Nyanza	509.8	8.38	40.1	4.19	5.1	1.45
Rift Valley	491.9	9.95	31.9	3.65	4.2	1.12
Western	480.6	12.70	26.3	5.90	5.1	1.49
Kenya	509.0	4.43	39.2	1.96	6.8	0.76

The level of knowledge about HIV and AIDS that a learner had was one of the main areas of interest in the study. The findings are presented in **Table 6.1**. Stakeholders in education need to be concerned about pupils in Western province who had the lowest (480.6) mean HAKT scores. The percentage of pupils in Kenya who reached the minimum level of knowledge about HIV was 39.2 percent. However only 6.8 percent reached the desirable level, Nairobi province recorded the highest percentage of pupils who reached the minimum level (67.5%), followed by Central province with 54.6 percent. The province with the smallest percentage of pupils that had reached the minimum level of knowledge was Western with 26.3 percent. The highest percentage of pupils with the desirable level of knowledge was registered in Nairobi at 25.7 percent, followed by North Eastern (23.8%). Most of the other provinces posted low percentages of pupils with desirable knowledge of HIV and AIDS i.e. Rift Valley (4.2%), Nyanza and Western (both 5.1%), Eastern (5.2%) and Coast (5.3%).

Policy Suggestion 6.1:

More needs to be done especially in Western province to increase the level of awareness of HIV and AIDS among pupils.

The study also sought to find out whether there was any gender difference with regard to the knowledge about HIV and AIDS. The results are presented in **Table 6.2**.

Table 6.2: Performance of pupils in HAKT by gender

Province	PUPILS											
	Transformed score				Reaching minimum level				Reaching desirable level			
	Boys		Girls		Boys		Girls		Boys		Girls	
	Mean	SE	Mean	SE	%	SE	%	SE	%	SE	%	SE
Central	539.2	11.91	541.0	10.02	53.4	6.16	55.9	5.24	10.4	2.70	11.0	2.63
Coast	508.2	13.47	494.1	15.06	35.9	5.72	31.3	7.19	6.4	4.20	4.0	2.15
Eastern	519.8	14.97	511.9	10.59	45.1	7.38	39.1	5.92	5.7	2.18	4.7	2.04
Nairobi	573.8	18.71	584.7	20.59	67.3	6.30	67.7	6.69	25.8	6.66	25.5	8.41
North Eastern	564.8	37.88	480.6	28.89	57.2	13.05	38.5	9.63	28.1	11.05	11.3	7.32
Nyanza	516.8	8.09	502.0	9.97	45.6	4.07	34.0	4.96	5.3	1.81	4.8	1.80
Rift Valley	502.0	8.71	483.0	11.82	36.3	3.89	27.9	4.30	6.5	1.67	2.1	0.83
Western	479.2	13.26	482.3	13.83	26.8	6.52	25.8	5.84	5.2	1.63	4.9	1.61
Kenya	513.6	4.46	504.3	5.04	41.9	2.16	36.5	2.19	7.6	0.90	5.9	0.78

The mean national score for boys was 513.6 and 504.3 for girls. Regionally Nairobi province recorded the highest mean score for both boys and girls at 573.8 and 584.7 respectively. The lowest level of awareness was recorded in Western (479.2) for boys and North Eastern (480.6) for girls. In terms of levels of knowledge about HIV and AIDS, 41.9 percent of boys and 36.5 percent of girls reached the minimum level. The national mean for boys reaching the desirable level was 7.6 percent compared to 5.9 percent for girls.

Nairobi had the highest percentage of pupils who reached the minimum level for both boys and girls at 67.3 and 67.7 percent respectively. This was followed closely by North Eastern for boys at 57.2 percent and Central for girls at 55.9 percent. The lowest percentage of pupils at the minimum level was recorded in Western province with 26.8 percent for boys and 25.8 percent for girls.

The highest percentage of pupils with desirable levels of knowledge were girls in Nairobi (25.5%) and boys from North Eastern province (28.1%) which was much higher than the 11.3 percent of girls reaching the desirable level in that province. The lowest percentage of boys with the desirable level of knowledge was recorded in Western province with 5.2 percent compared to 4.9 percent for girls. The lowest percentage of girls reaching desirable levels of knowledge was in Rift Valley with 2.1 percent.

It is important to note that North Eastern province had the highest percentage of boys with desirable levels of knowledge. It also followed Nairobi closely for boys' transformed scores and boys reaching the

minimum level. The findings of this study contradict those from the Kenya demographic and Health Survey 2008-2009 which established the HIV/AIDS Related Knowledge, Attitudes and Behaviour for the general adult population between ages 15-49. The study found that North Eastern lagged behind all other provinces for both men and women in comprehensive knowledge about AIDS compared to Nairobi which scored the highest (KNBS and ICF Macro, 2010).

The mean scores of pupils in the HAKT were also examined by socio-economic status (SES) subgroups; the results are presented in **Table 6.3**.

Nationally, pupils from low SES background recorded a mean score of 485.8 compared to 551.1 of the high SES. Among the low SES, pupils from North Eastern had the highest mean score (551.9), while pupils in Rift Valley had the lowest mean score of 465.5. As for the high SES pupils, the highest mean score was recorded in Nairobi (593.6), with the lowest being in Western province at 520.8.

The national mean percentage of pupils reaching the minimum level of knowledge among low SES pupils was 28.5 percent compared to 57.3 percent for the high SES pupils. For those who attained the minimum level of knowledge among the low SES, the highest percentage of pupils was recorded in North Eastern at 56.2 percent and the lowest in Rift Valley with 19.1 percent. For those who attained the minimum level of knowledge among high SES, Nairobi had the highest percentage of pupils reaching the minimum level with 72.9 percent with the lowest being from Western at 46.1 percent.

Table 6.3: Mean performance of pupils in HAKT by SES

Province	Transformed scores				Reaching minimum level				Reaching desirable level			
	Low SES		High SES		Low SES		High SES		Low SES		High SES	
	Mean	SE	Mean	SE	%	SE	%	SE	%	SE	%	SE
Central	516.5	20.99	563.7	15.74	46.5	13.44	65.4	5.83	2.3	2.38	15.1	5.17
Coast	483.8	12.42	545.8	28.58	25.2	4.51	50.1	10.32	1.4	1.00	17.4	11.00
Eastern	506.0	9.95	554.6	29.24	37.0	5.76	59.5	12.29	3.8	1.82	11.4	5.04
Nairobi	511.3	39.99	593.6	20.31	41.6	34.08	72.9	6.15	0.0	0.00	29.9	8.05
North Eastern	551.9	35.69	556.4	83.14	56.2	9.53	56.3	29.19	24.9	11.17	26.6	19.43
Nyanza	496.0	9.32	541.6	15.69	34.7	4.67	54.4	8.05	3.9	1.43	8.6	4.56
Rift Valley	465.5	13.57	531.7	11.89	19.1	4.04	48.0	5.57	0.7	0.53	10.6	3.53
Western	466.5	12.85	520.8	16.35	19.7	5.89	46.1	9.27	3.2	1.61	8.8	2.41
Kenya	485.8	5.43	551.1	6.51	28.5	2.32	57.3	2.69	3.0	0.62	14.3	2.03

With regard to those reaching desirable levels, the national average for low SES pupils was 3 percent compared to 14.3 percent for high SES. The highest percentage of pupils who attained the desirable level of knowledge among the low SES group was North Eastern at 24.9 percent with no low SES pupils in Nairobi attaining the desirable level of knowledge. Among the pupils with high SES,

Nairobi recorded the highest percentage of those who attained the desirable levels of knowledge at 29.9 percent with Nyanza at 8.6 percent recording the lowest percentage of pupils.

The study also sought to establish the differences, if any, in the levels of knowledge between rural and urban pupils. The results are shown in **Table 6.4**.

Table 6.4: Performance of pupils in HAKT by location of schools

Province	Transformed scores				Reaching minimum level				Reaching desirable level			
	Rural		Urban		Rural		Urban		Rural		Urban	
	Mean	SE	Mean	SE	%	SE	%	SE	%	SE	%	SE
Central	530.4	10.69	573.7	23.89	50.2	5.27	69.8	9.05	8.4	2.03	18.6	8.58
Coast	490.6	15.81	513.2	23.90	29.5	6.87	38.2	10.21	2.0	1.13	8.6	6.63
Eastern	494.1	8.95	573.7	22.75	30.8	4.57	71.9	11.39	2.0	0.91	13.7	6.05
Nairobi	-	-	579.2	19.07	0.0	0.00	67.5	6.08	-	-	25.7	7.08
North Eastern	526.3	46.32	562.8	60.78	47.6	19.64	57.9	14.29	16.9	8.76	31.9	21.05
Nyanza	498.1	8.71	544.1	15.93	34.2	4.23	57.5	7.94	4.1	1.41	7.9	4.38
Rift Valley	475.3	12.24	523.6	12.31	27.2	4.21	40.8	6.74	1.9	0.65	8.5	2.94
Western	478.6	15.04	483.7	25.83	25.7	6.42	27.3	13.07	4.2	1.82	6.3	2.85
Kenya	494.0	4.99	536.9	8.06	33.1	2.11	50.5	3.94	3.9	0.55	12.1	1.88

The national mean score for rural areas was 494.0 and 536.9 for urban areas. Regionally the highest transformed mean score for rural areas was recorded in Central province at 530.4, while the lowest score of 475.3 was recorded in Rift Valley province. In the urban areas the highest mean transformed score was recorded in Nairobi at 579.2 while the lowest mean score of 483.7 was in Western province.

The national percentage for rural pupils reaching minimum level of knowledge was 33.1 percent against 50.5 percent for urban pupils. The highest percentage of rural pupils who reached the minimum level was in Central province at 50.2 percent followed by North Eastern at 47.6 percent while the lowest was in Western at 25.7 percent. In the urban areas the highest percentage of pupils with minimum levels of knowledge of HIV and AIDS was recorded in Eastern at 71.9 percent with the

lowest being registered in Western at 27.3 percent.

The percentage of pupils reaching desirable levels was 3.9 percent in rural areas and 12.1 percent for urban areas. In the rural areas, North Eastern had the highest percentage of pupils reaching the desirable levels (16.9%). The highest percentage of pupils reaching desirable levels in urban areas came from North Eastern with 31.9 percent against Western with the lowest at 6.3 percent.

Pupils' access to HIV testing centres

Were there HIV Testing Centres within walking distance from pupils' homes?

The pupils were required to state whether HIV Testing Centre was within walking distance from their homes. The findings are as shown in **Table 6.5**.

Table 6.5: Pupils who indicated that the HIV Testing Centre was within a walking distance

Province	Yes		No		I Don't Know	
	%	SE	%	SE	%	SE
Central	53.9	9.32	43.9	9.34	2.2	0.90
Coast	35.9	7.13	52.7	7.67	11.3	3.31
Eastern	47.2	7.75	43.6	7.36	9.2	3.16
Nairobi	33.4	4.74	42.5	4.55	24.1	3.07
North Eastern	22.5	6.75	67.8	7.94	9.7	2.54
Nyanza	56.3	7.32	35.6	6.27	8.0	1.69
Rift Valley	38.6	6.05	51.5	7.04	9.9	2.83
Western	45.4	6.95	41.6	6.34	13.0	3.37
Kenya	45.6	2.90	44.8	2.90	9.6	1.10

Nationally, 45.6 percent said that a HIV Testing Centre was within a walking distance. Among the pupils, 44.8 percent indicated that HIV Testing Centre was not within a walking distance, and 9.6 percent indicated that they did not know how far it was. Regionally, North Eastern province had the highest percentage of pupils who said that HIV Testing Centre was not within a walking distance at 67.8 percent. This was followed closely by Coast at 52.7 percent then Rift Valley with 51.5 percent, while Nyanza (35.6%) province registered the lowest percentage of pupils who said that a HIV Testing Centre was not within walking distance. Among the pupils who did not know the distance to the HIV Testing Centre, Nairobi province had the highest number at 24.1 percent while Central province had the lowest (2.2%). Of those who knew the distance, Nyanza and Central had the highest number of pupils who said that the nearest HIV Testing Centre was within a walking distance at 56.3 and 53.9 percent respectively whereas North Eastern province registered the lowest number at 22.5 percent.

These results show that the majority (54.4%) of pupils in Kenya do not have HIV Testing Centre within walking distance or were not aware of the existence of one. For those who said they did not know, especially in the case of Nairobi province, it could be a clear expression of ignorance of the existence of HIV Testing Centre or an inability to judge walking distances.

Policy Suggestion 6.2:

There is a need to develop HIV and AIDS voluntary

testing strategy for school age children.

Pupils sources of information about HIV and AIDS

What source of information about HIV and AIDS did pupils consider to be the best?

The source of information on HIV and AIDS was an aspect of investigation in this study. In this subsection the focus was on the pupils' most preferred sources of information. The findings are presented in **Table 6.6**.

The most preferred source of information on HIV and AIDS was audio-visual such as radio, and television with 12.6 and 15.7 percent of pupils choosing them respectively. Teachers / head teachers were the next popular source at 8.9 percent with doctors at 7.4 percent. Classroom lesson, books were chosen by 6.1 percent of pupils each while talks by people infected with HIV, counsellor peer educators, print media such as posters, billboards, books magazines and newspapers, extra-curricular activities such as drama, plays, and school clubs etc. were chosen by between 1.0 and 5.0 percent of pupils. The least preferred source of information was the use of ICT such as computers and internet at below one percent.

Of those who preferred audio-visuals as the best source of information, pupils from Western province showed the highest preference for radio with 22.2 percent while Nyanza at 7.3 percent showed the least preference. Nairobi recorded the highest preference for TV as a source of information at 21.7 percent followed by Rift Valley at 17.6 percent, North Eastern recorded the least. Among those who preferred drama/ plays, Coast province at 10.2 percent recorded the highest preference followed by Nairobi province at 9.2 percent while Western with 3.6 percent presented the least. For doctors as a source of information, pupils from Nyanza province showed the highest preference at 12.9 percent followed by Coast and Central province with 9.5 and 9.1 percent respectively. Classroom lessons were most preferred in North Eastern at 16.5 percent and least preferred in Western at 1.8 percent. School heads were more preferred as sources of information in Central province at 14.7 percent. Relatives were more preferred in Central

Table 6.6: Pupils' views on the best source of information on HIV and AIDS

Province	Radio		TV		Books		Drama/ Play	
	%	SE	%	SE	%	SE	%	SE
Central	5.52	1.44	12.9	2.97	6.8	3.65	5.9	1.54
Coast	14.3	3.06	16.0	2.73	5.9	1.14	10.2	2.53
Eastern	15.9	3.61	14.5	2.60	11.1	1.74	7.1	2.64
Nairobi	8.1	1.66	21.8	2.58	6.4	2.92	9.2	1.68
North Eastern	12.1	4.69	11.3	4.49	8.7	1.71	4.8	2.24
Nyanza	7.3	1.31	14.6	2.43	3.6	0.81	5.8	1.41
Rift Valley	13.2	2.42	17.6	2.64	4.7	1.08	5.6	1.47
Western	22.2	4.09	15.9	2.45	5.6	2.01	3.6	1.28
Kenya	12.6	1.12	15.7	1.08	6.1	0.74	6.1	0.70
Province	Classroom lessons		Teachers		Doctors		Relatives	
	%	SE	%	SE	%	SE	%	SE
Central	8.0	3.58	14.7	3.30	9.1	3.03	9.0	2.81
Coast	3.5	1.09	4.9	1.73	9.5	2.69	5.2	1.65
Eastern	7.4	1.89	8.0	2.01	4.4	1.45	4.0	1.13
Nairobi	7.0	4.22	3.9	1.43	4.3	1.35	4.3	1.89
North Eastern	16.5	5.25	8.1	2.45	7.8	1.40	0.5	0.50
Nyanza	8.2	2.46	5.8	1.13	12.9	3.34	4.2	0.95
Rift Valley	3.7	0.80	10.2	2.44	4.7	1.09	6.4	1.65
Western	1.8	0.57	9.6	3.04	6.8	2.12	3.6	1.03
Kenya	5.6	0.80	8.9	0.97	7.4	0.91	5.4	0.66

province at 9.0 percent.

Although the most preferred source of information on HIV and AIDS was audio-visual, there is great variation when it comes to preferences given to specific sources of information within provinces. The regional variation when it comes to preference given to specific sources of information point to the fact that information about HIV and AIDS should be presented in a multi-modal manner, that is, in formats that enable learners to relate to it using several sensory modalities.

Policy Suggestion 6.3:

There is need to enhance the role of media in providing information on HIV and AIDS.

Pupil HIV and AIDS classes

What percentage of pupils had attended classes or lessons on HIV and AIDS during the school year?

The MOE guidelines on timetabling require that there are two Physical Education (P.E) lessons in a

week. One of the P.E lesson should be dedicated to HIV and AIDS, and life skills education which has a specific syllabus while other subjects are expected to infuse and integrate HIV and AIDS messages.

The study required pupils to state whether they had attended HIV and AIDS classes during the school year. The response was either "No" if they had not attended, or "Yes" if they had attended. The results are presented in **Table 6.7**.

Table 6.7: Pupils who had attended HIV and AIDS lessons/classes

Province	Attended		Not attended	
	%	SE	%	SE
Central	98.2	0.72	1.8	0.72
Coast	78.2	8.39	21.8	8.39
Eastern	79.6	8.07	20.4	8.07
Nairobi	79.0	6.06	21.0	6.06
North Eastern	70.0	7.43	30.0	7.43
Nyanza	81.8	6.40	18.2	6.40
Rift Valley	87.5	5.44	12.5	5.44
Western	83.0	6.44	17.0	6.44
Kenya	84.9	2.48	15.1	2.48

Nationally the 84.9 percent of pupils that had attended HIV and AIDS classes while those who had not attended stood at 15.1 percent. At the regional level, North Eastern province with 30.0 percent had the highest percentage of pupils who had not attended HIV and AIDS classes while the vast majority of pupils from Central province (98.2%) had attended HIV and AIDS classes followed by Rift valley at 87.5 percent.

As per the data in Table 6.7, although the number of pupils who had attended HIV and AIDS classes in their school year was high (84.9%). The most notable finding was that their level of knowledge as described in section 6.4 was below the desirable levels. This might be an indicator that the quality of teaching in the lessons does not promote the acquisition of the desired knowledge and behavioural change in the learners.

Policy Suggestion 6.4:

There is a need to establish structures and mechanisms to monitor the quality of teaching and learning of HIV and AIDS.

The study required the pupil to identify their favourite HIV and AIDS class-based activity. The results are presented in **Table 6.8**.

The most preferred HIV and AIDS class-based activity was the teacher’s lesson with 33.2 percent of the pupils selecting this option. This was followed by video/film (18%), asking questions (14.4%), group discussions (8.0%), radio recorded program (7.8%), talk by HIV-infected person (6.7%) and Reading material (6.1%), taking a trip to a hospital and finally filling questionnaires were the least preferred class-based activity. Although teacher lessons seems to be the most preferred method among pupils in all the provinces, the least preferred varied between trip to hospital and filling questionnaires. In Nairobi, Western and Rift Valley the least preferred class-based activity was taking an excursion to the hospital so as to learn about HIV and AIDS, whereas in the rest of the provinces, the least preferred class-based HIV and AIDS was filling in questionnaires.

Other than the teachers’ lessons being the most preferred activity, other activities that can

Table 6.8: Pupils’ ranking of the most preferred HIV and AIDS activity

Province	Reading material		Teacher lesson		Video/ Film		Radio programme	
	%	SE	%	SE	%	SE	%	SE
Central	4.3	1.54	35.4	3.6	18.0	4.71	7.7	2.81
Coast	9.3	2.28	34.3	3.4	8.4	2.42	7.9	3.08
Eastern	6.7	2.03	45.1	4.9	9.6	3.45	7.5	3.01
Nairobi	7.2	1.76	34.4	5.0	22.0	3.77	3.9	1.05
North Eastern	7.5	3.25	49.7	5.3	7.0	2.23	7.0	1.22
Nyanza	6.5	1.69	22.4	2.8	19.0	3.90	7.6	1.38
Rift Valley	5.3	1.05	32.8	3.2	26.0	3.14	8.9	1.78
Western	6.8	1.60	31.0	4.4	15.0	3.10	7.4	1.27
Kenya	6.1	0.63	33.2	1.5	18.0	1.51	7.8	0.87
Province	Ask questions		Talk by HIV infected person		Group discussion			
	%	SE	%	SE	%	SE		
Central	16.7	2.31	3.3	1.53	11.5	4.54		
Coast	13.2	2.88	9.6	2.32	7.5	1.87		
Eastern	13.4	1.99	5.6	2.1	8.6	3.19		
Nairobi	13.1	2.07	10.0	2.93	6.0	2.25		
North Eastern	4.5	1.88	4.7	1.42	10.1	3.74		
Nyanza	20.5	3.72	7.9	2.39	8.8	1.88		
Rift Valley	9.9	2.41	5.6	1.26	7.1	1.10		
Western	15.5	3.1	10	2.78	4.6	1.48		
Kenya	14.4	1.14	6.7	0.81	8.0	1.00		

constituted pedagogic activities used to enrich the teaching-learning process such as viewing audio-visuals, group discussions and asking questions are also preferred. It should be noted that the top three preferences were teacher-directed activities in which the learner is actively involved.

Policy Suggestion 6.5:

There is need to strengthen classroom lessons about HIV and AIDS with Audiovisual materials.

Pupil attitudes towards HIV and AIDS

(a) What percentage of pupils felt that a pupil infected with HIV should be allowed to attend school?

This study sought to find out pupils attitudes towards HIV and AIDS specifically in regards to stigmatization and discrimination against people living with HIV and AIDS.

Pupils were asked whether an HIV infected pupil should be allowed to continue attending school. Three options were provided for the pupils to respond: either “Yes” if they did not mind the infected pupil continuing, “No” if the infected pupil should not continue with school and “I am not sure” if they were unsure. The results of the analysis are presented below in **Table 6.9**.

Table 6.9: Pupils’ response on whether they would allow HIV and AIDS infected pupils to school

Province	No		Yes		Not Sure	
	%	SE	%	SE	%	SE
Central	32.2	4.96	59.4	5.15	8.5	3.09
Coast	41.4	5.33	45.5	4.67	13.1	2.82
Eastern	40.0	4.61	49.1	4.88	10.9	2.41
Nairobi	17.0	3.64	70.9	5.82	12.2	2.88
North Eastern	45.0	6.80	45.3	7.24	9.7	2.32
Nyanza	34.9	3.47	56.9	3.85	8.2	1.37
Rift Valley	40.2	4.80	50.6	5.14	9.2	1.55
Western	46.6	5.21	44.2	5.88	9.2	2.47
Kenya	38.1	1.91	52.3	2.06	9.6	0.85

The national mean percentage for pupils who said “Yes” was 52.3 percent, “No” was 38.1 percent, while those “I am not sure” constituted 9.6 percent. In the category of those who said “Yes” the highest percentage was registered in Nairobi (70.9%) and

the least in Western at 44.2 percent. The highest percentage of pupils who said “No” was from Western province (46.6%) followed closely by North Eastern with 45.0 percent while the lowest was in Nairobi at 17.0 percent. For those “I am not sure” the highest percentage was recorded in Coast province at 13.1 percent and the lowest being Nyanza with 8.2 percent.

The above results show that Western province had the highest percentage of pupils with a negative attitude towards those infected with HIV and AIDS while Nairobi and Central had the highest percentage of pupils with positive attitude. In reference to section 6.1 presenting results about the level of HIV and AIDS awareness, Pupils from Western province lagged behind their counterparts on most variables while Nairobi outperformed the other provinces. This suggests that there could be a relationship between knowledge level and the kind of attitudes developed towards people infected with HIV and AIDS.

(b) How would pupils behave towards their friends who were infected with HIV?

The pupils were also asked whether they would “Avoid or shun”, “I am not sure” or have a “Positive attitude” towards a friend infected with HIV. The results from the analysed data are shown in **Table 6.10**.

Table 6.10: Pupils' attitude towards a friend infected with HIV and AIDS

Province	Be more friendly		Same as before		Avoid him/her		Not sure	
	%	SE	%	SE	%	SE	%	SE
Central	36.2	6.04	31.0	3.47	20.2	3.30	12.6	1.79
Coast	16.9	3.40	30.2	3.63	26.3	3.20	26.6	4.37
Eastern	22.5	4.48	28.7	4.04	31.7	4.65	17.2	2.88
Nairobi	44.0	4.03	21.7	2.31	9.1	2.15	25.3	2.36
North Eastern	20.2	2.61	35.2	6.68	30.2	5.31	14.5	2.48
Nyanza	24.2	3.15	26.6	2.77	25.1	2.88	24.0	2.26
Rift Valley	16.2	3.46	28.6	3.71	24.5	2.88	30.7	4.61
Western	19.2	2.30	21.8	2.72	27.2	2.90	31.8	2.84
Kenya	23.2	1.65	27.5	1.42	25.0	1.34	24.4	1.53

Nationally 27.5 percent of pupils would continue to treat a friend infected by HIV and AIDS the same as before. This was closely followed by those who would 'Avoid or Shun' their friend at 25 percent and those "Not Sure" at 24.4 percent.

Regionally, the highest percentage of those who said they would "Avoid or Shun" was recorded in North Eastern province (30.2%) while the lowest was registered in Nairobi Province at 9.1 percent. For those who said they were "Not sure" Western province recorded the highest percentage at 31.8 percent while Central Province posted the least at 12.6 percent. Central province had the highest percentage of pupils with positive attitudes at 67.2 percent whereas Western had pupils with the lowest positive attitude standing at 41.0 percent.

The trend in these data seems to support the theory that pupils with high levels of knowledge of HIV and AIDS (see Table 6.1) are less likely to discriminate as the case is with Central and Nairobi provinces. Whereas it could be possible to associate the low percentage of positive attitude towards contact with a HIV infected friend among pupils in Western province with the lack of knowledge about HIV and AIDS, the finding from North Eastern province seem to contradict this hypothesis. Despite the fact that they come second to Nairobi in terms of levels of knowledge about HIV and AIDS (see Table 6.1), the data show that the province had one of the highest percentages of pupils who were likely to discriminate against an HIV infected friend.

Policy Suggestion 6.6:

There is an urgent need to improve the attitude of pupils towards others who are infected with HIV and AIDS.

(c) Were pupils willing to take care of relatives who became ill with AIDS?

Pupils were also asked whether they would be willing to take care of a relative with HIV and AIDS. Their responses were either "No" if they were not willing to care for an ailing relative, "I am not sure" if they are unsure and "Yes" if they would be willing to take care of an ailing relative. The results are presented in Table 6.11.

Table 6.11: Pupils' attitude towards taking care of a HIV and AIDS relative

Province	Would pupils take care of HIV and AIDS relative?					
	No		Yes		Not Sure	
	%	SE	%	SE	%	SE
Central	4.6	1.10	92.2	1.78	3.2	1.06
Coast	26.8	4.72	60.8	5.57	12.4	2.18
Eastern	13.7	2.56	77.4	4.12	8.9	2.50
Nairobi	11.3	2.64	79.5	3.65	9.1	2.15
North Eastern	29.9	4.97	62.7	6.01	7.4	2.40
Nyanza	24.6	3.36	68.3	3.39	7.1	1.27
Rift Valley	21.8	3.25	71.0	3.62	7.2	1.38
Western	28.0	4.16	60.9	4.82	11.1	2.57
Kenya	19.5	1.32	72.6	1.56	7.9	0.72

The national percentage of pupils not willing to care for an ailing relative was 19.5 percent while those pupils who were "Not Sure" were 7.9 percent and 72.6 percent for those willing to take care of an ailing relative.

Regionally, North Eastern province had the highest percentage of pupils not willing to take care of a relative (29.9%) and Central province posted the lowest percentage at 4.6 percent. The highest percentage of pupils "Not Sure" was in Coast province at 12.4 percent while Central had the least at 3.2 percent. Among those willing to take care of an ailing relative Central province recorded the highest percentage at 92.2 percent while Western and Coast had the least at 60.9 and 60.8 percent respectively.

The attitudes towards allowing HIV-infected pupils to continue in school, having contact with an HIV-infected friend, and caring for a relative with HIV and AIDS seem to have a complex relationship with levels of knowledge about HIV and AIDS. From the results reported in Table 6.1, North Eastern recorded the second highest percentage of pupils reaching the desirable level of knowledge while at the same time they recorded the highest percentage of pupils with negative attitudes towards caring for ailing relatives. Western province recorded the lowest levels of reaching minimum knowledge while they recorded a significant percentage of pupils with positive attitudes towards caring for ailing relatives. At the same time, Central province had the highest percentage of pupils with the most positive attitude towards caring for an ailing relative while their pupils posted a relatively high level of knowledge and low levels of stigma.

This subsection of the study required pupils to state whether they would be willing to allow a HIV infected teacher in school. They were supposed to respond with either "No" if they were not willing to allow a HIV infected teacher in school, "I am not sure" when unsure and "Yes" if they were willing to allow a HIV infected teacher in school. The results are presented in Table 6.12.

At the national level, 39.2 percent of the pupils were not willing to allow a HIV-infected teacher in school, 49.9 percent were willing while 10.9 percent were indifferent. Regional comparisons show that North

Eastern province has the highest number of pupils not willing to allow a HIV-infected teacher in school at 43.0 percent while Nairobi at 21.7 percent had the lowest percentage of pupils not willing to allow a HIV-infected teacher in school.

Table 6.12: Pupils' attitude towards allowing a HIV and AIDS teacher in school

Province	Allow HIV and AIDS infected teacher To school					
	No		Yes		Not Sure	
	%	SE	%	SE	%	SE
Central	37.8	5.45	55.0	5.31	7.2	1.87
Coast	42.1	4.88	45.0	4.39	13.0	3.15
Eastern	41.1	4.94	45.2	5.00	13.7	2.90
Nairobi	21.7	3.61	62.4	5.55	15.9	4.39
North Eastern	43.0	6.50	45.9	7.46	11.0	2.55
Nyanza	35.5	3.24	55.9	3.60	8.6	1.31
Rift Valley	42.7	4.44	47.2	4.53	10.0	1.69
Western	40.9	5.50	46.0	5.51	13.1	2.90
Kenya	39.2	1.91	49.9	1.93	10.9	0.89

Nairobi province had the highest percentage of pupils willing to allow an HIV-infected teacher in school with 62.4 percent. This was closely followed by Central and Nyanza Provinces at 55.0 and 55.9 percent respectively whereas Coast Province with 45.0 percent had the lowest percentage of pupils with the same opinion. The highest percentage of pupils "Not sure" was from Nairobi at 15.9 percent and the lowest from Central with 7.2 percent.

6.3 Teachers' HIV and AIDS Knowledge and Attitudes

General Policy Concern 6.2:

(a) What were the teacher knowledge levels about HIV and AIDS?

(b) What were the teacher sources of information about HIV and AIDS?

(c) What were the teacher attitudes towards HIV and AIDS?

Teacher knowledge about HIV and AIDS

What were the teachers' knowledge levels about HIV and AIDS?

One of the aspects of the study was to establish the level of HIV and AIDS knowledge among teachers by province, gender, social economic status and school location.

One of the aspects the study focused on was teachers' knowledge about HIV and AIDS. The results are presented in **Table 6.13**.

Table 6.13: Teacher performance on the HAKT and teachers reaching the minimum and desirable levels of knowledge on HIV and AIDS

Province	Transformed score		Reaching minimum level		Reaching desirable level	
	Mean	SE	%	SE	%	SE
Central	828.6	25.87	100.0	0.00	100.0	0.00
Coast	807.0	34.43	100.0	0.00	89.9	7.51
Eastern	787.4	20.16	100.0	0.00	96.6	3.41
Nairobi	821.2	24.53	100.0	0.00	100.0	0.00
North Eastern	806.9	24.98	100.0	0.00	96.2	3.86
Nyanza	802.7	16.53	100.0	0.00	96.1	3.29
Rift Valley	761.8	14.80	100.0	0.00	89.9	4.42
Western	784.5	12.76	100.0	0.00	100.0	0.00
Kenya	792.2	7.75	100.0	0.00	95.3	1.51

Nationally, the mean transformed score among teachers on the HAKT was 792.2. Regionally, the highest mean score was recorded in central province with a mean of 828.6 and the lowest was Rift Valley with 761.8.

The national percentage of teachers reaching the minimum level was 100%. This level of performance was consistent across all the provinces. In three provinces-Western, Nairobi and Central, 100 percent of teachers reached the desirable levels of knowledge. The provinces with the lowest percentage of teachers reaching desirable levels were Coast and Rift Valley with 89.9 percent each.

The results show that teachers' level of awareness on HIV and AIDS is indicated by the national mean score and those reaching minimum and desirable levels. However it is important to note that the provinces where teachers attained the lowest mean scores i.e. Western and Rift Valley, were the same provinces where pupils had the lowest HAKT mean scores when compared to their counterparts in other provinces.

Teacher attitudes towards HIV and AIDS

What percentage of teachers felt that a pupil infected with HIV should be allowed to attend school?

Teachers' attitudes towards persons living with HIV and AIDS were another focus for the study. The findings of the data analysis are presented below.

Teachers were asked whether an HIV infected pupil should be allowed to proceed with school. Teachers were required to respond either "No" if the infected pupil should not continue with school, "I am not sure" if they were unsure and "Yes" if the infected pupil should continue. The results are shown in **Table 6.14**.

Table 6.14: Attitude of teachers towards a HIV infected pupil continuing in school (stigma)

Province	No		Not Sure		Yes	
	%	SE	%	SE	%	SE
Central	0.0	0.00	1.9	1.91	98.1	1.91
Coast	0.0	0.00	0.0	0.00	100.0	0.00
Eastern	2.3	2.36	0.0	0.00	97.7	2.36
Nairobi	0.0	0.00	0.0	0.00	100.0	0.00
North Eastern	0.0	0.00	0.0	0.00	100.0	0.00
Nyanza	0.0	0.00	2.9	2.87	97.1	2.87
Rift Valley	0.0	0.00	0.0	0.00	100.0	0.00
Western	0.0	0.00	0.8	0.80	99.2	0.80
KENYA	0.4	0.36	0.9	0.59	98.8	0.69

The national figure for the teachers who said "No" was 0.4 percent. Those who were "I am not sure" were 0.9 percent while those who said "Yes" constituted 98.8 percent. Regionally, all teachers agreed that a pupil infected with HIV should be allowed to continue with school except for Eastern province (97.7%), Nyanza (97.1%), Central (98.1%) and Western (99.2%).

Teacher access to HIV testing centres

Were there HIV Testing Centres within walking distance from teachers' homes?

Teachers were required to state whether an HIV Testing Centre was within a walking distance from their homes. The respondents were required to respond either "Yes" if the HIV Testing Centre was within a walking distance, "No" if it was beyond the

walking distance and "I do not know" if they did not know how far the HIV Testing Centre was. The findings are shown in **Table 6.15**.

Table 6.15: Availability of a HIV Testing Centre within walking distance to teacher's home

Province	Reading Teachers				Mathematics Teachers			
	No/ Not Sure		Yes		No/ Not Sure		Yes	
	%	SE	%	SE	%	SE	%	SE
Central	27.8	9.42	72.2	9.42	15.0	6.96	85.0	6.96
Coast	31.3	11.75	68.7	11.75	21.8	12.28	78.2	12.28
Eastern	39.5	10.43	60.5	10.43	20.0	8.74	80.0	8.74
Nairobi	1.3	1.35	98.7	1.35	6.2	5.11	93.8	5.11
North Eastern	54.0	14.16	46.0	14.16	31.4	13.16	68.6	13.16
Nyanza	23.4	7.68	76.6	7.68	30.1	8.66	69.9	8.66
Rift Valley	31.8	8.25	68.2	8.25	31.9	8.03	68.1	8.03
Western	13.1	6.16	86.9	6.16	16.9	8.09	83.1	8.09
Kenya	27.0	3.54	73.0	3.54	23.4	3.45	76.6	3.45

Nationally, 73.0 and 76.6 percent of Reading and Mathematics teachers respectively had HIV Testing Centres within walking distance. On the other hand, 27.0 percent of Reading teachers and 23.4 percent of Mathematics teachers did not have the facilities within a walking distance and were not aware how far away these facilities were.

Nairobi province, with 98.7 and 93.8 percent, had the highest percentage of Reading and Mathematics teachers respectively with HIV Testing Centres within walking distance followed by Reading teachers from Western Province at 86.9 percent and Mathematics teachers from Central province at 85.0 percent. North Eastern with 46.0 percent had the lowest percentage of Reading teachers with an HIV Testing Centre within walking distance. Rift Valley and North Eastern with 31.9 and 31.4 percent respectively had the highest percentage of Mathematics teachers who did not have or did not know if there was a HIV Testing Centre within walking distance. These were followed closely by Nyanza at 30.1 percent.

These findings indicate that majority of teachers countrywide lived within walking distance of a HIV Testing Centre and therefore the majority had access to these services with the exception of North Eastern province where over half of Reading teachers said they had not or did not know if there was a HIV Testing Centre within walking distance. The findings also indicate that some teachers were

not aware how far away the HIV testing facilities were located.

Policy Suggestion 6.7:

Publicity of HIV Testing Centres should be increased.

Teacher HIV and AIDS tests

What percentage of teachers had taken HIV tests? This study also sought to establish whether teachers had taken an HIV and AIDS test to check whether they were infected. The findings are presented in **Table 6.16**.

The findings show that majority of Reading and Mathematics teachers in the country (55.2 and 61.3 percent respectively had not taken HIV and AIDS test. North Eastern province had the highest proportion of Reading teachers who had not taken a HIV and AIDS test at 71.0 percent followed by Rift Valley province with 70.9 percent. Rift Valley province had the highest percentage of Mathematics teachers who had not taken a HIV and AIDS test at 80.6 percent followed by North Eastern province with 80.1 percent. The highest percentage of Reading teachers who had taken the test was in Nairobi province with 64.8 percent followed by Nyanza province at 62.6 percent, while Eastern had the highest percentage of Mathematics teachers at 57.6 percent followed by Nairobi at 56.3 percent.

Table 6.16: Teachers who have had an HIV and AIDS test taken

Province	Reading teachers				Mathematics teachers			
	NO		YES		NO		YES	
	%	SE	%	SE	%	SE	%	SE
Central	65.7	9.40	34.3	9.40	76.8	8.91	23.2	8.91
Coast	41.4	12.81	58.6	12.81	62.2	12.84	37.8	12.84
Eastern	61.5	10.04	38.5	10.04	42.4	10.22	57.6	10.22
Nairobi	35.2	9.57	64.8	9.57	43.7	12.42	56.3	12.42
North Eastern	71.0	12.14	29.0	12.14	80.1	8.09	19.9	8.09
Nyanza	37.4	7.73	62.6	7.73	47.8	8.63	52.2	8.63
Rift Valley	70.9	6.62	29.1	6.62	80.6	6.10	19.4	6.10
Western	45.2	10.03	54.8	10.03	53.1	10.39	46.9	10.39
Kenya	55.2	3.61	44.8	3.61	61.3	3.60	38.7	3.60

Bearing in mind that nearly all the sampled teachers nationwide had a desirable level of knowledge about HIV and AIDS, yet only a third of them had taken an HIV and AIDS test, it means that HIV and AIDS awareness campaigns on voluntary testing and counselling have not been effective at the school level.

Teacher self-assessment of risk of being infected with HIV and AIDS

What did the teachers think was their general risk of being infected with HIV?

Teachers' self-assessment of their risk of contracting HIV was investigated by the study. The findings are presented in **Table 6.17**.

Table 6.17: Self risk assessment of being infected with HIV by teachers

Province	Reading Teachers				Mathematics Teachers			
	No/low/ medium risk		High/very high risk		No/low/medium risk		High/very high risk	
	%	SE	%	SE	%	SE	%	SE
Central	53.2	10.98	46.8	10.98	44.5	10.10	55.5	10.10
Coast	70.3	11.40	29.7	11.40	37.4	13.25	62.6	13.25
Eastern	43.8	10.22	56.2	10.22	44.8	10.69	55.2	10.69
Nairobi	52.0	11.62	48.0	11.62	55.7	11.99	44.3	11.99
North Eastern	87.6	6.35	12.4	6.35	87.7	7.24	12.3	7.24
Nyanza	61.3	8.42	38.7	8.42	57.6	8.74	42.4	8.74
Rift Valley	36.9	7.54	63.1	7.54	43.3	8.18	56.7	8.18
Western	53.0	11.32	47.0	11.32	50.3	10.67	49.7	10.67
Kenya	50.5	3.86	49.5	3.86	47.7	3.90	52.3	3.90

At the national level, 49.5 percent of the Reading teachers perceive themselves to be at high or very high risk compared to 52.3 percent of Mathematics teachers, while 50.5 percent Reading and 47.7 percent Mathematics teachers perceived themselves to be at no, low or medium risk.

Of those considering themselves at high / very high risk, Reading teachers from Rift Valley had the highest percentage at 63.1 percent followed by Eastern (56.2 percent) while Mathematics teachers from Coast province had the highest proportion at 62.6 percent followed by 56.7 percent in Rift Valley. Among those who perceive their risk of infection as being zero, low or medium, North Eastern province registered the highest at 87.6 percent for both

Reading and Mathematics teachers followed by Coast for Reading teachers at 70.3 percent.

These results show that approximately half of Reading and Mathematics teachers consider themselves to be at high or very high risk of contracting HIV. This trend could be explained by other factors that are beyond the scope of this study such as self-assessment of the kind of risk their own behaviour might be exposing them to HIV and AIDS.

Policy Suggestion 6.8:

Stakeholders in education should undertake

further research on factors associated with personal HIV and AIDS risk assessment of teachers and head teachers.

Teacher sources of information about HIV and AIDS

What source of information about HIV and AIDS did teachers consider to be the best?

The participants in this study were required to select their preferred HIV and AIDS awareness promotion activity. The results areas indicated in **Table 6.18**.

Table 6.18: Mathematics teachers' perception of the best HIV and AIDS activity

Province	Lecture		Video/film		Ask questions		Talk by HIV person		Group discussions		Role Play	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Central	0.00	0.00	13.3	9.40	15.8	12.26	19.3	11.34	29.1	15.28	18.6	15.19
Coast	0.00	0.00	18.2	13.63	13.0	12.73	16.5	12.56	0.0	0.00	17.7	13.41
Eastern	6.7	4.91	25.6	11.78	6.3	6.23	21.1	12.21	4.2	4.29	7.1	5.72
Nairobi	18.2	11.38	23.7	10.74	2.3	2.32	26.5	10.78	17.0	9.25	0.0	0.00
North Eastern	15.6	10.95	18.0	12.13	0.0	0.00	7.9	5.60	6.4	6.38	14.8	12.64
Nyanza	6.1	5.96	39.3	12.13	0.0	0.00	15.9	7.69	12.1	7.50	0.0	0.00
Rift Valley	12.3	6.55	23.5	8.63	7.3	7.04	22.4	9.55	0.0	0.00	16.6	11.91
Western	5.8	5.80	23.2	11.93	0.0	0.00	49.6	14.45	0.0	0.00	5.0	5.04
Kenya	7.6	2.42	24.6	4.38	6.0	2.84	24.2	4.63	10.3	2.98	10.1	4.19

According to the findings, the most preferred HIV and AIDS course/activity for Mathematics teachers was the use of video/film at 24.6 percent followed by a talk from a HIV infected person at 24.2 percent. This was followed by group discussions at 10.3 percent and role play at 10.1 percent. Lectures were chosen by 7.6 percent and asking questions by 6.0 percent.

The findings above indicate that Mathematics teachers preferred audio-visual. The least preferred sources are where teachers have to infer information whether by reading or searching for information themselves and making field excursions. The findings largely corroborate those of pupils who actually preferred similar sources of information (see **Table 6.1**). However, whereas teachers highly prioritize talks by HIV-infected persons, it was among the least preferred source of information by pupils. These findings also could reflect the fact

that most teachers had a positive attitude towards HIV-infected persons compared to the pupils who had registered a higher percentage of negative attitudes towards those infected (see **Tables 6.9, 6.10 and 6.11**).

Policy Suggestion 6.9:

Teachers should be provided with more interactive information sources on HIV and AIDS.

6.4 School Heads' Attitudes and School Policy on HIV and AIDS

General Policy Concern 6.3:

(a) What were the school head attitudes towards HIV and AIDS?

(b) What were the school policies regarding teachers with HIV and AIDS?

School head attitudes towards HIV and AIDS

(a) What percentage of school heads felt that a pupil infected with HIV should be allowed to attend school?

This study sought to find out school heads' attitudes towards HIV and AIDS with regard to the aspect of stigmatization and discrimination of persons living with HIV and AIDS. School head teachers were asked whether a HIV infected pupil should be allowed to proceed with school. Head teachers were required to respond either "No" if the infected pupil should not be allowed to continue with school, "I am not sure" if they were unsure or "Yes" if they should be allowed to continue. The findings of the data analysis are presented in **Table 6.19**.

Table 6.19: School heads' attitudes towards HIV infected pupils continuing in school (stigma)

Province	Should a HIV positive pupil be allowed to attend school?			
	No/Not sure		Yes	
	%	SE	%	SE
Central	12.3	8.55	87.7	8.55
Coast	0.0	0.00	100.0	0.00
Eastern	0.0	0.00	100.0	0.00
Nairobi	0.0	0.00	100.0	0.00
North Eastern	0.0	0.00	100.0	0.00
Nyanza	0.0	0.00	100.0	0.00
Rift Valley	0.0	0.00	100.0	0.00
Western	0.0	0.00	100.0	0.00
Kenya	1.7	1.23	98.3	1.23

The results as presented in **Table 6.19** above clearly show that although the majority of the school heads (98.3%), have a positive attitude towards pupils infected with HIV (i.e. they have no stigma), over 38 percent of their pupils display high level of stigma towards their infected counterparts with slightly over 52 percent having positive attitudes. However 12.3 percent of the head teachers from Central province felt that HIV and AIDS infected pupils should not be allowed to continue attending school.

(b) What percentage of school heads felt that a teacher infected with HIV should be allowed to continue teaching?

School head teachers were asked whether they

would allow a HIV infected teacher to continue teaching in their school. The results are presented in **Table 6.20**.

Table 6.20: School head teachers' opinions on whether teachers with HIV and AIDS should be allowed to teach in schools

Province	Should an HIV positive teacher be allowed to continue teaching?			
	No/ Not Sure		Yes	
	%	SE	%	SE
Central	12.3	8.55	87.7	8.55
Coast	0.0	0.00	100.0	0.00
Eastern	0.0	0.00	100.0	0.00
Nairobi	0.0	0.00	100.0	0.00
North Eastern	0.0	0.00	100.0	0.00
Nyanza	0.0	0.00	100.0	0.00
Rift Valley	0.0	0.00	100.0	0.00
Western	0.0	0.00	100.0	0.00
Kenya	1.7	1.23	98.3	1.23

Nationally, 98.3 percent of the school heads were willing to allow HIV infected teachers to continue teaching in their schools with 1.7 percent either not willing to do so or not sure whether they would allow them. Regionally, in 7 out of 8 provinces, all the sampled school heads said they would allow HIV-infected teachers to continue teaching in their schools with the exception of Central province where 87.7 percent of the school heads would allow HIV- infected teachers to continue teaching in their schools. At the same time, 12.3 percent of the school heads from Central province were not ready to allow HIV positive teachers to teach, or were not sure of whether they would allow them to do so. The results show that school heads had a positive attitude toward staff members who were HIV positive.

School head access to HIV testing centres

Were there HIV Testing Centres within walking distance from school heads' homes?

School heads were required to state whether the nearest HIV Testing Centre was within walking distance from their homes. They were required to respond either "Yes" if the HIV Testing Centre was within walking distance, "No" if it was beyond the walking distance and "I do not know" if they did not know how far the HIV Testing Centre was. The findings are reported in **Table 6.21**.

Table 6.21: Availability of HIV Testing Centres within walking distance of School head teachers' homes

Province	No/Not Sure		Yes	
	%	SE	%	SE
Central	30.6	10.61	69.4	10.61
Coast	37.5	12.97	62.5	12.97
Eastern	46.4	11.01	53.6	11.01
Nairobi	5.7	5.74	94.3	5.74
North Eastern	56.3	15.35	43.7	15.35
Nyanza	21.8	7.32	78.2	7.32
Rift Valley	38.5	8.82	61.5	8.82
Western	20.8	8.05	79.2	8.05
Kenya	31.7	3.84	68.3	3.84

According to the findings, on average, 68.3 percent of the school heads nationwide have HIV Testing Centres within walking distance, 31.7 percent did not know or did not have HIV Testing Centre facilities within walking distance. Nairobi province with 94.3 percent had the highest proportion of school head teachers with HIV Testing Centre services within walking distance followed by Western Province with 79.2 percent. North Eastern and Eastern with 56.3 and 46.4 percent respectively had the highest percentage of school heads with HIV Testing Centre services beyond a walking distance or not sure.

These findings demonstrate that the majority of the school heads lived within walking distance of HIV Testing Centres. The findings also indicate that some head teachers either do not know or are not sure how far the HIV Testing Centre facilities are located from their homes.

School head training on HIV and AIDS

What percentage of school heads had attended in-service courses on HIV and AIDS?

In this study, the school heads were required to indicate whether they had attended any in-service course on HIV and AIDS. Results as presented in **Table 6.22**.

According to the findings, the national average of the school head teachers who had attended in-service course on HIV and AIDS was 84.8 percent against 15.2 percent who had not. Regionally, the highest percentage of the head teachers who had attended in-service course on HIV and AIDS was

Table 6.22: School heads who have attended an in-service course on HIV and AIDS

Province	NO		YES	
	%	SE	%	SE
Central	13.8	6.45	86.2	6.45
Coast	24.6	11.29	75.4	11.29
Eastern	8.8	6.10	91.2	6.10
Nairobi	13.5	9.21	86.5	9.21
North Eastern	34.4	15.12	65.6	15.12
Nyanza	15.4	6.12	84.6	6.12
Rift Valley	22.0	7.69	78.0	7.69
Western	4.8	4.81	95.2	4.81
Kenya	15.2	2.89	84.8	2.89

from Western province at 95.2 percent followed by Eastern province with 91.2 percent. North Eastern province with 34.4 percent had the highest percentage of pupils whose school heads had not attended an in-service course followed by Coast province with 24.6 percent. Results show that there is no province where all schools head teachers had undergone an in-service course on HIV and AIDS. It is worth noting that although Western had registered the highest percent (95.2 pupils) of pupils with head teachers who had attended an in-service course on HIV and AIDS, pupils from this province had the lowest mean HAKT score in the country.

The results indicate that there is quite a substantial number of school head teachers who have not attended an in-service course on HIV and AIDS. This might partly explain the reason why some head teachers still stigmatize and discriminate against infected persons in some provinces.

Policy Suggestion 6.10:

There is need to intensify the provision of in-service courses on HIV and AIDS for school head teachers in all the provinces.

School head HIV and AIDS tests

What percentage of school heads had taken HIV tests?

This study also sought to establish whether school heads had taken an HIV and AIDS test to establish their status. The findings are presented in **Table 6.23**.

Table 6.23: School heads who have taken HIV and AIDS test

Province	No		Yes	
	%	SE	%	SE
Central	78.4	8.99	21.6	8.99
Coast	84.9	9.07	15.1	9.07
Eastern	75.2	8.97	24.8	8.97
Nairobi	31.1	11.66	68.9	11.66
North Eastern	65.9	13.95	34.1	13.95
Nyanza	54.3	9.15	45.7	9.15
Rift Valley	70.0	8.62	30.0	8.62
Western	89.4	7.88	10.6	7.88
Kenya	71.2	3.67	28.8	3.67

The findings show that a large majority of school heads in the country (71.2%) had not taken a HIV and AIDS test with only 28.8 percent having been tested. Western province had the highest proportion of pupils with school heads who had not taken a HIV and AIDS test at 89.4 percent followed by Coast province with 84.9 percent and Central province with 78.4 percent. The highest percentage of pupils

Table 6.24: School policy on HIV and AIDS ill teachers

Province	Stay at Home		No Duties at All		No Teaching Duties		Try to Teach	
	%	SE	%	SE	%	SE	%	SE
Central	0.0	0.00	0.0	0.00	8.4	5.98	91.6	5.98
Coast	2.3	2.40	6.2	6.22	14.8	10.04	76.7	11.36
Eastern	0.0	0.00	0.0	0.00	12.2	6.84	87.8	6.84
Nairobi	0.0	0.00	0.0	0.00	4.7	4.76	95.3	4.76
North Eastern	0.0	0.00	0.0	0.00	5.5	5.69	94.5	5.69
Nyanza	0.0	0.00	2.4	2.37	4.2	3.10	93.4	3.86
Rift Valley	5.0	3.50	0.0	0.00	9.5	4.97	85.6	5.90
Western	0.0	0.00	0.0	0.00	19.9	9.45	80.1	9.45
Kenya	1.5	0.92	0.9	0.64	10.4	2.50	87.2	2.69

The findings show that nationally, 87.2 percent of the school head teachers were willing to allow an ailing teacher to try and teach whenever he/she could. According to the table, 10.4 percent of the head teachers were not assigning teaching duty to the ill teacher. Moreover, 0.9 percent of the heads do not assign ailing teachers teaching duties nor any other duty. The remaining 1.5 percent of the school heads said that they had a policy of allowing the ailing teachers to stay at home.

Regionally, Nairobi province at 95.3 percent had

with school heads who had taken the test was in Nairobi province with 68.9 percent followed by Nyanza province at 45.7 percent and North Eastern with 34.1 percent.

Policy Suggestion 6.11:

School heads should be encouraged to take HIV and AIDS tests as role models for teachers and pupils.

School policy regarding teachers who have HIV and AIDS

What was the school policy with regard to teachers who have long illness related to AIDS?

Head teachers were required to state whether they had a school policy with regard to teachers who were ill from HIV and AIDS. The results were as presented in **Table 6.24**.

the highest percentage of pupils whose school heads were willing to allow ailing teachers to continue teaching followed by North Eastern province with 94.5 percent, Nyanza province with 93.4 percent and Central with 91.6 Percent. Among the school heads who did not assign teaching duties to ailing teachers, Western province with 19.9 percent had the highest proportion followed by Coast province (14.8%) then Eastern province at 12.2 percent. Only Coast and Nyanza provinces with 6.2 and 2.4 percent respectively did not assign any duties to ailing teachers, whereas 2.3 percent of school head

teachers in Coast and 5.0 percent in Rift Valley simply allowed ailing teachers to stay at home.

Policy Suggestion 6.12:

There is need for a clear policy with regard to the teaching duties of a teacher with AIDS and other diseases like cancer, typhoid, and respiratory related illnesses.

School head self-assessment of risk of being infected with HIV and AIDS

What did the school heads think was their general risk of being infected with HIV?

The School heads were requested to provide their own assessment of the risk of being infected with HIV. Results are presented below in **Table 6.25**.

Table 6.25: Self risk assessment of school heads being infected with HIV.

Province	No/Low Risk/Medium		High/Very High Risk	
	%	SE	%	SE
Central	75.7	9.96	24.3	9.96
Coast	82.6	12.01	17.4	12.01
Eastern	57.3	10.92	42.7	10.92
Nairobi	60.4	13.76	39.6	13.76
North Eastern	88.0	11.50	12.0	11.50
Nyanza	59.6	8.81	40.4	8.81
Rift Valley	67.8	7.58	32.2	7.58
Western	52.8	11.33	47.2	11.33
KENYA	64.7	3.84	35.3	3.84

The results presented in **Table 6.25** show that at the national level, 64.7 percent of pupils had school heads who perceived themselves as being at no, low or medium risk of contracting HIV while 35.3 percent perceived themselves as being at a high or very high risk. At the regional level, the highest proportion of school head teachers who perceived themselves as being at no, low or medium risk was in North Eastern and Coast provinces with 88.0 and 82.6 percent respectively. School head teachers from Western province with 47.2 percent considered themselves to be at a high or very high risk followed by those from Eastern province at 42.7 percent and Nyanza province at 40.4 percent.

Over half of school heads perceived themselves

as being at no, low or medium risk of contracting HIV, while slightly over a third perceived themselves as being at either high or very high risk. These results could provide an explanation as to why an overwhelming majority of the school heads had not taken an HIV test. At the same time, the percentage of school heads who perceived themselves to be at high or very high risk is almost the same as those who have taken an HIV test (see Table 6.23 on percentage of school heads who had taken an HIV test). However, this relationship requires further investigation before a confident generalisation can be made.

Policy Suggestion 6.13:

The training of HIV and AIDS for head teachers needs to be strengthened especially concerning testing and mitigating risky behaviours.

6.5 Conclusion

Pupils with the lowest levels of knowledge concerning HIV and AIDS are likely to be females from lower SES status backgrounds in schools located in rural areas. Although nearly half of the pupils in this study had reached the minimum levels of HIV and AIDS knowledge, the vast majority of them did not have desirable levels both at national and regional level. As for the teachers, all of them had attained minimum levels of knowledge while an overwhelming majority displayed desirable levels of knowledge about HIV and AIDS.

A considerable proportion of pupils have negative attitudes towards others infected with HIV and AIDS. On the other hand the majority of teachers and school heads had a positive attitude towards infected persons. There exists a big disconnect between teachers' and school heads' knowledge and attitudes concerning HIV and AIDS and that of their pupils in Standard 6.

Pupils preferred lessons from their teachers, videos and films as the source of knowledge about HIV and AIDS, with the least preferred being trips to hospitals and talks from HIV infected persons. On the other hand, teachers preferred media such as video/films and talks by infected persons while trips to hospitals and answering questionnaires were the least preferred. It would be of interest to carry out

a study and establish which of the most preferred sources are most frequently used in schools. This would explain whether teachers are using their most preferred sources of information or the pupils' most preferred sources.

A considerable proportion of pupils, teachers and school heads do not have HIV and AIDS testing services within walking distance of their homes. This corroborates the finding that there were high proportions of teachers (55%) and school heads (71%) that have never been tested for HIV and AIDS. Risk perception among teachers varies from province to province although over a third of the teachers perceive themselves as being at very high risk of infection. Approximately half of the teachers perceive themselves as being at no, low or medium risk of infection. This is slightly lower than that of head teachers (64.7%). A greater emphasis should be placed on the training of teachers in HIV and AIDS especially concerning testing and mitigating risky behaviour.



CHAPTER 7

7.0 READING AND MATHEMATICS ACHIEVEMENT LEVELS OF PUPILS AND THEIR TEACHERS

7.1 Introduction

All education systems have multiple outcomes. Usually these outcomes include cognitive achievement (what do pupils know), affective achievement (attitudes such as whether pupils like going to school or like subjects such as Reading and Mathematics) and behavioural values (such as civic responsibility and good moral values like respect and social work). It is common for educational authorities to be mostly interested in cognitive outcomes, but other outcomes must not be forgotten. This chapter reports on cognitive outcomes. It must be stressed that when presenting the cognitive data in this chapter, the aim is not to look at achievement as simply pass or fail in order to continue to the next standard in school, but rather to examine how well the education system has performed in terms of teaching basic literacy and numeracy skills to pupils by the end of Standard 6.

In previous chapters, information has been provided on input and process variables. These have included teaching quality (and teacher qualifications); the utilisation of curriculum and instructional materials; teacher motivation; the school and class setting; school management and institutional leadership; curriculum implementation and monitoring; inspection and advisory services; and home practices that affect achievement.

The analysis in this chapter is based on two policy concerns:

1) What were the levels (according to the Rasch scores and descriptive levels of competence) and variations (among schools and provinces) in the achievement levels of Standard 6 pupils and their teachers in Reading and Mathematics

2) What was the Reading and Mathematics achievement levels of important sub-groups of Standard 6 pupils and their teachers (for example pupils and teachers of different gender, socio-economic levels and location)?

7.2 Two Ways of Presenting Test Scores

The performance results of Standard 6 pupils are presented in two different ways:

Means (traditional)

The first approach is the traditional method of reporting the mean scores of pupils and teachers across Kenya nationally and for the eight provinces. This approach provides an aggregated average measure of performance in the form of a number. While the approach follows a familiar pattern for the presentation of test scores, its main disadvantage is that it does not provide a clear description of the “meaning” of a particular level of performance.

Competency levels

The second approach is based upon a scaling technique known as the Rasch model. This makes it possible to align the ability levels of pupils and teachers with the difficulty levels of test items, and to make a probabilistic

linkage between person ability and item difficulty. It is further possible to place the test items along a “difficulty” dimension and then group them into “clusters” that are linked to common groups of skills. The clusters of test items can then be examined and described in terms of the specific skills that pupils need to provide correct responses. Moreover, pupil and teacher performances can be aligned to one of the eight “competency levels” in literacy and numeracy. In order to measure cognitive outcomes, tests were administered to pupils in Reading and Mathematics.

It will be recalled that not only was it possible to have a total Rasch score but also that the test data were analysed in such a way that different levels of competency or skills in achievement could be identified and in turn the percentages of pupils reaching these levels calculated. The competency levels can also be regarded as instructional levels. For example, pupils who have mastered the skills in, say, Level 3 but not in Level 4 are in a position to begin to learn the knowledge and skills embodied in Level 4. At the national level, this is important feedback for curriculum planners. At the school level, such information can be useful for teachers in planning their lessons, assuming that they receive such information early.

Furthermore it was possible to establish minimum and desirable levels of mastery. These levels were computed using SACMEQ I data. In SACMEQ I, each country set country-specific minimum and desirable levels of mastery. As a result, the percentages of mastery were not directly comparable. So, for each of the minimum and desirable levels, an “average” mastery score was calculated for the seven countries. The appropriate Rasch calibrated score was then determined for these two “average” mastery levels. The Rasch model was also used to link the scores for SACMEQ II to the scores for SACMEQ III and place all the scores onto the same scale. This means that the “average” mastery scores could also be used in SACMEQ III and the percentages of reaching each of these levels could be compared across the two studies.

At the same time, the achievement level of Standard 6 teachers in Reading and Mathematics was measured. It was possible to place the teachers’ and pupils’ achievement on the same scale and

compare the results. The major reason for measuring the achievement of teachers is the belief that their mastery of the subject matter is critical in curriculum implementation.

The average score of all pupils in all fourteen countries participating in SACMEQ II was set at 500 and the standard deviation was 100. Teachers from the same countries were placed on the same scale as the pupils. The levels and variations in the competencies in Reading and Mathematics for both pupils and teachers are presented and discussed in this section. **Tables 7.1** and **Table 7.2** give a summary of the Reading and Mathematics levels that were used in assessing competencies in learners and teachers.

Table 7.1: Levels of Reading skills

	READING SKILL LEVELS
Level 1	Pre-Reading: Matches words and pictures involving concrete concepts and everyday objects, and follows short simple written instructions.
Level 2	Emergent Reading: Matches words and pictures involving prepositions and abstract concepts; uses cuing systems (by sounding out, using simple sentence structure, and familiar words) to interpret phrases by Reading forwards.
Level 3	Basic Reading: Interprets meaning (by matching words and phrases completing a sentence, matching adjacent words) in a short and simple text by reading forwards or backwards.
Level 4	Reading for meaning: Reads forwards and backwards in order to link and interpret information located in various parts of the text.
Level 5	Interpretive Reading: Reads forwards and backwards in order to combine and interpret information from various parts of the text in association with external information (based on recalled factual knowledge) that “completes” and contextualises meaning.
Level 6	Inferential Reading: Reads forwards and backwards through longer (narrative, document or expository) texts in order to combine information from various parts of the text so as to infer the writer’s purpose.
Level 7	Analytical Reading: Locates information in longer (narrative, document or expository) texts by reading forwards and backwards in order to combine information from various parts of the text so as to infer the writer’s personal beliefs (value systems, prejudices, and/or biases).
Level 8	Critical Reading: Locates information in longer (narrative, document or expository) texts by reading forwards and backwards in order to combine information from various parts of the text so as to infer and evaluate what the writer has assumed about both the topic and the characteristics of the reader - such as age, knowledge, and personal beliefs (value systems, prejudices, and/or biases).

Table 7.2: Levels of Mathematics skills

MATHEMATICS SKILL LEVELS	
Level 1	Pre-numeracy: Applies single step addition or subtraction operations. Recognises simple shapes. Matches numbers and pictures. Counts in whole numbers.
Level 2	Emergent numeracy: Applies a two-step addition or subtraction operation involving carrying, checking (through very basic estimation), or conversion of pictures to numbers. Estimates the length of familiar objects. Recognizes common two-dimensional shapes.
Level 3	Basic numeracy: Translates verbal information (presented in a sentence, simple graph or table using one arithmetic operation) in several repeated steps. Translates graphical information into fractions. Interprets place value of whole numbers up to thousands. Interprets simple common everyday units of measurement.
Level 4	Beginning numeracy: Translates verbal or graphic information into simple arithmetic problems. Uses multiple different arithmetic operations (in the correct order) on whole numbers, fractions, and/or decimals.
Level 5	Competent numeracy: Translates verbal, graphic, or tabular information into an arithmetic form in order to solve a given problem. Solves multiple-operation problems (using the correct order of arithmetic operations) involving everyday units of measurements and/or whole and mixed numbers. Converts basic measurement units from one level of measurement to another (for example metres to centimetres).
Level 6	Mathematically skilled: Solves multiple-operation problems (using the correct order of arithmetic operations) involving fractions, ratios, and decimals. Translates verbal and graphic representation information into symbolic, algebraic, and equation form in order to solve a given mathematical problem. Checks and estimates answers using external knowledge (not provided within the problem).
Level 7	Problem solving: Extracts and converts (for example, with respect to measurement units) information from tables, charts, visual and symbolic presentations in order to identify, and then solve multi-step problems.
Level 8	Abstract problem solving: Identifies the nature of an un-stated mathematical problem embedded within verbal or graphic information, and then translates this into algebraic or equation form in order to solve the problem.

7.3 Overall Pupil and Teacher Mean Scores and Competency Levels

General Policy Concern 7.1:

What were the levels (according to Rasch scores and descriptive levels of competence) of Standard 6 pupils and their teachers?

The results for pupils and teachers are presented in the following sections of this chapter.

Pupil and teacher mean scores

What were the overall pupil and teacher mean scores in Reading and Mathematics?

In **Table 7.3**, the national mean score for Reading for pupils was 543.1, while for teachers it was 792.1. In the case of Mathematics, the national mean score for pupils was 557.0 and for teachers it was 906.1. From these results, it can be seen that teachers performed much better than pupils in both subjects and in both SACMEQ II and SACMEQ III studies. Overall comparison between SACMEQ II and III shows that there was a slight drop in the performance of both pupils and teachers in Reading and Mathematics during SACMEQ III.

In general, pupils in Kenya performed higher than the 500 mean from SACMEQ II countries in both Reading and Mathematics. For pupils’ Reading test scores, Nairobi was highest with 622.1, followed by Central province with 574.3. The lowest Reading test scores were recorded in Western province with a mean score of 497.3. For Mathematics, Nairobi province had the highest mean score of 610.0, followed by North Eastern with a mean score of 600.2. This was a considerable improvement from 548.9 in SACMEQ II. The same province was second only to Nairobi in the NASMLA Class 3 Study (Wasanga et al., 2010). The lowest mean performance for pupils was recorded in Western province at 516.1.

On the part of teachers’ Reading scores, the leading province was Nairobi with a mean score of 817.0, followed by Western province at 801.9. North Eastern had the lowest mean score at 769.0 (but the teachers in North Eastern had improved compared with SACMEQ II). For Mathematics teachers, Western

Table 7.3: Means for the Reading and Mathematics test scores of pupils and teachers (SACMEQ II and SACMEQ III)

Province	SACMEQ II							
	PUPILS				TEACHERS			
	Reading		Mathematics		Reading		Mathematics	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Central	556.7	11.73	579.1	10.21	805.9	9.19	954.6	14.39
Coast	558.2	15.85	568.2	13.09	774.3	11.73	954.2	17.52
Eastern	568.5	12.67	581.3	12.50	812.5	13.20	1,035.5	28.93
Nairobi	624.5	12.23	604.9	12.11	805.6	23.87	930.4	17.86
North Eastern	527.3	11.56	548.9	11.43	747.3	11.86	930.6	28.07
Nyanza	533.8	11.20	555.3	11.05	781.9	15.66	953.2	14.59
Rift Valley	530.7	12.40	551.4	10.99	793.0	9.61	955.3	22.15
Western	526.9	8.86	539.1	9.50	786.0	9.00	958.3	16.81
Kenya	546.5	4.97	563.3	4.64	794.4	4.84	968.5	8.87
Province	SACMEQ III							
	PUPILS				TEACHERS			
	Reading		Mathematics		Reading		Mathematics	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Central	574.3	15.11	574.4	11.75	798.0	8.28	894.2	23.60
Coast	553.8	13.41	569.8	12.21	790.5	10.81	910.7	37.03
Eastern	550.6	13.25	569.2	12.67	788.8	8.83	900.4	15.19
Nairobi	622.1	18.10	610.0	20.86	817.0	14.50	901.2	24.95
North Eastern	560.4	25.09	600.2	27.59	769.0	14.98	877.3	16.32
Nyanza	545.1	9.80	555.0	7.32	782.9	10.12	900.8	16.60
Rift Valley	527.5	10.95	549.2	8.07	789.9	8.07	909.9	13.37
Western	497.3	10.18	516.1	7.61	801.9	12.62	922.8	32.58
Kenya	543.1	4.92	557.0	3.98	792.1	3.91	906.1	8.37

province led with 922.8, followed by Coast province at 910.7, and North Eastern province had the lowest mean score (877.3). Informal observations of the correlation between pupils’ and teachers’ scores suggest negative correlation. Pupils in Western province who had the lowest scores in Mathematics had teachers with high scores while pupils in North Eastern province with higher scores had teachers with lowest scores in both Reading and Numeracy.

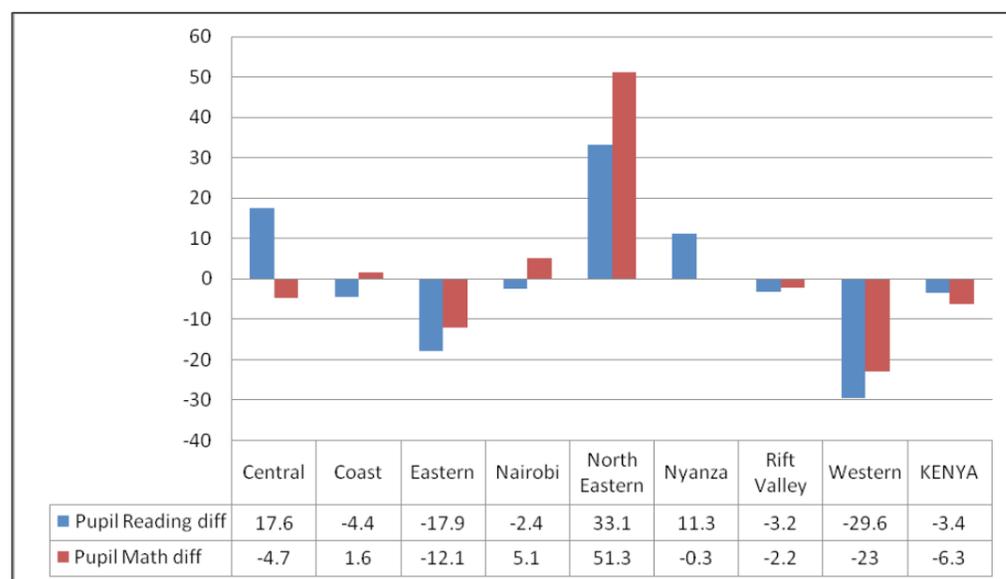
Policy Suggestion 7.1:

Urgent interventions by all education stakeholders need to be taken to improve Reading and Mathematics achievement in primary schools. Special attention should be paid to Western Province.

For comparison purposes, the mean differences for

test scores in SACMEQ II and III for both pupils and teachers in Reading and Mathematics per province are summarised in **Figures 7.1** and **7.2** below.

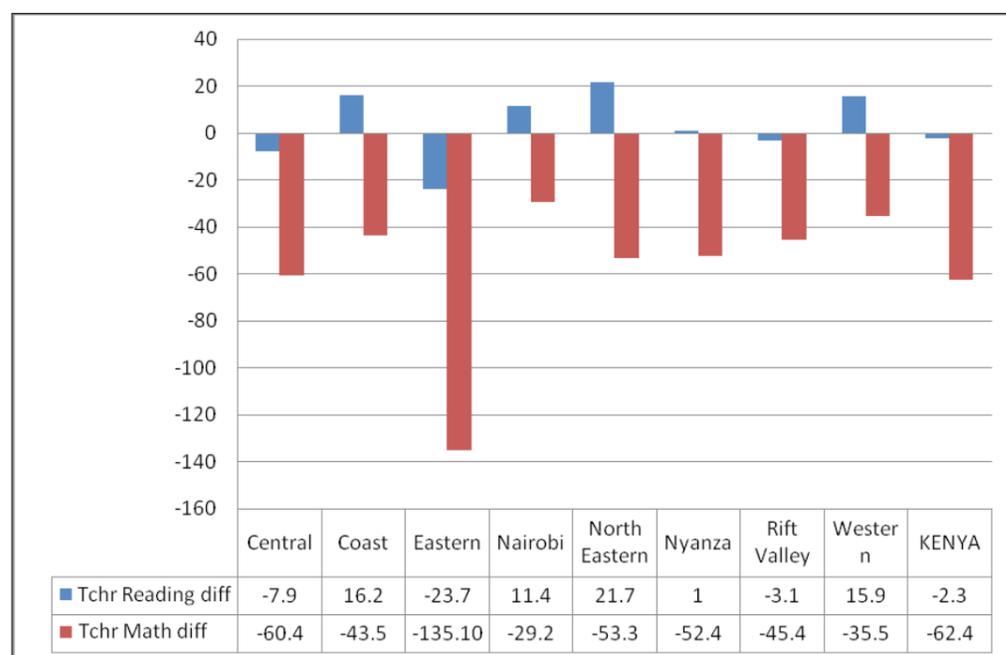
Figure 7.1: Differences in Reading and Mathematics test scores between SACMEQ II and SACMEQ III for pupils from different provinces



As shown in **Figure 7.1**, North Eastern had the highest positive changes between SACMEQ II and III (33.1 and 51.3 mean score points for Reading and Mathematics, respectively), while Western province had the largest drops in achievement (29.6 and 23.0 points for Reading and Mathematics respectively).

The overall mean difference between SACMEQ II and III for Mathematics was -6.3 mean score points, and for Reading the difference was -3.4 mean score points, which indicates that performance in both subjects dropped slightly

Figure 7.2: Differences in Reading and Mathematics test scores between SACMEQ II and SACMEQ III for teachers from different provinces



For teachers' Reading scores, it can be seen from **Figure 7.2** that North Eastern province had the highest positive change at 21.7 score points (indicating that there was improvement in Reading among teachers in this province) while Eastern province had the highest negative change at 23.7 score points. It can be seen further that all provinces recorded a decline in the performance of the teachers in the Mathematics tests. As in Reading, Eastern province also had the highest negative change for Mathematics (-135.1), while Nairobi province had the lowest negative drop at -29.2. Overall, there was a mean drop in Mathematics of -62.4 score points.

Pupil and teacher competency levels

What percentages of pupils and teachers were reaching various competency levels in Reading and Mathematics?

The percentages of pupils and teachers operating at various Reading and Mathematics competency levels in the SACMEQ II and SACMEQ III studies have been given in **Tables 7.4 to 7.7**.

Table 7.4: Pupils reaching various Reading competence levels by province (SACMEQ II and SACMEQ III)

SACMEQ II																
Province	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8	
	%	SE														
Central	0.2	0.16	3.5	1.14	5.9	1.20	19.6	3.11	30.8	2.84	21.0	2.77	14.4	3.14	4.6	2.36
Coast	1.3	0.93	4.9	2.23	8.7	2.78	18.2	4.73	19.5	2.88	21.7	3.88	20.3	4.23	5.4	1.73
Eastern	0.4	0.31	3.2	1.34	6.6	2.10	16.9	3.37	21.9	2.41	23.9	3.07	20.9	3.75	6.2	1.87
Nairobi	0.8	0.58	1.3	0.72	4.2	1.97	4.6	1.13	16.5	2.69	21.6	2.84	32.3	3.91	18.6	4.02
North Eastern	1.3	0.77	11.2	2.81	15.7	2.56	20.7	3.09	19.3	2.20	15.4	2.28	11.6	3.03	4.7	1.98
Nyanza	1.1	0.67	3.6	1.13	12.8	2.80	25.2	3.08	28.7	3.08	14.9	2.74	9.8	2.53	4.0	1.46
Rift Valley	2.2	0.92	7.4	2.00	17.2	2.99	18.8	2.49	20.8	2.32	18.6	2.76	10.2	2.23	4.8	2.00
Western	0.8	0.42	4.2	1.52	10.8	1.96	27.5	2.69	30.9	2.59	16.0	2.53	6.8	1.81	2.9	1.65
Kenya	1.0	0.27	4.6	0.66	10.8	1.02	20.4	1.24	25.3	1.09	19.2	1.18	13.6	1.18	5.1	0.81

SACMEQ III																
Province	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8	
	%	SE														
Central	1.9	0.64	4.2	1.18	9.7	2.58	14.2	2.14	16.7	2.39	18.2	2.67	23.4	4.53	11.7	3.54
Coast	0.5	0.37	3.9	1.42	8.0	2.36	22.3	3.30	24.5	2.86	20.2	2.35	14.4	2.72	6.2	2.88
Eastern	1.8	1.08	3.6	1.00	9.1	2.05	20.9	3.39	23.0	2.95	22.6	3.40	12.7	2.37	6.2	3.25
Nairobi	0.2	0.20	2.0	1.10	2.8	0.79	11.0	2.58	15.2	2.90	19.6	2.85	25.8	2.53	23.3	6.63
North Eastern	4.9	1.89	5.6	1.63	9.9	2.01	16.6	3.94	15.1	1.73	19.5	2.58	14.8	3.60	13.6	6.38
Nyanza	2.4	0.83	3.7	0.92	9.6	1.86	19.5	2.27	25.3	1.80	21.6	2.24	14.3	2.53	3.6	1.43
Rift Valley	1.9	0.92	7.9	2.23	14.5	1.99	21.0	2.02	22.9	1.77	17.1	2.03	9.6	1.76	5.0	1.45
Western	5.5	1.35	10.4	1.81	19.7	2.06	22.6	2.07	20.4	1.84	12.6	2.10	7.6	2.36	1.3	0.83
Kenya	2.3	0.38	5.7	0.71	11.8	0.85	19.6	0.99	21.8	0.87	18.7	1.00	13.7	1.08	6.4	0.93

Table 7.5: Pupils reaching various Mathematics competence levels by province (SACMEQ II and SACMEQ III)

SACMEQ II																
Province	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8	
	%	SE														
Central	0.0	0.00	6.2	1.49	26.7	3.41	27.1	2.49	22.1	2.25	13.4	2.29	2.9	1.07	1.6	1.19
Coast	0.2	0.20	8.3	2.61	30.1	7.35	21.8	3.36	23.2	4.49	13.6	3.44	2.3	0.77	0.6	0.38
Eastern	0.8	0.56	8.3	1.95	23.0	3.94	26.8	2.25	19.4	2.63	14.9	3.17	5.1	1.49	1.7	0.62
Nairobi	0.0	0.00	8.2	2.40	12.8	2.73	27.5	3.13	22.9	2.53	18.2	2.97	7.7	2.06	2.8	1.14
North Eastern	1.8	1.18	18.4	2.41	26.2	3.18	27.5	3.24	9.7	1.68	8.2	2.60	7.2	2.61	0.9	0.51
Nyanza	1.1	0.57	9.7	2.17	36.2	3.63	24.1	2.50	17.3	2.04	8.2	2.65	2.0	0.65	1.5	0.99
Rift Valley	0.5	0.29	13.8	2.41	32.4	3.68	24.9	2.20	15.6	2.39	8.4	2.06	3.7	1.36	0.7	0.57
Western	0.9	0.45	12.7	2.38	40.0	3.69	27.7	3.90	12.2	2.51	4.0	1.71	1.4	0.59	1.0	0.99
Kenya	0.6	0.17	10.1	0.90	30.7	1.59	25.7	1.07	17.9	1.02	10.4	1.03	3.3	0.48	1.3	0.36
SACMEQ III																
Province	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8	
	%	SE														
Central	0.4	0.25	8.4	2.00	24.7	3.34	26.4	2.03	19.3	2.53	14.6	2.68	4.1	1.66	2.0	0.94
Coast	0.4	0.35	4.2	1.12	26.4	4.10	34.7	4.88	19.2	2.47	10.4	1.96	2.4	1.34	2.4	1.96
Eastern	0.8	0.45	7.0	1.56	24.2	4.75	35.5	3.15	14.7	2.35	12.8	2.80	3.3	1.40	1.7	1.42
Nairobi	0.5	0.34	5.9	1.48	16.1	3.46	27.9	4.39	18.0	1.69	15.4	2.76	8.5	2.88	7.8	3.33
North Eastern	1.0	0.59	11.1	3.44	17.2	2.83	23.5	2.51	17.1	3.02	13.2	2.72	7.5	2.38	9.3	6.13
Nyanza	0.2	0.17	10.0	2.45	26.0	2.55	36.6	2.24	16.4	2.03	8.5	1.40	1.5	0.42	0.7	0.30
Rift Valley	0.5	0.24	10.8	2.39	29.7	2.98	33.0	2.09	14.8	1.86	8.7	1.52	2.1	0.64	0.5	0.22
Western	1.2	0.47	22.6	3.00	33.9	2.53	26.8	2.01	10.1	2.33	5.3	1.16	0.1	0.13	0.0	0.00
Kenya	0.6	0.13	10.6	0.96	27.1	1.34	32.1	1.00	15.5	0.89	10.1	0.77	2.5	0.41	1.4	0.35

Table 7.6: Teachers reaching various Reading competence levels by province (SACMEQ II and SACMEQ III)

SACMEQ II																		
Province	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8			
	%	SE																
Central	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	2.6	2.64	97.4	2.64
Coast	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	16.0	8.88	84.0	8.88
Eastern	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	7.7	5.43	92.3	5.43
Nairobi	0.0	0.00	0.0	0.00	2.9	2.95	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	7.0	6.92	90.1	7.32
North Eastern	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	22.4	9.22	77.6	9.22
Nyanza	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	15.5	7.72	84.5	7.72
Rift Valley	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	1.5	1.49	98.5	1.49
Western	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	1.7	1.73	98.3	1.73
Kenya	0.0	0.00	0.0	0.00	0.1	0.08	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	6.4	1.88	93.5	1.88
SACMEQ III																		
Province	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8			
	%	SE																
Central	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	100.0	0.00
Coast	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	100.0	0.00
Eastern	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	1.0	1.06	99.0	1.06
Nairobi	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	3.2	3.30	0.0	0.00	96.8	3.30		
North Eastern	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	1.9	1.97	98.1	1.97		
Nyanza	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	11.8	5.81	88.2	5.81		
Rift Valley	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	4.5	3.22	95.5	3.22		
Western	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	6.3	5.20	93.7	5.20		
Kenya	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.1	0.12	4.4	1.55	95.5	1.56		

Table 7.7: Teachers reaching various Mathematics competence levels by province (SACMEQ II and SACMEQ III)

SACMEQ II																
Province	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8	
	%	SE	%	SE												
Central	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	3.8	2.66	96.2	2.66
Coast	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	3.7	3.75	96.3	3.75
Eastern	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	1.3	1.32	98.7	1.32
Nairobi	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	11.5	6.65	88.5	6.65
North Eastern	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	4.6	4.63	0.0	0.00	12.1	8.45	83.3	9.29
Nyanza	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	3.6	3.56	96.4	3.56
Rift Valley	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	7.1	4.17	92.9	4.17
Western	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	2.9	2.98	97.1	2.98
Kenya	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.03	0.0	0.00	4.3	1.41	95.6	1.41
SACMEQ III																
Province	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8	
	%	SE	%	SE												
Central	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	28.3	11.40	71.7	11.40
Coast	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	6.3	6.39	0.0	0.00	93.7	6.39
Eastern	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	2.5	2.59	0.0	0.00	97.5	2.59
Nairobi	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	2.3	2.35	2.1	2.09	9.9	5.24	85.6	6.96
North Eastern	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	2.0	2.07	98.0	2.07
Nyanza	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	2.8	1.94	15.8	5.62	81.4	6.12
Rift Valley	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	10.2	3.97	89.8	3.97
Western	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	13.3	5.83	86.7	5.83
Kenya	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.1	0.09	1.4	0.68	11.8	2.39	86.7	2.52

Nationally, as shown in Table 7.4, most pupils in SACMEQ III attained level 4 (19.6%), 5 (21.8%), or 6 (18.7%) competencies in Reading. However, Nairobi had more pupils in levels 6 (19.6%), 7 (25.8%) and 8 (23.3%) and Western province had more pupils at the lower levels 2 (10.4%), 3 (19.7%) and 4 (22.6%).

In Mathematics, Table 7.5 indicates that nationally, the highest percentage of pupils operated at level 4 with 32.1 percent, followed by 27.1 percent at level 3. The majority of pupils were still at these levels even in SACMEQ II. Level 1 had the lowest percentage of pupils (0.6%). Nationally, in SACMEQ III, majority of the pupils attained levels 3 (27.1%), 4 (32.1%) or 5 (15.5%) competencies in Mathematics. Less than 10 percent of the pupils in each province achieved the highest levels 7 and 8. A

considerable proportion of Western province pupils performed at levels 2 (22.6%) and 3 (33.9%) which represent emergent and basic skills, respectively.

Policy Suggestions 7.2:

Teachers and educators need to focus on helping pupils attain higher Reading and Mathematics competencies using appropriate teaching methods and facilities.

In Table 7.6, the national percentage of teachers were concentrated at level 8 of Reading competence with 95.5 percent, slightly higher than in SACMEQ II, where they were 93.5 percent. Provincially, Central and Coast provinces had the highest percentage with 100 percent. With the exception of Nyanza province (88.2%), the other provinces had between

93 percent and 99 percent of teachers who attained the Reading competence level 8.

Table 7.7 shows that the vast majority of teachers (86.7%) operated at Mathematics competence level 8, with 11.8 percent at level 7. This is a slight drop from the 95.6 percent who reached level 8 in SACMEQ II. There was an improvement from level 7 to 8 in Nairobi and North Eastern provinces between SACMEQ II and SACMEQ III. The provinces that recorded the highest percentage of teachers at level 8 were North Eastern (98.0%) and Eastern (97.5%). On the other hand, Central province with only 71.7 percent had a relatively low percentage of teachers in level 8. In comparing competence levels in Reading and Mathematics, nationally

teachers performed better in Reading (95.5 percent at level 8) than in Mathematics (86.7 percent at level 7) nationally.

Pupils and teachers with acceptable Reading skills

What percentages of pupils and teachers had acceptable Reading skills?

The following tables present a summary of results and discussions on the percentage of Standard 6 pupils and teachers with acceptable (operating at competency level 4 or above) Reading skills in SACMEQ II and III by province. It should be noted that there is no equivalent benchmark for Mathematics.

Table 7.8: Pupils and teachers with acceptable Reading skills by province (SACMEQ II and SACMEQ III)

Province	PUPILS				TEACHERS			
	SACMEQ II		SACMEQ III		SACMEQ II		SACMEQ III	
	%	SE	%	SE	%	SE	%	SE
Central	90.4	1.98	84.3	4.00	100.0	0.00	100.0	0.00
Coast	85.1	4.62	87.5	3.44	100.0	0.00	100.0	0.00
Eastern	89.7	3.03	85.5	3.09	100.0	0.00	100.0	0.00
Nairobi	93.7	2.15	95.0	1.41	97.1	2.95	100.0	0.00
North Eastern	71.7	3.75	79.6	4.88	100.0	0.00	100.0	0.00
Nyanza	82.5	3.63	84.3	3.04	100.0	0.00	100.0	0.00
Rift Valley	73.3	4.72	75.7	4.21	100.0	0.00	100.0	0.00
Western	84.2	2.93	64.5	4.21	100.0	0.00	100.0	0.00
Kenya	83.6	1.52	80.2	1.56	99.9	0.08	100.0	0.00

Notes: Acceptable; pupils and teachers who have attained competency level 4 and above

Results in Table 7.8 show that the percentage of pupils reaching acceptable Reading skills nationwide was 80.2 percent in SACMEQ III; a slight drop when compared with the results in SACMEQ II. Provincially, there was high percentage of pupils in Nairobi reaching acceptable Reading skills with 95.0 percent. This was followed by Coast at 87.5 percent, Eastern at 85.5 percent and, Central and Nyanza provinces, both at 84.3 percent. Relatively low percentages of pupils reached acceptable Reading skills in Western province at 64.5 percent. On the part of teachers, the national mean percentage between SACMEQ II and III differed by 0.1 percent, that is, 99.9 percent and 100

percent respectively, in the percentage of teachers reaching acceptable Reading skills. The positive change occurred due to the percentage of teachers in Nairobi province with acceptable Reading skills which increased from 97.1 percent in SACMEQ II to 100.0 percent in SACMEQ III.

7.4 Pupil Mean Scores and Competency Levels Divided by Important Subgroups

General Policy Concern 7.2:

What are the Reading and Mathematics achievement levels of important sub-groups of Standard 6 pupils and their teachers?

Pupil mean scores by subgroups

What were the pupil mean scores in Reading and Mathematics divided by gender, socioeconomic background and school location?

It is also useful to examine the scores for different pupils across gender, socio-economic class and location of the school (either rural or urban). The results of the data analysis are presented in **Table 7.9** below.

Table 7.9: Means for the Reading and Mathematics test scores of pupils by subgroups (SACMEQ II and SACMEQ III)

SACMEQ II	Reading		Mathematics	
	Mean	SE	Mean	SE
Pupil gender				
Boys	546.4	5.39	574.2	5.47
Girls	546.6	5.42	552.4	4.80
School location				
Rural	531.0	5.29	552.8	5.34
Urban	578.9	9.55	585.1	8.32
Socioeconomic level				
Low SES (Bottom 25%)	516.2	5.24	541.2	5.35
High SES (Top 25%)	597.3	7.02	601.7	7.70
SACMEQ III	Reading		Mathematics	
	Mean	SE	Mean	SE
Pupil gender				
Boys	544.1	4.92	567.6	4.27
Girls	542.1	5.60	546.0	4.34
School location				
Rural	525.6	5.58	544.5	4.28
Urban	575.6	8.49	580.0	7.52
Socioeconomic level				
Low SES (Bottom 25%)	517.8	5.20	540.9	4.26
High SES (Top 25%)	600.2	7.79	595.8	7.57

One of the aims of this study was to establish whether there were gender differences in Reading achievement among pupils. For SACMEQ III, the national mean score for boys in Reading was 544.1 compared to 542.1 for girls (see **Table 7.9**). These results show that on average, boys outperformed girl in SACMEQ III. When these scores were compared to those of SACMEQ II registered in 2000, there were little or no gender differences in Reading achievement. However, it is important to note that there was a general decline in Reading achievement for both genders when compared with the mean scores of SACMEQ II with boys' performance dropping by 2.3 mean score points and girls by 4.5.

With regard to achievement in Mathematics, the results in **Table 7.9** show that the national mean score for boys was 567.6 compared to 546.0 for girls in SACMEQ III. This marked a difference of 21.6 mean score points between the genders. The performance for both boys and girls in SACMEQ III showed a drop from 2000, with mean scores declining by 6.6 points for boys and 6.4 for girls. This shows that the average performance for both boys and girls has declined slightly over the last seven years.

Policy Suggestion 7.3:

More needs to be done to improve the performance of girls in Mathematics. A lot also need to be done to improve performance of pupils in rural and low SES areas.

Results presented in **Table 7.9** above show that the national Reading mean score for urban pupils was higher than that of rural pupils in SACMEQ III. The same trend was recorded seven years earlier in SACMEQ II. However, a comparison between the mean scores for Reading in SACMEQ III and SACMEQ II show that the average mean score had declined over the last seven years by 5.4 for rural pupils and 3.3 for their urban counterparts. In Mathematics, the nationwide mean score for urban pupils was higher than that of the rural pupils in both SACMEQ III and II. However, there has been a reduction in the national Mathematics mean score by 8.3 among rural pupils and 5.1 for urban pupils.

The analysis of data as presented in **Table 7.9** above shows that pupils from high SES backgrounds attained a higher national mean score for Reading in both SACMEQ III and II compared to those with low SES. However, there was an improvement in the national mean score in SACMEQ III for both low and high SES pupils by 1.6 and 2.9 respectively. Comparative results in Mathematics between low and high SES pupils showed that the latter performed better in both SACMEQ III and II. It was observed that both low and high SES pupils had a higher mean score in Mathematics in SACMEQ II than in SACMEQ III with a mean difference of 0.3 for low SES and 5.9 for high SES.

Pupils competence levels by important subgroups

What were the pupil competency levels in Reading and Mathematics divided by gender, socioeconomic background and school location?

As presented in **Table 7.10** below, in SACMEQ III the largest gender difference was in level 6 where girls outperformed boys by 2.2 percent points. It should be noted that in level 3 a higher percentage of girls (1.6%) performed better than boys. This is in contrast to SACMEQ II where major gender differences were recorded in level 5.

The findings in **Table 7.11** show that in SACMEQ III, there were gender differences in pupils reaching various competence levels in Mathematics. Girls outperformed boys between level 1 and 4 with a major difference being registered in level 3 where the proportion of girls reaching this level was 6.1 percentage points higher than boys. Between levels 5 and 8, a higher percentages of boys than girls were recorded with a major difference in level 6 where there were 4.7 percentage points more boys than girls. After level 7 the difference narrowed slightly. This trend is similar to the one found in SACMEQ II.

In SACMEQ III, in the lower levels (between 1 and 4) in Reading higher percentages of rural pupils are found with the biggest difference being recorded at level 4. At level 5, there was no difference in the percentage of pupils who had attained the necessary competence. Larger percentages of urban pupils were found between levels 6 and 9, with the biggest difference of 9.3 percentage points being recorded at level 8. In SACMEQ II, a similar trend is recorded although this time the rural pupils outnumbered their urban counterparts in levels 1-5 with a major difference of 11.4 percentage points being recorded in level 4. Greater percentages of urban pupils were found in levels 6-8 with the biggest difference of 12.2 percentage points being recorded at level 7.

In Mathematics, according to **Table 7.11**, higher percentages of rural pupils reached levels 1 to 4 compared to the urban pupils. The biggest difference of 8.8 percentage points was recorded in level 3. The trend was reversed from level 5 with a higher percentage of urban pupils reaching the various competence levels. The largest difference,

5.8 percent, was registered in level 6. In SACMEQ II, a similar trend was witnessed where a higher percentage of rural children reached levels 1 to 4 with the largest difference of 9.4 percentage points at level 3. The reverse trend was observed as from level 5 to 8, where more urban pupils reached these competence levels with the biggest difference (6.6 percentage points) at level 6.



Table 7.10: Pupils reaching various Reading competence levels by subgroups (SACMEQ II and SACMEQ III)

SACMEQ II	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8	
	%	SE														
Pupil gender																
Boys	1.2	0.33	4.8	0.77	11.7	1.26	20.1	1.49	23.2	1.30	19.3	1.35	14.8	1.51	5.0	0.89
Girls	0.9	0.31	4.4	0.83	9.9	1.24	20.8	1.46	27.4	1.49	19.1	1.49	12.4	1.22	5.1	0.90
School location																
Rural	1.1	0.30	5.2	0.86	11.7	1.22	24.1	1.52	28.0	1.25	17.8	1.46	9.6	1.33	2.5	0.55
Urban	0.8	0.54	3.1	0.95	8.9	1.86	12.7	1.79	19.8	2.00	22.2	2.02	21.8	2.05	10.6	2.08
Socioeconomic level																
Low SES (Bottom 25%)	1.5	0.44	5.7	1.01	16.4	2.08	26.9	1.99	26.2	1.91	15.3	1.87	6.6	1.37	1.4	0.47
High SES (Top 25%)	0.3	0.17	1.3	0.38	5.1	1.02	12.9	1.71	20.1	1.91	22.3	1.76	25.0	1.95	13.1	2.02
SACMEQ III	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8	
	%	SE														
Pupil gender																
Boys	2.3	0.40	6.3	0.70	11.0	0.90	19.9	1.17	21.8	1.06	17.6	1.18	14.0	1.19	7.1	1.12
Girls	2.3	0.62	5.2	0.93	12.6	1.08	19.3	1.27	21.8	1.17	19.8	1.35	13.4	1.26	5.6	0.89
School location																
Rural	2.8	0.53	7.0	1.00	14.2	1.13	22.3	1.18	21.8	1.07	17.3	1.30	11.5	1.35	3.1	0.56
Urban	1.3	0.41	3.4	0.56	7.4	1.02	14.5	1.74	21.8	1.53	21.2	1.31	17.9	1.73	12.4	2.39
Socioeconomic level																
Low SES (Bottom 25%)	3.1	0.75	7.1	1.11	13.5	1.34	24.5	1.67	25.2	1.56	14.6	1.48	9.8	1.40	2.0	0.44
High SES (Top 25%)	0.9	0.29	2.1	0.53	5.6	0.98	10.1	1.28	17.8	1.51	22.8	1.69	24.1	1.71	16.5	2.58

The results presented in **Table 7.10** above show that in Reading in SACMEQ III, the low SES pupils reached the first 5 levels with greater frequency than their high SES counterparts; the biggest difference of 14.4 percentage points was in level 4. As expected, from levels 6 to 8, the high socio-economic status pupils outperformed their low socio-economic status counterparts with the largest difference being registered in level 8. In SACMEQ II, a similar trend was recorded where greater percentages of low SES pupils reached the levels 1-5, the largest difference (14 percentage points) occurred at level 4. From levels 6 to 8, the high SES group outperformed the low SES pupils with the largest difference (18.4 percentage points) being recorded at level 7.

As presented in **Table 7.11** above, in SACMEQ III, higher percentages of pupils with low SES reached the Mathematics competence levels of 1 to 4, with a difference of 10.1 percentage points at level 3. For levels 5-8, the trend reversed with more pupils with high SES reaching these competence levels. The

biggest difference between the SES groups was recorded at level 5. A similar trend is observed in SACMEQ II where a higher percentage of low SES pupils reached the first 4 competence levels with the biggest difference at level 3. For levels 5-8, a higher percentage of high SES pupils reached these competence levels with a difference of 11.8 percentage points being observed at level 6.

Pupils with acceptable skills by subgroups

What percentages of pupils had acceptable Reading skills divided by gender, socioeconomic background and school location?

Table 7.11: Pupils reaching various Mathematics competence levels by subgroups (SACMEQ II and SACMEQ III)

SACMEQ II	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8	
	%	SE														
Pupil gender																
Boys	0.1	0.10	8.4	0.91	28.9	1.92	24.6	1.35	19.5	1.27	12.7	1.32	3.9	0.73	1.8	0.51
Girls	1.1	0.32	11.8	1.23	32.3	1.91	26.9	1.54	16.4	1.26	8.1	1.09	2.7	0.49	0.7	0.34
School location																
Rural	0.8	0.24	11.5	1.17	33.7	1.90	26.7	1.39	15.9	1.28	8.3	1.25	2.5	0.50	0.8	0.31
Urban	0.2	0.15	7.3	1.25	24.3	2.64	23.9	1.60	22.3	1.44	14.9	1.61	4.8	1.08	2.4	0.89
Socioeconomic level																
Low SES (Bottom 25%)	0.7	0.30	12.2	1.66	38.2	2.46	27.1	2.12	13.9	1.62	5.9	1.08	1.5	0.53	0.5	0.38
High SES (Top 25%)	0.3	0.17	5.9	0.98	18.7	2.00	23.4	1.96	24.9	1.56	17.7	1.95	5.9	1.17	3.3	0.96
SACMEQ III	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Level 8	
	%	SE														
Pupil gender																
Boys	0.4	0.15	9.7	1.02	24.1	1.49	30.6	1.12	17.6	1.13	12.4	0.99	3.3	0.48	1.9	0.47
Girls	0.8	0.21	11.6	1.40	30.2	1.68	33.6	1.53	13.4	1.08	7.7	0.85	1.8	0.49	0.9	0.29
School location																
Rural	0.7	0.18	12.3	1.30	30.2	1.68	33.0	1.20	13.7	1.07	8.1	0.90	1.6	0.31	0.5	0.14
Urban	0.3	0.15	7.6	1.22	21.4	1.85	30.4	1.71	19.0	1.36	13.9	1.31	4.3	1.03	3.1	0.97
Socioeconomic level																
Low SES (Bottom 25%)	0.6	0.22	13.4	1.79	29.1	1.75	35.1	1.94	12.1	1.05	8.0	1.03	1.2	0.31	0.5	0.22
High SES (Top 25%)	0.1	0.11	5.5	0.87	19.0	2.01	27.9	1.86	21.6	1.58	15.9	1.38	6.3	1.22	3.6	1.07

Table 7.12: Pupils with acceptable Reading skills by subgroups (SACMEQ II and SACMEQ III)

	SACMEQ II		SACMEQ III	
	%	SE	%	SE
Pupil gender				
Boys	82.4	1.73	80.4	1.58
Girls	84.9	1.80	79.9	1.93
School location				
Rural	81.9	1.79	76.0	2.12
Urban	87.1	2.88	87.9	1.50
Socioeconomic level				
Low SES (Bottom 25%)	76.5	2.57	76.2	2.32
High SES (Top 25%)	93.4	1.19	91.4	1.31
KENYA	83.6	1.52	80.2	1.56

According to the results presented in **Table 7.12** below, in SACMEQ III a higher percentage of boys had acceptable Reading skills compared to the girls. This was in contrast to SACMEQ II where a higher percentage of girls had acceptable Reading skills. However, a decline was recorded in the percentage of pupils with acceptable Reading skills,

for both genders, from SACMEQ II to SACMEQ III. The percentage of boys with acceptable Reading skills dropped from 82.4 percent in SACMEQ II to 80.4 percent in SACMEQ III while girls dropped from 84.9 percent in SACMEQ II to 79.9 percent in SACMEQ III.

In **Table 7.12**, in both SACMEQ III and II, a greater percentage of urban pupils had acceptable Reading skills compared to their rural counterparts. Whereas the percentage of urban pupils with acceptable Reading skills improved by 0.8 percentage points in SACMEQ III, that of the rural group declined by 5.9 percentage points. As presented in **Table 7.12** in SACMEQ III, a higher percentage of pupils from the high SES had acceptable Reading skills than those with low SES. This trend is replicated in SACMEQ II. However, in SACMEQ III there was a decline in the percentage of pupils with acceptable Reading skills in both low and high SES groups.

7.5 Conclusion

Generally, boys continued to register higher mean scores for Reading and Mathematics compared to the girls. The location of the school also seems to influence achievement in Mathematics and Reading with urban pupils recording a higher mean score in both subject areas. The socio-economic background of pupils tends to influence achievement in Mathematics and Reading as the high SES pupils continued to register higher mean scores in both subjects than their low SES counterparts.

With regard to competence levels, there were higher percentages of girls, pupils from rural areas and those with low SES attaining lower levels of competence in Reading and Mathematics than boys, urban pupils and high SES pupils. For levels 5-8 the trend reversed with higher percentages of boys, urban pupils and high SES pupils attaining these levels.

In terms of provincial analysis, pupils in Nairobi performed very well in comparison to all others. North Eastern province which is an arid area posted good results which were however marred by steep gender differences in favour of boys. Overall Western province had the lowest achievement and also experienced a dramatic decline in pupil achievement compared to SACMEQ II.



CHAPTER 8

8.0 RESULTS OF MULTILEVEL ANALYSIS

8.1 Introduction

This chapter presents a multilevel analysis of the SACMEQ III data. The study was carried out to investigate the pupil-level and school-level variables that influenced pupils' achievement in Reading and Mathematics achievement.

Multilevel analysis was carried out using STATA version 11 (Stata Corp, 2009). In the first step in this analysis, about 70 predictor variables for both Reading and Mathematics which were significant at $p=.05$ were selected using multiple linear regression. Further analysis using the multilevel model was done at two levels, namely pupil and school. Results are presented in the following four sections of this chapter.

8.2 Reading Multilevel Analysis

Reading pupil level

At the pupil level, the results of the analyzed data revealed that: pupils' age, pupil absenteeism in order to care for siblings, pupils' number of siblings and pupil staying with other family negatively impacted their performance. The following is a more detailed analysis of the pupil-level variables found to impact most on Reading achievement.

Table 8.1: Results of Multilevel Analysis of Reading at Pupil Level

Variable name	Coef.	SE	t	P> t
Pupil age (months)	-1.08	0.10	-10.49	0.000
Pupil absenteeism reason – care of siblings	-37.53	6.90	-5.44	0.000
Pupil speaks English at home	37.88	7.59	4.99	0.000
Pupil number of siblings	-2.91	0.58	-5.02	0.000
Pupil staying with another family	-27.99	8.08	-3.46	0.001
Constant	702.22	18.25	38.47	0.000

Pupils who are absent from school perform poorly in Reading. This is likely to negatively affect performance as pupils lose learning opportunities from teachers, exposure to the materials and practice in the skills.

Pupils who speak English at home do well in Reading. This could be attributed to more practice in Reading.

Pupils staying with another family perform poorly in Reading. This could be attributed by a lack of parental love and moral support. Their emotional development is interfered with.

Pupils from families with many siblings perform poorly. This is likely to be as a result of ineffective supervision of school-related activities by parents and guardians.

Pupils who are young perform better in Reading than their older counterparts. This could be caused by repetition or admission of over-age pupils, meaning the older pupils were the ones who had struggled in the past.

Reading at school level

Analysis of the school level revealed that pupils who had repeated at least once, pupils who were helped

with homework at home, and high pupil-teacher ratios negatively affected Reading achievement. This implies that the pupils who are “helped with homework” lack the opportunity to learn since the helper actually does the homework for them.

Table 8.2: Results of Multilevel Analysis of Reading at School Level

Variable name	Coef.	SE	t	P> t
Pupil at least one repetition	-33.52	2.74	-12.22	0.000
Pupil borrow books – school library	5.80	2.85	2.04	0.042
Pupil borrow books – other kind of library	27.60	4.80	5.75	0.000
Pupil sitting places in class	92.30	30.99	2.98	0.003
Homework help at home	-14.24	3.37	-4.23	0.000
School head sex	30.60	3.77	8.37	0.000
School location	38.62	3.19	12.12	0.000
Pupil-teacher ratio	-1.27	0.09	-13.59	0.000
Ratio of girls	-94.70	19.06	-4.97	0.000
Reading teacher years Professional training	7.50	1.63	4.59	0.000
Constant	556.63	34.67	16.06	0.000

On the other hand, encouraging pupils to borrow books from the school library/ other kind of library, adequate sitting places, female school heads, location of the school and Reading teacher years of professional training positively affected performance in Reading. A detailed analysis of the specific variables is given below.

Schools with adequate sitting places performed better in Reading. This implies that the pupils were comfortable and there is a better learning atmosphere.

Schools where pupils borrow books from other libraries such as community and government libraries perform better in Reading. This could be due to increased opportunities for more learning experiences.

Schools with pupils who have repeated at least once had low achievement in Reading. This could be because the pupils who repeat classes are generally low achievers. It is also evident from

existing literature that repetition does not increase test scores.

Schools with pupils who borrow books from their school libraries achieved better in Reading. This could be because of easy access to Reading materials provides more opportunity for practice.

8.3 Mathematics Multilevel Analysis

Mathematics pupil level

The following variables at pupil level: pupil age, pupil sex (female), pupil absent to care for siblings, pupil staying with another family, pupil stay by self, pupil looking after younger relatives negatively affected achievement in Mathematics. A more detailed analysis of Mathematics achievement at pupil level is given below.

Table 8.3: Results of Multilevel analysis of Mathematics Achievement at pupil level

Variable name	Coef.	SE	t	P> t
Pupil age (months)	-0.49	0.10	-5.04	0.000
Pupil sex	-30.09	3.99	-7.55	0.000
Pupil absent to care for siblings	-36.18	6.23	-5.81	0.000
Pupil speaks English at home	32.16	6.85	4.69	0.000
Pupil staying with another family	-19.36	7.34	-2.64	0.008
Pupil stay by self	-29.12	10.49	-2.78	0.006
Pupil look after younger relatives	-14.14	4.02	-3.52	0.000
Pupil socio-economic status	3.66	0.78	4.71	0.000
Pupil uses computer at home	53.35	11.94	4.47	0.000
Constant	602.80	19.64	30.70	0.000

Pupils who use computers at home achieved better in Mathematics. This could be attributed to exposure to mathematical operations through computer exercises. Use of computers seems to enhance computation and numeracy skills.

Pupils who were absent from school to care for their siblings had low achievement in Mathematics. This could be caused by less learning opportunities and a lack of practice in mathematical operations.

Pupils who speak English at home perform better in Mathematics. This could be because the pupils applied English to interpret Mathematics questions properly since the test was in English.

Boys achieved better in Mathematics than girls. This may be attributed to gender stereotypes of girls' performance in sciences and in particular Mathematics.

Pupils who stay alone at home perform poorly in Mathematics. This could be because of lack of proper guidance, moral support, and other learning facilities.

Pupils staying with other families achieved less well in Mathematics. This could be caused by problems in emotional development and lack of moral support.

Pupils who look after their younger relatives had lower achievement in Mathematics. This could be because they are overburdened by household chores and have less time for Mathematics.

Pupils staying with siblings achieved better in

Mathematics. This could have been caused by peer teaching between the pupils and their siblings especially if the siblings were older and in higher grades.

Pupils who come from families with higher SES perform better in Mathematics. This could be because of positive social interaction and the availability of learning resources. The Government should come up with policies for dealing with people from low SES backgrounds.

Younger pupils perform better in Mathematics compared to their older counterparts. Poor performance in Mathematics among the older people could be attributed to the demoralizing effects of repetition.

Mathematics school level

School building condition: Pupils in schools with dilapidated buildings performed less well in Mathematics. This may be attributed to a lack of adequate support from the government or the school community in terms of funding. Similarly, poor management could lead to these poor conditions of the school buildings.

Table 8.4: Results of Multilevel analysis of Mathematics Achievement at School level

Variable name	Coef.	SE	t	P> t
School building condition	-22.67	-8.18	-28.10	0.000
Pupil repeat class	-28.09	-10.24	-33.47	0.000
Pupil borrow book from school library	16.12	5.71	10.59	0.000
Constant	582.57	218.81	577.35	0.000

Class repetition: Repetition was shown to negatively affect pupil performance in Mathematics.

Schools that encouraged pupils to borrow books from school library: Encouraging pupils to borrow books from the school library improved performance in Mathematics. This may be due to greater exposure to Mathematics or increased reading competence which improved pupils' ability to understand Mathematics questions.

8.4 Implications

The implications for policy and practice that emerge from these analyses are clear. For factors reported at the between-pupil, within-school level, advances can be made in pupil achievement by making changes in the learning conditions for some pupils within a school. Likewise, there are several variables where differences between schools might change in ways that would noticeably improve the average performance of the schools. The implications of this study are many, some of which are new whereas others have already been stated in previous SACMEQ reports.

Based on the findings reported in this chapter, the following policy suggestions can be made.

Policy Suggestion 8.1:

Education stakeholders should continue their efforts to eliminate absenteeism and class repetition.

Policy Suggestion 8.2:

Caregivers should encourage children to speak English both at home and at school because it is the medium of instruction at grade 6.

Policy Suggestion 8.3:

Guardians should be encouraged to provide parental love to the pupils who stay with them. Parents should monitor their children's progress in school.

Policy Suggestion 8.4:

Parents with large families should be encouraged

to pay more attention to each child's academic activities.

Policy Suggestion 8.5:

Parents and head teachers should discourage grade repetition but instead look for alternative ways of assisting low achievers.

Policy Suggestion 8.6:

All pupils should be provided with spacious classrooms with adequate sitting places.

Policy Suggestion 8.7:

a) Pupils should be encouraged to utilise libraries in schools and those found in the community.

b) More community libraries need to be established.

Policy Suggestion 8.8:

E learning strategies should be utilised to supplement traditional methods of teaching and learning Mathematics in primary schools.

Policy Suggestion 8.9:

The Ministry of Education should put more emphasis on gender-sensitivity in the teaching of Mathematics in primary schools.

Policy Suggestion 8.10:

Teachers should encourage girls to have a positive attitude towards Mathematics.

Policy Suggestion 8.11:

More education support for orphans and pupils staying away from their families should be provided.

Policy Suggestion 8.12:

The community and education stakeholders can reduce the burden of pupil care-givers by providing social services to the younger relatives.

Policy Suggestion 8.13:

Families should encourage siblings to assist one another in doing Mathematics problems.

Policy Suggestion 8.14:

The Government and other stakeholders in education should continue with the renovations of school buildings in order to provide suitable learning environments.



CHAPTER 9

9.0 CONCLUSIONS AND AGENDA FOR ACTION

9.1 Impact of SACMEQ Studies in Kenya's Education System

Since 1998, SACMEQ's educational policy research projects have built a reputation for rigour and comprehensiveness. Results have been used in Kenya to make informed decisions on planning the quality of education. SACMEQ I and SACMEQ II research projects led to the publication of policy research documents e.g. "Ministry of Education/SACMEQ I Policy Research Report (2001)" and "The SACMEQ II project in Kenya: A study of the conditions of schooling and the quality of Education in Kenya (2005)". These two documents along with other such publications have had impact on the planning and implementation of reforms that are directed at the improvement of education in Kenya. These documents informed policies that supported the FPE initiative that was inaugurated in 2003. The initiative occasioned an unprecedented increase in pupil populations in both public and private primary schools.

One of the key policies was the Sector Wide Approach Planning whose framework was the Kenya Education Sector Support Programme (KESSP). In the KESSP, government strategy involves working in partnership with communities, parents, other government departments and development partners to improve the school learning environment and accessibility. The government development partners made significant budgetary allocations to improve teaching and learning resources.

In particular, the Ministry constructed and renovated physical facilities and equipment in public learning institutions including those in disadvantaged areas. Between 2003 and 2010 a total of KSh 8.1 billion has been spent in constructing and renovating over 6,700 classrooms in primary schools (MoE Infrastructure Office Records, 2010). There was also significant spending on instructional materials which totaled KSh 6 billion during the same period of time (Republic of Kenya, 2008).

Outcomes of both SACMEQ I and II studies noted that a large proportion of children in primary school were overaged with mean ages being 165.9 and 168.4 months respectively. High repetition rates may be responsible for this state of affairs. For a variety of reasons, over half of the pupils had repeated a class at least once. Overage pupils are likely to leave school prematurely, and it is for this reason that the Ministry of Education decided to put in place Non-Formal Education (NFE) programmes for the provision of alternative education opportunities for those who were unable to take a place in the formal education system.

The Ministry of Education recognized and appreciated the importance of SACMEQ research results in informing policy and to that effect has introduced a budget line under 'Education Quality Monitoring and Evaluation'. The National Assessment Centre (NAC) which is housed in the Kenya National Examinations Council (KNEC) was established to perform this new function of the Ministry. Participating in SACMEQ has additional benefits. Through mentoring and exposure to international standards as provided by IIEP/SACMEQ, the NAC has built an effective capacity to manage its own national assessments.

SACMEQ studies have continued to play a critical role in educational reform by informing policies. The data from the SACMEQ III study will provide a new impetus to this function as it is a first in two ways. Firstly, it is the first study conducted after the introduction of the FPE, and will in comparison with the results of SACMEQ II play an evaluative role for the programme. Secondly, data on HIV and AIDS in schools was collected for the

first time and will provide the first detailed picture of the levels of knowledge, attitudes and practices in Kenyan primary schools concerning this important issue.

9.2 Summary of Findings

Data was collected in 2007 from 4,436 Standard 6 pupils in 193 primary schools in eight provinces in Kenya. The study set out to provide details on the characteristics of pupils, their teachers, head teachers, physical infrastructure and learning environment of schools and levels of knowledge, attitudes and perceptions concerning HIV and AIDS.

The average age is still above that appropriate for Standard 6. This may be attributed partly to admissions of overage pupils following the implementation of free primary education. Attention needs to be paid to boys in Eastern and Rift Valley provinces where their enrolment was seen to decline significantly. Similarly, girls in the North Eastern and Coast provinces had enrolments lower than the national average for female pupils. Another finding is that communities have less involvement in supporting school activities such as paying teachers and construction of school facilities. However, the contribution of the community in the provision of school meals has increased. Though pupil absenteeism and dropout has significantly reduced, the study has also revealed that there are increased cases of pupil and teacher behaviour problems. These include vandalism, classroom disturbances, sexual harassment and drug abuse (alcohol abuse among teachers).

Over time, education infrastructure and facilities have improved. This includes better means of communication, school fencing and classrooms. However there are high regional disparities and some areas still lack electricity connection, head teachers' offices and pupil toilets.

There are serious gender and regional differences in HIV and AIDS knowledge among pupils. Except in Nairobi and Western provinces, boys scored higher than girls in the HAKT. Similarly, pupils from rural and also lower SES backgrounds scored less than their urban and higher SES peers, respectively. Though pupils preferred the mass media as a source of knowledge on HIV/AIDS, they still valued classroom

lessons for the same purpose. Other alarming findings were that a sizeable proportion of pupils held negative attitudes towards those infected with HIV and AIDS, and that many teachers and school heads had never taken a HIV test.

In general, there was a slight decline in national scores in both Reading and Mathematics. The decline was marked in Western province. Though Nairobi's scores stagnated, they remained the highest in the country. Boys, pupils from urban and higher SES backgrounds dominated attainment at higher competency levels in both Reading and Mathematics.

From these findings, a total of 61 policy suggestions were formulated. They are presented in this chapter and are thematically arranged and are also targeted at specific stakeholders in the education sector.

9.3 Improving the Quality of Primary Education in Kenya: Some Policy Suggestions

The main goal of this study was to identify the successes of the basic education system and to point out areas that need improvement. The report identified thematic areas where action is required so as to improve the quality of education. These areas are outlined as follows;

a) Parental and community involvement for quality education: The home background of the pupil is critical to success in school. These suggestions are therefore directed at parents, caregivers and other significant family-related institutions.

b) Improving the learning environment: Refers to the interventions that can lead to improved teaching and learning conditions, materials and facilities. It also includes the development and improvement of classroom facilities and school infrastructure.

c) Addressing gender issues: These suggestions are expected to address practices in classrooms, schools and homes that negatively impact on girls and boys. Related to this are further suggestions aimed at improving the gender balance in human resource deployment in schools.

d) Human capacity development: Some of the findings in the study have revealed areas in which

teachers and school heads require additional professional support. This support can be provided through in-service training and education programmes (INSTEP) by the Kenya Education Staff Institute (KESI), teacher training colleges, universities and other capacity development institutions.

e) Mitigating the effects of HIV and AIDS in schools: Though HIV/AIDS pandemic is now in its third decade, there remain a number of deficiencies in HIV and AIDS-related knowledge, attitudes and practises of pupils, teachers and school heads. These suggestions require urgent action by all stakeholders in the education sector.

f) Improving pupil achievement: This list of policy suggestions directly address interventions that directly impact on Reading and Mathematics achievement. These suggestions which mainly refer to classroom, school and regional interventions may be cautiously extended to other subject areas in the primary school curriculum.

g) Further Research: There is need to obtain more details and deeper insights into issues that may not have been adequately addressed in this study. This agenda can be pursued jointly or singly by public research agencies, the civil society and other development partners.

The following policy suggestions are directed at stakeholders that include departments in the Ministry of Education, parents, community organisations, teachers, school heads, school management committees and development partners. The policy suggestions may be implemented with the following timeframes and cost levels:

Table 9.1: Descriptions of time and budget-frames

Time-frame	Interpretation
Short	Under a year
Medium	1 – 2 years
Long	3 – 5 years
Cost	Interpretation
Low	Can be accommodated in existing budget
Moderate	Minimal additional funds allocation
High	Major capital expenditure



Table 9.2: Summary of policy suggestions

Policy suggestion	Relevant implementation organization	Time frame	Cost
a) Parenting and Community Involvement for Quality Education			
Policy Suggestion 3.3: The MoE, in collaboration with the Department of Adult Education, should carry out an evaluation of the adult education programme, especially for mothers, with a view to assessing its effectiveness and impact on pupils' education and learning outcomes.	MoE Adult Education Department	Medium	Moderate
Policy Suggestion 3.4: To support reading and learning, parents/guardians should be encouraged to provide learning materials at home for their children.	Parents	Long	Low
Policy Suggestion 4.9: School administrators should strengthen strategies on the involvement of parents in learning of pupils	SMCs	Long	Low
Policy Suggestion 8.1: Education stakeholders should continue in efforts to eliminate absenteeism and class repetition.	Parents SMCs	Long	Low
Policy Suggestion 8.2: Caregivers should encourage children to speak English both at home and at school.	Parents SMCs	Short	Low
Policy Suggestion 8.3: Guardians should be encouraged to provide parental love to pupils who stay with them. Parents should monitor their children's progress in school.	Parents SMCs	Long	Low
Policy Suggestion 8.4: Parents with large families should be encouraged to pay more attention to each child's academic activities	Parents SMCs Stakeholders	Long	Low
Policy Suggestion 8.5: Parents and school heads should avoid pressuring pupils to repeat a Standard.	Parents SMCs School heads	Long	Low
Policy Suggestion 8.11: More education support for orphans and pupils staying away from their families should be provided by caregivers in the Government and civil societies concerned with the care of these vulnerable children.	Development partners Community Parents	Long	Moderate
Policy Suggestion 8.12: The community and stakeholders can reduce the burden of pupil care-givers by providing social services to younger relatives.	Community Parents	Long	Low
Policy Suggestion 8.13: Family should encourage siblings to assist one another in doing mathematics problems	Parents	Long	Low
b) Improving the Learning Environment			
Policy Suggestion 3.7: The emphasis on access to reading materials should move beyond the provision and maintenance of textbooks to pupils having the reading materials in their hands and using them. There should be a clear monitoring and evaluation process to determine the utilization of resources.	MoE SMCs	Long	Low
Policy Suggestion 3.8: The Ministry of Education and other stakeholders in education should strengthen the monitoring of FPE funds in the acquisition of stationery for learners.	MoE SMCs	Long	Moderate
Policy Suggestion 4.1: The Government should provide interventions based on age profiles in the respective regions.	MoE	Long	Low
Policy Suggestion 4.3: The Government and stakeholders should construct affordable housing and amenities in marginalized and rural areas.	MoE	Long	High
Policy Suggestions 4.10: The government should ensure an equitable provision and development of teaching aids in all provinces.	MoE	Short	Low
Policy Suggestion 5.3: There is a need for schools to prioritize infrastructural development focusing on curriculum implementation needs.	MoE Development partners	Medium	High

Policy suggestion	Relevant implementation organization	Time frame	Cost
Policy Suggestion 5.7: Education stakeholders should take urgent measures to construct good quality toilets especially in marginalized areas.	MoE Development partners	Medium	High
Policy Suggestion 5.11: The MoE should set up mechanisms to help schools in managing behavioural problems especially those of a delinquent nature among pupils.	MoE	Short	Low
Policy Suggestion 5.12: As a matter of urgency, sex offenders among pupils need to be identified and isolated for corrective action.	MoE	Short	Low
Policy Suggestion 5.15: The TSC should enhance efforts in preventing sexual offences committed by teachers in primary schools.	MoE TSC	Short	Low
Policy Suggestion 8.6: All pupils should be provided with spacious classrooms with adequate sitting places	MoE Development partners	Long	High
Policy Suggestion 8.14: The Government and other stakeholders in education should continue with the renovations of school buildings in order to provide a suitable learning environment.	MoE Development partners	Long	High
c) Addressing Gender Issues			
Policy Suggestion 3.2: There is a need for action by all stakeholders to address gender disparities in enrolment particularly in the North Eastern province and other marginalized regions.	MoE Other stakeholders	Long	Low
Policy Suggestion 4.2: The Government should provide incentives for female Reading and Mathematics teachers in North Eastern province.	TSC	Long	High
Policy Suggestion 5.1: There is a need for affirmative action on the appointment of female head teachers especially in marginalized regions.	TSC	Medium	Low
Policy Suggestion 7.3: More needs to be done to improve the performance of girls in Mathematics.	MoE Other stakeholders	Long	Low
Policy Suggestion 8.9: The MoE should put more emphasis on gender-sensitivity in the teaching of Mathematics in primary schools.	MoE	Long	Low
Policy Suggestion 8.10: Teachers should encourage girls to have a positive attitude towards Mathematics.	Teachers	Long	Low
d) Human Capacity Development			
Policy Suggestion 4.4: the Government should develop a profession development policy for teachers in line with vision 2030.	TSC	Short	Low
Policy Suggestion 4.5: There is a need for regular needs assessments to determine the areas that Reading and other subject teachers require in-service training.	TSC KESI	Long	Moderate
Policy Suggestion 4.6: The current policy of a minimum 40 teaching periods per week is not realistic and the TSC should consider revising it downwards.	TSC	Short	Low
Policy Suggestion 4.7: The MoE should sensitize/ train teachers on effective time management. Teachers training institutions should incorporate good practice into training programmes.	MoE TTCs	Short	Low
Policy Suggestions 4.11: The government should establish functional educational resource centres in all provinces. There is also a need to encourage all teachers to visit and use the resource centres. There is a need for in-service training on the importance of ERC and how they can impact on quality education.	MoE	Medium	High
Policy Suggestion 5.2: The Ministry of Education in collaboration with the TSC should base the appointment of school heads on relevant qualifications.	MoE	Short	Low

Policy suggestion	Relevant implementation organization	Time frame	Cost
Policy Suggestion 5.8: Head teachers especially in Nairobi province should be required to prioritize teaching as a core duty.	MoE DQAS TSC	Short	Low
Policy Suggestion 5.13: There is a need for TSC to put solid structures in place to manage teachers' behavioural problems such as guidance and counselling, psycho-social support and referrals.	MoE DQAS TSC	Short	Low
Policy Suggestion 5.14: Urgent intervention measures need to be put in place to deal with rising cases of alcohol and drug abuse among teachers.	MoE TSC NACADA	Medium	Moderate
e) Mitigating the Effects of HIV and AIDS in Schools			
Policy Suggestion 6.1: More needs to be done especially in Western province to increase the level of awareness of HIV and AIDS among pupils.	MoE MoH Development partners	Medium	Moderate
Policy Suggestion 6.2: There is a need for the development of an HIV and AIDS voluntary testing strategy for school aged children.	MoE MoH Development partners	Medium	Moderate
Policy Suggestion 6.3: There is a need to enhance the role of media as a source of information on HIV and AIDS.	MoE KIE	Medium	Moderate
Policy Suggestion 6.4: There is a need to establish structures and mechanisms to monitor the quality of teaching and learning of HIV and AIDS.	MoE KIE	Medium	Moderate
Policy Suggestion 6.5: There is a need to strengthen classroom lessons about HIV and AIDS with audiovisual materials.	MoE KIE	Medium	Moderate
Policy Suggestion 6.6: There is an urgent need to improve the attitude of pupils towards others who are infected with HIV and AIDS.	MoE KIE	Medium	Moderate
Policy Suggestion 6.7: Publicity on HIV Testing Centres should be enhanced	MoE MoH	Short	Low
Policy Suggestion 6.9: Teachers should be provided with more interactive information about HIV and AIDS.	KIE	Medium	Moderate
Policy Suggestion 6.10: There is a need to intensify the provision of in-service courses on HIV and AIDS for school head teachers in all the provinces.	KIE KESI	Medium	Moderate
Policy Suggestion 6.11: School heads should be encouraged to take HIV and AIDS tests as role models for teachers and pupils.	MoE MoH	Short	Low
Policy Suggestion 6.12: There is a need for a clear policy with regards the rights and privileges of a teacher suffering from AIDS.	TSC MoH KNUT	Short	Low
Policy Suggestion 6.13: More should be done as regards the training of HIV and AIDS for teachers especially concerning testing and mitigating risky behaviours	KESI MoH	Short	Moderate
f) Improving Pupil Achievement			
Policy Suggestion 3.5: There is a need for additional policies and interventions pertaining to pupil health as a means of increasing access to education.	MoH MoH	Short	Moderate
Policy Suggestion 4.8: a) The MoE should come up with clear guide line on pupil assessment, b) There is a need to rationalise and monitor the time spent on assessments.	MoE KNEC/NAC	Short	Low
Policy Suggestion 7.1: Urgent interventions by all education stakeholders need to be taken to improve Reading and Mathematics achievement in primary schools. Special attention should be paid to Western province	MoE Stakeholders in Western Province	Short	Moderate
Policy Suggestions 7.2: Teachers and educators need to focus on helping pupils attain higher Reading and Mathematics competencies using appropriate teaching methods and facilities.	MoE TTCs CEMASTE	Medium	Moderate

Policy suggestion	Relevant implementation organization	Time frame	Cost
Policy Suggestion 8.5: Parents and school heads should avoid pressuring pupils to repeat a Standard.	Parents SMCs School heads	Short	Low
Policy Suggestion 8.7: a) Pupils should be encouraged to utilise libraries in schools and those found in the community b) more community libraries need to be established .	SMCs School heads Development partners	Medium	Moderate
Policy Suggestion 8.8: E learning strategies should be utilised to supplement traditional methods of teaching and learning Mathematics in primary schools	MoE	Long	High
g) Further Research			
Policy Suggestion 3.1: There is a need for the MoE and other stakeholders to carry out independent and focused action research on incidences of overage pupil enrolment, and formulate appropriate interventions to mitigate the situation.	MoE KNEC/NAC	Medium	Moderate
Policy Suggestion 3.6: There is a need to involve stakeholders to both engage in research and discussions about the way forward with regard to repetition in educational practice.	MoE KNEC/NAC	Medium	Moderate
Policy Suggestion 3.10: There is a need for further research on incidences and levels of extra tuition in public and private schools with a view of formulating policy.	MoE KNEC/NAC	Medium	Moderate
Policy Suggestion 5.9: There is a need for studies on the effectiveness of school assessments.	MoE KNEC/NAC	Medium	Moderate
Policy Suggestion 5.10: The MoE should set up structures to facilitate, monitor and evaluate the nature and quality of community participation in schools.	MoE KNEC/NAC	Medium	Moderate
Policy Suggestion 6.8: Stakeholders in education should undertake further research on factors associated with the personal HIV and AIDS risk assessments of teachers and school heads	TSC KNEC/NAC	Medium	Moderate

NOTE:

The implementing agencies whose abbreviations appear in the recommendations are listed as follows;

MoE	–	Ministry of Education
MoH	–	Ministry of Health
KIE	–	Kenya Institute of Education
KESI	–	Kenya Education Staff Institute
KNEC/NAC	–	Kenya National Examinations Council/ National Assessment Centre
SMC	–	School Management Committee
TTC	–	Primary teacher training college
CEMASTEAM	–	Centre for Mathematics, Science and Technology

9.4 Conclusions

The study has shown that efforts to improve educational quality need to seriously consider the pupil's home background. In particular, eleven of the policy suggestions are directed at parents and the community in which the pupil resides. Most of these suggestions are similar to those made in SACMEQ II, and indicated that little progress has been made. The implementation of the FPE in the intervening period may have sent the wrong signal to parents who may have thought that education, especially in publicly-funded schools, is the sole responsibility of the Government. The policy suggestions in this thematic area require more forceful advocacy and close follow-ups in implementation.

The study has also shown that there was an improvement in human resource in Kenyan schools. There was an improved gender balance among school heads. Nevertheless there is a need to continue with in-service training, providing teachers with more learning materials, including learning

resource centres. The rapid expansion of schools and enrolments witnessed in the last decade may unfortunately come with increased behaviour problems among pupils and teachers. To this end there is need to deal with the teachers' problems, especially alcohol abuse while at the same time equipping them to deal with pupils' problems.

While the Government has done a lot to improve school infrastructure, there are areas that require urgent attention e.g. pupils' toilets, teachers' housing and classrooms, especially in marginalized areas. Given that a link was found between computer use and improved achievement, schools should be further encouraged to setup ICT facilities for teaching and learning.

The HIV and AIDS pandemic has had a huge negative impact on education in Kenya. One of the responses by the Ministry of Education was the incorporation of HIV and AIDS education into the curriculum. This study presented the first evaluation of such programmes and thirteen policy suggestions were formulated. These suggestions include scaling up classroom lessons using audio-visual sources of information and counselling to reduce negative attitudes towards those infected. Teachers and school heads require more in-service training and increased opportunities to get tested for HIV.

The SACMEQ III report should spur further research in areas that were either not adequately addressed in the investigation or those that raised additional questions that need probing. Areas that were mentioned for this type of follow up investigation include class repetitions, incidences of over-age enrolment, the practice of extra tuition and the participation of the community in schools. Hopefully these studies will shed more light on the pertinent issues and lead to further policy suggestions.

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