

**THE RELATIONSHIP BETWEEN SELECTED EDUCATIONAL INPUTS AND
STUDENTS' ACADEMIC PERFORMANCE IN SECONDARY SCHOOLS IN
BUNGOMA DISTRICT-KENYA**

BY

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DECLARATION AND RECOMMENDATION

DECLARATION

This project is my own original work and has not been previously presented for award of a degree in any University.

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RECOMMENDATION

This project has been submitted for examination with my approval as a University supervisor.

Signed  Date 16/09/08

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2009/79082

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DEDICATION

To my wife, Joan Masinde and children Sylvia, Peter, Emmanuel and Winie: they endured hard times and stood with me while I laboured on this work.

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ABSTRACT

Education is a key determinant of development in any given nation. A well trained labour force fosters technological advancements and new methods of production, both of which are critical ingredients of sustained economic development. Such labour force can only be developed through provision of quality education. In Kenya, the Government and individuals expend huge resources towards provision of education inputs in schools. But education quality as measured by students' academic performance in national examinations has remained poor over the years. For instance, of the 71 Districts that presented candidates for KCSE in Kenya, none attained above the average index of 6.5 out of the highest possible index of 12.0 in the year 2005. The relationship between available Educational inputs and students' academic performance is not clear among schools in Bungoma District. The purpose of this study was to investigate the relationship between selected Educational inputs and students' academic performance in Bungoma District. Descriptive Survey research design was used. The population entailed 129 secondary schools spread in ten Divisions in the District. Bumula and Kanduyi Divisions of the District were purposively selected for the study because they were associated with poorer performance in national examinations. There were 32 schools in the two Divisions of which 20 were selected for use in the study. All Provincial Schools were selected purposively while District Schools were drawn using proportionate random sampling. Headteachers of sampled schools were respondents. The Questionnaire and Interview Schedule used to collect data were developed by the researcher and validated through review by three lecturers in the Faculty of Education, Egerton University. K-R 20 was used to estimate reliability. Calculation showed that reliability indices for the instruments were 0.83 and 0.76 respectively. Data was analysed using Pearson's correlation. All statistical tests were done at $\alpha = 0.05$. Research findings showed a significant relationship existed between some selected education inputs and students' academic performance. This study may be used by the Government, school administrators and parents to guide policy so that Educational inputs with the greatest impact on performance are given due priority in decisions that relate to provisions for schools.

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LIST OF ABBREVIATIONS AND ACRONYMS

- DAC: Document Analysis Checklist.
- DDC: District Development Committee
- DDP: District Development Plan
- DEB: District Education Board
- DEO: District Education Office
- EFA: Education For All
- EPF: Education Production Function
- GER: Gross Enrolment Ratio
- IS: Headteachers' Interview Schedule
- HQ: Headteachers' Questionnaire
- KCPE: Kenya Certificate of Primary Education
- KCSE: Kenya Certificate of Secondary Education
- KNEC: The Kenya National Examinations Council
- Ksh: Kenya Shillings
- PTA: Parents Teachers Association
- TSC: Teachers Service Commission
- UNESCO: United Nations Education Scientific and Cultural Organization

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Education is considered one of the measures of quality of life and a means for improving that life (Republic of Kenya, 1992; Masolo, 2000). In delineating the link between education and economic development, proponents of the human capital theory defined human capital as that productive capacity embodied in human persons, which include skills, abilities, and ideas that result from investment in education (Todaro, 1992). Education can improve the quality of labour there by increase production (Todaro, 1992). This assertion is made on the basis that the behaviour of people responsible for accumulation of productive factors and knowledge can be modified by policy through education (UNDP, 1996). Education allows the whole production process to benefit from positive externalities. Since educated people use capital more efficiently, and are more likely to innovate, they spread these positive attributes to their co-workers who learn from them and also become more productive (UNDP, 1996).

World Bank (2000) survey of development indicators revealed that of the world's 1.2 billion people living in absolute poverty, 813 million (68%) live in Africa and South Asia. The population living below the poverty line in these regions is 46% and 40% respectively. Watkins (1999) projected that over 75 million children from these regions will still be out of school by the year 2015, and two thirds of them will be living in Sub-Saharan Africa. This indicates that resources required for educational investment are scarce and people's capacity to provide for educational inputs is highly compromised. Fuller (1990) observed that inadequate educational inputs undermine quality of education output. Any improvement in peoples' status via education could have a critical impact on breaking the vicious cycle of poverty which is associated with inadequate schooling.

The bleak scenario on the education front has created circumstances causing most countries of Africa, Asia, and Latin America to lag behind in exploiting to the fullest the resources (human and material), which they have been naturally endowed (Nwana, 1996). He argues that this is related to their status as exporters of raw materials to the factories in Europe,

Japan and North America, and their position as consumers of finished products. Chapman & Carrier (1990) seem to acknowledge that lack of education perpetuates poverty when they report that many donors are admitting that many of their development assistance programmes in sectors such as agriculture, health and population are thwarted where a critical mass of the population is without basic skills of literacy, numeracy and reasoning.

Over the years, boys have been favoured in provision of education in Kenya (Abagi & Odipo 1997). However, Nation Correspondent (2007) reported that the number of girls taking KCSE examinations has continued to increase in some provinces, which is a positive development. Studies by World Bank (2000) have revealed that increasing women's education increases their productivity not only on the farm but also in industries. This comes about because there is greater labour participation by women through late marriage, lower fertility and greatly improved child health and nutrition. Improved child health and nutrition due to educated mothers has a multiplier effect on the quality of a nation's human resource for many generations to come (Harbison and Hanushek, 1992). When fertility drops due to late marriage, the proportion of people who depend on the working population decline, while the proportion of the elderly rise much slowly. Thus a large pool of workers will be able to support the young and old dependants. This creates an opportunity for increased personal savings, investment, and faster economic growth.

According to Posner (1992) education output is justified by the objectives it serves. He explains that schooling should be conceived as a production system in which individual learning outcomes are the primary product. However, aims advanced for education are diverse; to enumerate the learning outcomes of education about which it might be useful to have empirical information would be an endless task. It is in this view, perhaps, that Greaney & Kellaghan (1996) assert that given the range of educational aims and the complexity and difficulty in measuring outputs, some selection has to be made in deciding what outputs should be measured for use in a performance indicator system. He suggests that more attention should be given to the cognitive output. This is because it is not only difficult to obtain agreement on the value of all schooling outcomes but also difficult to measure some of these outcomes.

Despite the obvious interest by policy makers, politicians and the general public in what education achieves, and despite the substantial investments in inputs that go into its provision, Greaney & Kellaghan (1996) report that few systems in either industrial or developing countries have until recently systematically collected and made available information on the outputs of education. They observe that throughout the world, one hears expressions of dissatisfaction with the levels of performance of "today's students", though there may be little evidence that standards are in fact falling. But even without such evidence, a case can still be made with regard to changes in the world of work that are resulting in a mismatch between Educational outputs and the needs of society. The mismatch relates to students who perform very poorly in an education system and who previously found employment in unskilled work but can no longer find such employment because jobs that require only minimal literacy skills are fast disappearing from the labour market (Townshend, 1996).

Formal education requires that children spend a considerable amount of time in school. But in cases where school attendance provides no learning experience, there is no social, economic or pedagogical justification for investing in education inputs (Windham, 1992). The need for better-educated students has caused decision makers in the industrialised countries like USA, UK, Japan and a few developing countries such as Chile, Colombia, Mauritius, Namibia and Thailand to put in place a monitoring system to gather information needed to describe and monitor the nature of student performance. The proportion of the Education Systems' output relevant to the needs of the labour market and the number of inadequately prepared students leaving the system is also covered (Greaney & Kellaghan, 1996). To them, relevant knowledge and skills acquired in school assume greater significance because of increased global economic competition marked by rapid movement of capital and new technologies from country to country. In such a situation, it is claimed that a country's level of productivity and ability to compete depend greatly on workers' and management's skills in using capital and technology effectively and efficiently (World Bank, 1991). Thus an education system's output of skilled people becomes the only sustainable competitive advantage that a nation can have.

The Koech commission (Republic of Kenya, 1998) explained that the ultimate purpose of secondary education in Kenya is to provide equal opportunities for every individual up to a minimum of twelve years in school. At the end of this level, the individual will be an adult and shall have been exposed to the essential education for self-reliance. Psacharopoulos and Woodhall (1985) observed that students' academic performance is a key indicator of the quality of education output. Posner (1992) also views school success as targeted almost exclusively at achievement tests and scores over a specified period of time. Achievement data gathered over the said period can serve to strengthen the factual basis of decision-making. Since the education system is committed to the principle of equality of opportunity (Republic of Kenya, 2001; 2003a), one would want to monitor the extent to which groups or regions enjoy equal access to and participate in education. Information from national assessments can bring this a step further by providing evidence about the performance of such groups in the education system. This is useful in informing policy, monitoring standards, directing teachers' efforts in raising students' performance, promoting accountability, increasing public awareness and informing political debate.

Assessment data can also foster a sense of realism in the debate on an education system's output on appropriate levels of student achievement. According to Kellaghan & Greaney (1992), unrealistic academic performance standards have probably contributed to the high student failure rates that are a feature of many education systems in developing countries. They argue that such high expectations may be prompted by the desire to maintain the traditional colonial education standards. However, such a target may be almost impossible to attain given the low level of socio-economic development of some countries.

Though it is argued that quality education is not merely passing examinations (Republic of Kenya, 1998), performance grades are the most widely used indicator of education quality in Kenya. The Kenya National Examinations Council (KNEC) was established to conduct School and Post School Examinations and award certificates to successful candidates (KNEC, 2006). The council reports areas of the syllabus that were not adequately covered as evidenced by the poor performance of candidates in those areas (KNEC, 2006). According to the report, ranking of schools in KCSE is worked out by considering all the candidates' mean

grades and marks to obtain a school mean grade and performance index based on a twelve-point numeric grading system. The lowest grade, E, corresponds to an index of 1.00, while the highest grade, A, corresponds to an index of 12.00 which indicates the best performance on the grading scale. The grading procedure has been extended to rank districts based on the performance of schools within the District.

In Kenya, there is evidence that the school system has failed to meet its objectives as revealed by the poor performance in National Examinations (Republic of Kenya, 2003a). In fact, of the seventy-one Districts that presented candidates for examination in the year 2005, none posted an index above 6.50 (Education Watch, May- June, 2006). This is the average index on the KCSE grading scale (KNEC, 2006).

For Bungoma District, the situation was worse given its perceived poverty. It is estimated that 56% of the people in the district live below the poverty line (Republic of Kenya, 2002; 2005a). Due to this state of affairs, the District was identified by the 1994 and 1997 Welfare Monitoring Group as one of the districts contributing substantially to national poverty (Republic of Kenya, 2002). The District Development Plan (Republic of Kenya, 2002) identified high population density coupled with limited resources in the District as the major causes of poverty. Available land is increasingly being fragmented into sub-economic units. The population growth rate for the District is 4.3%, with 72.1% of the population in the age group 0 - 24 years (Republic of Kenya, 2005a). The immediate impact of this is the high dependency ratio that puts the labour force in a precarious position especially given it is largely unskilled (or semi-skilled) and ravaged by HIV/AIDS and other diseases (Republic of Kenya, 2002). Indeed, the District Annual Monitoring and Evaluation Report (Republic of Kenya, 2006) revealed that the progress of Education has been adversely affected because of the increasing number of children who are kept out of school because families cannot afford fees.

Statistics (Republic of Kenya, 2002) indicate that the average years of schooling in the District are 3.5 and 3.0 years for boys and girls respectively in a country with eight years of compulsory attendance at the primary school level. It is further reported that enrolment rate

at the secondary level is a mere 27%, with a huge dropout rate of 28% being recorded. To compound the problem, data from the District Education Office on education progress between the year 2002 and 2005 indicated that of all the students who sat for KCSE, only 28% on average scored above an index of 6.5 (or the lower threshold of grade C+) out of the highest possible index of 12.0.

The question that arises centres on identifying inputs over which some control can be exercised, and which are likely to contribute to improvement in student performance. Greaney and Kellaghan (1996) suggested that data on some of these manipulable inputs may have to be collected along with performance data over time in order to make decisions about an education system's output quality as revealed by students' academic performance. Though it is argued that quality education is not merely passing exams, it is the grades attained in examinations that are used to select students for employment and further training. The anxiety that grips teachers and parents at the time the National Examination results are announced points to the importance that they attach to examination grades (Galabawa, 2003). He observes further that the schools' examination ranking feeds the perception that those at the top offer better quality education; therefore schools and institutions compete with a sense of pride on finding that they perform better than their rivals.

The secondary education sector in Kenya has problems linked to education inputs (Republic of Kenya, 1998; 1999; 2003a). Lockheed and Verspoor (1991) observe that ineffective education inputs are "blind alleys of investment". Choosing effective inputs would be the first step towards improving an education system's output on the quality of learning achievement. Some inputs that are thought to contribute to improved academic performance include facilities, students' entry scores, unit cost, teachers, and textbooks (Hallack, 1972; Fuller, 1986; Psacharopoulos & Woodhall, 1985; Haneveld & Craig, 1996). These inputs were identified for examination of their contribution to education output in Bungoma District.

Facilities considered included libraries, laboratories and classrooms: they provide the setting in which individual teachers work with students to attain desirable education output. Students

and their entry qualifications (KCPE marks) is an indicator of skills and abilities acquired before joining secondary school education, and reflect a students' potential for future educational attainment (Posner, 1992). Unit cost is the input that enables schools to procure and sustain other requisite inputs during the education production process. Teachers are an input that directs learning towards what is assessed for certification (Greaney & Kellaghan, 1996). Textbooks on the other hand facilitate the learning process that ultimately leads to improved quality of education output. Haneveld & Craig (1996) observe that the impact on performance is better where teachers have books that describe what to teach, how to teach and how to evaluate students.

According to Ngware, Wamukuru & Odebero (2006), schools require adequate educational inputs such as physical facilities, and teaching/learning materials since they all have a direct bearing on the quality of education output. In addition, Ross & Mahlch (1990) argued that when the environment in which students work is improved by the school system through provision of teaching aids, detectable gains in knowledge, skills and values acquired would be realised. The contribution of some of the inputs to education output needs to be understood in order to improve secondary school education especially in Bungoma District.

1.2 Statement of the Problem

The World Bank points out that the adequacy of education inputs has a direct bearing on an education systems' quality output as measured by students' academic performance. In Kenya, government documents reveal that secondary school education has been characterised by poor performance in national examinations. Often, parents are anxious about examination results because further training and employment for their children is tied to good performance which is not forthcoming at this level. The inputs that are a subject of this study include facilities, students' entry score, unit cost, teachers and textbooks. The relationship between these inputs and students' academic performance has not been understood among schools in Kenya, and more so Bungoma District. This study attempted to establish this relationship.

1.3 Purpose of the Study

The purpose of this study was to examine the relationship between selected educational inputs and students' academic performance in secondary schools in Bungoma District.

1.4 Objectives of the Study

The objectives of the study were:

1. To find out how facilities relate to students' academic performance in secondary schools in Bungoma District.
2. To establish the relationship between students' entry score and students' academic performance in secondary schools in Bungoma District.
3. To determine the relationship between unit cost and students' academic performance in secondary schools in Bungoma District.
4. To investigate how student/teacher ratio relates to students' academic performance in secondary schools in Bungoma District.
5. To find out how student/textbook ratio relates to students' academic performance in secondary schools in Bungoma District.

1.5 Research Questions

The study sought solutions to the following questions:

1. How do facilities relate to students' academic performance in secondary schools in Bungoma District?
2. What is the relationship between students' entry score and students' academic performance in secondary schools in Bungoma District?
3. What is the relationship between unit cost and students' academic performance in secondary schools in Bungoma District?
4. How does student/teacher ratio relate to students' academic performance in secondary schools in Bungoma District?
5. How does student/textbook ratio relate to students' academic performance in secondary schools in Bungoma District?

1.6 Significance of the Study

This study was expected to provide information that may be used to guide Government policy on education inputs based on research evidence and which may help maximise the use of available inputs. Such information may help to lower the cost of schooling and improve academic performance in secondary schools. The findings of this study are also likely to provide donors and other interest groups with information and data required for planned intervention in programs involving education inputs. To school administrators, this study may offer suggestions on priority education inputs that need to be given attention in schools to improve students' academic performance. Identification of key inputs that are critical to students' performance is expected to help schools scale down on non-core inputs and reduce overall expenditure. Parents who shoulder the burden of funding school programmes may also get better returns in terms of improved performance for their children arising from the implementation of recommendations made in this research about education inputs for schools.

1.7 Assumptions of the Study

This study was carried out on the basis of the following assumptions:

1. Transfer of students into the school, cancelled transfer of students out of school such that transfers in and out of school had no significant effect on students' unit cost.
2. The internal school environment was supportive to student learning in all the sampled schools so that all schools with equal measure enforced curriculum implementation and evaluation.
3. Students in each school paid fee in equal proportions so that a uniform expenditure on each of them arising from the fees they paid was possible.

1.8 Limitation of the Study

Proper record keeping was a problem in a number of schools. Information given based on such poorly kept records may not reflect the true position of things in schools.

1.9 Definition of Terms

The following terms in this study have meaning as defined below:

Academic Performance: For this study, Academic Performance was used to mean grades and indices used to assess students' academic achievement in national examinations. For the purpose of this study, the standard for good performance was attainment of the average index of 6.50 (grade C+) in KCSE.

Community: For this study, Community used to refer to groupings based on shared educational concerns. Examples are PTAs, Church organizations and racial or ethnic groups concerned with the education of their members.

Educational Output: For this study, Education Output was used to refer to the proportion of students who attained an index of 6.5 or grade C+ and above in KCSE.

Enrolment: For this study, Enrolment was used to refer to the number of students admitted to a given school in a given year for the purpose of academic instruction.

Facilities: For this study, Facilities was used to refer to buildings used in schools to facilitate the learning process. Room areas were measured against students using the facility to determine student/space ratio (space utilization factor).

Educational Inputs: For this study, Educational Inputs was used to refer to facilities, students' entry qualification, unit cost, teachers, and textbooks. To measure the degree of use of inputs, their quantity or capacity was established against the number of students available to use the specific input.

Poor: For this study, Poor was used to refer to members of the community who are unable to access or afford basic human needs like food, shelter, health, education and sanitation (Republic of Kenya, 2002). Poverty is characterised by low income and high dependency ratio.

Unit Cost: For this study, Unit Cost was used to refer to the cost of maintaining a student in school for one academic year. Unit cost was determined by dividing total school expenditure by the number of students enrolled in school in the given year.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter examined related literature under the following headings: Purpose of Secondary School Education, Performance of Secondary Education, Financing Secondary Education, Facilities and Secondary School Education, Secondary Education and Unit Cost, Students' Entry Qualification, Textbooks and Teachers in Secondary Education, Effect of Environment on Students' Academic Performance, and finally, Theoretical Framework and Conceptual Framework.

2.2. Secondary School Education

Secondary school education is considered a level of education at which learners are expected to acquire proficiency in both academic and some applied subjects (Republic of Kenya, 1998). Students are expected to take the first recognized National Examination that will usher them into higher education, various fields of training in their chosen career, or direct entry into the world of work. The ultimate purpose of secondary school education therefore, is to fulfil the objective of exposing every individual to a minimum twelve years of essential education for future life choices after school.

But participation in the school system alone may not guarantee acquisition of essential education for self-reliance. Lockheed (1996) reported that the World Conference on Education for All adopted article 4 of the world declaration on Education for All in recognition that the provision of education is only meaningful if students actually acquire useful knowledge, reasoning ability, and skills and values. It was emphasised in that document that the focus of education must be on "actual learning" rather than exclusively involvement and continued participation in organised programmes. Lockheed & Murphy (1996) argue that students can demonstrate acquisition of essential education through performance tests since they focus on skills, knowledge and capacities that students acquire through education. Besides, tests can be used to hold regions, schools and other administrative units accountable for student achievement of the objectives of education based on the assessment of academic performance.

2.3 Student Performance in Secondary School Education

All Developed and Developing Nations believe that Education is the best instrument for optimal development in the least time (Nwana, 1996). It is the rationale for the huge financial investments in education that countries have made and will continue to make. Decision making in education must be based on sound empirical information if countries are to achieve maximum benefit from these investments. Lockheed (1996) observes that economists now recognise the importance of monitoring student learning (the key education output), and educational inputs. He argues that a comparison of the physical, human and operational educational resources available can enable an assessment of the relative quality of education made available to students.

Tests are the most common measures of student achievement, and are majorly used to monitor the learning progress. According to Lockheed (1996), tests focus on skills, knowledge and capacities that students acquire through education. He argues that the purpose of testing is to hold schools, regions and administrative units accountable for student achievement. Thus to him, the questions that need to be answered are: How much are students learning? Are they learning more today than they were learning five years ago?

Whereas public examinations are an important aspect of education in Africa, Asia, Europe and the Caribbean, Kellaghan (1996) reports that education authorities often routinely collect information on the operation of their education systems that relate to students enrolled, student teacher ratio, and progression and retention of students in schools. However, obtaining data on education outputs is uncommon.

In Developing Countries faced with many people who had no access to schooling of any kind, quantitative concerns related to the number of pupils, teachers, classrooms and textbooks outweighed concerns about quality. However Lockheed & Murphy (1996) observe that throughout the Developing World, policy makers and educators are considering numerous strategies for enhancing the quality of education. Making the correct choice is easier when information on the education system's performance is available. Knowledge of

such information provides a basis for policy decisions regarding goals of education and effective allocation of scarce resources.

World Bank (1995) views Education as important in enabling Nations meet their economy's growing demand for adaptable manpower that can readily acquire new skills, and in supporting continued expansion of knowledge. According to the Government of Kenya, (Republic of Kenya, 2003) the quality of education at any level is measured by its ability to equip learners with skills to live and operate as useful members of society, as well as preparing them for lifelong learning. Kallaghan (1996) seems to concur with these views when he asserts that performance in public examinations is an appropriate measure for assessing the output of schools on skills acquired. Providing public examinations in many subjects enables information on achievement in a wider range of skills to be obtained. He notes that since examinations are geared towards school curricular, students, teachers and the general public regard them as important. Schools are therefore under strong pressure to teach the subject matter and skills that are examined. The concentration on test scores as measures of achievement is backed by research findings that showed that these measures are related to subsequent performance of labour (Harbison and Hanushek, 1992); they are reasonable proxies for economically pertinent skills

Since the advent of the 8-4-4 education system in Kenya in 1984, the curriculum was expected to be practical oriented to meet the goals of equipping learners with basic social and economic skills. But the practical aspect of the curriculum has not been fully utilized, largely due to the relatively high implementation costs (Republic of Kenya, 2003a). This raises plausible questions: Are teaching/learning materials acutely inadequate in schools? Is the cost factor so grave that it undermines the quality of education offered? And how do education inputs procured in schools contribute to the attainment of education goals? This gives rise to the need to establish how available education inputs relate to students' academic performance in secondary schools. There is little information on the degree to which each of the selected inputs contributes to students' academic performance in Bungoma district.

2.4 Financing Secondary School Education

Studies reveal that financing education takes different forms and is not only concerned with monetary inputs to education. According to Bray (1996) communities and governments contribute materials, labour, expertise and land. Since these inputs would have had to be purchased if they were not provided, they are considered substitutes for cash. He views the scale of community financing as an indicator of the demand for education in the specific locations.

Cumming et al (1995) observed that Uganda relied on parents and broader communities to bridge the gap when the national education system collapsed in the 1970s up to 1980s. World Bank studies show that China, El Salvador, Malaysia and Indonesia have had community financing arising from demand for alternative forms of education that relate to cultural and religious needs of groups. On the other hand, for countries such as Chad, Nepal, Mali and Myanmar government resources are inadequate even for providing teachers, and communities have to employ their own (Bray, 1996).

Mechanisms for mobilising community financing depends on how schools are operated and the purpose of the financial need. Bray (1996) reported that in Cameroon, Parents and Teachers' Associations are responsible for raising funds and providing facilities. Among the Igbo of Nigeria, "launching ceremonies" for funds raising are done with sanctions such as fines to ensure compulsory attendance. In Botswana, households and individuals are levied at rates determined by elders, while in parts of Tanzania, co-operative unions generate funds by levying each kilo of coffee sold through the co-operatives.

Similar systems exist in parts of Asia (Dandekke, 1996) as cited in Bray (1996). In Laos Peoples' Republic for instance, chairmen of Village Community Associations usually oversee construction of rural schools where levies are imposed with allowances for substitution of labour. Recurrent needs of community schools in Singapore are raised through central provident deductions for racial based associations. In India, levies on purchases made at village shops are used to raise funds for local schools. Other mechanisms for raising money for capital works include festivals, cultural and harvest shows and sponsored walks.

Kenya uses a bursary fund to finance the education of poor but academically bright students in secondary schools (Mwai, 2007).

Questions have been raised with regard to financial management in schools. Lockheed and Verspoor (1991) reported that in many Developing Countries, education systems are unable to meet their objectives due to problems associated with costs. Hallack (1972) observed that challenges facing education systems in Developing Countries included high levels of expenditure already reached, and the constant rise in unit cost. A comparative examination of education expenditure in countries of the world is worth considering. In 1997 for instance, public spending on education was 5.3% of GNP in Europe, and 2.9% of GNP in East Asia (World Bank, 2000). Kenya spent over 6.6% of GNP on education over the financial year period 1996/97 - 2001/02 (Republic of Kenya, 2000). However, Europe and Kenya had 108% and 24% of the relevant age group participating in secondary school education respectively. One would infer that countries that spent more on education like Kenya could improve academic performance with the same or less spending by focussing on the most cost effective education inputs. Fuller (1990) reported the case of Malawi where budgetary resources necessary for erecting more classrooms, train more teachers and produce more textbooks have declined. The devastating effect of this decline is that resources are stretched over a rapidly rising number of students, resulting in decline of education quality.

In Kenya, various methods, which were seen as likely to augment resources and define strategies for education financing more closely adapted to social and economic realities have been suggested. A Government commission (Elimu Yetu Coalition, 2003) recommended a cost-sharing framework by which the Government meets salaries of teachers and education administration costs. Parents were to provide tuition fees and textbooks. Communities on the other hand were to be responsible for putting up physical facilities and ensuring their maintenance.

However, the cost sharing framework had one shortcoming: no guidelines were given as to the extend parents and communities were expected to share costs. This left parents at the mercy of school boards, who identify the needs to be financed in all spheres of school

operation and call upon parents to foot the costs. Besides, costs were transferred to parents at a time when they were still struggling to meet the increased education costs brought about by the implementation of a new education system. Given the differential economic endowment of regions and even social groups, there were bound to be disparities in terms of access to quality education since not all groups could marshal resources on equal footing. Bray (1996) reported findings by Munya et al (1995) indicating that many parents feel exploited by school committees, which are considered demanding and unsympathetic on the burdens they impose. Abagi & Olweya (1999) and Elimu Yetu Coalition (2003) seem to concur with these views when they observe that fees typically contribute between 91% and 100% of all financial resources available in schools. Government subsidies on the other hand hardly ever exceed 8% of the schools' total budget. The question that arises centers on focusing more on inputs and measures that can provide the means to reduce the strain parents are subjected to, and lower costs of education while improving academic performance at the same time.

2.5 Facilities and Secondary School Education

Though facilities are taken for granted in the Developed Nations of the world, the problems relating to facilities are endemic in many Developing Countries. Haneveld & Craig (1996) observes that there is growing research evidence that links the availability of classrooms with reasonable sizes, libraries and other infrastructure to good academic performance. The World Bank, which is the largest donor to education, contributed to many capital-intensive investments in school facilities in Africa (The World Bank, 1995). Though The Bank's funds are today used less for buildings and more for other educational inputs, The Bank strongly advocates for projects that support community and household involvement in providing school facilities.

In Kenya communities provide facilities in schools under the cost-sharing framework (Republic of Kenya, 1988; Elimu Yetu Coalition, 2003). This arrangement was thought of as likely to help overcome what Bray (1996) referred to as heightened expectations of what the Government can and should do. According to him, these expectations reinforce a dependent mentality rather than self-reliance. It was expected that under this arrangement, society

would increase participation rates at the secondary school level beyond what the Government alone was able to.

However, the challenge of equity stands out: some communities are in a better position to help themselves than others because they are more endowed. The effect of this arrangement is that the education system is unable to provide opportunities to cope with the growing number of school age children in all regions. It is observed that some children have to contend with poor schools and pressing poverty that can be realistically alleviated by taking advantage of opportunities for immediate employment in the agricultural sector (Harbison & Hanushek, 1992; Abagi & Odipo, 1997; Todaro, 1994).

The high population density coupled with limited resources was identified as the major cause of poverty in Bungoma District. According to the 1999 census, the age group 0-24 years constituted 72.1% of the population in the District. The immediate impact of this is the high dependency ratio that puts the labour force in a precarious position. With absolute poverty standing at 56% (Republic of Kenya, 2005), education progress has been adversely affected because of the increasing number of children who are kept out of school because families cannot afford school fees. Worse, Government interventions have not yielded the desired results. For instance, it was observed that the bursary scheme is abused and has not benefited many deserving children (Aduta, 2007; Elimu Yetu Coalition, 2003). They argue further that there is limited awareness among parents on the existence of bursary due to limited publicity; and the criteria for the award of bursary remain unclear to the general public as a result of which only those who are informed apply. These problems take a toll on school attendance and performance in National Examinations in Bungoma District.

How reasonable can it be to imagine that if more schools were opened up in the District, or those available expanded to provide more school places, many students would enrol and perform well? The expense factor involved in this arrangement would require that we first find out how stretched facilities are in available schools. Of greater significance to the study, is the need to establish the contribution of the available facilities to students' academic performance relative to other education inputs.

2.6 Secondary Education and Unit Cost

Studies have shown that the correlation between annual expenditure per pupil on educational materials and the time required to complete a cycle are significantly negative in Africa (Harbison & Hanushek, 1992). However, Chapman & Carrier (1990) found that overall school expenditure and specific materials input had positive relationship with students' academic performance in Brazil. It is not clear from these arguments if unit cost is central to students' academic performance.

A closer examination of the situation in Kenya, however, reveals that students are forced out of school when they fail to pay fees. Poor payment of school levies has been identified as a threat to students' school attendance (Republic of Kenya, 1998; 1999a; 2003b; Abagi & Olweya, 1999). Absenteeism associated with inability to pay school levies has adversely affected school attendance in Bungoma District (Republic of Kenya, 2006). Its impact on students' academic performance in school is negative and severe. Some scholars have cited the inability of the poor majority to pay for and access education as sufficient reason for the Government to take the full cost of secondary education. However, Lockheed & Verspoor (1991) argues that education should be the responsibility of both parents and the Government for two reasons: on one hand, since reproductive decisions are generally left to parents, the primary responsibility for child rearing and education must remain with them. On the other hand, investment in human capital will not be sufficient if parents bear the full financial burden of educating their children. This is because parents rarely consider the societal benefits that education generates when they calculate costs and benefits of sending their children to school. Besides, society has a legitimate interest in children's education and socialisation, and adequate financial help from the Government is imperative.

The question of unit cost and performance becomes more critical when one considers that a number of schools fail to meet some of their financial obligations despite household contributions. Ngare (2007) reported that headteachers and BOGs had ignored fee guidelines that were intended to streamline sourcing of school funds from parents. The guidelines spelled out the maximum charges for each category of schools and were only to be adjusted with approval from the Ministry of Education. Earlier, The East African Standard (June, 24,

2004: 1) had reported that protests by headteachers had forced the Government to withdraw fee guidelines and instead directed that individual schools determine charges with assistance from local education officers at district level.

Since all materials acquired in schools depend on the financial commitment to schools by the public, and which translates into unit cost, the issue of importance would be the basis on which the levies are charged in these institutions. The current state is one where schools with similar characteristics have huge disparities in the levies they charge. Given the scarcity of resources, levies need to be based on economic considerations and expenditure directed to items critical to students' academic performance. Psacharopoulos & Woodhall (1985) revealed that schools with high achievement scores in Malaysia did not spend more than average; schools with the highest costs on the other hand did not achieve above average results. It is not known how unit cost relates to performance in Kenya and more so Bungoma district.

2.7 Secondary Education and Students' Entry Qualification

Indicators of student progress through school provides a measure of an education systems' success in maintaining the flow of students from one level to another, and thus impart a particular level of knowledge and skills. Harbison & Hanushek (1992) reported that learning achievement is an important determinant of promotion of students in Brazil. They argued that although achievement is usually measured at discreet points in time, past inputs affect students' current levels of achievement. The grades attained reflect the nature of past inputs and indicate prospects for future performance. (Galde & Gouzales 1980) agree with these findings when they report that students in Nicaragua are promoted on the basis of learning achievement at the lower levels. According to Chapman & Carrier (1990), causes of students' failure to meet entry qualifications are numerous. They include:

1. Family related factors such as low educational attainment by parents.
2. Student characteristics such as low regard for future utility of education, poor motivation and low academic ability.
3. School related factors such as physical remoteness, poor classroom environment and school effectiveness.

Though Psacharopoulos & Woodhall (1985) observe that few researches have been done on how students' entry qualifications compares with scores at the terminal grade, statistics from Bungoma District Education Office indicate that students are selected to join secondary schools on the basis of their performance in KCPE. The desire to see students admitted on the basis of their KCPE performance is the reason Ministry of Education officials supervise the selection of students who join secondary schools at the start of each academic year. Though the marks with which students are admitted in secondary schools vary depending on the District's overall performance and availability of space in the schools, 250 is considered as the pass mark for KCPE. This study shall attempt to find out the relationship between academic performance in KCSE and KCPE entry qualifications in secondary schools in Bungoma District.

2.8 Textbooks and Teachers in Secondary Education

A number of researches have been done on the role of teachers and textbooks in the learning process. Evidence that textbooks have a significant impact on student learning is considerable. According to Haneveld & Craig (1996), the impact is even better where there are supplementary reading materials, and where teachers have guidebooks that describe what to teach, how to teach and how to evaluate student learning. Evidence was very strong that children in Developing countries who have access to textbooks and other reading materials learn more than those who do not access them. Harbison & Hanushek (1992) also observed that in Developing Countries, where variations in inputs are much higher than in the Developed World, textbooks and supplementary instructional materials are more likely to affect students' performance. This school of thought is further reinforced by Ross & Mahlch (1990), who argued that an improvement in the environment in which students work with learning aids would be expressed in detectable gains in knowledge, skills and values acquired.

Despite all the indications of the importance of teachers and textbooks to students' learning, no research specific to Kenya and in particular Bungoma District has been done to attest to their impact on students' academic performance. Haneveld & Craig (1996) cautions that lack of reinforcement between the two inputs: teachers and timed use of textbooks can have

disastrous effects on students' academic achievement and progress in schools. According to The World Bank (2000), students' progress to higher levels may be limited by availability of teachers and textbooks. This may result in repetition or dropout, which are indicators of a poorly performing Education system.

Fredrickson (1972) observed that repeaters not only increase the cost of education for the family and school system, but also create excess capacity in the system in terms of increased student/teacher ratio or student/textbook ratio. Eshiwani (1993) also identified a critical implication for students repeating or dropping out: a large backlog of children out of school creates pressure on the entire school system to provide more teachers, textbooks and facilities to accommodate them.

In alluding to these problems, Mutua & Namaswa (1991) talked of a situation where repetition could "snowball" down the system until it negatively affects intake in each year of admission. Lowering intake ratio automatically increases the participation gap. The limited Education Budget makes this situation more difficult. Psacharopoulos & Woodhall (1985) estimated that the number of children of primary school age admitted in Africa could have increased by 15-20% without extra expenditure if there was no repetition. An examination of how teachers and textbooks relate to academic performance in secondary schools in Bungoma District may help mitigate the problem of poor academic performance in Kenya, which is symbolised by repetition and dropout.

2.9 Effect of Environment on Students' Academic Performance

One critical issue concerning Education in Developing Countries including Kenya is the distraction from schooling that children come across. Some children have to contend with poorly equipped schools and pressing poverty that can be realistically alleviated by taking advantage of opportunities for immediate employment in the agricultural sector (Harbison and Hanushek, 1992; Abagi and Odipo, 1997; Todaro, 1994). Besides, parents' view of modern schooling influences pupils' school attendance and performance. Chapman & Carrier (1990) documents causes of poor of performance in three categories. The first relates to family factors such as low income and low educational attainment by parents. The second is

low regard for future utility of education, poor motivation and low academic ability of students. The last concerns school related factors such as physical remoteness, poor classroom environment and school effectiveness. The Coleman report revealed that schools are not important in determining student achievement in the USA (Harbison & Hanushek, 1992). It was pointed out that families and peers were the primary determinants of variations in performance.

Fuller (1990) argues that where there is frequent lack of support from parents, students tend to progress slowly through the grades and drop out of school often before the prescribed period of compulsory attendance is completed. He cites Japan and USA where studies revealed that pupils' later performance is higher where parents encourage them to achieve, expect earlier mastery of skills, and ask questions rather than prescribing the actions that children should take.

In Kenya, children who don't interact with an academically stimulating environment when away from school perform poorly (Chepcheng' & Kiboss, 2004). These findings however do not tell us how educational inputs can mitigate the negative impact of the environment on students' academic performance. It therefore becomes critical to establish how the selected Education inputs: facilities, students' entry score, unit cost, teachers and textbooks relate to academic performance in Bungoma District given the hostile environment students face when away from school.

2.10.1 Theoretical Framework

The theory of the firm guided this study. This is because modern theories of economic growth have focused on developing human capital as an endogenous factor that could accelerate technological progress towards economic growth. This is made on the basis that the behaviour of people responsible for accumulation of factors of production and knowledge can be modified by policy through education. Since educated people use capital more efficiently (UNDP, 1996), education allows the whole production process to benefit from positive externalities so that it becomes more efficient; educated people are more likely to innovate, and spread the benefits of education to their co-workers who learn from them and

also become more productive. Thus a rise in levels of education causes a rise in all factors of production.

Formal education and the family help impart many skills beyond literacy and numeracy (UNDP, 1996); other abilities that are gained include discipline, taking pride in personal work, being flexible, open minded and willing to co-operate. What is learnt in school assumes even more importance because of increased global competition, marked by rapid movement of capital and new technologies from country to country. In such a situation it is claimed that a country's level of productivity and ability to compete depend greatly on workers' and management's skills in using capital and technology efficiently and effectively (World Bank, 1991). Thus, the skilled people become the only sustainable competitive advantage that any nation can have.

The theory of the firm provides a framework for the analysis of Educational inputs in relation to outputs and to determine if profits (the education objectives) are being realised. The theory would operate on the premise that resources used in schools are scarce, and schools must operate at an objective: to produce students who have excelled academically at minimum cost rather than to satisfy unspecified public roles. In this respect, the Education Production Function (EPF) is viewed as a tool which can be used by schools to predict what happens if resources were added in or subtracted from the system, and to help in analysing what action should be taken if the price of various inputs were to change (Harbison & Hanushek, 1992; Haneveld & Craig, 1996). According to Psacharopoulos & Woodhall (1985), a simple input-output model would be of the form $Y = f(X_n)$. X_n represents the independent variables, or inputs while Y is the dependent variable representing outcomes. In this respect, X_1 , X_2 , X_3 , X_4 , and X_5 represent facilities, student entry score, unit cost, student/teacher ratio, and student/textbook ratio respectively while Y represents academic performance.

2.10.2 Conceptual Framework

Independent variables

Dependent Variable

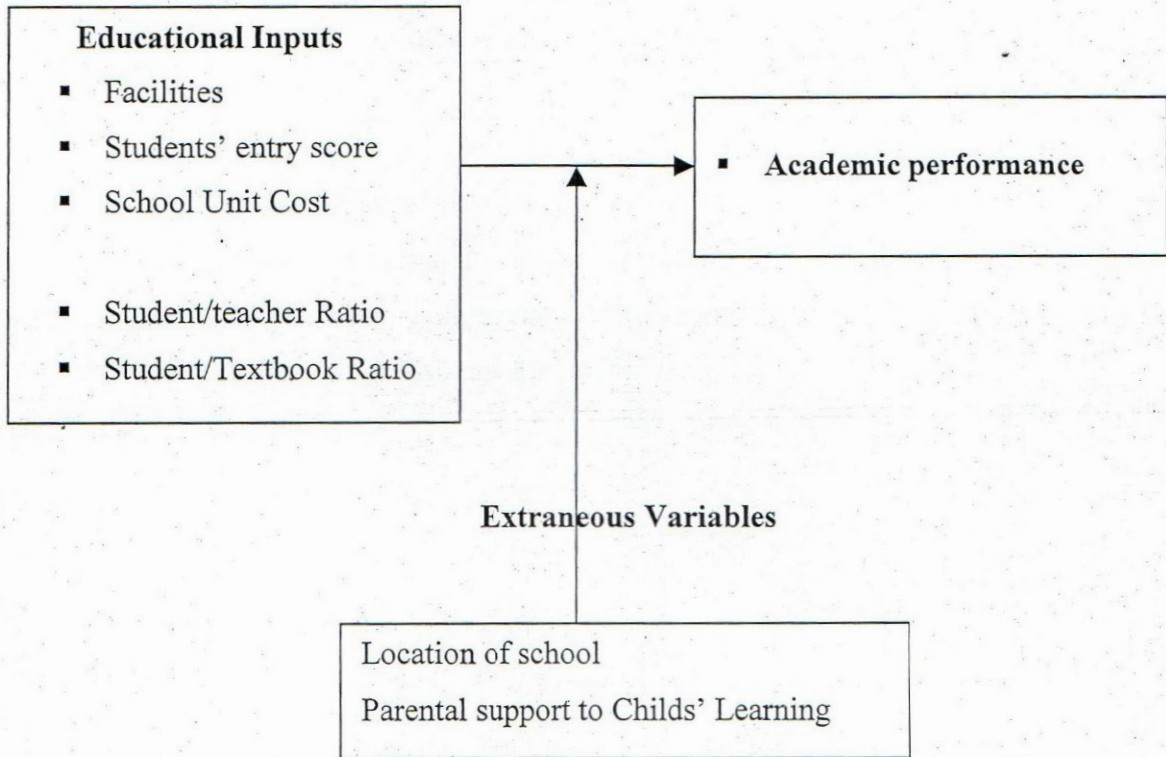


Figure 1: Conceptual Framework Relating Inputs and Students' Academic Performance.

The conceptual model (Fig. 1) attempts to combine all units of analysis in the Education process that relate to the study. Academic performance is the most widely used indicator of the quality of education output. In defining the quality of education, facilities, students' entry qualification, unit cost, student/teacher ratio, and student/textbook ratio, all count. Students and their entry qualifications as inputs are subjects in the Education process. Teachers and textbooks are inputs that facilitate the learning process, which may ultimately lead to improved academic performance. Facilities on the other hand are inputs that provide the setting in which individual teachers work with students using other input factors in the production process within the framework. Lastly, unit cost is the single input factor that

enables schools to acquire and sustain other requisite Educational inputs during the production process. This framework conceives Education as a production system in which individual student performance is the primary product; objectives are conceived in terms of desirable learning, while educational goals are distinguished from non-educational goals by determining if they can be attributed to students' academic performance. Thus, evaluation of a school's success is targeted almost exclusively at achievement test scores

Students' academic performance may be affected by several other factors. Factors such as location of the school and parental support to child's learning were controlled through sampling. Within these are the local, social-economic and cultural factors that mix to define the context in which the school operates for its effectiveness.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discussed research design, population, sample size and sampling procedures. Instruments, their validity and reliability followed these before data collection procedures were discussed. The data analysis section was the last part to be discussed in the chapter.

3.2 Research Design

Descriptive survey research design was used in this study. Survey is described as an attempt to collect data from members of a sample in order to determine the current status of the population with respect to one or more variables (Mugenda & Mugenda, 1999; Guy, 1976). Determining the current status may involve assessment of a variety of information. Guy (1976) observes that school surveys are generally conducted for the purpose of internal or external evaluation, or for assessment of projected needs, and are usually conducted as a cooperative effort by local personnel and a visiting team of experts. Thus, surveys provide valuable information to both schools studied and the other agencies or groups whose operations are school related. Ogula (1998) views descriptive survey design as suitable for collecting data that describes specific characteristics of a phenomenon for the purpose of reporting things the way they are. This design was found appropriate for this study because it facilitated the collection of data through direct enquiries and observations.

3.3 Population

The population of this study entailed 129 Secondary Schools distributed in ten Divisions of Bungoma District (Republic of Kenya, 2002). This was the total number of Secondary Schools in the District as established from statistics in the DEO's office. Headteachers of these schools formed the unit of observation. The total number of headteachers was 129 since each school had one headteacher. Bungoma district was selected due to its proximity to the working station of the researcher. It had also been observed that students school attendance and performance in national examinations had not met expectations of stakeholders in education in the District (Republic of Kenya, 2006). Kanduyi and Bumula Divisions were purposively sampled from the ten Divisions because they have pockets of the very poor

urban and rural settlements respectively in the District (Republic of Kenya, 2002). Besides, the two divisions and specifically Bumula Division were identified as having low enrolment and poorer students' performance in national examinations in the District.

3.4 Sample Size and Sampling Procedure

A sample of 20 schools drawn from the two sampled Divisions. According to Kathuri & Pals (1993), the minimum sample size for a survey research should be 20-50 cases. On this basis, a sample of 20 secondary schools from Bumula and Kanduyi divisions were selected. Schools are normally categorised into Provincial and District Schools. Provincial Schools were selected by purposive sampling. There were seven Provincial Schools in the two divisions. For such a small population selecting a sample from among them would be meaningless, and taking the whole population is advisable (Mugenda & Mugenda, 1999). Provincial Schools were regarded as having a better supply of facilities and equipment and drew students both locally and from other Districts within Western Province.

Proportionate random sampling was used to select thirteen District schools in a population of twenty-five schools in the two Divisions. Consequently, six schools were selected from twelve schools in Bumula Division, while seven were drawn from thirteen schools in Kanduyi Division. This method of sampling ensured District Schools were equitably drawn from the two Divisions where the research was conducted. District Schools were generally regarded as being deficient in the supply of facilities and equipment. Majority were Day Schools that serve the local population. Headteachers of the selected schools were automatic subjects or respondents. Being in the managerial positions in their respective schools, they were better placed to give any information required for the study.

3.5 Instrumentation

Two instruments were used to gather information for the study. These were the Headteachers' questionnaire (HQ), and Headteachers' Interview Schedule (IS). The researcher personally administered the instruments.

The HQ had 7 items. The first item sought information about the category of schools, and student enrolment in the four classes between 2002 and 2005. The second item covered information about facilities in relation to their quantities and average capacities. The third item sought information on students' entry scores on admission into the schools; this was followed by the fourth item, which covered information on the school budget, and the amount and source of school finance between 2002 and 2005. Information about the number of teachers in school, and the number of lessons timetabled in schools was covered by item five. Item six covered information on textbooks, where the number of books per subject offered in school was sought. The last was the seventh item, which covered data on students' performance in KCSE between 2002 and 2005 and their average KCPE marks.

Open-ended questions where subjects filled in spaces provided at the end of each question were used in the questionnaire. Open-ended questions were found appropriate because responses gathered gave an insight into the background, feelings and decisions of the subjects. The schools were measured by category of either Provincial or District. School enrolment was measured by the number of students admitted in school in each year under examination, while the average KCPE mark scored by students before joining secondary school was used to measure Students' entry score.

Unit cost is the average expenditure on one student in one academic year. To measure unit cost, information about total school income or revenue was obtained using the questionnaire. The total income was divided by total enrolment in the given year to get unit cost. The Questionnaire provided for teachers to be examined by seeking and obtaining information in each school about the number of teachers, and lessons allocated to them as per the approved curriculum based establishment. Textbooks were measured by the stock of books available and in use by students in all examinable subjects offered by the specified school. The schools' performance was its output on various skills, attitudes and abilities. But since it is often difficult to obtain such information, school mean scores were taken as proxies for the schools' output on these attributes.

The interview schedule (IS) had ten items, which subjects responded to. The instrument adopted unstructured or open ended questions with spaces into which the researcher entered information and data obtained from respondents during interview. This instrument was found useful in complementing the HQ since it allowed the interviewer to ask questions that led respondents towards giving data to meet the study objectives. Besides the IS also enabled the researcher to observe respondents and gain insight into their feelings about Educational inputs (facilities, students' entry score, unit cost and the financial position of the school, and adequacy of teachers in terms of meeting programmed tasks in school). Other observations related to responses and feelings about textbooks and their adequacy across the subjects offered in school, and the influence of environment related factors on students' academic performance. Environmental aspects examined included parental support to child's learning and location of the school.

3.5.1 Piloting instruments

Instruments were piloted in three secondary schools in a Division that was not used in the study. This helped identify problems that subjects encountered when responding to items, and to identify items that had ambiguities. Thus, the main reason for piloting instruments was to improve on their effectiveness in collecting relevant data. In addition, it was done to gain familiarity with the coding and statistical methods to be used in analysing data. The researcher then analysed the items and responses that were given and accordingly improved the scope and comprehensiveness of the instruments. The results were also used to calculate the reliability index and to further improve on the validity of the instruments.

3.5.2 Validity of Instruments

Kathuri & Pals (1993) view validity as the degree to which a test actually measures the variable it claims to measure. Three specialists from the Department of Curriculum, Instruction and Education Administration established face validity of the instruments through review. They were approached to assess the concepts the instruments were trying to measure, and to determine if the instruments accurately examined the items under study. Final corrections were made based on comments given by the professionals and findings from literature reviews.

3.5.3 Reliability of Instruments

The reliability of a tool ensures that the tool consistently measures what it is supposed to measure. From the theory of measurement, each response to an item reflects the true score for the intended construct, and to some extent some random error (Rossi et al., 1983). A reliable measure should minimise the measurement error so that the error is not highly correlated with the true score. On the other hand the relationship between the true score and the observed score should be strong. K-R 20 reliability tests examine such relationships. This method of estimating reliability was preferred in this study because it reduces the time required to compute the reliability coefficient. Besides, the reliability index estimated is always lower. Mugenda & Mugenda (1999) observed that it is always better to underestimate the reliability of a measure than to over estimate, to avoid making erroneous conclusions.

Calculation revealed that the HQ and IS had a reliability index of 0.83 and 0.76 respectively. An index of 0.70 would be taken to mean the instruments were reliable (Fraenkel & Warren, 1990). Thus, the instruments were considered reliable because calculated indices of reliability were above the acceptable threshold.

3.6 Data Collection Procedures

A letter of introducing the researcher to the ministry of education was obtained from the Department of Curriculum, Instruction, and Educational Management. This enabled him to visit the Bungoma District Education Office to request for a permit to visit schools in the District and collect data. It also helped him to obtain information from the DEO's office about schools in the District. After permission was granted, the researcher booked appointments with headteachers of sampled schools through visits to the schools. Discussions about the purpose of the study were also held with the headteachers.

Questionnaires were delivered to the headteachers on appointed dates by the researcher. Further discussions were held with the respondents to allow for any clarifications before they reacted to items under investigation. It was agreed that the researcher collects the questionnaires after subjects complete responding to items. Delivery and collection of questionnaires by the researcher was preferred because it enabled the researcher to control

the respondents and overcome any possible sources of bias at this stage. This approach ensured a return rate of 100%, which increased the reliability of the research. Interviews were also held with headteachers, where further details about issues under investigation were recorded.

3.7 Data Analysis

Descriptive statistics were used to analyse data. Pearson's correlation coefficient, r , was also calculated to determine the degree and direction of the relationship between each of the selected education input and students' academic performance. Positive Pearson correlation coefficients indicated that performance may improve with increase in the units of the given input variable, while negative correlation coefficients indicate that performance may decline with increase in the given units of the education input. All statistical tests were done at $\alpha = 0.05$.

Table 1: Summary of Data Analysis

Research Question	Variables		Statistical Analysis
	Independent	Dependent	
1. What is the relationship between Facilities and students' academic performance?	Facilities	Students' academic Performance	<ul style="list-style-type: none"> • Descriptive Statistics. • Pearson's Correlation
2. What is the relationship between Entry Score and students' academic performance?	Students' Entry Score	Students' academic Performance	<ul style="list-style-type: none"> • Descriptive Statistics • Pearson's Correlation
3. What is the relationship between Unit Cost and students' academic performance?	Unit Cost	Students' academic Performance	<ul style="list-style-type: none"> • Descriptive Statistics • Pearson's Correlation
4. What is the relationship between Student/teacher ratio and students' academic performance	Student/teacher Ratio	Students' academic Performance	<ul style="list-style-type: none"> • Descriptive Statistics • Pearson's Correlation
5. What is the relationship between student/textbook ratio and students' academic performance?	Student/textbook Ratio	Students' academic Performance	<ul style="list-style-type: none"> • Descriptive Statistics • Pearson's Correlation

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter examined research findings and their implications to stakeholders in education. Pearson's correlations were used to analyse and determine the strength and direction of the relationship between variables constituting inputs and performance as posited in research questions.

4.2 What is the Relationship between Facilities and Students' Academic Performance?

The study examined the use of libraries, laboratories and classrooms in relation to students' academic performance. Ratios were used to indicate the degree of use of the facilities in terms of the number of students per unit space. To measure student/library space ratio, total student enrolment was divided by total library space. A big ratio indicated a high concentration of students in a given library space.

It was observed that most Provincial Schools (85.7%) had libraries compared to 38.5% of District Schools, which had libraries. However, the average student/library space ratio in Provincial Schools was higher, at 10.97:1 compared to 7.94:1 for District Schools. This indicated that at any given time, there were more students per library space in Provincial Schools than in District Schools. The highest student/library space ratio for provincial schools was 30.05:1 compared to 27.6:1 for District Schools. The absence of libraries in 61.5% of the District Schools compared to 14.3% for Provincial Schools suggests that the later may be at a comparative advantage arising from benefits associated with this facility. This may have contributed to the better performance observed in Provincial Schools compared to District Schools

Table 2: Relationship between Student/Library Space Ratio and Performance

Correlations

		Mean score	Library space ratio
Mean score	Pearson Correlation	1.000	-.181
	Sig. (2-tailed)	.	.241
	N	80	44
Library space ratio	Pearson Correlation	-.181	1.000
	Sig. (2-tailed)	.241	.
	N	44	44

From the results of Pearson's correlation (Table 2), it was found that the association between student/library space ratio and performance was not significant ($r = 0.181$, $\alpha = 0.241$). This implied that library space was not critical to students' academic performance. Schools therefore don't need to go for very spacious library facilities in an effort to improve students' academic performance. Haneveld & Craig (1996) observed that availability of libraries contribute positively to students' academic performance. The weak negative correlation coefficient between Student/library space ratio and performance indicated that increasing student/library space ratio may lower students' academic performance. In view of the congestion on library space observed across the schools as evidenced by the high student/library space ratios, the correlation results suggest that indeed it is possible that libraries are stretched in some schools and efforts need to be made to expand them. Besides, there is need to provide this facility in a number of schools that do not have.

Student/laboratory space ratio was obtained by dividing total student enrolment in a given year by total laboratory space in the given school. A big ratio indicated a high concentration of students in a given space. All Provincial Schools studied had laboratories, unlike in District Schools where only 76.9% had laboratories. A big effort to provide laboratories was observed, which pointed to the perceived importance of laboratories in contributing to students' academic performance especially in science subjects. It was observed further that there was higher pressure on laboratory space in Provincial Schools than in District Schools. On average, provincial schools had a student/laboratory space ratio of 8.18:1 compared to

7.94:1 for District Schools. The highest student/laboratory space ratio recorded for provincial schools was 15.03:1 relative to 11.54:1 for District Schools. It is clear that provincial schools were at an advantage over District Schools in providing laboratory services to their students. A possible explanation to the observed better performance in Provincial Schools in comparison to District Schools may be the contribution of laboratory services to students' learning achievement.

Table 3: Relationship between Student/laboratory Space Ratio and Performance

		Mean score	Laboratory space ratio
School mean score	Pearson Correlation	1.000	.221
	Sig. (2-tailed)	.	.070
	N	80	68
Laboratory space ratio	Pearson Correlation	.221	1.000
	Sig. (2-tailed)	.070	.
	N	68	68

From the results of Pearson's correlation (Table 3), the relationship between student/laboratory space ratio and performance was not significant ($r=0.221$, $\alpha = 0.07$). This showed that laboratories may not be a critical input in so far as students' academic performance was concerned. However a positive relationship existed between student/laboratory space ratio and performance. This indicated that increasing students per given space may have a positive effect on performance. The implication of this finding is that laboratory space does not significantly contribute to performance and that laboratories available in some schools had the capacity to accommodate more students. This may be possible when laboratories are used in shifts. Therefore, schools should not focus on very spacious laboratory facilities when seeking to improve students' academic performance.

Student/classroom space ratio was obtained by dividing total student enrolment in school in a given year with total classroom space available for use by students in the school that year. A big ratio indicated a high degree of utilisation of classroom space. Classrooms were the

single facility that was available in all schools. The mean student/classroom space ratio for District Schools was 0.71:1 compared to 0.95:1 for Provincial Schools. The highest student space ratio recorded for District Schools was 1.13:1 relative to 1.35:1 for Provincial Schools. The lowest ratio was 0.38:1 and 0.40:1 for District and Provincial Schools respectively. According to UNESCO standards, utilization factor for facilities should be above 80%. On average, Provincial Schools met this criterion while District Schools fell below the recommended threshold. It can be concluded that classroom space was under-utilised across the schools, with District schools taking the lead in under-utilised classroom space.

Table 4: Relationship between Student/classroom space Ratio and Performance

Correlations

		Mean score	Classroom space ratio
Performance by school mean score	Pearson	1.000	.506
	Correlation		
	Sig. (2-tailed)	.	.000
	N	80	80
Student classroom space ratio	Pearson	.506	1.000
	Correlation		
	Sig. (2-tailed)	.000	.
	N	80	80

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

Pearson's correlation results (Table 4) revealed that there was a significant positive relationship between student/classroom space ratio and performance. This implies classroom space was a critical Educational input to students' academic performance, and increasing the number of students in class may have a positive effect on performance. This result reinforces the observation that classes were under-utilised in most schools. Enrolment needs to be raised for schools to operate optimally. Such increased enrolment may positively impact on performance.

Interviews with headteachers revealed that they strongly felt facilities contributed positively to students' academic performance. Those whose schools lack libraries and laboratories felt their schools could have performed better if they had the facilities. Indeed, this could be the reason for students being admitted to join Secondary Schools on the basis of the available facilities. The results of the correlation between facilities and performance discussed above agree with findings by Haneveld & Craig (1996), who observed that there is a link between availability of classrooms with reasonable sizes, libraries and other infrastructure to good academic performance in Developing Countries.

4.3 What is the Relationship between Students' Entry Score and Performance?

Students' entry score was obtained by dividing the sum of students' KCPE marks with total enrolment in the class that year. An examination of students' entry score revealed that Provincial Schools had a higher average entry score of 317 marks compared to 216 marks for District Schools. The highest entry score admitted in provincial schools over the four-year period was 385 marks compared to 308 marks for District schools. The corresponding lowest mark for the two categories of schools was 260 and 190 marks respectively. It is evident that Provincial Schools admitted students of higher entry scores compared to District Schools. This could be another possible reason for the observed better performance in provincial schools relative to District schools.

The finding that students are admitted with as low as 190 marks would seem to contradict the perception that the DEO's office controls admissions so that only those who attain above a set minimum threshold of 250 marks are admitted to secondary schools. All headteachers interviewed confirmed that students were admitted on the basis of their performance in KCPE. They also agreed that most students who join school with higher grades performed better than those who had weak grades at the end of the four-year course. However, when the number of students admitted cannot raise the required class sizes, those with lower marks than the cut-off threshold are allowed to join the schools. Such students tended to perform poorly at the end of the four-year course.

Table 5: Relationship between Students' Entry Score and Performance

Correlations

		Mean score	Student's entry score
School mean score	Pearson Correlation	1.000	.712
	Sig. (2-tailed)	.	.000
	N	80	80
Student's entry score	Pearson Correlation	.712	1.000
	Sig. (2-tailed)	.000	.
	N	80	80

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

Pearson's correlation result (Table 5) indicated that there was a significant positive relationship between student's entry score in Form One and performance. This means that students who enter Form One with higher scores tend to perform better than those who enter with low marks. Similar findings were reported in Morocco, Nicaragua and Brazil (Psacharopoulos & Woodhall, 1985; Galde & Ganzales, 1980; Harbison & Hanushek 1992). According to Harbison & Hanushek (1992) past inputs (which are reflected in performance at the time) affect current levels of student achievement. This revelation points to the need to improve teaching in primary schools so that students excel and join form one with high marks. This will guarantee them a higher chance of good performance at the end of their four-year course. This finding gives justification for selecting students to join Form One on the basis of their performance in KCPE.

In fact, Greaney & Kellaghan (1996) seem to have alluded to similar findings when they report that in countries where National assessment had taken root, potentially low scorers may be made to repeat to boost overall performance especially if such performance was perceived by schools as important indicators of what was valued in education output.

Since the secondary school cycle admitted students after they completed an eight-year primary cycle, it would be in the interest of all stakeholders at this level to ensure that students attained high scores before joining secondary schools. On the part of parents,

provision of books and other reading materials would be an effort towards this end. School and education administrators may be required to set and maintain minimum entry scores for those who wish to join their schools after graduating from primary. The Government on the other hand, may be required to play the role of supplying teachers on a needs based arrangement so that certain communities, regions and groups are not disadvantaged. Also, areas where parents and communities were genuinely unable to put up facilities should be supported through Government grants. Such measures may guarantee equitable access, which is a prerequisite for assessing an Education systems' performance on quality of output.

4.3 What is the Relationship between Unit Cost and Performance?

Unit cost was obtained by dividing total recurrent expenditure by the total number of students enrolled in a school that year. Findings established that Provincial Schools were more costly than District Schools. The average unit cost for Provincial Schools was Sh.21,310, nearly double the average of Sh.12,530 for District Schools. However there was a big difference between the highest and lowest unit cost for both Provincial and District Schools. The highest unit cost recorded for Provincial Schools was Sh.29,207 compared to Sh.17,689 for District Schools. The corresponding lowest unit cost was Sh.13,052 and Sh.6,980 respectively. These huge disparities in the costs could be an indicator that some schools are under funded on critical inputs, while others are heavily funded to meet the cost of critical inputs. Schools that had sources of income other than fees were able to raise more revenue to enable them to spend more, thus raising their unit costs. Some of the alternative sources of revenue were proceeds from school farms, "harambee", donations and partnerships with foreign institutions, which funded selected areas of academic interest like books and equipment.

Headteachers view a school's stable financial base as a catalyst for activities that enhance improved academic performance in schools. Though ability to pay fees was not a criterion for admission of students, all schools were funded from the fees that parents paid. Fees charged were decided by the BOG in consultation with PTA, and with approval from the DEB. This is the standard Ministry of Education policy requirement. Most schools collected less than 70% of their budgeted revenue. The budgets have generally been on an upward

trend to match the escalating cost of living. Similar findings were reported in a survey of tuition charges in Kenyan secondary schools (Ngare, 2007; Aduta, 2007; Otieno, 2007). It was observed that fees largely contributed to students' irregular attendance and eventual dropout from school. This undermined academic performance. However, there was a feeling among headteachers that school programmes cannot be sustained without adequate fee payments.

Table 6: Relationship between Average Unit Cost and Performance

Correlations

		Mean score	Students' unit cost
School mean score	Pearson Correlation	1.000	.462
	Sig. (2-tailed)	.	.000
	N	80	79
Students' unit cost	Pearson Correlation	.462	1.000
	Sig. (2-tailed)	.000	.
	N	79	79

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

To obtain a numeric measure of relationship, unit cost was correlated with the corresponding performance in the respective schools over the four year period studied. Pearson's correlation result (Table 6) indicated that student's unit cost was significantly related to performance at $\alpha = 0.05$. The correlation coefficient between unit cost and performance was found to be positive. This shows that increasing unit cost may have a positive impact on performance. This revelation points to the need for schools to raise their income base. Parents may be required to pay more in terms of school levies. But this option should be pursued with caution since a National fee structure was developed to prevent schools from charging exorbitant fees that keep poorer students out of school. This directive is implemented in line with the Government policy of making education affordable in order to increase access. Measures to set maximum fees chargeable are justified on the basis of the Millennium Development Goals Status Report for Kenya (Republic of Kenya, 2005b), which indicated that Kenya's poverty index was 56% and the proportion of people living below the poverty

line was projected to rise to 65.9% in the year 2015 if the current trend continues. It will require school managers to be innovative and initiate alternative sources of income.

Income generating projects already in some schools included farming (keeping Dairy cattle, poultry, cultivating maize and sugar cane), renting school halls, and offering catering services for short time seminars or workshops that take place in some schools. Increased government support through provision of on time bursaries, grants and scholarships could also boost school attendance and performance in examinations. However, irregular disbursement of funds meant to assist the needy students and poor administrative skills that lead to mismanagement of funds by headteachers have already been identified as a threat to education progress in Bungoma District (Republic of Kenya, 2006). If measures are not put in place to check this problem, unit cost is likely to shoot up and undermine students' school attendance and performance.

4.4 What is the relationship between Student-teacher Ratio and Performance?

Student/teacher ratio was obtained by dividing total school enrolment in a given year by the total number of teachers available for student instruction in the given school. A big ratio indicated a high concentration of students against a teacher at the given time in school. An analysis of teachers indicated that student/teacher ratio was higher in Provincial Schools than in District Schools. The average student/teacher ratios were 17.64:1 and 14.58:1 for Provincial and District Schools respectively. These figures were lower than the average ratio of 19:1 for the District (Republic of Kenya, 2006). The national student/teacher ratio is estimated at 14:1-20:1 (Education Insight, 2006). From these statistics, it can be inferred that on average, schools from the two Divisions were better staffed relative to other schools in the District, but within the range of the national average.

It was observed however, that disparities existed among the schools in the Divisions. The highest student/teacher ratio was 30.5:1 for provincial schools compared to 32.6:1 for District Schools. On the lower side, provincial schools recorded a student/teacher ratio of 13.03:1 compared to 5.45:1 for District Schools. The huge disparity observed revealed the imbalance that existed in the distribution of teachers in schools. This was something that could have

adversely affected students' performance. One would agree with the DDC report (Republic of Kenya, 2006), which observed that the subject of monitoring and evaluation had not received sufficient attention in Kenya's development planning context. Monitoring and evaluation measures would check for and correct such disparities as soon as they were detected. Though availability of teachers was not a criterion for admission of students in schools, headteachers felt teachers were not adequate, and that their schools could perform better if they had a low student/teacher ratio.

Table 7: Relationship between student/teacher Ratio and Performance

Correlations

		Mean score	Student teacher ratio
Performance by school mean score	Pearson Correlation	1.000	.402
	Sig. (2-tailed)	.	.000
	N	80	80
Student teacher ratio	Pearson Correlation	.402	1.000
	Sig. (2-tailed)	.000	.
	N	80	80

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

Student/teacher ratio was correlated with performance over the four-year period of study across the schools to obtain a numerical measure of relationship. Pearson's correlation results (Table 7) revealed that a significant positive relationship existed between student teacher ratio and performance. It can be inferred that increasing the number of students per teacher may have a positive impact on performance. As the situation is currently in schools, performance may not be compromised, perhaps until a higher optimal threshold was reached. This finding would seem to suggest that the imbalance in the distribution of teachers creates an artificial shortage of teachers in some schools, which can be overcome by redistribution. The government may need to check for and correct disparities in the distribution of teachers to avoid the costs that arise due to failure to monitor staffing levels in schools.

Since student/teacher ratio was a proxy for measuring teacher utilization, this result showed that performance was likely to improve if teachers were more utilised. Ngala, Sang & Odebero (2005) reported similar findings on the relationship between utilisation of personnel and their productivity. This revelation has an important implication on staffing policy, in view of under enrolment observed in classrooms: schools need to maintain a certain minimum number of students in class to be guaranteed continued supply of teachers. The Government also needs to ensure that new schools are not registered in the neighbourhood of those still under enrolled to help increase class sizes in established schools.

An aspect closely associated with student/teacher ratio is the teaching load, which indicates lessons per week assigned to a teacher. Student/teacher ratio has weakness, in that it does not reflect how a teacher is utilised on instructional activities. In an effort to overcome this shortcoming, average teacher loads were used to demonstrate the degree of teacher utilisation on instructional activities. Average teacher load was obtained by dividing the total number of lessons in a week in a given school by the number of teachers available in the school. It was observed that average teacher load was 22.19 for District Schools and 19.82 for Provincial Schools. This compares very closely with the National average of 22 lessons per week (Education Insight, May 2006). The highest average teacher load in District Schools was 35.2 while provincial schools had 27.5. The lowest average teacher load in District Schools was 15.71 compared to 15.30 for provincial schools. There was observed disharmony between student/teacher ratio and teacher loads. High student/teacher ratio would be expected to correspond to high teacher loads. However this was not the case. This may be explained by the observed under enrolment in classes especially in District Schools. A situation where a few students attend class sessions increases the teacher loads even when the student/teacher ratio is low.

Table 8: Relationship between Teaching Staff Load and Performance

Correlations		Mean score	Staff Load
Performance by school mean score	Pearson Correlation	1.000	-.073
	Sig. (2-tailed)	.	.520
	N	80	80
Teaching staff load	Pearson Correlation	-.073	1.000
	Sig. (2-tailed)	.520	.
	N	80	80

An analysis of Pearson's correlation in (Table 8) revealed that the relationship between teaching staff load and students' academic performance was not significant at $\alpha = 0.05$. A weak negative correlation coefficient existed which implied that raising the staff load may lower students' academic performance. Thus, increasing teacher loads may impact negatively on students' academic performance. There was a possibility that teaching loads were above the optimum levels for effective teacher utilisation; this is because staff loads examined in this study did not factor in non-instructional teacher activities like co-curricular, administrative duties, and other welfare related services offered to students by teachers. Otieno (June, 28, 2007) observed that TSC had directed that teachers be given a minimum load of 27 lessons for those who are not involved in administrative duties within the school.

According to Education Insight (2006) an inter-ministerial task force mandated the ministry of education through TSC to undertake a survey to determine ways through which teachers could be effectively utilised. The task force established that a teaching load of 30 lessons per week for a teacher was reasonable and achievable. It was observed that this teaching norm would have a large impact on effective teacher supply. For instance, the taskforce reported that an increase in the teaching load from an average of 22 lessons to 30 lessons would be equivalent to an increase in supply by 10,400 teachers in secondary schools. In view of these

conflicting findings, there is need to establish the optimum load at which teachers can operate with guaranteed effectiveness.

4.5 What is the Relationship between Student-book Ratio and Performance?

This study examined the stock of books in schools against students enrolled for the years under study. Student/book ratio was obtained by dividing enrolment with the total number of books available for student use on academic work. A big ratio indicated a high concentration of students on a book at any given time.

An examination of the average student/book ratio indicated that there were more students per book in District Schools than Provincial Schools. District Schools recorded an average student/book ratio of 8.62:1 compared to 3.06:1 for Provincial Schools. The highest student/book ratio of 25.38:1 was recorded in District Schools compared to 8.46:1 for Provincial Schools. On the lower side, Provincial Schools recorded a ratio of 0.51:1. One District School did not have an official arrangement to provide students with books.

Availability of textbooks was not a criterion for admitting students in schools. However, headteachers felt that books were not sufficient in schools, and that textbooks and other instructional materials were critical in widening the understanding of the subject content among teachers. This enhanced their capacity to teach, hence contributing positively to academic performance. Schools rationed procurement of books on the basis of perceived centrality of subjects to the curriculum. For this reason subjects like English, Kiswahili and Mathematics, which are compulsory, tended to have a higher share of the supply relative to other optional subjects.

Table 9: Relationship between Student-book Ratio and Performance

Correlations		Mean	Student book ratio
Performance by school mean score	Pearson	1.000	-.225
	Correlation		
	Sig. (2-tailed)	.	.051
	N	80	76
Student book ratio in school	Pearson	-.225	1.000
	Correlation		
	Sig. (2-tailed)	.051	.
	N	76	76

To obtain a numerical measure of relationship between textbooks and students' academic performance, the student/book ratio obtained across the schools was correlated with the corresponding performance over a four-year period. Pearson's correlation results (Table 9) indicated that the relationship between student/book ratio and performance was not significant. A negative Pearson's coefficient was obtained, which implied that increasing student/book ratio may undermine students' performance. This finding is realistic since raising student/book ratio reduces the effective contact time between a given student and the book available for use at the given time.

This finding underscores the need to provide students with sufficient textbooks to enable them access the books any time they needed to. This is in agreement with the finding that books have a significant impact on student learning (Haneveld & Craig 1996; Harbison & Hanushek, 1992). After examining a number of research findings, Elimu Yetu Coalition (2003) concluded that it is now widely accepted that there is a positive correlation between availability of textbooks and students' academic performance. Lockheed & Verspoor (1991) also concurred with these findings; they argued that textbooks deliver the curriculum,

organize the scope and sequence of information presented and provides opportunities for students to use what they have learnt.

Since performance was a proxy for measuring a system's output of quality education, this revelation underscored the critical role that books and other instructional materials played in the learning process. Parents who want to improve the quality of their children's grades need to provide them with books for use when at home and in school. Those schools that did not have an official arrangement to provide students with books and other instructional materials were making a costly mistake that will disadvantage students, for they were likely to perform poorly. The Government and Donors may need to include books as one of the key items to be funded in schools. Such a measure may shore up disadvantaged schools so that their performance improves.

4.6 Relationship between Enrolment and Performance

The number of students enrolled defines a school in Kenya (Republic of Kenya, 1980). The number of students enrolled is the basis upon which all educational inputs are provided in schools. It was observed that the lowest enrolment was 60 students while the highest recorded was 929 students. The mean enrolment for the sampled schools was 291 students. There was a large spread in enrolment with a standard deviation of 244.48. The cumulative enrolment (which represented the total share of students admitted in the different categories of schools) was higher in Provincial Schools at 66.58% relative to 33.42% for District Schools. The average yearly institutional enrolment for Provincial Schools was 553 compared to 150 for District Schools. There was, however, a bigger range in enrolment in provincial schools than in District Schools over the four-year period under study.

Table 10: Relationship between Student Enrolment and Performance

Correlations

		Enrolment	Mean score
Students enrolled in school	Pearson Correlation	1.000	.771
	Sig. (2-tailed)	.	.000
	N	80	80
Performance by school mean score	Pearson Correlation	.771	1.000
	Sig. (2-tailed)	.000	.
	N	80	80

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

To examine the relationship between student enrolment and performance, Pearson's correlation was used (Table 10). Student enrolment in each school was correlated with the corresponding performance over the four-year period under study. The result of Pearson's correlation indicated a significant relationship between enrolment and performance. The big positive correlation coefficient obtained points at an association where increase in enrolment may enhance students' performance. This outcome is realistic given the observed class under enrolment in many schools. Such schools could benefit from economies of large scale by increasing enrolment in their classes. Achieving optimal enrolment in classes may guarantee effective utilisation of other complementary educational inputs like teachers, books and facilities for overall improved performance.

Headteachers acknowledged that the environment in which students and schools operated affected students' academic performance. For instance, though a number of parents found difficulties, the financial support they gave to their children's education was identified as contributing positively to academic performance. However, many teachers felt that few parents found time to sit with and guide their children in relation to their academic work; few visited schools to find out the progress of their children and seek remedies for improvement. Besides, majority of parents bought books only if such books were required, and the requirement enforced by school authorities. Thus there was low parents' investment in child teachability. This finding was similar to those reported in Government documents that

identified negative attitude towards education, repugnant cultural practices and high poverty and illiteracy levels as threats to attainment of Education for All (Republic of Kenya, 2002; 2003a; 2005). Any effort by parents to broaden their support to children's learning is likely to improve performance.

Physically remote schools were found to suffer irregular inspection by Quality Assurance officers and were not popular with teachers. The setting in and around the schools was such that they were prone to resisting positive change that would turn around the schools towards progressive improvement in performance. The low morale among teachers from remote and far to reach schools caused them to always look for transfer to urban schools where social amenities were adequately provided for.

Urban schools in the District were found to be popular with both students and teachers, but suffered a number of distractions. Entertainment spots tended to attract some students especially at night, while a section of teachers operated small businesses that divided their attention between school and private work. In either of the cases, a school's academic performance suffered.

The Government Taskforce on Student Discipline and Unrest in Secondary Schools (Republic of Kenya, 2001) also observed that many schools that had not been inspected for a long period of time had continued to perform poorly. The taskforce reported that the Kenyan society had become increasingly materialistic such that an individual was not seen in terms of who he is but what he owns. It was argued that in the quest for acquisition of wealth, hard work and honesty had been replaced with corruption and other unscrupulous means (Republic of Kenya, 2001). This is what might explain the tendency by some teachers to devote teaching time on private business. The taskforce also recognised deviant behaviour among students arising from these external influences as a setback to students' performance and recommended appointment of trained teachers with knowledge and skills necessary for guiding and counselling students. Teacher transfers emanating from bribery or pressure from leaders were said to affect the quality of teaching especially if replacements for such teachers were not made. These interruptions undermine students' academic performance.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This study set out to examine the relationship between selected educational inputs and students' academic performance in secondary schools in Bungoma District. The summary of findings, Implications, conclusion and recommendations are presented below.

5.2 Summary of Research Findings

It was observed that Provincial Schools enrolled students with higher entry marks than District School. The correlation between entry score and performance was positive. This showed that higher entry scores tended to cause students to perform better at the end of their four-year course.

Provincial Schools had a higher average enrolment of 553 compared to 150 for District Schools; the schools respectively catered for 66.58% and 33.42% of the students enrolled in the two Divisions. A significant positive relationship existed between enrolment and performance. This implied that performance may improve if schools enrolled more students.

Results further established that District Schools had a higher average student/book ratio than Provincial Schools. The correlation between student/book ratio and performance showed a negative relationship. This implied that raising the student/book ratio was likely to cause performance to decline; therefore efforts must be made to provide students with more books in order to enhance performance.

The research found that all schools studied had classrooms, but which were on average under-utilised. Classroom space utilisation was higher in Provincial Schools than District Schools. The correlation between student/classroom space ratio and performance was positive and significant. This showed that admitting more students in classrooms may not lower students' academic performance.

An analysis of laboratories showed that 85% of schools studied had laboratories. All Provincial Schools had laboratories compared to 76.9% of the District Schools, which had the facility. The facility was more strained in Provincial Schools than in District Schools. A weak positive correlation, which was not significant, existed between student/laboratory space ratio and performance. This finding suggested that laboratory space was not a critical Educational input. Besides those available had not reached their optimum levels of use. Schools that had this facility may increase the number of students using the facility without undermining performance.

It was also found that only 55% of the schools studied had libraries, which were over-utilised. This problem was more severe in provincial schools than District Schools. The correlation between student/library space ratio and performance revealed a negative association, which was not significant. Thus library space alone was not a critical educational input. Other complementary inputs like books and other equipment probably impact more on students' academic performance when they work in combination with appropriate library room space. However increasing the number of students using the available facilities may undermine performance.

Unit cost is perceived to be critical to a school's operations. The research found that Provincial Schools spent more per student on average than District Schools. Huge disparities existed in the cost of maintaining a student even when schools had similar characteristics. The correlation between unit cost and performance was positive and significant. This finding suggested that schools needed more financial resources to better students' performance. It was observed that fees was the single largest cause of students dropping out of school; therefore alternative sources of financing students should be sought to avoid disrupting school attendance, which negatively affects students' performance.

When student/teacher ratio was analysed, it was found that District Schools had a higher number of students per teacher compared to Provincial Schools. Pearson's correlation showed student/teacher ratio had a significant positive relationship with performance. This implied that student/teacher ratio may not have reached the optimum threshold, and

increasing the number of students against a teacher could enhance performance. This result still pointed towards the need to redistribute teachers with a view to eliminating disparities that existed between schools. This may facilitate a rise in enrolment in schools for optimum utilisation of teachers.

Since student/teacher ratio does not show teacher engagement in instruction related activities, teacher loads were used to measure actual teacher utility on instructional tasks. It was found that District Schools had higher teacher loads compared to Provincial Schools. The relationship between teacher loads and performance was not significant at $\alpha = 0.05$. However, the negative correlation coefficient implied that increasing teacher loads was likely to undermine performance. This was a likely explanation to the poorer performance of District Schools relative to Provincial Schools in the two Divisions.

The environment in which students operate was found to impact on students' academic performance. For instance, parents' support to children's learning was found to contribute to improved academic performance. The location of the school was found to negatively affect academic performance if it did not have internal and external stimulants to academic discourse.

5.3 Implications of Findings

Findings of this study demonstrated that there exists a relationship between educational inputs and students' academic performance. Stakeholders, namely the government parents and donors interested in improving education standards need to put in place measures that will ensure adequate and timely provision of education inputs in schools. The government's decision to offer free tuition in public schools is a step in the right direction, which should not make other partners in the provision of education complacent in playing their role of supporting education programmes. Schools may need to admit more students in classrooms, while communities should link up with the government to ensure available schools are sufficiently enrolled before starting new ones. More financial resources to complement government funding should be encouraged since findings showed that increased funding was likely to improve performance.

Schools should emphasise more on complementary inputs like books and equipment that relate to libraries and laboratories since library and laboratory space on their own were not significantly related to students' academic performance. The study also suggests that student/teacher ratio may not be an accurate indicator of how teachers relate to students' academic performance. This is because the number of students enrolled in classes varied across subjects making teachers to attend to different numbers of students during instruction. Different subjects in schools are therefore at different level of need for teachers. Though measures are already in place for the TSC to supply teachers as per the approved curriculum of each school, setting limits on the minimum number of students that can be put under a teacher's instruction may improve levels of teacher utilisation.

5.4 Conclusion

The following conclusions were made based on the study findings:

1. Students' entry score had a significant relationship with students' academic performance. There is justification for the education system to persist in encouraging students who score high marks at the end of the primary cycle to proceed and complete Secondary Education.
2. Students/book ratio was related to students' academic performance. This showed that more books needed to be availed to students to improve their performance. Students in schools that invest more in books were likely to perform better.
3. Classroom space had a positive relationship with students' academic performance. Thus more students should be admitted into classrooms especially in District Schools for effective utilization of classroom space.
4. Unit cost was positively related to students' academic performance. Therefore schools need more financial resources to shore up students' academic performance.
5. Library and laboratory space were not significantly related to students' academic performance. Therefore schools should not focus on very spacious laboratories and libraries in their effort to improve performance.
6. Student/teachers ratio had a positive relationship with performance. This implied that teachers contributed to students' academic performance. At the current level of school

operation, increasing the number of students attended to by a teacher in class was not likely to undermine performance.

5.5 Recommendations

The following recommendations were made on the basis of the study findings for the improvement of academic performance in Bungoma District and by extension, Kenya.

1. The Government, donors, parents and other stakeholders in Education need to step up assistance to schools so that they are adequately provided for, in terms of critical educational inputs. Towards this end, the governments' decision to provide free tuition in secondary schools is a step in the right direction. This is because schools that had a better supply of inputs tended to perform better.
2. Parents should recognise the positive influence of entry scores on performance at secondary school level by making provisions that will foster good performance at the end of the primary cycle. These provisions include books and levies that go into procurement of inputs critical to the learning process. Such measures are likely to improve the performance of their children at primary and later, at the secondary school level.
3. School Administrators may need to employ innovative ways of raising revenue for their schools to complement government funding and charges levied on parents. Starting internal income generating projects, sourcing funds through donors and charities, and partnering with educational institutions in Developed Countries for exchange programs could benefit a school's academic programmes.
4. To ensure that teachers and classrooms are effectively utilised, it is imperative that the Government sustains the policy on school registration that will ensure optimal levels of enrolment for cost effective use of these education inputs. Efforts by the government to stop registration of schools in the neighbourhood of those that are under enrolled should be supported by all stakeholders to raise the number of students in existing schools and give them the impetus to perform better.
5. Schools should not focus on very spacious laboratories and libraries in their effort to improve students' performance. These facility space was not found to be significantly related to students' academic performance

5.6 Suggestions for Further Research

The research presented in this study has shown that there exists a strong relationship between Educational inputs and performance. However more research needs to be done in the following areas:

1. A study on cost effective teacher utilisation and its influence on academic performance is recommended. This is because student/teacher ratio ignores the time period of teacher engagement in instructional activities. On the other hand, teacher loads ignore the number of students under instruction at a given time yet such numbers and time are the basis on which schools are staffed and financed.
2. Further, a research on optimal school size and its relationship to performance is advisable. This is because a level of production of quality graduates that is cost effective will enable a bigger proportion of the populace to access education. Such a study may also give the Government a basis for setting fee guidelines. Such guidelines may gain wider acceptance among school managers if they are realistic to the financial needs of schools.
3. A comprehensive study that covers facilities, and the quantity and quality of appropriate equipment and materials that make the facilities function effectively is recommended. This is because this study examined space available for use by students in the facilities, yet space is only one aspect of facilities that can be utilised. The recommended study may unearth information and data that will comprehensively reflect the place of facilities in students' academic performance.

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APPENDIX A: HEADTEACHERS QUESTIONNAIRE

This questionnaire seeks information relating to educational inputs and performance in Public Secondary Schools. The information you provide in this questionnaire will be treated confidentially and for academic purpose only. Please fill in the required information as precisely as possible.

INSTRUCTIONS

- 1 Tick (✓) or use the space provided at the end of each question to give your responses.
- 2 For questions that require numerical data, fill in the space or table provided at the end of the question.

1 INFORMATION ABOUT THE SCHOOL

1 Name of the school

2 Is your school a district or provincial school?.....

3 Enter student enrolments for the years indicated in the table.

Year	Form 1	Form 2	Form 3	Form 4	No of Streams
2002					
2003					
2004					
2005					

2 INFORMATION ABOUT FACILITIES

1 i) Do you have a library in school? Yes () No ()

ii) If "YES" in 1 i) above, what is the capacity of the library?.....

2 i) Do you have a laboratory /laboratories in school? Yes () No ()

ii) If "YES" in 2 i) above, what is the capacity of the laboratories?.....

3 i) How many classrooms do you have in your school?.....

ii) What is the average capacity of each classroom?.....

3 INFORMATION ABOUT STUDENTS' ENTRY SCORES

Indicate the highest and lowest KCPE entry mark for students in your school for the years indicated in the table below:

Year	2002	2003	2004	2005
Highest score				
Lowest score				

4 INFORMATION ABOUT UNIT COST

i) Indicate the total amount of fees charged per student annually. Kshs.....

ii) Indicate the amounts from other sources of school finance in the table below:

Year	Amount (Kshs.)	Sources of Finance
2002		
2003		
2004		
2005		

iii) Indicate the expected and actual amounts of money received by the school for the years indicated in the table below:

Year	Expected Amount of Money (Budget)	Actual Amount of Money Collected
2002		
2003		
2003		
2004		

5 INFORMATION ABOUT TEACHERS

i) How many teachers do you have in your school?

ii) Indicate the number of teachers and the recommended lessons per week for the various categories of teachers:

Category	Headteacher	D/Headteacher	HOD	Subject teachers
No. Teachers				
No. Lessons				

iii) Indicate the total lessons per week on timetable in your school.....

6 INFORMATION ABOUT TEXTBOOKS

1 Indicate the number of books in your school against the subjects as indicated in the table below:

Subject	Number of Books
English	
Kiswahili	
Maths	
Biology	
Physics	
Chemistry	
History	
Geography	
CRE	
Agriculture	
Commerce	

7 INFORMATION ON ACADEMIC PERFORMANCE

Indicate in the table below, data on students' performance in KCSE and their KCPE marks when they entered your school over the period indicated.

Year	School Mean Score	Average KCPE Mark	
2002			
2003			
2004			
2005			

APPENDIX B: INTERVIEW SCHEDULE FOR HEADTEACHERS

- 1 Name of school.....
- 2 Give a brief outline of your school's student establishment since the year 2002:
2002.....
2003.....
2004.....
2005.....
- 3 In your opinion, what is the contribution of the following facilities to students' performance?
 - a i) Library.....
 - ii) Laboratories.....
 - iii) Classrooms.....
 - b i) Students' entry score.....
 - ii) Fees charged per student.....
 - iii) Teacher/Student ratio.....
 - iv). Textbooks and teachers guides.....
4. i). Who finances school programmes besides parents?.....
.....
ii) Who decides the amount of fees charged by the school?.....
.....
iii) Compare the current budget and that in 2002.....
vi). What proportion of the budget do you manage to collect and spent?.....
- 5 Comment on the criteria for admission of students in this school in relation to:
 - i) Availability of facilities.....
 - ii) Students' entry marks.....
 - iii) Ability to pay fees.....
 - iv) Availability of teachers.....
 - v) Availability of textbooks.....
- 6 Do some students fail to be promoted?
- 7 Do you have sufficient textbooks across the subjects in this school?.....

8 Do you consider the teachers you have to be adequate?.....

9 Briefly explain how the following factors affect the academic performance of your school:

i) Parents (investment in child teachability, psychological guidance, etc)

.....
.....

ii) Location of the school

.....
.....

iii) Demand for child labour

.....
.....

10 Briefly comment on future prospects of your school in relation to academic performance.....

.....
.....

APPENDIX C: SECONDARY SCHOOLS IN BUMULA AND KANDUYI DIVISIONS

Bumula Division	Kanduyi Division
Myanga Secondary	Kimukung'i Secondary
Netima Secondary	Ndengelwa Secondary
Napara Secondary	Kitale Secondary
Mayanja Secondary	Kongoli Secondary
Mungore Girls	Sikalame Secondary
Lumboka Secondary	Kimugui Secondary
Bumula Secondary	Mwibale Secondary
Chiliba Secondary	Sang'alo Secondary
Nang'eni Secondary	Bulondo Secondary
Mateka Secondary	Musikoma Secondary
Mwiruti Secondary	Lwanda Secondary
Miluki Secondary	Samoya Secondary
-	Bungoma Baptist Secondary
Kimaeti Secondary	Kibabii Boys
Kabula Secondary	Bungoma Boys
Khasoko Boys	Cardinal Otunga Girls
-	Bukembe Secondary

**APPENDIX D: PROVINCIAL SCHOOLS DATA ENTRIES FOR THE YEARS 2002-
2005**

Year	Enrol	Libcap	Labcap	Clascap	Entsco	Totcost	Teach	Les	Bk/sbj	Mean
2002	595	20	40	560	275	13175000	34	704	71	5.3
2003	597	20	40	560	286	13175000	34	704	71	5.01
2004	601	20	40	560	263	13375000	34	704	71	5.82
2005	505	20	40	560	294	13375000	34	704	71	5.61
2002	301	40	25	320	280	6880161	16	352	271	4.34
2003	285	40	25	320	275	5935372	16	352	271	5.42
2004	295	40	25	320	285	5429702	16	352	271	5
2005	256	40	25	320	290	5223249	16	352	271	5.05
2002	457	0	72	640	299	12990868	34	528	175	5.9
2003	479	0	72	640	295	13990258	34	528	175	5.05
2004	460	0	72	640	300	11160155	34	528	175	5.17
2005	443	0	72	640	270	11160155	34	528	175	4.94
2002	218	60	45	540	260	3065000	16	440	428	7.1
2003	305	60	45	540	268	5565096	16	440	428	7.69
2004	488	60	45	540	290	6369364	16	440	428	7.05
2005	446	60	45	540	312	8162967	16	440	428	7.46
2002	929	100	150	800	353	16333497	53	880	368	6.97
2003	929	100	150	800	353	17365741	53	880	368	7.49
2004	929	100	150	800	353	19400000	53	880	368	7.12
2005	929	100	150	800	366	21357000	53	880	368	6.99
2002	829	200	150	640	385	19258904	46	704	216	8.48
2003	844	200	150	640	370	19457899	46	704	216	8.46
2004	840	200	150	640	375	20399454	46	704	216	8.6
2005	866	200	150	640	380	20266308	46	704	216	8.7
2002	400	40	80	495	350	6619165	25	528	194	7.23
2003	355	40	80	495	350	8326969	25	528	194	7.45
2004	439	40	80	495	355	7176472	25	528	194	6.43
2005	472	40	80	495	345	9457705	25	528	194	6.74

2002	169	45	45	270	274	1307929	14	220	29	5.13
2003	152	45	45	270	297	1294660	14	220	29	5.32
2004	161	45	45	270	303	1400781	14	220	29	5.26
2005	201	45	45	270	308	1688933	14	220	29	4.9
2002	115	30	45	180	230	1676692	11	220	21	4.28
2003	136	30	45	180	246	2031723	11	220	21	4
2004	136	30	45	180	238	2031723	11	220	21	4.43
2005	124	30	45	180	260	2700970	11	220	21	4.72
2002	75	0	0	160	250	812420	12	220	21	3.38
2003	109	0	0	160	279	1219682	12	220	21	3.9
2004	147	0	0	160	306	1991477	12	220	21	4.42
2005	167	0	0	160	288	2125383	12	220	21	4.86
2002	136	34	55	360	250	1020000	9	220	19	4.35

APPENDIX E: DISTRICT SCHOOLS DATA ENTRIES FOR THE YEARS 2002-2005

	Enrol	Libcap	Labcap	Clascap	Entsco	Totcost	Teach	Less	Bk/sbj	Mean
Year										
2003	166	34	55	360	250	1025000	9	220	19	4.9
2004	190	34	55	360	250	1880000	9	220	19	4.57
2005	200	34	55	360	250	1505000	9	220	19	4.67
2002	124	0	40	200	250	1035895	10	220	21	4.19
2003	126	0	40	200	250	1586750	10	220	21	5.11
2004	126	0	40	200	250	1485150	10	220	21	4.6
2005	138	0	40	200	250	1985850	10	220	21	5.67
2002	271	0	35	360	243	2384000	16	440	16	5.61
2003	360	0	35	360	267	3283200	16	440	16	5.26
2004	379	0	35	360	288	3626410	16	440	16	5.6
2005	406	0	35	360	290	4612140	16	440	16	5.27
2002	169	0	40	240	250	2153000	14	220	7	4.36
2003	139	0	40	240	260	2168000	14	220	7	4.6
2004	141	0	40	240	250	2150000	14	220	7	4.19
2005	144	0	40	240	270	2152758	14	220	7	4.14
2002	90	5	20	160	190	773978	10	220	43	3.32
2003	112	5	20	160	190	2148523	10	220	43	4.08
2004	119	5	20	160	200	2751102	10	220	43	4.21
2005	138	5	20	160	200	3538321	10	220	43	4.89
2002	145	0	80	200	261	2547385	10	220	56	4.48
2003	144	0	80	200	270	2101827	10	220	56	5.39
2004	164	0	80	200	288	1871375	10	220	56	4.61
2005	160	0	80	200	289	1824013	10	220	56	4.38
2002	67	0	0	100	271	592054	7	176	18	3.18
2003	60	0	0	100	251	775420	7	176	18	3.83
2004	66	0	0	100	257	741503	7	176	18	4
2005	85	0	0	100	300	1377273	7	176	18	3.77
2002	100	0	45	140	227	1399650	9	220	40	4.88

2003	122	0	45	140	218	1597866	9	220	40	4.32
2004	138	0	45	140	280	2608103	9	220	40	4.55
2005	183	0	45	140	292	2717525	9	220	40	5.11
2002	149	40	40	280	294	1175186	5	176	45	3.88
2003	163	40	40	280	281		5	176	45	4.78
2004	142	40	40	280	298	2511790	5	176	45	5.21
2005	159	40	40	280	294	2735298	5	176	45	4.93
2002	98	0	0	120	272	684080	11	176	0	4.07
2003	60	0	0	120	240	512509	11	176	0	3.91
2004	96	0	0	120	245	799023	11	176	0	3.44
2005	107	0	0	120	245	1438810	11	176	0	3.59

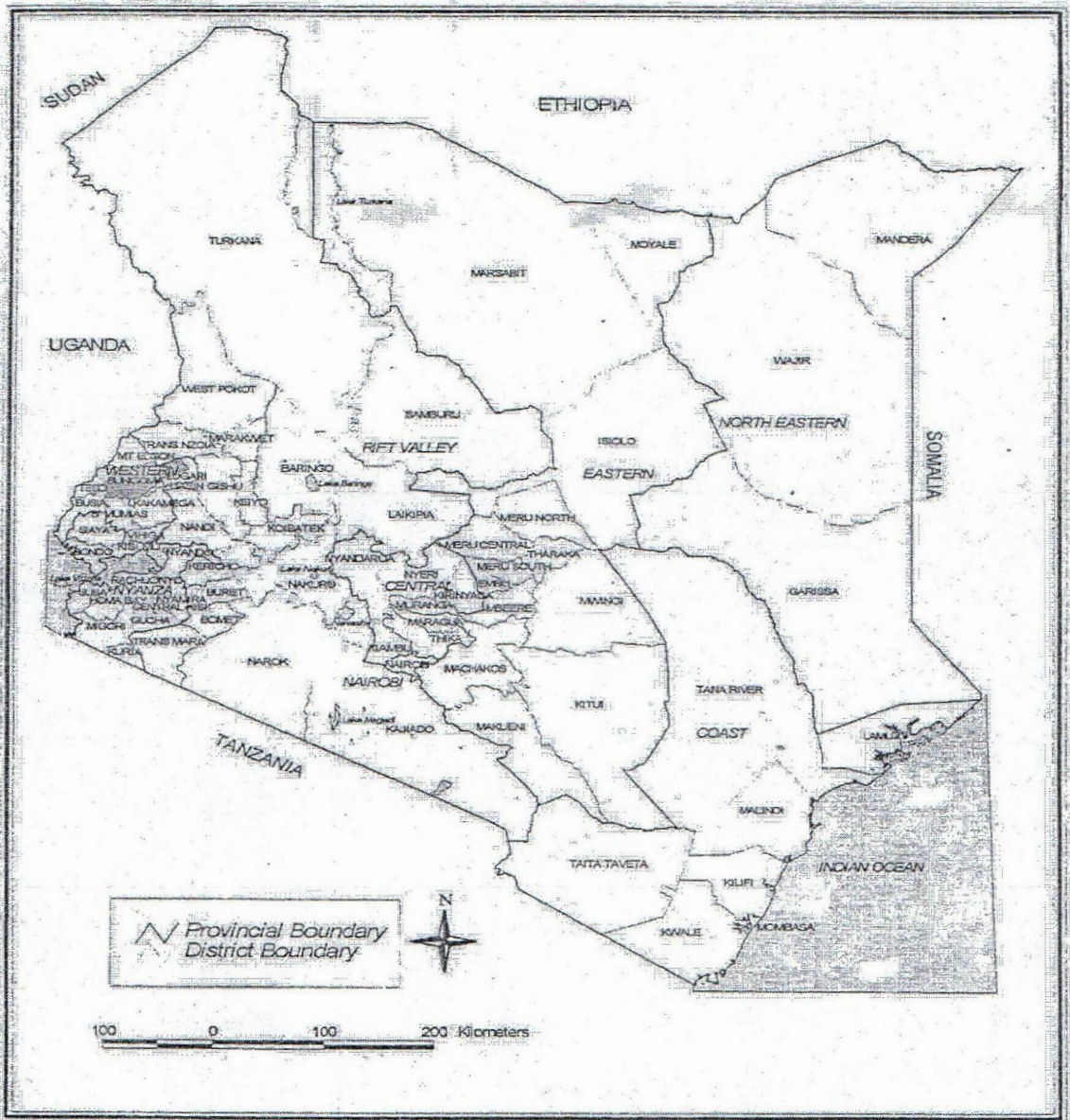
APPENDIX F: SUMMARY OF INPUT RATIOS FOR SCHOOLS

Enrol	St/Lib	St/lab	St/class	Ents	Unit cost	St/tech	TechLoad	St/bk	Mean
595	29.75	14.875	1.0625	275	22142.86	17.5	20.70588	8.380282	5.3
597	29.85	14.925	1.066071	286	22068.68	17.55882	20.70588	8.408451	5.01
601	30.05	15.025	1.073214	263	22254.58	17.67647	20.70588	8.464789	5.82
505	25.25	12.625	0.901786	294	26485.15	14.79412	20.70588	7.112676	5.61
301	7.525	12.04	0.940625	280	22857.68	18.8125	22	1.110701	4.34
285	7.125	11.4	0.890625	275	20825.87	17.8125	22	1.051661	5.42
295	7.375	11.8	0.921875	285	18405.77	18.4375	22	1.088561	5.00
256	6.4	10.24	0.8	290	20403.32	16	22	0.944649	5.05
457	0	6.347222	0.714063	299	28426.41	13.44118	15.52941	2.611429	5.9
479	0	6.652778	0.748438	295	29207.22	14.08824	15.52941	2.737143	5.05
460	0	6.388889	0.71875	300	24261.21	13.52941	15.52941	2.628571	5.17
443	0	6.152778	0.692188	270	25192.22	13.02941	15.52941	2.531429	4.94
218	3.6333	4.844444	0.403704	260	14059.63	13.625	27.5	0.509346	7.1
305	5.0833	6.777778	0.564815	268	18246.22	19.0625	27.5	0.712617	7.69
488	8.1333	10.84444	0.903704	290	13051.98	30.5	27.5	1.140187	7.05
446	7.4333	9.911111	0.825926	312	18302.62	27.875	27.5	1.95614	7.46
929	9.29	6.193333	1.16125	353	17581.81	17.5283	16.60377	2.524457	6.97
929	9.29	6.193333	1.16125	353	18692.94	17.5283	16.60377	2.524457	7.49
929	9.29	6.193333	1.16125	353	20882.67	17.5283	16.60377	2.524457	7.12
929	9.29	6.193333	1.16125	366	22989.24	17.5283	16.60377	2.524457	6.99
829	4.145	5.526667	1.295313	385	23231.49	18.02174	15.30435	3.837963	8.48
844	4.22	5.626667	1.31875	370	23054.38	18.34783	15.30435	3.907407	8.46
840	4.2	5.6	1.3125	375	24285.06	18.26087	15.30435	3.888889	8.6
866	4.33	5.773333	1.353125	380	23402.2	18.82609	15.30435	4.009259	8.7
400	10	5	0.808081	350	16547.91	16	21.12	2.061856	7.23
355	8.875	4.4375	0.717172	350	23456.25	14.2	21.12	1.829897	7.45
439	10.975	5.4875	0.886869	355	16347.32	17.56	21.12	2.262887	6.43
472	11.8	5.9	0.953535	345	20037.51	18.88	21.12	2.43299	6.74
169	3.7556	3.755556	0.625926	274	7739.225	12.07143	15.71429	5.827586	5.13

152	3.3778	3.377778	0.562963	297	8517.5	10.85714	15.71429	5.241379	5.32
161	3.5778	3.577778	0.596296	303	8700.503	11.5	15.71429	5.551724	5.26
201	4.4667	4.466667	0.744444	308	8402.652	14.35714	15.71429	6.931034	4.9
115	3.8333	2.555556	0.638889	230	14579.93	10.45455	20	5.47619	4.28
136	4.5333	3.022222	0.755556	246	14939.14	12.36364	20	12.36364	4
136	4.5333	3.022222	0.755556	238	14939.14	12.36364	20	12.36364	4.43
124	4.1333	2.755556	0.688889	260	21782.02	11.27273	20	5.904762	4.72
75	0	0	0.46875	250	10832.27	6.25	18.33333	3.571429	3.38
109	0	0	0.68125	279	11189.74	9.083333	18.33333	5.190476	3.9
147	0	0	0.91875	306	13547.46	12.25	18.33333	7	4.42
167	0	0	1.04375	288	12726.84	13.91667	18.33333	7.952381	4.86
136	4	2.472727	0.377778	250	7500	15.11111	24.44444	7.157895	4.35
166	4.8853	3.018182	0.461111	250	6174.699	18.44444	24.44444	8.736842	4.9
190	5.5885	3.454545	0.527778	250	9894.737	21.11111	24.44444	10	4.57
200	5.8823	3.636364	0.555556	250	7525	22.22222	24.44444	10.52632	4.67
124	0	3.1	0.62	250	8353.992	12.4	22	5.904762	4.19
126	0	3.15	0.63	250	12593.25	12.6	22	6	5.11
126	0	3.15	0.63	250	11786.9	12.6	22	6	4.6
138	0	3.45	0.69	250	14390.22	13.8	22	6.571429	5.67
271	0	7.742857	0.752778	243	8797.048	16.9375	27.5	16.9375	5.61
360	0	10.28571	1	267	9120	22.5	27.5	22.5	5.26
379	0	10.82857	1.052778	288	9568.364	23.6875	27.5	23.6875	5.6
406	0	11.54286	1.127778	290	5302.36	25.375	27.5	25.375	5.27
169	0	4.225	0.704167	250	12739.64	12.07143	15.71429	24.14286	4.36
139	0	3.475	0.579167	260	15597.12	9.928571	15.71429	19.85714	4.6
141	0	3.525	0.5875	250	15248.23	10.07143	15.71429	20.14286	4.19
144	0	3.6	0.6	270	14949.71	10.28571	15.71429	20.57143	4.14
90	18	4.5	0.5625	190	8599.756	9	22	2.093023	3.32
112	22.4	5.6	0.7	190	19183.24	11.2	22	2.604651	4.08
119	23.8	5.95	0.74375	200	23118.5	11.9	22	2.767442	4.21
138	27.6	6.9	0.8625	200	25640.01	13.8	22	3.209302	4.89

145	0	1.8125	0.725	261	17568.17	14.5	22	2.589286	4.48
144	0	1.8	0.72	270	14596.02	14.4	22	2.571429	5.39
164	0	2.05	0.82	288	11410.82	16.4	22	2.928571	4.61
160	0	2	0.8	289	11400.08	16	22	2.857143	4.38
67	0	0	0.67	271	8836.627	9.571429	25.14286	3.722222	3.18
60	0	0	0.6	251	12923.67	8.571429	25.14286	3.333333	3.83
66	0	0	0.66	257	11234.89	9.428571	25.14286	3.666667	4
85	0	0	0.85	300	16203.21	12.14286	25.14286	4.722222	3.77
100	0	2.222222	0.714286	227	13996.5	11.111111	24.44444	2.5	4.88
122	0	2.711111	0.871429	218	13097.26	13.555556	24.44444	3.05	4.32
138	0	3.066667	0.985714	280	18899.3	15.333333	24.44444	3.45	4.55
183	0	4.066667	1.307143	292	14849.86	20.333333	24.44444	4.575	5.11
149	3.725	3.725	0.532143	294	7887.154	29.8	35.2	3.311111	3.88
163	4.075	4.075	0.582143	281		32.6	35.2	3.622222	4.78
142	3.55	3.55	0.507143	298	17688.66	28.4	35.2	3.155556	5.21
159	3.975	3.975	0.567857	294	17203.13	31.8	35.2	3.533333	4.93
98	0	0	0.816667	272	6980.408	8.909091	16	0	4.07
60	0	0	0.5	240	8541.817	5.454545	16	0	3.91
96	0	0	0.8	245	8323.156	8.727273	16	0	3.44
107	0	0	0.891667	245	13446.82	9.727273	16	0	3.59

APPENDIX G: MAP OF KENYA SHOWING BUNGOMA DISTRICT



APPENDIX I: LETTER OF INTRODUCTION



EGERTON

Telephone: Nakuru 62481/91/92
Telegrams: UNIVERSITY, Njoro
Kenya

UNIVERSITY

P. O. Box 535
Njoro

EU/ACA/C,I & EDUC. MGT/1/7

August 4, 2006

In reply quote Ref:

Date:

TO WHOM IT MAY CONCERN.

REF: SAMWEL WAMALWA MUNDA: REG. EM15/0847/03

The above subject is a registered Post-Graduate student pursuing Masters in Educational Management (M.Ed, Mgt) in the dept. of Curriculum, Instruction and Educational Management, Faculty of Education.

Mr. Munda has successfully defended his research proposal and is now ready for Field data collection. Towards this, he needs authority from your office to enable him to access relevant data from schools for this study.

Any assistance accorded to enable him get these information will be highly appreciated.

Yours sincerely

Dr. A.K. Sang

THESIS/PROJECT RESEARCH CO-ORDINATOR.

Dept. of Curriculum, Instruction & Educational Management

AKS/mok

APPENDIX J: LETTER OF AUTHORITY TO CONDUCT RESEARCH

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

Telephone: Bungoma: 30148
DEO's House : 30584
FAX:05530700
When replying please quote
Our Ref: BD/GA/29/4/73.



DISTRICT EDUCATION OFFICE
BUNGOMA DISTRICT,
P.O. BOX 40,
BUNGOMA

16th August, 2006.

The Principals,
Secondary Schools,
BUMULA/KANDUYI DIVISIONS

RE: RESEARCH AUTHORIZATION

MUNDA WAMALWA - REG. EM15/0847/03

The above mentioned is a Masters student at Egerton University. He is pursuing Masters in Educational Management (M.Ed, Mgt) in the department of Curriculum, Instruction and Educational Management: Faculty of Education.

Kindly accord him all the necessary assistance.


G. AMATHA
FOR: DISTRICT EDUCATION OFFICER
BUNGOMA.

DISTRICT EDUCATION OFFICER
BUNGOMA DISTRICT

EGERTON UNIVERSITY LIBRARY