COST – EFFECTIVENESS ANALYSIS OF EDUCATING DAY AND BOARDING SECONDARY SCHOOL STUDENTS IN KISUMU DISTRICT, KENYA

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN PLANNING AND ECONOMICS OF EDUCATION

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ABSTRACT

The purpose of Cost effectiveness analysis in education is to ascertain which programmes or combination of programmes can achieve particular objectives at the lowest cost. By choosing those programmes with the least cost for a given outcome, society can use its resources more effectively. The study analyzed cost effectiveness of educating day and boarding secondary school students in Kisumu district Kenya. The study was carried out in Kisumu district because the district has both rural and urban settings since Kisumu town is the head quarter of the district.The specific objectives of the study were to; analyze the performance of day and boarding students, evaluate the cost effectiveness of educating boarding and day secondary students, to establish both the direct private and direct social costs of educating a student in boarding and day secondary school, and to establish home and school environmental factors affecting day and boarding students. The theory that was used in this study was the Cost Effectiveness Analysis Theory. It was used in this study to calculate the performance of day and boarding secondary schools against their cost. The research designs that were used in the study were descriptive survey and ex post facto designs. Five schools were selected using saturated sampling procedure. One of the schools was used for pilot study to ensure reliability of the research instruments while the remaining four schools were used for the main study. The selection of teachers and students was done by systematic sampling procedure. The Population consisted of five head teachers, 140 form four teachers, and 281 form four day students and 328 form four boarding students. The sample size will be as follows; four head teachers 43 form four teachers, 93 day students and 103 boarding students, which is 33% of the population for the teachers and the students. In collecting the data, four questionnaires were used. To ensure face validity of the research instruments three experts from the department were consulted. A test retest method was used to establish reliability coefficients which were 0.767 for Head Teachers Questionnaire. Others were 0.761, 0.748 and 0.753 teachers day and boarding students questionnaires respectively. Data was analyzed using descriptive statistics such as percentages, mean, and inferential statistics such as linear multiple regression analysis and factor analysis methods. The results of the finding of the study revealed that, the average direct private cost of educating day and boarding form four student per year was 26,414/- and 37,641/- respectively. On average the fees charged by the schools to boarders and day scholars per annum was 29,400/- and 16,250/- respectively. The government subsidy only caters for 40.22% of the total cost of day student, and 28.23% of the total cost to boarders. Ninety point one per cent of the direct social cost of education was utilized in the payment of teachers' salary; this was due to long experience of the teachers that averaged 14.68 years. The total direct social cost of education a day and a boarding student per year was 62,193/- and 74,140/- respectively. The day student performed better than the boarding student with a mean of 8.12 and 7.41 respectively. The boys performed better than the girls with a mean of 8.01 and 7.27 respectively. The Cost Effective Ratio for the day and boarding student was 7,748/- and 10,005/- respectively. To improve the performance of a day student by one point requires 7,748/- compared to 10,005/-, required by a boarder. The main problems faced by day students were; staying long distance from school, lack of family or parental support and low family socio economic status. The boarders were mainly affected by lack of discipline, inadequate reading and boarding facilities. The significance of the study is that it might give direction to policy makers on how to provide secondary education in a more cost effective way.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Although there is considerable talk among policy makers about the need for cost effectiveness analysis in education, there is only limited evidence that it is applied (Ashdown and Rossi, 2002). While education is considered the key to economic success, and investments in education by national governments as well as international agencies are growing, most educational investments continue to be made on the basis of untested or partially tested assumptions about the cost effectiveness of particular interventions (Ashdown and Rossi, 2002).

According to Woodhall (2004) cost effectiveness Analysis consists of three steps. First the cost of the alternatives must be carefully measured; secondly the outcomes or educational effectiveness of the alternatives must be measured e.g. a standardized test scores of students in each school; and finally cost and effective measures are combined to calculate cost effectiveness ratio, by dividing the cost by effectiveness to show for example the school that produces the greatest improvement for a given cost.

In Europe, higher education, including secondary education begun with training in religion and philosophy. Its purpose was to prepare leaders, especially religious leaders, and its curriculum reflected this purpose. As time passed, general topics for more applied professions were added as part of secondary education curricula (Cowell and Holsinger, 2000).Those early European secondary schools were almost exclusively for males, focusing on promotion of logical thinking, refined form of expression, and improved

memory (Cowell and Holsinger, 2000). From nineteenth century to the second world war, the curriculum begun to encompass more subjects such as modern languages and literature, modern history, scientific and technological subjects.

There is a vast body of literature that identifies the expansion of secondary education as a key component of successful development strategies (Schultz, 1988; Psacharopoulos, 1994). In spite of this general consensus, there is still much disagreement about how to allocate scarce public resources within secondary education sector in a cost effective way (Coady and Parker, 2002). Because of secondary education's middle position between primary and tertiary levels, its programs have had a functional role: giving students access to higher education, preparing students to life long education, and preparing students to work (World Bank, 2002b). In addition to those traditional functions, society is increasingly demanding that secondary education encompass subjects such as the environment, human rights, drug addiction, AIDS, poverty and unemployment (World Bank, 2002b).

According to the World Bank secondary education is most expensive relative to Gross National Product per capita in African countries with the lowest enrolment rates (World Bank, 2001a). According to Lewin (2006) cost per pupil for secondary schooling in Africa average six times that of primary level. Non teaching costs can be as much as 40% of the total cost per pupil. Studies have also shown that African countries with low secondary enrolment rates cannot finance substantially higher participation rates from domestic public resources (Lewin and Caillods, 2001). Although some African countries

have increased the funding for secondary education, the absolute amount of funds might not be sufficient to generate a tangible impact (Jatta, 2006).

As primary schooling in Sub Saharan Africa becomes universalized, the demand for access to secondary education increases (Lewin, 2004). Over the last decade, secondary education enrolment rates have not increased substantially in many of the poorest countries (Lewin, 2004). Access remains highly unequally distributed geographically and in terms of social-economic backgrounds of those who participate. For example in Ethiopia Gross Enrolment Ratio (GER) stands at below 10% for the whole country, but there is dramatic disparities by region, gender, and rural and urban dimensions (Ethiopian Ministry of Education, 2004).

The experience in Uganda, Tanzania and Kenya shows that elimination of fees at the primary level has resulted in increased demand for secondary education (Raja and Burnett, 2004). To attain the goal of universalizing primary education access and completion, countries must maintain or increase their transition rates to secondary schooling. If the rates fall retention in upper primary will decrease as it becomes clear that for many there will be no progression to higher education levels (Lewin, 2004).

As primary schooling becomes universalized, participation at secondary level will become a major determinant of life chances and a major source of subsequent inequality (Lewin, 2004). Access to and success in secondary schooling will continue to be highly correlated with subsequent employment and income distribution patterns.

Low enrolment in secondary education in East Africa may reflect lack of supply of schooling, the opportunity cost of attending school and factors such as distance from

school (Raja and Burnett, 2004). Major determinants for enrolment include household income, schooling costs, presence of schools, transportation, community involvement, and education quality and relevance (Raja and Burnett, 2004).

As secondary schooling expands, the case of subsidizing boarding secondary schools weakens. Schools can be located within daily travel distances for the majority of school age children (Lewin, 2006). Selective boarding secondary schools are common in Africa, but can double or triple the per pupil cost and results in much lower enrolment rates than would otherwise the case.

The cost of providing secondary education for most Kenyan households has remained prohibitive at 25,000/= for boarding secondary schools and 10,500/= for day secondary schools (Ayodo, 2006). The secondary school expenditure per pupil for household in Kenya represents 65.4% of the average per capita consumption expenditure (Ministry of Education, 2003). The average per pupil expenditure by household amounted to 200% of the total per capita income measured by consumption of the poorest 20% of Kenyan households (Doellikar, 1998). This explains the recorded low participation rates by the poor in secondary school level which is only about 5%.

In January 2008 the Kenyan Government introduced Free Secondary Education (FSE) by releasing US$ 41 million subsidy for the first quarter of FSE (Malenya, 2008). Kenya joins the ranks of a few African countries that have rolled out 12 year universal basic education plan in line with the international protocol signed in 1990 at Jomtien, Thailand and in 2000 in Dakar Senegal (World Bank, 2002b).

According to Holsinger, Jacob and Migimu (2002), in Uganda many boarding school meals are frequently badly managed or badly prepared, despite the adequacy of the diet. Kitavi and Westhluzan (1997) reported over crowding in dormitories in boarding schools, with sometimes double the originally intended number of students being accommodated

In spite of those problems, an average boarding student enjoys living and studying conditions which are luxurious, compared to the hardship and squalor endured by many day students. According to Clarissa (1992), Desarrollo (2007), Evans (1999) Jagero (1999) Scharff and Brady (2006) and Oloo (2003), the greatest problem faced by day students was home environment that was not conducive to reading. Other problems includes: long distances from school, bad company at home, lack of proper accommodation and proper diet.

According to reports by African Almanac (2004) and studies by Holsinger, Jacob and Migimu (2002) Chediel, Sekwao and Kirumba (2000) Jagero (1999) and Oloo (2003), the majority of day secondary schools continued to perform poorly in the national examinations compared to boarding secondary schools. For example according to Kisumu District Education office, about 65% of schools which were ranked in the top ten in the district from 2005 to 2008 in the National Examinations were boarding secondary schools.

the cost effectiveness of educating students in day and boarding secondary schools, in Kisumu district Kenya. There have been very few cost effectiveness analysis studies carried out by researchers, policy makers and postgraduate students in Africa (Figueredo and Anzolane, 2003), therefore there was an urgent need to conduct one.

1.3 Purpose of the Study

The purpose of this study was to analyze cost effectiveness of day and boarding secondary students in Kisumu District, Kenya.

1.4 Objectives of the study

The specific objectives of the study were:

(i) To establish the direct private costs of educating a student in day and boarding secondary schools in Kisumu district Kenya.

(ii) To establish direct social costs of educating a student in day and boarding secondary schools in Kisumu district Kenya.

(iii) To evaluate the performance of day and boarding secondary students.

(iv) To evaluate whether it is more cost effective to educate a boarding or a day secondary student.

(v) To establish home and school environmental factors affecting day and boarding secondary school students in an attempt to achieve academic excellence.

1.5 Research Questions

The following were the research questions that guided this study:-

(i) What are the direct private costs of educating day and boarding secondary students?

(ii) What are the direct social costs of educating day and boarding secondary students?

(iii) How does the performance of day and boarding secondary students compare?

(iv) How does the cost effectiveness of educating day and boarding secondary students compare?

(v) What are the home and school environmental factors affecting day and boarding secondary school students in a bid to achieve academic excellence?

1.6 Significance of the Study

According to Drew, Hardman and Hart (1996) significance of the study refers to the rationale for the study and its relationship to theory, knowledge and practice. The study should add to the scholarly research and literature in the field, and the study should help in improving practice and policy.

The findings of the study will add to scholarly research and literature in cost effectiveness analysis in economics of education.

(i) The use of cost effectiveness analysis to judge educational interventions, which is an efficiency theory, has been scarce. Since the field of economics of education was derived from human capital theory most of the economics of education researchers give priority to research areas, such as rate of return analysis, cost benefit analysis and education production theory. The study calculated the cost effectiveness ratio for both day and boarding students in secondary schools in Kisumu district, Kenya.

To improve educational practice and policy the findings of study;

(ii) The study would provide information that could be used by teachers, head teachers, parents, Parents' Teachers Association (PTA), Board of governors (BOG), Ministry of Education on ways of improving performance of day and boarding secondary schools in Kenya.

(iii) Since the study will compare the performance and the cost of day secondary students with that of boarding secondary students, it would help in justifying the expansion of day secondary schools in Kenya or it could suggest whether the government should invest more in boarding secondary schools.

(iv) The study might also give information on ways of lowering private and social costs in day and boarding secondary schools. It will also suggest which type of secondary school to invest in by the government and private organizations so as to expand secondary education in a more cost- effective way. This is more urgent because of the additional enrolment of about 1.5 million students in primary schools following the government's implementation of free primary education in 2003 and additional enrolment of 200,000 in secondary schools since the implementation of FSE in January 2008.

1.7 Theoretical Framework

The theory that was used in this study is the Cost-Effectiveness Analysis Theory, which is an efficiency theory. Cost – effectiveness analysis compares the output achieved by combination of various inputs, which can allow policy makers to identify the lowest cost of achieving a desired level of output that can be achieved for a given cost (Psacharopoulos and Woodhall, 1985). For both government and individuals, the choice between different ways of investing resources rests to a great extent on evaluation of both

costs and benefits associated with the investment. The theory assumes that the profitability of education can be increased by either increasing the output or decreasing the cost of education therefore it is an efficiency measure in education (Woodhall, 2004)

The Cost-Effectiveness Analysis Theory was developed in the 1950s by the United States Department of Defense as a device for adjudicating among the demands of the various branches for the armed services for increasingly costly weapons systems with different levels of performance and overlapping missions (Hitch and McKean, 1960). Gradually the tools of cost effectiveness analysis made their way from the Pentagon to other government agencies, with the United States of American (USA) President Lyndon Johnson, requirement that all budgetary requests be supported by a programmed, planned, and budgeting system that tied mission and goals to cost (Levin, 2001).

By the 1960s it had become widely used as a tool for analyzing the efficiency of alternative government programs outside of the military, although its applications to educational decisions have been much slower to develop (Levin, 1995). A particularly strong expansion of cost effectiveness analysis is found in evaluating health services (Drummond, O'Brien, Stoddart, and Torance, 1977; Gold, Siegel, Russell, and Weinstein, 1996). The World Bank undertook a massive and comprehensive study to guide resource allocation for twenty four categories of health interventions for disease control in developing countries by using a cost effectiveness framework (Jamison, Mosley, Measham, and Bobadilla, 1993). Indeed, in the early 1990s the use of the tool in considering educational resource allocation was restricted largely to the United States and

had not emerged as a decision approach to resource allocation in other countries (Levin, 1995).

In early 1970's Levin was the first economist of education to use cost effectiveness analysis. He wanted to establish cost effectiveness analysis as a useful evaluative tool in the field of education and other areas of human service. He used the data from the Coleman report (1966) to compare the cost effectiveness of two alternative strategies for teacher selection; hiring of more experienced teachers or those with higher verbal test scores (Levin, 2001). The results suggested that it was from five to ten times more effective per unit of cost to raise student achievement by getting more verbally able teachers than those with greater experience.

In early 1970's, it was obvious that the use of cost effectiveness analysis to judge educational interventions was not of much interest to economists (Levin, 2002). The field of economics of education was derived from human capital theory and was devoted primarily to the estimation of rates of return to educational investments rather than efficiency in institutional resource allocation by level of education (Levin and Mc Ewan, 2000). Even today, rate of rate of return analysis is far more prominent than cost effectiveness research in the field of education (Levin, 2002). Educational evaluators were preoccupied with educational effectiveness regardless of the cost implications. It seemed that a major priority should be the integration of costs with effectiveness measures to rank alternatives to their efficiency in resource use (Levin, 2002).

Application of Cost - effectiveness theory in education has been carried out by the following researchers: Levin, (1970), Jamison, Kless and Wells (1978), Levin (1987), Lockheed and Hunushek (1988). Cost – effectiveness analysis is very useful because it provides educational planners and economists with information useful in making rationale policy decision in terms of optimum resource use. They used the theory to calculate the cost effectiveness ratio to different type of schooling, giving an idea at which level within the schooling system investments gives the highest returns. In this study the theory was used to calculate the cost effectiveness ratio of boarding and day secondary education. The theory is useful in this study because provided a method of choosing between two types of investments i.e. day or boarding secondary school.

The study used the following formula to calculate cost effectiveness ratio to both day and boarding students.

$$\textbf{Cost- Effectiveness Ratio (CER)} = \frac{\textbf{Cost of educating a student}}{\textbf{Effectiveness}}$$

Cost effectiveness analysis is closely related to cost benefit analysis. The approach to measuring costs is similar for both techniques, but in contrast to cost effectiveness analysis where results are measured in educational terms, cost benefit analysis use monetary measures of outcomes. In this study effectiveness of education will be restricted to the performance of both boarding and day students in Kenya Certificate of Secondary Education examinations. Therefore the above formula was modified as follows;

$$\textbf{CER} = \frac{\textbf{Cost of educating a secondary student}}{\textbf{Performance in KSCE examinations}}$$

1.8 Scope of the Study

(i) Both the social and the private cost of educating both boarding and day students were calculated only for the form four students who were sitting for the KCSE exams. It was impossible to obtain the costs from form one to form four due to some students transferring to other schools, and others joining the schools in form two or three. It was impossible to identify the cohort who completed the four year cycle in the same school.

(ii) Effectiveness was restricted to the performance of the students in KCSE examinations. Other effectiveness measures such as graduation rates, discipline and good citizenry were not included.

1.9 Limitations of the Study

(i) Cost – effectiveness analysis derives its cost effectiveness ratio to investment in schooling on the basis of the effectiveness and costs at the time the data is collected. The cost effectiveness ratios may measure the effectiveness to investment already made, but they may well not remain valid for further investments undertaken now or in future, since the effectiveness and costs are likely to change with time.

(ii) Some of the respondents left some questions either incomplete or failed to answer some items at all. This problem was common with the teachers' questionnaire, especially in one of the school where some teachers felt that there are being unnecessarily bothered by too many research students from local universities.

(iii) Some head teachers were always out of their stations, or when present were always busy to have enough time to complete the questionnaire items therefore

the researcher had to make several trips to such schools in order to obtain positive response.

(iv) This study was limited to day and boarding secondary schools in Kisumu District. The district was divided into two districts, Kisumu West and Kisumu East Districts in mid 2007.

(v) Only direct private and direct social costs were included in the study. Indirect private and social costs especially costs such as earning foregone in terms of teacher's time, opportunity cost of students' time, cost of donated land and buildings was ignored.

1.10 Assumptions of the Study

(i) The quality was equated with student's good examination performance, because such training improves effectiveness ratio to educational output.

(ii) The day and boarding secondary students had the same school inputs such as teachers, head teachers, admission scores laboratory equipment, teacher-pupil ratio and instructional materials.

(iii) Motivation of teachers and head teachers to work was the same in all the secondary schools.

(iv) That most teachers and all head teachers in the secondary schools were employed by Teacher's Service Commission (TSC) and their salaries are standardized.

1.11 Definition of Terms

Academic Achievement: It is good performance or success in a standardized national examination such as KCSE.

Boarding secondary school: Those are second level educational institution where the students reside within the institution's compound.

Cost Benefit Analysis: It is an economist's tool, which is designed to provide an economic appraisal of an investment possibility. It gives a systematic comparison of the magnitude of the cost and the benefits of some form of investment in order to asses its profitability (Woodhall, 2004).

Cost-Effectiveness Analysis: It compares the output achieved by combination of various inputs, which can allow us to identify the lowest cost of achieving a desired level of output or the greatest level of output that can be achieved for a given cost (Psacharopoulos and Woodhall, 1985).

Cost Effectiveness Ratio (CER): It is defined as the cost of a program or combination of programs divided by its effectiveness, such as test scores in standard examination (Levin, 1995).

Day secondary school: Those are second level educational institutions where students reside outside the institutions and they commute from home to school every school day.

Direct oblimin rotation: It is the standard method when one wishes a non- orthogonal (oblique) solution, that is one in which the factors are allowed to be correlated (Tucker and MacCallum, 1997).

Education Effectiveness: It can be described as the extent to which the desired educational output is achieved (Scheerens, 2000).

Education efficiency: It is defined as the desired level of educational output against the lowest possible cost (Scheerens, 2000).

Eigenvalues: It measures the variance in all the variables which is accounted for by that factor (Suhr, 2005).

Factor Analysis: It is a statistical procedure used to uncover relationships among many variables. This allows numerous Intercorrelated variables to be condensed into fewer dimensions known as factors (Suhr, 2005).

Opportunity cost of Secondary Students: Those are wages and salaries that a student must forgo in order to enroll in education rather than to find employment. They reflect the value of the goods or services that the student would have produced in employment (Woodhall, 2004).

Principal Components Analysis (PCA): It seeks a linear combination of variables such that the maximum variance is extracted from the variables (Tucker and MacCallum, 1997).

Private Cost of Education: It is the cost of education to an individual, households, and the community to support the production of educational services at the school (Woodhall, 2004).

Scree Plot: It is a plot in which the x axis is the factors arranged in descending eigenvalue, and the y axis is the value of the eigenvalues (Suhr, 2005).

Social Cost of Education: It is the total amount of resources that society devotes to education (Woodhall, 2004).

Varimax Rotation: It is an orthogonal rotation of the factor axes to maximize the variance of the squared loading of a factor on all the variables in a factor matrix, which has the effect of differentiating the original variables by extracted factor (Tucker and MacCallum, 1997).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter deals with review of literature, and according to Creswell (2003); Schloss and Smith (1999), literature review should be closely related to the variables in the research questions or hypothesis. The literature was reviewed under the following sub titles; direct private cost of secondary education, direct social cost of secondary education; performance of secondary school students; cost effectiveness analysis; home and school environmental factors affecting day and boarding secondary school students, according to the five objectives of the study.

2.2 Direct Private Cost of Secondary Education

Private cost of education is the cost of education to an individual, households, and the community to support the production of educational services at the school. The costs include direct private costs, private contributions, and indirect private costs (Woodhall, 2004).

Private contributions refer to donations in cash or in kind from parents, individuals, or community organizations to a school. A study by the World Bank (2002a) in Iraq found out that there was many instances where parents and communities to mobilize energy and their resources in support of secondary schools to address the dire circumstances resulting from crisis and instability during the Gulf war.

A study in Thailand by Benveniste, Porter, Thomas and Atinc (2007) shows that educational costs poses a larger burden to poor families, who must contribute a greater share of the house hold income after paying for food and other basic needs. While the Thailand government is providing 12 years of free education, non tuition costs such as library fees, examination levies, meals and transportation serve as substantial financial obstacles for the poor families. Thailand has implemented several key policy interventions in an attempt to boost secondary enrolment. Such interventions include loan and lunch programs scholarships and bicycle lending project for the rural students, which have indeed contributed to the recent surge in secondary access.

A study by Gropello (2006) of secondary education in Latin America and East Asia found out that lack of private resources is a key determinant of access to, and completion of secondary education. Direct costs are potential constraints to schooling in both regions. Direct costs represent, for instance, about 22% of per capita household income in Bolivia and 20% to 30% in China. Constrains related to forgone income from work are stronger among the poor and in lower income countries in Latin America and East Asia. For instance, although the percentage of working children and youth is 2% in Argentina and Chile, it is 30% in Bolivia, Guatemala, Vietnam and Indonesia, and it reaches 54% in Cambodia.

Supplementary tutoring is another private cost of education, which originally had very positive aims. According to Hallack and Poisson (2007), tutoring is meant to improve student learning; provide remedial courses to under-achievers; offer opportunities for teachers to earn supplementary income and make better use of out of school time for both

teachers and students. This tutoring is meant to fill large gaps in students' learning times that are caused by a number of factors such as student and teacher absence, frequent closure of schools, ineffective teaching and negligence on the part of the teacher. In some countries, supplementary tutoring has become a major industry consuming a considerable amount of parents' money and pupils' time. Hallack and Poisson (2007) further state that private tuition has become a source of distortion that adversely affects mainstream education and the goal of equality in education.

A study by Nsemukila (2003) in Zambia found out that private cost of education include tuition fees, PTA fees, sports fund, examination fees, boarding fees, uniform and school related clothing, school books and supplies, transportation, school maintenance, private tuition and food. On average households spent twice as much on female students as on male students. Households in urban areas spent nearly twice as much as those in the rural areas.

Poverty keeps many secondary students from gaining access to education due to inability to meet direct cost of schooling. Studies done in Malawi, Ghana, Zambia, Ethiopia and Tanzania have shown that in many African countries, students especially girls are hindered from effective participation in schooling due to inability to afford such costs (Kelly, 1999). Inability to afford the direct cost to secondary education contributes to low performance due to irregular attendance (Mbilinyi, 2003).

In Tanzania the rate of fees charged in secondary schools in 2000 was Tshs 40,000 for day schools while boarding schools were charging Tshs 70,000 almost twice that of day

schools (Chediel, Sekwao and Kirumba, 2000). In addition to the above fees, there are voluntary parent's contributions which often exist in practice to supplement the fees and in theory should be authorized by Ministry of Education, but are difficult to control in reality. This voluntary fee is sometimes high as the fees charged above (Chediel, Sekwao and Kirumba, 2000).

A study in Kenya by Noormohamed (1998) has shown that the direct cost of sending a child to secondary school is reflected in expenditure on uniform, textbooks, stationary, building funds. Other costs include activity fee, tuition fee, personal emoluments, caution money, local traveling, medical, repairs, mock and maintenance fee.

Gogo (2002) indicated that fees paid by secondary students in Rachuonyo district accounted for 48.41% of the funds raised by schools. Other contributions came from the government: for teachers' salaries (47.43%), governments' bursaries (0.45%), income generating activities (0.30%) and both local and foreign donors gave money for development projects. The fees paid by the students were used in day to day running of the schools and for development expenditure.

Previously the Kenyan Government used to give grants to public secondary schools. The current policy states that parents are responsible for development cost and recurrent cost including teaching and learning materials, feeding and boarding, uniform, remuneration of non-teaching staff and transport, while government pays teachers' salaries (Ogula, 2003). Parents are also responsible for tuition, public examinations, students' personal expenses (Ngware, Onsumu and Muthika, 2007).

Since the late 1980's household contribution to secondary education has risen considerably. Given that household contribution to physical facilities and instructional materials was meant to be optional, a growing proportion of households are making contribution below what is needed or are opting out of secondary education for their children if they cannot afford the needed levies (Republic of Kenya, 2003). Household burden in financing secondary education is high, whereas households meet only 20% of primary and 8% of university education costs; they shoulder 60% of secondary education costs (Malenya, 2008). According to Njeru and Orodho, (2003) the proportion of household's income expenditures on education varies from 30% to 44% of their annual incomes, while almost two thirds of households spend less than 15% of their annual income on health and housing.

Studies by Juma (2003), Kiage (2003), Olweya (1996), indicated that the major factor influencing drop out rate in secondary schools was lack of school fees and other levies.
The cost of secondary education to household has increased rapidly because of school demands attributed to items not directly contributing to teaching and learning (Republic of Kenya, 2003). Transport and pocket money to cater for lunch expenses were the two key items contributing most to the increasing cost of secondary education in urban areas (Njeru and Orodho 2003). The cost stood at Kshs 12, 290 constituting 35% of the total fees in urban secondary schools. A study by Killean and Sipple (2000); Beaumont and Pianca (2000), in the USA showed that transporting rural students was more than twice as expensive as transporting urban students and nearly 50% more costly than transporting students in suburban districts. When the distance to school is short, students can frequently walk to school, therefore expenses on transport are thereby reduced.

According to Howly and Howly (2001) in the USA, secondary students who spend less time traveling to and from school are able to spend more time with family and friends, in community activities, and even in school work.

The above study by Benveniste et al (2007) in Thailand is similar to this study because like Thailand, Kenya also provides 12 years of free education, but other private costs, such as transport, examination, meals are paid for by parents. The study concurred with the above studies by Gropello (2006), Hallack and Poisson (2007), Chadiel, Sekwao and Kirumba (2000), Gogo (2002), Kiage (2003), Olweya (1996) and Njeru and Orodho (2003). The studies confirmed that private costs of education were a major factor that determines the enrolment and completion rates in secondary education in developing countries. The studies also confirmed that the private cost of education was a major burden to the poor, and this could influence the drop out rate and affect equality in secondary education.

The above studies by Juma (2003) and Kiage (2003) used ex post facto design; Olweya (1996) used correlation design, while the rest used only descriptive survey design. In this study apart from ex post facto design descriptive survey design was also used. The descriptive survey design has an advantage because it is easy to apply research instruments such as questionnaires which allow for the collection of data from large number of respondents in a relatively short period (Borg and Gall, 1983). The study further evaluated how private cost of education affects the performance of day and boarding students. This study went further to analyze how private cost of education

affected the performance of girls and boys differently in day and boarding secondary schools, with the same educational inputs.

2.3 Direct Social Costs of Secondary Education

There are two types of social costs; direct social cost is the total amount of resources that society devotes to education. This includes the cost of teachers and other staff, books, other goods and services such as heating or lighting, and the value of buildings and equipment. Indirect social costs include the value of teachers' time and the value of the buildings, equipment and land used by the students, which could have been put to other uses (Woodhall, 2004).

According to Pinyakong, Virasilp, and Samboon (2007) during the last decade the education sector has received the largest share of total public expenditure, the share of education as a proportion of Gross Domestic Product (GPD) rose from 3.3% to 4.0% in 2004. Sources from non governmental educational funding include donations made by individuals and communities in cash and in kind; income generated by secondary schools by students from school properties or intuitional funds from such organizations as World Bank, African Development Bank and foreign countries such as UK Germany, France and the USA.

Gropello (2006) in Latin America and East Asia showed that as funds become scarce, many public secondary schools are moving into self-financing schemes including running business, asking teaching staff to take consultancy positions, leasing school property and fundraising. Critics argue that such revenue-raising activities could increase inequality by

placing additional burdens on parents who must have already paid for direct and indirect expenses. Others complain that the off-budget revenue activities will distract managers from focusing on educational delivery and turn them into businessmen. For example schools in Beijing Haidan district used the budgeted funds from the city only to pay salaries, and had to rely on school business of: renting out space, fees for an optional foreign language program to pay for other school expenses Gropello (2006). Revenues from such activities could reach a half the budgeted funds.

In Kenya, (Njeru and Orodho, 2003), the Government of Kenya expects secondary schools to generate revenues by; engaging in income generating projects such dairy or poultry keeping, crop growing; renting out houses to staff at subsidized rates; hiring out school facilities such as vehicles, halls and public address system; seeking financial support from donors. Interviews with head teachers, PTA, and BOG members indicated that those alternative sources of funding have not been introduced into schools budgets so as to reduce fee burden on the parents. Furthermore most schools with such projects had not adequately involved staff members, PTAs and BOGs in their activities.

According to the Republic of Kenya (2003) the overall Government role in funding of secondary education includes the professional development of teachers, teacher's remuneration, provision of infrastructure, administration and management, and provision of bursaries and scholarships for needy students. In 2004/05, expenditure on secondary education as a percentage of GDP and total education budget was 1.6% and 22%, respectively (Ngware, Onsumu and Muthika, 2007). Public financing is predominantly recurrent expenditure (93.5%) while the proportion of secondary non-recurrent

expenditures including bursaries was estimated at 6.5%, implying high households financing mainly through user chargers.

Teachers and non teaching staff salaries are the major recurrent expenditure in education system Bregman and Stallmeister (2001). Because of their importance in the teaching and learning process, teachers play a crucial role in determining the efficiency and effectiveness of public educational expenditures. A study by Olel (2000) found out that social costs to secondary education in Kisumu district was mainly determined by student teacher ratio, teacher salary and teacher qualification.

The Ministry of Education has over the years targeted programs that aim at reducing the burden of the cost of education to households. The programs include bursary and grants for needy and bright children. Bursaries which are aimed at enhancing retention of bright and needy students and especially girls are disbursed by Bursary Constituency Committees (BCC) for better targeting (Ministry of Education, 2004). During the 2000/01 financial year, a total of Sh. 536 million was disbursed, an amount destined to benefit 28% of the poor students in the secondary schools (Ministry of Education, 2003). However a study by Odebero (2002) found out that the higher the socio-economic background of the students in Busia district the higher the bursary given. For the participation rates to be raised in secondary schools there is a need to review the criteria for selection of students with financial needs.

In 2007/2008 Financial year the local communities through Constituency Development Fund (CDF) were getting approximately Ksh 50 million to help with socio economic

development in each constituency. According to Mwarwanga, Okomu and Orero (2007), in case of Nyanza Province, with 32 constituencies operating as a block will have approximately Ksh 1.66 billion per year. Stake holders in the province have agreed in principle to earmark a portion of this fund towards investing in education across the Nyanza region (Mwarwanga, Okomu and Orero, 2007).

In 2004, the ministry of education provided funds to the poor secondary schools to improve their laboratories. In 2004, about 700 schools, ten from each of the 70 districts benefited, with each school getting Sh. 214,385 (Ministry of Education, 2004). In 2006, the ministry received more funds from the Treasury for the laboratory equipment and the number of schools to benefit has doubled from ten to twenty in each district.

The introduction of FSE targets raising the student enrolment to 1.4 million from 1.2 million in 2007 (Malenya, 2008). It also aims at ensuring that deserving children from poor families do not miss out on secondary education. One requirement for FSE is that for a school to benefit there has to be a student population of between 40 and 45 per class. Each student will receive a total of Ksh 10,265 per year. The money is expected to meet the full cost of tuition, repairs, travel and transport, administration, electricity and water bills, activity fees and non teaching staff salaries (Otieno, 2008). With FSE 1.4 million students are expected to join public secondary schools in 2008.

The introduction of FSE came at a time when the violence over disputed December 2007 elections had claimed at least 1200 peoples lives and about 600,000 displaced with many schools closed (Malenya, 2008). According to the Ministry of Education by February

2008, 9200 secondary students were displaced, 4682 were boys while 2979 were girls (Ministry of Education, 2008). Furthermore four secondary schools were burnt, 18 schools were vandalized, and 708 secondary school teachers had been displaced, mainly from Rift Valley Province. The Kenya News Agency reported on 1st February 2008 that the post election violence had affected 1.1 million secondary students (Onsongo, 2008). That figure included all learners who were not able to report to their schools, those learners who reported but were not being taught because their teachers had been displaced, and the schools that were not able to open on time for the first term.

According to the above study by Pinyakong, Virasilp and Samboon (2007), education sector has received the largest share of public expenditure from both the governments and non governmental organizations such as World Bank, African Development Bank, income generating activities from schools. The study concurred with studies of Gropello (2006), Ngware et al (2007) and Njeru and Orodho (2003). According to Bregman and Stallmeister (2001), Ministry of Education (2003 and 2004), Mulenya (2008), Otieno (2008) and Odebero (2002) the expenditure from the government was mainly used to pay teachers and for their professional development, provision of infrastructure, bursaries through CDF and scholarships for needy students. Other expenditures included money for laboratory improvements, money for FSE, and money for administration and management. This study went further and evaluated how the CDF, Income Generating activities Bursaries and Laboratory Equipment funds have been used to improve the performance of day and boarding secondary students.

2.4 Performance of Secondary School Students

According to World Bank (2001b), the first written public examination was introduced over 2000 years ago in China to select the most able citizens for positions in the civil service and to reduce the effects of patronage. The Chinese system was brought in Europe in the 16th century and the Jesuits incorporated the examinations in their schools. Prussians established an exam system for selection to civil service around the middle of 18th century, followed by France after the revolution. By the middle of 19th century, competitive examinations had been introduced in Britain and India to select the increasing number of government officials in the expanding empire.

In many countries in Africa, Asia, Latin America and Europe, public or external examinations have long occupied a central role in the assessment of individual students at the end of secondary schooling (Ross and Genevois, 2006). Public examinations serve a number of important functions. First, they help control the disparate elements of education system by specifying goals and standards of education. Second, examinations are used to certify the achievement of students, providing evidence a student may need in the market place. Third, examinations are used to select students for further education in what is considered an objective and unbiased way in situations in which the number of student places diminishes at each level (Ross and Genevois, 2006). Fourth, examinations especially when results are published, may serve an accountability function for teachers and schools. Finally examinations at the end of secondary schooling legitimize membership in international global society, and facilitate international mobility (Keeves, 1994; Kellaghan and Greaney, 1992; Kellaghan and Madaus, 2003).

According to Hallack and Poisson (2007) the main function of public examinations is to distribute educational benefits throughout the world on the grounds that they can serve as instruments for making objective and neutral judgments. According to a study by World Bank (2005) learning assessments are crucial for measuring education quality and relevance, diagnosing system weaknesses and motivating policy reform.

Public exit examinations can provide performance information which can hold both schools and students accountable (Hunushek and Wobmann, 2007). Students in countries with public exit examinations systems tend to systematically outperform students in countries without such systems (Bishop, 1997; Bishop, 2006; Wobmann, 2003). In the two nations Canada and Germany where the existence of external examinations vary within the country because some region feature them and others not, it has been similarly shown that students perform better in regions with external exams (Bishop, 1997; Jurges, Schneider, and Buchel, 2005).

Weak monitoring and assessment systems remain major obstacles for improved learning outcomes at the secondary school level (Bregman and Stallmeister, 2002). Systematic and internationally comparable assessment of learning in secondary education at classroom, school, and system levels is not widespread, and considerable reliance has been placed on public examinations to ensure that the common curricula are covered (World Bank, 2001). The examinations then affect the content and the skills covered in school, and teachers gear their teaching to the examinations, which tend to encourage rote learning (Bregman and Stallmeister, 2002).

According to Ross and Genevois (2006), many studies and official reports have pointed to the limitations of public examinations. Those include the fact that a heavy reliance on paper and pencil tests limits the knowledge and skills that can be tested; and that examinations contain very little reference to the everyday life of the student outside the school. A study by World Bank (2007) in Organization of Eastern Caribbean States (OECS), the number of Caribbean Examination Council (CXC) examination passes matters greatly. Students' passes are used extensively as screening device for entry into Community Colleges and University of West Indies. Most job announcements in the region refer to the desired number of CXC passes. As long as this holds true, teachers and students will continue to devote marginal attention to competencies that are not assessed by the CXC examinations.

In the Middle East and North Africa opportunities for access to secondary and higher education are rationed through national examinations at the end of primary and secondary cycle (World Bank, 2002a). In Tunisia for example, a predetermined pass rate of 35% for secondary completion examination is used to control university admission (World Bank, 1997), and in Iran only 10% of university candidates are admitted (World Bank, 1995). In Algeria examinations are used to control access to secondary education, with a limit set at 50% of grade nine candidates (World Bank, 2001b).

According to a study by Bregman and Bryner (2003), in Africa examinations are used as a selection mechanism, to eliminate students from the system rather than to certify them. Some African countries choose to purchase examinations from international organizations such as Cambridge International Examinations in United Kingdom. This is

partly to promote public confidence in the quality of the examinations, since the stakes for the students and their parents are high. For example in Mauritius students sit the Cambridge School Certificate which is prepared by a foreign institution in Britain (Bah-lalya, 2006). However it appears that the adoption of such examination reflects colonial heritage, which lags behind the current assessment culture of the former colonial power. The problem with those examinations is that they cannot properly reflect the objectives and desired outcomes of secondary education systems in African countries.

In Tanzania, there are three official examinations conducted in large scale. The form two examinations are essentially used for diagnostic purposes and for continued assessment in the O–level secondary education. The form four and form six examinations mark the completion of secondary school cycle (Chediel, Sekwao and Kirumba, 2000). The National Examination Council of Tanzania (NECTA) is responsible for the design, regulation, conduct and administration of the national examination.

According to African Almanac (2004) the best secondary school in the continent was Grey College of South Africa followed by Rift Valley Academy of Kenya. Other top secondary schools in Africa include King Edwards School and Hilton College (South Africa), St George College and Prince Edward School (Zimbabwe), International School of Kenya (Kenya), Accra Academy (Ghana) and Lycee Lamine Gueye (Senegal), were the top ten schools in that order.

The criteria used to grade the schools included the strength and active reach of the Old Students Associations, the profile of the school in terms of academic excellence and its

extracurricular activity, the presence of the school in the news and its tendency to attract news coverage, and the reputation, achievements, and high profile of the schools' current and past students (African Almanac Research, 2004).

In Kenya other schools in top 100 included, Strathmore School (29), Alliance High School (36), Starehe Boys Centre (46), Lenana School (52), Hillcrest Secondary School (84) and Mangu High School (91). All the schools in top 100 from Kenya were boarding schools except International School of Kenya and Hillcrest Secondary School, both the schools offer foreign curriculum.

A study by Husinger, Jacob and Mugimu (2002) in Uganda found that students from traditionally prestigious boarding government schools exhibit better performance in the national examinations than do students from other schools which were mainly day schools. Parents in Uganda who can afford to take their children to boarding schools generally choose to do so. The perception among most parents in Uganda is that boarding schools offer students the best environment for learning.

In Kenya for the past decade, standards in many district secondary schools which are mainly day schools have not improved, for example only 600 out of over 4,000 secondary schools attain an average mean score of C in 2007 KCSE examination (Otieno, 2008).

According to Desarrollo (2007) in Latin America, girls outperformed boys in languages by 1-2% points, but there was no gender difference in mathematics scores. The question of gender difference in academic performance in African secondary schools is neither

conclusive nor unanimous. In some countries such as Kenya girls have lower academic performance than boys, while in Mali there is no difference in performance between boys and girls (Barthes, Nair and Malpade, 2000). But according to Mensch and Lloyd (1997) studies in Nigeria and Thailand have shown a higher achievement for girls in a single sex schools relative to mixed schools but lower achievement for boys when schools with similar resources are compared.

According to 2008 KCSE results, girls performed poorly with only 16 girls making it to the list of top 100 best students. In the top 20 position overall, only 2 girls (10%) made it to the merit list, and this trend in performance has been almost the same since 2005 (Otieno, 2008). According to Aduda (2005) only 3 (3%) of top 100 students in Nyanza province were girls.

According to Hallack and Poisson (2007) one major advantage of public examinations is to distribute educational benefits in an objective and a neutral manner. The finding concurred with studies by World Bank (2001b), Ross and Genevois (2006), Kellaghan and Greaney (1992), Kellaghan and Madaus (2003).

In Kenya a recent study by Munavu, Ogutu and Wasanga (2008) indicated that access to higher education is largely dependant on performance in KCSE examinations, since it is used as the standardized selection criteria. High cost private and national and provincial boarding schools tend to produce the best performing students in KCSE therefore they dominate public universities. Their findings was similar to the above studies by Ross and

Genevois (2006), Bregman and Bryner (2003), and World Bank (2007, 2001b, 1997 and 1995).

The third most important function of public national examination according to Wobmann (2005) was the measurement of education quality and relevance, diagnosing system weaknesses, and motivating policy reforms. In Kenya according to Munavu, Ogutu and Wasanga (2008), national examinations have tended to define the style and intensity of teaching at school level. Currently over 57% of the teachers in secondary schools spend most of their time preparing students to master test taking skills in order to pass KCSE examinations. Furthermore, over 30% of the teachers in secondary schools use past examination papers as teaching resources in the classroom at least once a week. Time for teaching is misappropriated to testing and coaching. This is understandable, since passing with relatively better grades means a different future world for both the students and the teachers. The function was similar to the one mentioned by Bishop (1997, 2006), Wobmann (2005), Jurgers, Schneider and Buchel (2005), and Bregmann and Stallmeister (2002).This study was different from the above mentioned studies, because in this study the performance was used to calculate cost effective ratio which is an efficiency measure in education.

2.5 Cost – Effectiveness Analysis of Education

The purpose of Cost-effectiveness analysis in education is to ascertain which programmes or a combination of programmes can achieve particular objectives at the lowest cost (Levin, 1995). The underlying assumption is that different costs are associated with different educational results (Carnoy, 1995). By choosing those

programmes with the least cost for a given outcome, society can use its resources more effectively. Levin (1995) argues that measures of educational effectiveness can be those which a decision maker would normally consider, such as improvement in student scores, and that cost–effectiveness evaluations generally require less time and other resources than cost benefit analysis.

A cost- effectiveness analysis study by Coady and Parker (2002) in Mexico compared the cost-effectiveness of subsidizing investment in education to the poor, i.e. bringing the poor to the education system and the extensive expansion of the education system i.e. bringing education to the poor, in increasing the enrolment of secondary students. Using double difference regression estimators on data collected before and after the programs for randomly selected control and treated households, the study found out that it was more cost-effective to subsidize secondary education, than extensive expansion of secondary schools.

Another cost effectiveness study in Mexico involved Telesecundaria Educational Television Program (TETP). The program was initiated in 1968 to allow schools in remote rural areas to deliver secondary school curriculum identical to that of convectional schooling (Fugieredo, and Anzolane, 2003). TETP was also meant to encourage students to play an active role in improving the quality of life of their communities by tackling issues such as hygiene, pollution, water accessibility and human rights (Calderon, 1998). While the per pupil costs in TETP and traditional secondary schools are similar, the program is an important way of providing remote rural areas in Mexico with access to high quality education in a cost effective way (De Moura

Castro, 1998). TETP students have higher promotion rates and lower drop out rates than convectional secondary schools, and their results on achievement tests are comparable (Calderoni, 1998).

A study by Quinn, Mondfrans and Worthen (1984) examined the cost- effectiveness of two different Mathematics curriculum in secondary schools in America. One approach was based upon a traditional text book application. The other was a locally developed curriculum that emphasized highly individualized instruction with special method of teaching mathematics. The latter curriculum was more effective, but was also 50% more expensive than the traditional one (Quinn et al, 1984). The educators found out that even though the locally developed curriculum was more effective, it was less cost-effective due to its high cost.

In 1974, in an effort to meet growing demand for secondary schooling, South Korean government established Air Correspondence High School (ACHS), a distance education program leading to the same examination taken by regular high school students (Figueredo and Azolane, 2003). Student's fees, rather than government funding covered most of the programs' costs. According to Figueredo and Anzolane (2003) the academic achievement in ACHS was about 12% lower than that of regular high school students, but this was achieved at one- fifth of the cost per graduate of regular high school, making the program highly cost effective. One important factor in the success of the program is that its curriculum is the same as that of the regular high school.

In 1989 the government of India established the National Open School (NOS), in order to extend secondary education to students without access to traditional secondary education (Anzalone, 1995). The primary mediums of learning in NOS are self instructional guides and supplementary audio and video programs available through study centers. The NOS has been particularly successful in reaching disadvantaged groups such as girls, members of the secluded castes and tribes, and handicapped persons. After enrolling, the students have five instead of four years to complete their course of study, allowing them ample time to study at their own pace without having to give up their jobs thus reducing opportunity cost of education (Figueredo and Anzolane, 2003). Since NOS generates 92% of its recurring cost through student fees, it offers students from disadvantaged groups special concessions thus becoming more cost effective in providing secondary education than traditional secondary schools (Anzalone, 1995).

A study by Tatto et al (1991) of teacher training in Sri Lanka compared the cost-effectiveness of training in colleges of education and in teachers colleges as well as through distance education. Teacher performance and pupil achievement were used as a measure of effectiveness. Teachers who received distance education were almost as effective as those trained in colleges, but costs of their training was a small fraction of the cost of institutional training. In a country that has shortage of teachers, it appears that expansion of distance education was most cost- effective.

In 1979, the Open Junior Secondary School (OJSS) was established in Indonesia to extend educational opportunities to secondary school age children who were not served

by regular education system (Figueredo and Anzolane, 2003). The main mediums of study of the OJSS are the printed guides supported by radio and TV programs, audiocassettes or video programs. In 1999, there were 376,620 OJSS students in 3,773 locations throughout Indonesia, and about 95% of the students passed the national final examinations making the program to be highly successful and very cost effective way of providing secondary education (Indonesian Ministry of Education and Culture, 1998). But the OJSS program has some drawbacks due to difficulties in recruiting enough writers capable of developing high quality learning materials (Figueredo and Anzolane, 2003)

To increase the access to secondary schooling in Malawi, there was a rapid expansion of Malawi College of Distance Education (MCDE) and their Distance Education Centers (DECs) (Samarrai and Zaman, 2002). Government funding in DECs was limited to paying of teachers' salaries which resulted in lower unit cost compared to Convectional Secondary Schools (CSS). According to the Ministry of Education in Malawi (1997) in 1997, 36% of CSS students passed Malawi School Certificate compared to only 8% of DEC students. Even though the passing rate for DEC students was much lower compared to CSS students due to their lower unit cost the DECs ware more cost effective compared to CSS (Samarrai and Zaman, 2002).

Another cost-effective study in Uganda by Jacob, Holsinger and Mugumu (2005), between private and government sponsored secondary schools, found out that private secondary schools were more cost effective. This was because the per pupil spending in both government and private schools were almost similar, whereas the student

achievement was much better in private schools. The researchers also noted that there was more efficient use of funds in private schools than in government sponsored schools. According to Ngware et al, (2007), in Kenya the public expenditure on teacher salaries comprise 66% of the day school expenditures and 37.3% in national schools, while school fees comprise 60.8% for national schools compared to 30.6% in day schools. This distribution suggests that that any cost effectiveness strategy in secondary education should be targeted at expanding day schools, which charge lower school fees and have lower unit costs for on part of households.

None of the above studies has compared the cost effectiveness day and boarding secondary education. This study would find out whether educating a child in day or boarding secondary school is more cost-effective, both to the parents and to the society.

2.6 Home and School Environmental Factors Affecting Day and Boarding Students

The majority of day secondary schools in Kenya were originally established for urban students and children of the Asian communities. The boarding tradition began at the turn of 20th century by Anglican and Roman Catholic Missionaries, with an aim of adopting English public school system to the African race. Boarding schools are justified on Nation building grounds because they bring together students from different regional and ethnic backgrounds. In addition, they may offer economics of scale with regard to teacher utilization and they avoid commuting costs associated with day schools (Republic of Kenya, 2005).

Studies by Dermie, Lewis, and MacLean (2006), and Diriye (2006) attribute the poor performance of Somali pupils in United Kingdom to overcrowded accommodation. A typical Somali family of six children can have little or no space to organize their learning materials and may experience learning obstacles such as excessive noise levels. A study by Clarissa (1992) in Barbados examined home environmental factors that have a positive influence on achievement of secondary students. She found out that family stability, unity and security had a positive influence on school achievement. Data was collected from a sample of 105 form four students with 40% boys while 60% were girls.

A study by Evans (1999) on gender achievement of secondary education in Jamaica found out that socialization within the home and the community contributed to their motivation to achieve. According to Desarrollo (2007) in Latin America the extent to which parents or other family members are actively engaged in a student's education had a positive influence on student achievement. But a study by Hinnum and Park (2004) in rural China found out that there is no positive correlation between family and community cohesion with student achievement, however the study found out that the parent child interaction supported child's aspirations and confidence.

According to Dermie et al (2007) lack of parental support among the Somali students in the United Kingdom contributed to their poor performance. Many of the Somali parents were unable to offer help to their children because of lack of prior education or ability to use English. The above studies were supported by studies in Kenya by Jagero (1999), Oloo (2003) and Mackenzie (1997) that showed that home environment of the day

students that was not conducive to reading was a major problem affecting academic achievement.

The problems for day students arose from a lot of work at home. A study by Desarrollo (2007) in Latin America found out that secondary students with the responsibility of earning money for their families on a regular basis performed poorly in their national examinations. In Malawi according to Scharff and Brady (2006) girls are expected to help their mothers with labour intensive house hold chores before going to school and therefore arrive to class late and exhausted. Because of such responsibilities, girls are less likely than boys to perform well (Scharff, 2007). According to Mbilinyi (2003) most students especially girls are engaged in such activities as caring for their siblings when their parents are away, taking care of the sick and attending to traditional rituals, funerals and other celebrations. In Kenya Mensch and Lloyd (1997) found out that if girls have more domestic responsibilities than boys, they may have less time for homework. On the other hand, if girls are confined at home after school and boys allowed more freedom, girls may use some of their free time to do more homework thus performing better than boys.

Grantham, Himes, Williams, Duff, and Walker, (1998) while studying school performance of Jamaican girls found out that, better achievement levels were associated with possession of school materials and access to reading materials outside school. In rural China a study by Hinnum and Park (2004) found out that there was a positive correlation between the presence of reading materials at home and performance. The above studies by Grantham et al and Hinnum and Park was supported by a study by

Jagero (1999) in Kisumu district that found out that lack of reading materials at home was a major factor affecting the performance of day secondary students.

A study by Coady and Parker (2002) in Mexico found out that distance to secondary school had consistently large negative effect of the probability in enrolling in secondary school. The impact in general was much larger for girls than boys. For girls, a reduction of distance to the nearest secondary school by 1 kilometer would result in an increase in the probability of attending by 8.6% points, whereas for boys, the corresponding increase would be approximately 6.3% points.

Long distances from homes to schools are a likely cause of under participation among rural communities in Africa where only few schools exist (Malenya, 2008). According to De Jaeghere (2004) in Africa lack of formal secondary schools in close proximity to girls' homes prohibits their participation. Parents are always concerned about the safety of their daughters as they travel to and from school. In Sudan a study by Otieno (2006) revealed that parents would not allow their daughters to attend schools that are far from their homes, even if the schools they attend have boarding facilities. In Zambia a study by Nsemukila (2003) found out that 50% of the children in urban areas are located within 15 minutes walking distance to school compared to 14% in the rural areas. The average walking time to the nearest secondary school was 27 minutes for urban areas and 185 minutes for students in the rural areas.

A study by Kitavi and Westhuizan (1997) in Kenya showed that students from poor families who cannot afford to pay for transport costs must walk long distances to school.

In such situations by the time the students reach their schools they are already exhausted and less motivated to learn. The long distance to school can also lead to lateness, absenteeism, and drop out (Kitavi and Westhuizan, 1997).

Studies by Mwinzi and Kimengi (2006), Jagero (1999), Mensch and Lloyd (1997) in Kenya indicated that being sent home frequently to collect fees balance interfered with their learning, thus affecting their academic performance. On average students take up to one week per month to report back to school, in total the student ends up missing an average of one month per term which translates to one term per year (Mwinzi and Kimengi, 2006). The consequences of missing classes have far reaching effects on the students; such effects include, increasing probability of dropping out, discourages hard work, and stresses the student while trying to cover missed lessons, hence increases chances of failing (Mwinzi and Kimengi, 2006). According to Mensch and Lloyd (1997) school based factors that reduce learning time include disruptions due to teachers' absence, time out of class for chores or punishments. Some of the chores performed at school include preparing and serving food, running errands and assisting teachers in their homes.

In China, boarding secondary schools are very useful because they help to uplift the educational conditions of the students especially those whose parents are migrant workers (Government of China, 2007). In China there are 40 million children whose parents are working away from home. With their parents' physical absence, most of those children struggle with their lives especially towards education and personal development (Government of China, 2007). The Chinese government has a plan to establish additional

government boarding schools that are least expensive so that most Chinese parents can afford them. Most parents in China believe that boarding high schools can help students to be fully educated at the same time to be guided in forming and shaping the personal characteristics of the students to become responsible and good to the society.

Studies by Jagero (1999) and Holsinger, Jacob and Migimu (2002), found out that problems faced by boarding students included overcrowding in the students' hostels, inadequate and low quality food, scarcity of water, noise from class or neighbouring classes. Other problems include lack of good lighting system, interference from friends in the same or other classes and disturbances from non human activities like mosquitoes.

A study by Holsinger, Jacob and Migimu (2002) in Ugandan secondary schools found out that most boarding schools had no running water. Most of the schools depend on rain water trapped into water reservoirs such as plastic tanks. According to Kitavi and Westhuzan (1997) most boarding secondary schools in Kenya have inadequate supply of clean water. In such boarding schools there are not enough funds to drill boreholes, therefore the schools are forced to share water pump or tank with the local communities. The impact of safe, clean toilets in schools in Africa has been documented. A study by UNICEF reports that from 1997 to 2000, enrolment rates for girls jumped 17% after improvements in school sanitation, and the dropout rate among girls fell by even greater percentage (Rihani, 2007).

A study by Rihani (2007) showed that for female students to feel safe in school environment it is not only necessary for community to acknowledge a harassment

problem, it is also necessary to set up channels of reporting the incidences. Teachers should be empowered to report such behaviour and feel confident that appropriate action will be taken. A study by Scharff (2007) in Malawi found out that girls were more vulnerable than boys to abuse, both while in transit and when in school. To avoid lengthy walk to school some girls make their own lodging arrangement near community day schools that don not offer boarding facilities (Scharff and Brady, 2006). Those self boarders are unsupervised by the school and are therefore at risk of theft and self abuse (Scharff, 2007).

The studies by Clarissa (1992), Hinnum and Park (2004), Grantham et al (1998), Nsemukila (2003), Holsinger, Jacob and Migumu (2002) Jagero (1999), Oloo (2003) and Mackenzie (1997) used simple descriptive statistics and linear regression to analyze their data. In this study factor analysis which is a data reducing technique was used to analyze data, because there were so many variables. Factor analysis has an advantage because it provides an empirical basis for reducing all the variables to few factors by combining variables that are moderately or highly correlated to each other (Gall and Borg, 1996). Very few studies in Educational Management have used factor analysis for data analysis.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter consists of research design, study area, study population, sample and sampling techniques, and instruments of data collection. Other sections include validity and reliability of research instruments, administration of research instruments and methods of data analysis.

3.2 Research Design

A research design indicates a plan of action to be carried out in connection with a proposed research work. It provides only a guideline for the researcher to enable him to keep track of his actions and to know that he is moving in the right direction in order to achieve his goals (Charles, 1998).

The researcher employed the descriptive survey and ex post facto designs. A survey design involves asking a large group of respondents' questions about a particular issue (Mugenda and Mugenda, 1999). According to Creswell (2003) a survey design provides a quantitative or numeric description of trends, attitudes or opinions of a population by studying a sample of that population. From the sample results the researcher generalizes a bout the population especially if the population is too large. The design has an advantage because it is easy to apply research instruments such as questionnaires and which also allow for the collection of data from a large number of respondents in a relatively short period.

The limitation of descriptive survey research is that they depend on cooperation of respondents. When data collection procedures are erroneous, the responses given maybe inaccurate and hence, the whole study may be flawed and requesting information which is considered secret and personal encourages incorrect answers (Gall and Borg, 1996).

Kerlinger (1983) states that ex post facto is a systematic, empirical inquiry in which the researcher does not have direct control of independent variables because their manifestations have already occurred. In this study the cost of education and performance of day and boarding students had occurred by the time data was collected. The advantage of ex post facto design is that the data cannot be manipulated by the researcher or the respondent (Gall and Borg, 1996). According to Newman (1991) ex post facto design have limitations because the technique does not establish cause and effect in a relationship but it merely suggest it, and the results may not be easily reproducible.

3.3 Area of Study

This study was carried out in Kisumu District of Nyanza Province, Kenya. The district borders Nyando District to the East, Nandi District to the North East, Vihiga District to the North, Siaya District to the North West, Bondo District to the West and Rachuonyo District to the South. Kisumu town is the head quarter of Kisumu District.

According to 1999 census Kisumu District had a population of 504,359. This population is projected to reach 604,225 by 2008; about 20% increase (Republic of Kenya, 2002). The rapid population growth has placed a lot of pressure on services such as education. The district is divided into five divisions, namely; Maseno, Kombewa, Winam, Kadibo and Miwani, covering a total area of 918.5km.^{2}

The people who live below the poverty line in the district were estimated to be 53%, about 267,310 people (Republic of Kenya, 2002). In the Poverty Assessment Report for Kisumu District in May 2000, it was established that more than half the population was poor, and that poverty levels have been increasing over time.

Economically, the district relies heavily on agricultural related activities, such as growing rice, sugarcane, cotton and fishing. However due to lack of market and dilapidated infrastructure no sufficient income is realized from those activities. Many factories i.e. textile and sugar have been closed rendering many of their employees redundant. Other economic activities in the district include wage employment, rural self employment and urban self employment.

3.4 Study Population

According to Kisumu District Education Office there are five day and boarding secondary schools in the district. Those schools were listed as day schools, but Board of Governors run their boarding sections

Table 3.1 The Population of Day Students, Boarding Students, Head teachers and Teachers

School	D/S	B/S	H/T	TRS
P	21	14	1	14
Q	7	66	1	16
R	2	19	1	10
S	221	49	1	60
T	30	180	1	40
Total	281	328	5	140

Source: Kisumu District Education Office, 2006.

Key D/S Day students

B/S Boarding Students

H/T Head teachers

TRS Teachers

The researcher obtained the number of all the teachers teaching form fours, all the form four day and boarding students from the head teachers in the five schools. Therefore the total population of the teachers in the study was 140 while the number of students was 281 day students and 328 boarders. All the five head teachers participated in the study. Therefore the population of the study was 754. The students were drawn from form four because the researcher believes they will be able to give mature and more accurate responses. The form four students were selected by the researcher because they sat for KCSE national examinations, therefore the researcher could use their performance to calculate the cost- effectiveness ratio.

3.5 Sampling Procedure

Saturated and systematic random samplings were used in this study. Saturated sampling technique was used to select the schools, because all the five schools were used for the study. Saturated sampling technique for selecting the schools was used by the researcher because the target population was so small that selecting a sample would have been meaningless. One of the schools was used for pilot study while the remaining four schools were used for the main study. A pilot study involves small scale testing of the procedures that the researcher plan to use in the main study, and revising the procedures based on what the testing reveals (Gall and Borg, 1996).

All the head teachers of the five secondary schools participated in this study. The teachers, day and boarding students were selected using systematic random sampling. In a systematic sampling procedure, every K^{th} case of the population is selected for inclusion in the sample (Mugenda and Mugenda, 1999). This method is popularly used in those cases where a complete list of the population from which a sample is drawn is available. To obtain a truly random sample using this method, the list of all in the sampling frame was first randomized by the researcher.

About 33% of the target population was used in this study, and that was a fair representation (Gall and Borg, 1996). A total of four head teachers, 43 form four teachers, 93 day students and 103 boarding students participated in this study, bringing a total sample to 243 respondents

Table 3.2: Population and the Sample for Day Students Boarding Students Head teachers and Teachers

School	D/S	%	B/S	%	H/T	%	TRS	%
P	7	33	5	33	1	100	5	33
Q	2	33	22	33	1	100	5	33
S	74	33	16	33	1	100	20	33
T	10	33	60	33	1	100	13	33
Total	93	33	103	33	4	100	43	33

Source: Head teachers Kisumu District, 2006.

Key D/S Day students

% Percentage of the sample derived from the population

B/S Boarding Students

H/T Head teachers

TRS Teachers

3.6 Instruments of Data Collection

In collecting data, four questionnaires were used. The first questionnaire was Head teachers' Questionnaires on Factors Affecting Cost and Performance of the Students (HQFACPS), (Appendix one). The five questionnaires were administered to all the five head teachers who participated in the study. The HQFACPS sought information on factors affecting the cost and performance of students to their schools.

The second questionnaire was the Teachers' Information on Cost and Performance of Student Questionnaire (TICPSQ), (Appendix two). TICPSQ was designed for all the teachers who participated in this study. TICPSQ sought information from teachers on factors affecting the cost and performance of students.

The third questionnaire was the Day Student's Home Academic Information Questionnaire (DSHAIQ), (Appendix three). DSHAIQ was administered to all the day students who participated in this study. DSHAIQ sought information about day student's home and environmental factors affecting their academic performance.

The fourth questionnaire was the Boarding Students' Academic Information Questionnaire (BSAIQ), (Appendix four). BSAIQ was administered to all the boarding students who participated in this study. BSAIQ sought information on boarding students' school environmental factors affecting their academic performance.

3.7.1 Validity of Research Instruments

Validity has been defined by the extent to which a test measures what it claims to measure (Gregory, 1992). Therefore validity is the degree to which results obtained from the analysis of the data actually represent the phenomenon under study (Mugenda and Mugenda, 1999). If such data is a true reflection of the variables, then the inferences based on such data will be accurate and meaningful.

To ensure face validity of the research instruments, three members of the Faculty of Education at the University who are experts in this area of study scrutinized the research instruments. Their suggestions were used in revising the questionnaires before preparing

the final copy. Face validity is a non statistical assessment of whether or not a test appears to be valid (Fairchild, 2002). This concept is really not an index of validity at all; rather it simply addresses the layman acceptability of a measure (Gregory, 1992).

Before the instruments were used to collect the data for the study, a pilot study was conducted in one of the schools. This was to ensure that the researcher got the intended information from the questionnaires. The pilot study also helped to identify the problems the respondents would encounter while filling them. A pilot study also provides data for making estimates of time and the cost for completing various phases of the research (Gall and Borg, 1996). The number of respondents for the pilot study should be between 9% - 10% of the sample population (Gall and Borg, 1996). In this study a total of 24 respondents from school R were used for the pilot study, since the total sample population is 243.

3.7.2 Reliability of Research Instruments

Reliability is a measure of degree to which research instruments yields consistent results or data after repeated trials or the degree to which test scores are free from measurement errors (Fairchild, 2003; Mugenda and Mugenda, 1999; Gall and Borg, 1996). A cross disciplines competent researchers not only fail to report the reliability of their measures (Nunnally and Bernstain, 1994), but also fall short of grasping the inextricable link between reliability and effective research.

The test – retest method was employed to establish the reliability of the questionnaires. The technique involves administering the same instrument twice to the same group of

subjects (Gregory, 1992). The most critical problem with this method is to determine the correct delay between the two administrations of measure (Gall and Borg, 1996). If the re-test is administered too soon after the initial test, students may recall their responses to many of the items, which will tend to produce artificially high reliability coefficient. On the other hand, if the re- testing is delayed too long there is a good possibility that the students' ability to answer some items will change, and this may lead to lower reliability coefficient (Crocker and Algina, 1986). A period of two to four weeks is the most appropriate for most social researchers (Gregory, 1992).

The questionnaires were administered to the same secondary schools used in the pilot study within an interval of two weeks. Pearson Product Moment Correlation Coefficient was calculated for each questionnaire. Pearson Product Moment Correlation Coefficient (r) is computed when both variables to be correlated are expressed as continuous scores. The coefficient r is the most widely used bi variate correlation technique because most educational measures yield continuous scores and because r has a small standard error (Gall and Borg, 1996). In social sciences, acceptable reliability coefficient range from 0.6 (Nunnally and Bernstain, 1994; Gregory, 1992; Crocker and Algina, 1986; Gall and Borg 1996; Mugenda and Mugenda, 1999).

The Reliability Coefficient for the Head Teachers Questionnaire was 0.767. The others are Teachers' Questionnaire at 0.761, Day Students Questionnaire at 0.748 and Boarding Students' Questionnaire at 0.753 (Appendix Five). All the above Reliability Coefficients were between 0.6 showing that the four questionnaires were reliable.

3.8 Procedure of Administration of Research Instruments

The researcher reported to the Kisumu District Education Officer (DEO) find out the actual number of secondary schools with both day and boarding sections. The researcher visited the schools selected for the study, and explained to the head teachers the purpose of the study. He gave each head teachers the HQFACPS, and left them for about two weeks, so as to give the head teachers enough time to fill them.

The researcher was introduced to the teachers by the head teacher or his appointee. The researcher explained the purpose of the study to the selected teachers, and each teacher was given TICPSQ to complete. The researcher left the TICPSQ with the teachers for two weeks to give them enough time to fill them.

After being introduced to the students by the head teacher or his assistant, the researcher explained the purpose of the study to the students. After selection of the students, the researcher distributed the DSHAIQ to the day students and BSAIQ to the boarding students in the same class. The researcher ensured that the students were able to complete the questionnaire in his presence. Incase of any difficulties, the students were asked to seek clarification from the researcher. After completion of both questionnaires the researcher collected them personally from students.

The researcher thanked the students and assured them of the confidentiality and anonymity in reporting the findings of the study. The researcher assured the students the information they were giving was to be kept confidential and therefore their teachers, head teachers, parents or their colleagues will not have access to the information. The

researcher protected the identity of the students by asking them not to write their names on the questionnaire. They were instructed to only include their 2007 KCSE index numbers because the researcher obtained their KCSE examination results in February 2008, after they had done their examinations and left their various schools.

After two weeks, the researcher collected the HQFACPS and TICPSQ. After collection of the questionnaire, any information, which never came out, clearly was sought through unstructured interview with the concerned teacher or head teacher. Though the researcher was satisfied by the information he received from HQFACPS and TICPSQ.

3.9. Data Analysis

Data was analyzed using descriptive statistics, linear multiple regression and factor analysis methods using Statistical Package for Social Sciences (SPSS). For descriptive statistics the researcher examined all the completed questionnaires, and the information contained therein was tabulated in frequency tables and percentages.

The researcher developed a Likert like scale for most of the questionnaire items for easy analysis of the data. In the scale, the points were awarded by the researcher as follows;

Strongly Agree (SA)	= 5
Agree (A)	= 4
Undecided (U)	= 3
Disagree (D)	= 2
Strongly Disagree (SD)	= 1

Multiple regression analysis technique was used to calculate factors affecting cost effectiveness of education, since it showed the individual effect on each independent variable on the dependent variable. In factor analysis each set of variables that is combined forms a factor, which is a mathematical expression of the common element in the variables that are combined (Frankel, 1992).The method was used to analyze home and school environmental factors that affect performance. The weakness of factor analysis is that factors generated are only useful and meaningful as the variables entered into a correlation matrix. If the variables have little or nothing in common conceptually, a factor analysis is in appropriate (Gall and Borg, 1996).

The advantage of multiple correlation analysis, multiple regression analysis and factor analysis is that they permit one to analyze a relationship among a large number of variables in a single study (Gall and Borg, 1996).

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter is organized in five sub sections according to the five research questions and objectives. The sub sections includes; direct private cost of secondary education, direct social cost of secondary education, performance of secondary school students, cost effectiveness analysis, and home and school environmental factors affecting performance.

4.2 Direct Private Cost of Secondary Education

The first research question that guided this study is; what are the direct private costs of educating day and boarding secondary students?

Private cost of education is the cost of education to individuals, including earnings forgone by the students. The researcher calculated the unit cost or cost per pupil incurred by parents or guardians in educating a form four day or boarding student. Unit cost is very useful in comparing cost per pupil between schools of different sizes, or between urban and rural schools of the same system or between girls and boys at the same level of education.

The direct private cost was divided into two categories of costs by the researcher;

(i) The fist category was the money levied by the individual schools in form of fees and this money was paid directly to the various schools by the parents.

(ii) The second category was the money given directly to the students by their parents to sustain them in school. Such levies included cost of transport, pocket money etc.

The money paid directly to schools in form of school fees included the following; Tuition fees, activity, local transport, repairs and maintenance, medical, mock and KCSE examination fees, electricity and water, contingencies and caution money. The mentioned levies were standardized by the government, therefore all the schools, charged the same fee.

Table 4.1: Standardized School Fees charged in Shillings to Boarding and Day Secondary School Students per Year as indicated by Head teachers (n=4)

Levies	Boarding Student	Day Student
Tuition	3,600	3,600
Activity	900	900
Local Transport	1,000	1,000
Repairs and Maintenance	800	500
Medical	400	200
Mock examination	950	950
KCSE examination	3,200	3,200
Electricity and Water	1,000	500
Caution Money	500	500
Contingencies	700	400
Total	13,050	10,650

Table 4.1 shows the levies charged for both the boarding and day students. From the table the total fees charged was 13,050/- that was 54.5% of the total cost for boarding student, compared to 10,650/- (44.5%) for the day student. The boarding students paid more money than day students in the following levies; repairs and maintenance, medical, electricity and water, and contingencies. This was because the boarders were likely to utilize more of these services, after the day student had gone home, at the end of school day.

Table 4.2: Total fees charged in Shillings by the Schools to Boarding Students per Year According to Head teachers Responses (n=4).

Charges	Schools				
	P	Q	S	T	Average
Standardized Charges	13,050	13,050	13,050	13,050	13,050
Boarding fee	9,000	9,000	10,500	9,000	9,375
Building/PTA/Development	2,000	3,000	3,500	2,000	2,626
Personal emoluments	3,500	3,500	4,000	4,000	3,750
Science, Math teachers training	200	200	200	200	200
Others (Harambee, book donation)	--	--	1,600	--	400
Total	**27,750**	**28,750**	**32,850**	**28,250**	**29,401**

Other direct private levies that were charged by the schools as fees to parents included development funds, building funds, PTA funds, boarding fees, personal emoluments, book donations, and science and mathematics training levy. The fees charged varied from one school to another as shown in Table 4.2

As shown in Table 4.2 the total fees paid directly to the schools by boarding students ranged from 27,750/- to 32,900/- with the average boarding fees being 29,400/-.

School R was used by the researcher for pilot study and its findings were used to revise the questionnaires, therefore findings were not included in the final results. It should be recognized that pilot studies may have a number of limitation such as data contamination (Teijlingen and Hundley, 2005). Contamination may arise in two ways: where the data from the pilot study are included in the main results, and where pilot participants are included in the main study, but new data are collected from those people (Teijlingen and Hundley, 2005). Social scientists engaged in predominantly quantitative research are likely to argue that: "an essential feature of a pilot study is that the data are not used to test a hypothesis or included with the data from the actual study when the results are reported" (Peat et al, 2002). The obvious concern is that if there were problems with the research tools and modifications had to be made in the light of the findings of the pilot study, data could be flawed and inaccurate (Teijlingen and Hundley, 2005).

Table 4.3: Total Fees in Shillings Charged by the Schools to Day Students per Year According to the Head teachers Responses (n=4)

Levies	Schools				
	P	Q	S	T	Average
Standardized Charges	10,650	10,650	10,650	10,650	10,650
Building/PTA/Development	2,000	3,000	3,500	2,000	2,650
Personal emoluments	2,000	2,000	3,000	2,500	2,375
Science, Math teachers training	200	200	200	200	200
Others (Harambee, book donation)	--	--	1,600	--	400
Total	**14,850**	**15,850**	**18,950**	**15,350**	**16,250**

As shown in Table 4.3 the fee paid directly to the schools by the day students ranged from 14,850/- to 18,950/- with the average fees paid being 16,250/-.

Other direct private costs that were incurred by parents, but not paid directly to schools included money for lunch, pocket money, transport, replacement or repair of school uniforms, supplementary text books and private tuitions.

Since the amount of money spent by individual student for the above mentioned items was different for each student, the researcher calculated the average amount spent by each student, by obtaining the total amount of money spent by all students in a particular school and dividing this sum by the total number of students.

Table 4.4: Costs in Shillings Incurred by Parents with Students in Boarding Section per Year as Indicated by the Boarding Students (n=103)

Levies	Schools				
	P	Q	S	T	Average
Pocket Money	1,275	1,410	2,741	3,209	2,159
Transport	220	1,628	2,050	3,257	1,789
Uniform	717	1,082	920	329	762
Textbooks	1,000	1,100	1,813	1,913	1,456
Private tuition	2,000	2,000	2,100	2,200	2,075
Total	**5,212**	**7,220**	**9,624**	**10,908**	**8,241**

As shown in Table 4.4 above other private cost for boarding secondary students ranged from 5,212/- to 10,908/-.The average major cost was pocket money (2,159/-) followed

by private tuition (2,075/-). Private tuition was conducted twice a year in the months of April and august.

As shown in Table 4.5 day students incurred more costs than boarding students. The major cost for day scholars was money spent on lunch (4,796/-) followed by pocket money (2,859/-). The levies paid by parents for day scholars ranged from 8,192/- to 19,747/- with an average of 12,039/- as shown in table 4.5. The cost of private tuition was also high for the day student compared to other levies, as shown in table 4.5. This finding concurs with that of Hallack and Poisson (2007) that found out that supplementary tutoring has become a major industry consuming considerable amount of parents' money.

Table 4.5: Cost Shillings Incurred by Parents with Students in Day Secondary Schools according to Day Students Responses (n=93)

Levies	Schools				
	P	Q	S	T	Average
Lunch	4,080	3,600	4,604	6,900	4,796
Pocket Money	2,990	1,410	1,495	5,554	2,859
Transport	---	---	1,587	3,770	1,339
Uniform	577	1,082	295	135	552
Textbooks	942	1,100	1,447	2,202	1,423
Private tuition	1,000	1,000	1,200	1,200	1,100
Total	**9,589**	**8,192**	**10,628**	**19,761**	**12,039**

Table 4.6: Total Cost of Educating a Boarding and a Day Student per Year in Shillings and their Percentages as Indicated by the Students and the Head teachers (n=200)

School	Boarding	%	Day	%
P	32,962	58.96	22,939	41.03
Q	35,970	61.47	22,542	38.52
S	40,634	60.00	27,078	40.00
T	39,158	54.19	33,097	45.18
Average	**37,641**	**57.59**	**26,414**	**42.41**

As shown in Table 4.6 above the average cost of educating a form four boarding and a day student was Kshs 37,641 (57.59%) and Kshs 26,414 (42.41%) respectively per year. Schools in the rural areas (P and Q) were charging less than urban the urban schools (S and T).

Table 4.7: **The Average Total Cost per Year in Shillings of Educating a Boarding and Day Student in Form Four according to Students and Head teachers responses (n=200)**

Levies	Boarding	%	Day	%
Fees paid to schools	29,400	78.11	16,250	57.44
Money given to students	8,241	21.89	12,039	42.56
Total	**37,641**	**57.1**	**28,289**	**42.9**

As shown in Table 4.7 money given directly to students by their parents or guardians constitute a higher percentage of the total direct private cost for a day student (42.56%) compared to that of a boarding student (21.89%).

Table 4.8: The Average Direct Private Cost in Shillings of Educating a Student per Year in various categories as indicated by the Students and Head teachers (n=200)

Student	Cost
Day	26,414
Boarding	37,641
Girls day	28,018
Boys day	26,020
Girls Boarding	36,060
Boys Boarding	36,522
Girls	32,039
Boys	31,271
Average	**32,028**

As shown in Table 4.8 the cost of educating a girl in a day secondary school is slightly higher than that of a boy while the cost of educating a girl in a boarding school is almost the same as that of a boy student. This could be explained by the fact that girls who were day scholars spent more money on transport, they also required more pocket money, and they also spent more money purchasing lunch than the boys. Boys were more likely to walk to school or use a bicycle.

The indirect private cost of education includes the opportunity cost of student's time which was measured in terms of earnings forgone by the students when they continue with their secondary education rather than enter the labour force (Woodhall, 2004). In an attempt to measure earnings forgone for secondary school graduates, details of the

earnings of the people of similar age with similar qualifications who have not gone to secondary school will be needed. The data will be needed separately for women and men since pay is not equal in practice (Blaug, 1970). Due to lack of data, it is difficult to measure opportunity cost. People are in general reluctant to divulge their earnings, and as a result it would be inappropriate to use enquiries such as census to obtain this data (Woodhall, 1970). Even when data exist, difficulties still arise, because the majority of young people who go to full time education may have more ability than others not in full time education (Psacharopoulos and Woodhall, 1985). Using the earnings of those not in full time education could underestimate earnings foregone since if the students had actually gone to work, then their ability would have given them higher income.

According to the Kisumu District Population Survey of 2004, only 5.1% of the youths aged between 14 to 19 years were gainfully employed (Republic of Kenya, 2004). That age group is the secondary student's age group showing that those youths who were not in secondary school had unemployment rate of 94.9%. This shows that opportunity the cost for the student's time was very low but not negligible. As can be seen in Table 4.24 very few day students engaged in any labour to earn money for themselves and family. Most of the chores the students were engaging in were: cleaning the house, cooking or cleaning the compound and fetching water or fuel for cooking. It was very difficult to quantify those chores in terms of monetary values.

Since this study is a cost effective study that deals with comparisons that have similar goals, the opportunity cost for both day and boarding students were almost the same,

therefore it was ignored by the researcher when calculating the total private cost of educating a student in form four.

Table 4.9: The Cost of Free Secondary Education per Year in Shillings

Fee	Amount	%
Tuition	3,600	35.07
Repairs and Maintenance	400	3.90
Local Transport	400	3.90
Administrative Costs	500	4.87
Electricity, Water and Conservation	500	4.87
Activity	600	5.85
Personal Emolument	3,965	38.63
Medical	300	2.92
Total	**10,265**	**100.00**

Source; Ministry of Education 2008

Free secondary education was introduced at the beginning of 2008, when the researcher had collected some data on the private cost of education. As shown in Table 4.9 the bulk of the money provided by the government was to defray costs of tuition and for personal emoluments.

Parents are expected still to pay for mock and KCSE examinations, caution money, boarding fees, building funds, PTA funds and development funds directly to the schools.

Parents are also expected to cater for other costs that are not directly paid to the schools such as transport, pocket money, lunch, uniform, private tuition, and supplementary textbooks.

Table 4.10: The Percentage of Government Subsidy in Shillings to the total Cost of Educating a Student in Form Four

	Day Student	**Boarding Student**
Cost	26,414	37,641
Government subsidy	10,625	10,625
% of government subsidy	**40.22**	**28.23**

As shown in Table 4.10 above the government subsidy only caters for 40.22% of the total cost for a day student, 28.23% of the cost for boarders.

As shown in Tables 4.2 and 4.3, the average fee charged to boarders was 29,400/-, which was almost twice that of day scholars at 16,250/-. This finding concurred with the finding of Chadiel, Sekwao and Kirumba (2003) in Tanzania. In Tanzania the rate of fees charged was Tshs 40,000 for day student while boarding students were charged Tshs 70,000.

According to Njeru and Orodho (2003), transport and pocket money to cater for lunch expenses were the two key items contributing most to increasing cost of secondary education in urban areas. Their findings concurred with the findings of this study that

found out that the cost of lunch, pocket money and transport were the major costs for day students in schools S and T which were in urban areas, as shown in Table 4.5.

This study found out those girls who were day students paid more than the boys, as shown in Table 4.8. This finding concurred with the findings of a study by Nsemukila (2003) in Zambia. The study in Zambia found out that house holds spent twice as much in girls than boys

As shown in Table 4.10 although the government has introduced FSE, parents are still expected to cater for 59.78% of the cost for day student and 71.77% for boarders. The finding of this study concurred with that of Benvaniste, Porter, Thomas and Atinc (2007) in Thailand. Their study showed that even though the Thai government provides free secondary education non tuition costs such examination levies, meals transportation serve as substantial financial obstacle especially for the poor. Their study differs from this study because in Thailand the government had implemented several key policy interventions such as lunch programs, scholarships and bicycle lending projects, to boost enrolment. Such interventions have never been implemented in Kenya except for the bursary program.

4.2: Direct Social Cost of Secondary Education

The second research question that guided this study is: what are the social costs of educating day and boarding secondary student?

Direct social cost of education is the total amount of money society devotes to education. This includes the cost of teachers, books, heating, lighting and both the direct and indirect private cost of education. The direct social cost were mainly sourced from, CDF funds, income generating activities, Old Students' Association, bursaries and laboratory equipment from ministry of education as shown in Table 4.11.

Table 4.11: The Amount of Money in Shillings Received by the Schools from various Funds, per Year and their Percentages according to Head teachers Responses (n=4)

Funds	Amount (Kshs)	Percentage
CDF Funds	700,000	24.4
Income generating activities	886,949	30.9
Old student association	170,000	5.9
Bursaries	882,861	30.8
Laboratory equipment	227,465	7.9
Total	**2,867,275**	**100.00**

As shown in Table 4.11 the bulk of the funds were obtained from income generating activities (30.9%), bursaries fund (30.8%), and the CDF funds (24.4%). There was no contribution from, school sponsors board of governors or local and foreign donors.

Funds sourced from income generating activities were sourced from; hall hire, bus hire, renting out houses at subsidized rates and accommodation in the students' dormitories during holidays. Most of the schools had few houses for teachers since the schools were initially day schools, but the boarding sections were introduced by the BOGs. The available houses were rented to the head teachers, their deputies and boarding masters. Such types of income generating activities were found in urban secondary schools. Most rural schools kept dairy cattle, but none of the schools in the study kept poultry or grew crops.

From the teachers' questionnaire, the researcher managed to calculate teachers' salary, teachers' qualification and experience, and the teachers' concerns about fairness of distribution of the bursary funds to the form four students.

Table 4.12: The Average Teachers' Salary, Bursary Allocation, Qualification and Experience.

	N	Mean	Std. Deviation
Salary	43	4.99	2.18466
Bursary	43	2.6970	1.10354
Qualification	43	16.1212	0.92728
Experience	43	14.6818	6.66359

Key for bursary	Strongly Agree	= 5
	Agree	= 4
	Undecided	= 3
	Disagree	= 2
	Strongly Disagree	= 1

As shown in Table 4.12 the mean for bursaries was 2.697 showing that most teachers were either undecided or disagreed with the criteria used in the distribution of the bursaries to form four students. Since the bursaries were awarded at the constituency level maybe most of the teachers were not aware of the criteria used by Bursary Constituency Committees (BCC) in the allocation of the funds.

Key for salary and allowances paid to teachers per month

Below 15,000	1
0ver 15,000 to 20,000	2
Over 20,000 to 25,000	3
Over 25,000 to 30,000	4
Over 30,000 to 35,000	5
Over 35,000 to 40,000	6
Over 40,000 to 45,000	7
Over 45,000	8

From Table 4.12 the mean for teacher's emoluments was 4.99 showing that teachers actually earn an average of 30,000 to 35,000 per month. This monthly wage was quite high due to the teacher's experience which was on average 14.68 years.

Key for teacher qualification	(in years)
Form four	12
Form six	13
Diploma	15
Degree	16
Masters	18

As shown in Table 4.12 the average years for teacher qualification was 16.12, showing that on average the teachers had a university degree. No teacher had form four qualification, or form six showing that all the form four teachers were well qualified. Quite a number of form four teachers had masters degree, though they were earning the same salaries as those with bachelors degree with the same experience.

Table 4.13: Pearson Moment Correlation Coefficient for Teacher's Salary, Qualification and Experience

		Salary	Qualification	Experience
Salary	Pearson Correlation	1		
	Sig (2 tailed)	.		
	N	43		
Qualification	Pearson Correlation	0.098	1	
	Sig (2 tailed)	0.587	.	
	N	43	43	
Experience	Pearson Correlation	0.535**	0.006	1
	Sig (2 tailed)	0.0001	0.972	.
	N	43	43	43

**** Correlation significant at 0.01 level in a 2 tailed test.**

Teacher's salary and experience were highly correlated, as shown in Table 4.13. The Pearson Moment Correlation Coefficient was 0.535 and it was significant at 0.01 in a 2 tailed test. Teachers' qualification was positively correlated with the salary, at 0.098 though the correlation was not significant at 0.01 levels in a 2 tailed test. Teacher

qualification and experience had a low correlation at 0.006. This could mean that those teachers with many years of experience were not going for further studies.

Table 4.14: Regression Analysis of Salary against Qualification and Experience (n=43)

Model	B	Standardized beta (β)coefficient	T	Sig
(Constant)	-1.259	-----	-214	0.832
Qualification	0.223	0.095	0.618	0.541
Experience	0.175	0.534	3.483	0.002

Dependant variable: salary

From Table 4.14 the Regression equation can be written as

S= -1.259 + aX1 + bX2

Where S = Salary for teachers

X1= Qualification

X2 = Experience

Where a and b are constants

As shown in Table 4.14 a and b are standardized beta coefficients, and they are 0.095 and 0.534 respectively. Therefore the above equation can be written as

S= -1.259 + 0.095X1 + 0.534X2

From the second equation it can be concluded that one percentage increase in teacher experience will increase teacher salary by 0.534 percent, while one percentage increase in teacher qualification will increase teacher's salary by only 0.095 percent. Therefore it can

be concluded that teacher experience had a greater impact on direct social cost than teacher qualification.

Table 4.15: Direct Social Cost in Shillings of Secondary Students per Year and their Percentages as indicated by Head teachers (n=4)

	Amount per Student	Percentage
Teachers Salary	32,893.6	90.1
CDF Funds	1,346	3.7
Income generating funds	1,705.6	4.7
Old student Association	73.5	0.2
Bursaries	381.9	1.0
Lab Equipment	98.4	0.27
Total	**36,499**	**100.00**

As shown in Table 4.15 teachers salary was the greatest direct social cost at 32,893.60/- which was 90.1% of the total direct social cost at 36,499/-. Cost per student was calculated by multiplying the average teacher's salary with the total number of teachers and dividing by the total number of students. Other direct social costs per student per year included CDF funds at 1,346/- (3.7%), income generating activities at 1705.6/- (4.7%).

Since the government introduced FSE the direct social cost of secondary education should be 36,499/- plus 10,265/- (from FSE fund) totaling 46,764/- per student per year.

As can be seen in Table 4.16 the total private and direct social cost of educating a student in secondary school was 68,327/-. The average cost of educating a day student was 62,193/- and that of a boarding student was 74,140/-.

Table 4.16: Total Cost in Shillings of Educating a Secondary Student per year

Student	Cost
Day	62,913
Boarding	74,140
Girls day	64,517
Boys day	62,519
Girls Boarding	72,559
Boys Boarding	72,538
Girls	68,538
Boys	67,770
Average	**68,187**

Indirect social costs include the value of teachers' time, and the value of the buildings, capital equipment, land which could have been put to other uses. Since the research was conducted in schools with both day and boarding students the indirect social cost was the same for both day and boarding students.

Income generating activities accounted for the bulk of the funds received by the schools at 30.9%, as shown in Table 4.11. This finding concurred with the findings of Gropello (2006) in China and Njeru and Orodho (2003) in Kenya. Though in the Gropello study the income generating activities included teachers taking consultancy positions, and

students paying for foreign language, such activities were not undertaken in this study. A study by Njeru and Orodho found out that the alternative source of funding had not been introduced into the school budgets so as to reduce fee burden from the parents, in this study the head teachers indicated that the income generating activities defrayed 10% to 25% of their budget.

The second most important source for school funding was the bursary fund which accounted for 30.8% of the total funds as shown in Table 4.11.The bursaries were disbursed by Bursary Constituency Committees for better targeting (Ministry of Education, 2004). But according to the teachers, the fairness of the bursary distribution was questionable as shown in Table 4.12. A study by Odebero (2002) in Busia district concurred with the findings from the teachers in this study where he found that the higher the socio- economic background of the student the higher the bursary given.

As shown in Table 4.14 the major social cost per student was the teacher's salary, which accounted for 90.1% of the total cost. The teachers' salary was mainly determined by the teachers' experience and teachers' qualification, as shown in Tables 4.13 and 4.14.This study concurred with the study of Olel (2000) that found that social cost to secondary education in Kisumu district was mainly determined by teacher salary and teacher's qualification.

Introduction of FSE increased the social cost from an average of Kshs 36,499 to Kshs 46,764 that is a 29.1% increase in cost. This finding concurred with the finding of Pinyakong, Virasilp, and Samboon (2007) and Ngware et al (2007) that shows that education continues to receive the largest share of the total public expenditure. According

to Ngware (2007) et al most of the expenditure was recurrent (93.5%) this finding concurred with the finding of this study that showed that expenditure on teachers accounted for 90.1% of the social cost as shown in Table 4.15.

4.3 Performance of Secondary Students

The third research question that guided this study is: how does the performance of day and boarding secondary students compare?

A study by Munavu, Ogutu and Wasanga (2008) in Kenya indicated that access to higher education is largely dependant on performance in KCSE examinations, since it is used as the standardized selection criteria. When calculating cost effectiveness ratio, the effectiveness was taken as the performance of the students in KCSE examinations since it is a standard examination taken by form fours all over the country.

In calculating the performance of the students the researcher assigned the number 12 to a student who obtained an average of an A in the examination, A- was assigned 11 and so forth until E, which was assigned 1.

Key		
	A = 12	C- = 5
	A- = 11	D+ = 4
	B+ = 10	D = 3
	B = 9	D- = 2
	B- = 8	E = 1
	C+ = 7	
	C = 6	

Table 4.17: The Average Performance of the Students in 2007 KCSE.

Student	Performance
Day	8.12
Boarding	7.41
Girls day	7.46
Boys day	8.41
Girls Boarding	7.07
Boys Boarding	7.87
Girls	7.27
Boys	8.01
Average	**7.68**

Source; KNEC, 2007

As can be seen in Table 4.17 the day students performed better than the boarding students with a mean average of 8.12 compared to the boarders with a mean of 7.41. The finding shows that when provided with the same educational inputs day students can actually perform better than boarders.

As shown in Table 4.17 boys performed better than the girls with a mean of 8.01, compared to the girls mean of 7.27. The best performance was registered by boys in day section at an average of 8.41 while the worst performer was the girls in the boarding section at an average of 7.07. This difference in performance between the girls and the boys was a bout 11.2%.

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According to African Almanac (2004) report and studies by Husinger, Jacob and Mugimu (2002) in Uganda; Chediel, Sekwao and Kirumba (2000) in Tanzania; Jagero (1999) in Kisumu district and Oloo (2003) in Migori district found that the majority of day secondary students perform poorly in the KCSE examination compared to their boarding counterparts. The above studies were conducted in day and boarding secondary schools with different school facilities and inputs. In this study both the boarding and the day student had the same facilities and inputs, and that might explain why the day students performed better than the boarders.

Studies by Fuller (1987), Glewwe and Kremer (2006), Heyneman and Loxley (1983), Hunusheck (2003), Jagero (1999) and Wobmann (2005) showed that there is a positive relationship between school inputs and performance. Since in the above mentioned studies the boarding schools had superior educational facilities they performed better than the day schools. It can be concluded the boarding schools always perform better than day schools not because they are "boarding", but because of they have superior educational inputs than majority of the day schools.

According to Barthes, Nair and Malpade (2000) there is no difference in performance between boys and girls in Mali while in Kenya girls have a lower performance than boys. The study by Barthes, Nair and Malpade (2000) in Kenya concurs with this study, which found out that boys performed better than the girls as shown in Table 4.17. A report by Otieno (February, 2008) showed that according to 2008 KCSE results girls performed poorly with only 16 girls making it to the list of top 100 best students. In Nyanza province according to Aduda (2005) only 3% of top 100 students were girls.

4.4: Cost Effectiveness Analysis of boarding and day secondary students.

The fourth research question that guided this study was: how does the cost effectiveness of educating day and boarding secondary students compare?

Cost effectiveness analysis assumes that a certain benefit or outcome is desired and that there are several alternative ways to achieve it. The basic question asked is, ''which of those alternatives is the cheapest or most efficient way to get this benefit?"(Marczak and Sewell, 2000). By definition, cost effectiveness analysis is comparative, while cost benefit analysis considers only one program at a time. While cost benefit analysis always compares the monetary cost and the benefits of a program, cost effectiveness studies often compare programs on the basis of some other common scale for measuring outcomes such as performance in a standard examination. Cost effectiveness analysis address whether the unit cost is greater for one programme or approach than another, which is often much easier to do, and more informative than assigning a dollar value to the outcome (White, 1988).

The most common measure of cost effectiveness is the cost effectiveness ratio, namely the cost of an alternative divided by its effectiveness. When this is done for each alternative, it is possible to see which of the alternatives yields the best outcomes for a given cost (Levin, 1995). In principle, the alternative with the lowest cost per achievement gain will be the most desirable.

Cost effectiveness ratio is calculated by dividing the total cost of educating a form four student per year by performance. The average CER, as shown in Table 4.18 was 8,897/-, meaning that to improve performance of a student by one point required 8,897/-.

Table 4.18: Cost in Shillings, Performance and Cost Effectiveness Ratio of Boarding and Day Student

Student	Cost	Performance	CER
Day	62,913	8.12	7,748
Boarding	74,140	7.41	10,005
Girls day	64,517	7.46	8,648
Boys day	62,519	8.41	7,434
Girls Boarding	72,559	7.07	10,263
Boys Boarding	72,538	7.87	9,217
Girls	68,538	7.27	9,428
Boys	67,770	8.01	8,461
Average	**88,327**	**7,68**	**8,897**

As shown in Table 4.18 the CER for day and boarding student was 7,748/- and 10,005/- respectively. This shows that it costs the society 7,748/- to improve the performance of a day student by one point compared to 10,005/- required by a boarder for the same improvement.

As shown in Table 4.18 it is more cost effective to educate a boy at 8,461/-, compared to 9,428/- for the girls required to improve the performance in KCSE by one point. The

most cost effective way of providing secondary education had a CER of Ksh 7,434 for the boys who were day students as shown in Table 4.18.

Cost effectiveness is an efficiency measure. The CER is an efficiency ratio for comparing two systems on the basis of a specific cost effectiveness measure (Levin, 1983). Efficiency Ratio can be calculated using the following formula;

$$\textbf{Efficiency Ratio (ER)} = \frac{\textbf{CER of day student}}{\textbf{CER of boarding student}}$$

If the Efficiency Ratio = 1 then both systems are equally efficient
If the Efficiency Ratio > 1 then day student is less efficient
If the Efficiency Ratio < 1 then day student is more efficient

From Table 4.17 the ER=7748/ 10,005 = 0.774

Since this figure is less than 1 educating a student in a day school is a more efficient way of using resources, than educating a student in a boarding school.

Table 4.19: Pearson Moment Correlation Coefficient for Total Student Cost per Year, Performance, CER and Efficiency Ratio.

		Cost	Performance	CER	Efficiency ration
Cost	Pearson Correlation	1			
	Sig (2 tailed)				
Performance	Pearson Correlation	-0.625	1		
	Sig (2 tailed)	0.072	.		
CER	Pearson Correlation	0.910**	-0.890**	1	
	Sig (2 tailed)	0.001	0.001	.	
Efficiency Ratio	Pearson Correlation	0.904**	-0.896**	1.000**	1
	Sig (2 tailed)	0.0001	0.0001	0.000	.

****Correlation significant at the 0.01 in a 2 tailed test.**

As shown in Table 4.19 CER is highly correlated with the total cost of education. The Pearson Correlation coefficient was 0.910 and the correlation was significant at 0.01 levels in a 2 tailed test. Since CER is a measure of efficiency, CER was 100% correlated to efficiency ratio as shown in Table 4.19. Performance had a negative correlation to the cost, showing that the unit cost of educating a boarding student was higher than that of a day student while the performance of the day students was slightly better than the boarders.

Table 4.20: Regression Analysis of CER against Cost, Performance, and Efficiency Ratio.

Model	B	Standardized beta (β)coefficient	T	Sig
Constant	-994.315	-----	-0.605	0.572
Cost	-0.004	-0.017	-0.172	0.870
Performance	98.696	0.046	0.487	0.647
Efficiency ration	9406.627	1.056	6.172	0.002

Dependent variable: CER.

From Table 4.20, the following Regression equation can be derived:

Y = -994.315 + aX1 + bX2 + cX3

Where Y = CER

X1 = Cost

X2 = Performance

X3 = Efficiency Ratio

The above equation can be re written as follows

Y = -994.315 – 0.017X1 + 0.046X2 + 1.056X3

This equation can be interpreted as one percent increase in performance will increase CER by 0.046 percent. The cost of educating a student in secondary school has a negative regression coefficient to CER. Thus one percent increase in the cost of education will reduce CER by 0.017 percent.

Since Efficiency Ratio and CER are 100% correlated as shown in Table 4.19, the standardized coefficient (beta) for Efficiency Ratio was 1.056. This shows that an increase of one percent in Efficiency Ratio will increase CER by 1.056 percent.

It can be concluded that educating a day student is a more efficient way of using resources than educating a boarder. The finding concurs with the finding of Ngware et al (2007), Republic of Kenya (1988, 2004) which found that it is more cost effective to both the parents and the government to expand secondary education by investing in and expanding day schools. According to the Republic of Kenya (2005), the government is working towards integrating secondary education as part of basic education. This can only be achieved by promoting development of day schools as means of expanding access and reducing costs to parents, especially in areas with high population density

4.5. Home and School Environmental Factors Affecting Day and Boarding Students

The last research question that guided this study is: what are the home and school environmental factors affecting day and boarding secondary students in a bid to achieve academic excellence?

4.6.1 Home Environmental Factors

Most day students in the study had the following factors affecting their performance: lack of proper accommodation, lack of proper diet, a lot of work at home, bad company at home, home environment which is not conducive to learning, staying long distances from school, and lack of reading materials at home.

Table 4.21: Factors Affecting Performance of Girls and Boys who are Day Students (n=93)

	Mean	
	Boys	Girls
Accommodation (XI)	3.07	2.93
Diet (X2)	3.09	2.33
Work (X3)	3.65	3.93
Bad Company (X4)	3.78	2.73
Home Environment (X5)	4.07	3.67
Long Distance (X6)	4.02	3.93
Reading Materials (X7)	3.57	3.07
Performance (X)	8.30	7.80

As shown in Table 4.21 the greatest problem faced by the day students was the long distance to their schools at 4.02 and 3.93 (agree) for boys and girls respectively. For the boys, home environment which is not conducive to learning was also a problem with an average of 4.07 (agree). Girls did more work at home compared to the boys as shown in Table 4.21. This could have explained why girls perform poorly than boys in the national examinations.

Table 4.22: Pearson Moment Correlation Coefficient for Distance from Home, Lateness to School and Performance (n=93).

	Distance	Lateness	Performance
Distance	1		
Lateness	0.626*(girls) 0.068 (boys)	1	
Performance	-0.37(girls) 0.103(boys)	0.034(girls)-0.199(boys)	1

***Correlation significant at 0.05 level in a 2 tailed test.**

Staying long distances from school was one of the greatest problems faced by day students. On average the girls stayed a distance of 1.5 Km, while the boys' average was 2.5 Km. Long distances from school affected girls' performance than boys, while lateness to school had more effect on the boys' performance as shown in Table 4.22. The Pearson moment correlation coefficient for distance and performance was -0.37, shows that the girls that lived closer to their schools were likely to perform better in KCSE examinations as shown in Table 4.22. When students stay long distances from school they are likely to be exhausted by the time they reach school and this might affect their concentration, in the classroom.

For the boys lateness to school had a negative influence to the performance with a correlation coefficient of -0.199. This shows that boys who were late were likely to miss some lessons, because of lateness or when on punishment when late. For the girls lateness was highly correlated to distance from school, with a coefficient of 0.626 which was significant at 0.05 levels in a 2 tailed test.

Table 4.23: Regression Analysis of Distance to School and Lateness for the Girls against Performance (n=11).

Model	Un standardized B	Coefficients std Error	Standardized (β) beta	t	Sig t
Constant	8.263	0.959	-	8.618	0.000
Distance	0.977	0.486	-0.643	-2.010	0.068
Lateness	0.736	0.541	-0.436	1.362	0.198

Dependent variable: performance

From Table 4.23 the following regression equation can be derived;

Y = 8.263 + aX1 + bX2

Where a = -0.643

b = -0.436

Therefore Y = 8.263 -0.643X1 – 0.436X2.

As can be seen from Table 4.23, when the distance to school is lowered by 1 Km for the girls, the performance will increase by 0.643 percent. One percent reduction in lateness for the girls will increase the performance by 0.436 percent. For the boys distance to school had no effect on performance because the correlation coefficient was low at 0.103.

A lot of work at home was one of the problems affecting the day students. The chores included; cleaning the house, working in family farm or business, cooking, looking after young children, casual labour to earn money for themselves or family, running errands for parents, caring for domestic animals and drawing water or firewood.

Table 4.24: Chores undertaken by Day Students by Gender as indicated in the Likert scale by the students (n=93)

Chores	Girls	Boys
Cleaning the house(X1)	3.786	3.927
Working in family business or farm (X2)	2.143	2.600
Cooking or cleaning the compound (X3)	3.427	3.873
Looking after younger children (X4)	2.785	2.564
Casual labour to earn money (X5)	1.143	1.545
Running errands for parents (X6)	1.643	2.382
Caring for family domestic animals (X7)	1.643	2.109
Fetching water or firewood (X8)	2.714	3.873

From Table 4.24, boys performed more chores than the girls, except the duty of looking after young children. The work that was done by majority of day students was: cleaning the house, cooking or cleaning the compound and fetching water or firewood. There was no gender roles as the majority of the boys were involved even in traditional girls' roles such as cleaning the house and cooking, as shown in Table 4.24. Casual labour to earn money was the least popular chore with the students, at 1.143 and 1.545 (strongly disagree in the Likert scale) for girls and boys respectively. When students are engaged in a lot of work at home they will have less time to do their school work therefore their performance will be affected

Table 4.25: Pearson Moment Correlation Coefficient for Problems Faced by girls day students as indicated in Table 4.21 (n=11)

	X1	X2	X3	X4	X5	X6	X7	X
X1	1							
X2	0.674**	1						
X3	0.728**	481	1					
X4	0.641*	0.295	0.650**	1				
X5	0.202	-0.127	0.535**	0.488	1			
X6	0.777**	0.339	0.826**	0.479	0.382	1		
X7	0.531*	0.068	0.564*	0.688*	0.707**	0.409	1	
X	-0.361	0.098	-0.302	-0.047	-0.054	-0.487	-0.324	1

****Correlation is significant at 0.001 level in a 2 tailed test**

***Correlation is significant at 0.05 level in a 2 tailed test**

As can be seen from Table 4.25, long distances to school, poor accommodation at home, lack of reading materials at home and a lot of work at home had a negative influence on girls performance in KCSE, with correlation coefficients of -0.487, -0.361, -0.324 and -0.302 respectively. The girls who lacked proper accommodation at home also lacked proper diet, they had a lot of chores at home, and were likely to stay long distances to school. This is shown in Table 4.25, where there is a high correlation of the factors with accommodation at 0.674, 0.728, 0.641 and 0.777 respectively and the correlations were all significant at 0.001 in a 2 tailed test.

Table 4.26: Pearson Moment Correlation Coefficient for Problems Faced by Boys who are Day Scholars as Indicated in Table 4.21(n=82)

	X1	X2	X3	X4	X5	X6	X7	X
X1	1							
X2	0.582**	1						
X3	0.471**	0.431**	1					
X4	0.275*	0.031	0.165	1				
X5	0.219	0.103	0.358**	0.383**	1			
X6	0.250	0.378**	0.332**	0.337*	0.579**	1		
X7	0.358**	0.383**	0.283*	0.053	0.440**	0.404**	1	
X	0.022	0.123	0.137	0.186	0.090	0.069	-0.017	1

****Correlation is significant at 0.01 level in a 2 tailed test.**

***Correlation is significant at 0.05 level in a 2 tailed test.**

As shown in Table 4.26, lack of reading materials at home was the greatest problem affecting performance of boys with a correlation coefficient of -0.017. 0ther problems included lack of proper accommodation, home environment which is not conducive to learning and staying long distances from school. Unlike the girls, a lot of work at home was not a great hindrance to performance for the boys.

Factor analysis

Factor Analysis is a statistical procedure used to uncover relationships among many variables. This allows numerous Intercorelated variables to be condensed into fewer dimensions called factors.

Table 4.27: Keiser-Meyer-Olkin (KMO) and Bartlett's Test

		Boys	Girls
Keiser-Meyer-Olkin Measure of Sampling Adequacy		0.738	0.637
Barlett's Test of Sphericity	Approx. Chi-Square	123.581	78.416
	Df	28	28
	Sig	0.000	0.000

Keiser-Meyer-Olkin (KMO) measure of sampling adequacy is an index for comparing the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients. KMO values vary from 0 to 1, and values that are closer to 1 are better, indicating a factor analysis of the variable is good. A value of 0.6 is a suggested minimum (Ford, MacCallum and Trait, 1986). As shown in Table 4.27 both the KMO for the sample from the girls and the boys were greater than 0.6. The test provide minimum standard which should be passed before a principal component analysis (PCA), should be conducted.

Bartlett's test of sphericity is used to test the null hypothesis that the variables in the population correlation matrix are uncorrelated. As shown in figure 4.27 the observed significant level is 0.000, which is small enough to reject the hypothesis. It can be

concluded that the strength of the relationship among the variables is strong, and it is a good idea to proceed with factor analysis on the data.

Table 4.28: Communalities for Girls and Boys on the Greatest Problems faced by Day Students (n=93)

	Initial	Extraction	
		Girls	Boys
Accommodation	1	0.916	0.661
Diet	1	0.901	0.729
A lot of work	1	0.838	0.723
Bad Company	1	0.767	0.683
Home environment	1	0.851	0.764
Long Distances	1	0.820	0.677
Lack of reading materials	1	0.812	0.609
Performance	1	0.932	0.673

Extraction: Principal Component Analysis

Communality is the proportion of each variable's variance that can be explained by the factors. Principal component analysis works on the initial assumption that all variance is common, therefore before extraction the communalities are all 1 (Field, 2005). The values of the extraction column indicate the proportion of each variable's variance that can be explained by retained factors.

Variables with high values are well represented in the common factor space, while variables with low values are not well represented (Field, 2005). As can be seen in Table 4.28 the variables for both the boys and the girls have both high values of over 0.6.

Table 4.29: Total Variance Explained for the Problems faced by Girls Day Students.

Component	Initial eigenvalues			Extracted sum's of square loading		
	Total	% Variance	Cumulative %	Total	% Variance	Cumulative %
1	4.203	52.540	52.540	4.203	52.540	52.540
2	1.483	18.542	71.082	1.403	18.542	71.082
3	1.151	14.394	85.476	1.151	14.394	85.476
4	0.533	6.657	92:133			
5	0.337	4.211	96.344			
6	0.174	2.172	98.516			
7	0.091	1.131	99.648			
8	0.028	0.352	100.00			

Extraction Method: Principal Component Analysis.

From Table 4.29 the initial number of factors is the same as the number of variables used in the factor analysis. However not all the 8 factors were retained, except for the first three. The total column contains the eigenvalues. The first factor will always account for the most variance i.e. have the highest eigenvalue, and the successive factors will account for less and less variance. From Table 4.29, the first factor contains a total of 4.203 of the

variance which is 52.54% of the total variance. The 3 factors in total accounted for 85.476% of the total variance, which was quite high.

Table 4.30: Rotated Pattern Matrix for Problems Faced by Girls Day Students

	Component		
Problems	1	2	3
Accommodation		0.770	-0.300
Diet		0.991	
Work	0.489	0.533	
Bad Company	0.730	0.378	
Environment	0.974		
Long Distances		0.473	-0.550
Reading Materials	0.857		
Performance			1.001

Extraction Method: Principal Component Analysis

Rotation Method: Oblimin with Kaiser Normalization.

Rotated pattern matrix contains the rotated factor loadings which are correlations between the variable and the factor. Three factors have been extracted, and those are the factors that analysts are most interested in, and try to name. From Table 4.30 it can be concluded that, as indicated in factor 1, the girls who were staying in homes with environment that was not conducive to learning, were likely to have bad company at home. These girls also lacked reading materials at home. Therefore the first factor might be called family support for education of the student factor. Where there is a positive

family support, the students are likely to have a better environment for studying. Their parents will be able to provide good lighting system, good reading space, and minimal interference from family members or friends when doing homework. Supportive parents will readily provide reading materials at home for their children.

The second factor might be called the socio economic status of the family factor. As can be seen from Table 4.30 families from disadvantaged backgrounds cannot afford proper accommodation, diet and are likely to delegate a lot of chores at home to their children. The third factor is the examination performance factor. As can be seen in Table 4.30 staying long distance from school has a negative effect on performance for the girls as can be seen from factor 3.

As can be seen in Table 4.29 the first factor is responsible for 52.54% of the variance. This shows that girl's performance depends largely on the type of family support they receive at home.

Table 4.31: Total Variance Explained for the Problems faced by Boys in Day Schools

Component	Initial eigenvalues			Extracted sums' of square loading		
	Total	% Variance	Cumulative %	Total	% Variance	Cumulative %
1	3.122	39.019	39.019	3.122	39.019	39.019
2	1.296	16.198	55.218	1.296	16.198	55.218
3	1.101	13.762	68.980	1.101	13.762	68.980
4	0.785	9.818	78.789			
5	0.614	7.674	86.472			
6	0.554	6.930	93.402			
7	0.286	3.571	96.973			
8	0.242	3.027	100.00			

Extraction Method: Principal Component Analysis.

From Table 4.31 only 3 factors were retained from the 8 variables. The first factor contains a total of 3.122 of the variance which accounts for 39.019% of the total variance. The three factors accounted for 68.98% of the total variance.

Table 4.32: Rotated Pattern Matrix for Problems faced by Boys in Day School.

Problems	Component		
	1	2	3
Accommodation	0.771		
Diet	0.838		
A lot of work at home	0.837		
Bad company at home		0.656	
Home environment		0.887	
Long distances		0.791	
Lack of reading materials		0.455	-0.478
Performance			0.793

Extraction Method: Principal Component Analysis
Rotation Method: Oblimin with Kaiser Normalization.

From Table 4.32 it can be concluded that socio economic background of the boys was a major determinant factor than parental support as in the case of the girls, because it was the factor 1 for the boys. Positive family support factor in the case of boys was factor 2. It can be concluded from Table 4.32 that that the performance of the boys was affected by lack of reading materials at home as seen in factor 3.

As can be seen in Tables 4.21, 4.22 and 4.23 distance from school was one of the major factors affecting the performance of the day students. Distance from school affected girls more than the boys, even though the girls were staying 1 Km closer to the schools than the boys. The finding of this study concurs with the findings of Coady and Parker (2002) in Mexico, Otieno (2006) in Sudan, Nsemukila, (2003) in Zambia, Mulenya (2008),

Kitavi and Westhuizan (1997) in Kenya. The above studies showed that long distance to school can lead to frequent lateness, as supported by data from tables 4.21, 4.22 and 4.23.

As shown in Tables 4.21 and 4.24 a lot of work at home had a negative influence on the performance of the day students. The influence was more pronounced among the girls than the boys. The finding concurs with the findings of studies by Desarrollo (2007) in Latin America, Scarff and Brady (2006) in Malawi, Mbilinyi (2003) and Mensch and Lloyd (1997) in Kenya. According to the studies girls were expected to help their mothers in chores than the boys.

From the factor analysis, two factors were identified, parental support for education of the student and social economic status of the parents. The parental support was the main factor for the girls than the boys. This finding concurs with the findings from studies by Dermie, Lewis and MacLean (2006) and Dirye (2006) among Somali pupils in UK, Clarissa (1992) in Barbados, Evans in Jamaica and Desarrollo (2007) in Latin America. The above studies found out that parental and community support had a positive influence on performance.

The socio economic background factor affected the boys more than the girls. According to Republic of Kenya (2002) the people who live below the poverty line in Kisumu district were estimated to be 53% of the population. In the poverty assessment report in the district in May 2000, it was established that more than half of the population was poor, and the poverty levels have been increasing over time.

4.6.2 School Environmental Factors

The factors that affected their academic performance of boarding students included: lack of good lighting system, lack of reading space, lack of reading materials, interference

from friends in the same class, a lot of school chores e.g. cleaning and noise from classmates or neighbouring classes. Other problems included hunger due to inadequate meals, disturbance from non human activities e.g. mosquitoes, lack of proper accommodation in the dormitories, lack of proper diet, bad company in school, bullying, unbearable prefects and scarcity of boarding facilities e.g. bathrooms, water, toilets.

Table 4.33: Problems faced by Boarding Students, listed according to the Likert scale as Indicated by Boarding Students (n=103)

Problems	**Boys**	**Girls**
lack of good lighting system	2.25	2.30
lack of reading space	1.63	1.40
lack of reading materials	2.38	2.15
interference from friends in the same class	3.00	3.05
a lot of school chores e.g. cleaning	2.56	1.60
noise from classmates or neighboring classes	3.00	3.25
hunger due to inadequate meals	1.75	2.80
disturbance from non human activities e.g. mosquitoes	4.00	4.10
lack of proper accommodation in the dormitories	2.38	3.70
bad company in school	3.13	3.20
lack of proper diet	3.44	3.50
bullying	2.38	1.85
unbearable prefects	3.31	3.65
scarcity of boarding facilities e.g. water, toilets bathrooms	3.81	3.25

As can be seen in Table 4.33, disturbance from non human activities was a major problem for both boys and girls. Lack of reading space was not a problem to the boarding students, with an average of 1.63 and 1.40 for boys and girls respectively. The problems faced by the girls and the boys were similar, except for, a lot of chores which was experienced more by boys (2.56) than girls (1.60), hunger due to inadequate meals which was experienced less by the boys (1.75) than the girls (2.80). Bullying was another problem experienced more by boys (2.38) than girls (1.85).

Table 4.34: Pearson Moment Correlation Coefficient for Problems faced by Boarding Boys against Girls

		Boys	Girls
Boys	Pearson Correlation	1	0.720**
	Sig (2 tailed)		0.004
	N	103	103

****Correlation significant at the 0.001 level.**

As can be seen from Table 4.34 the Pearson Moment Correlation Coefficient was 0.720, and it was significant at 0.001 level in a 2 tailed test, which was quite high. The researcher combined the data from the boys and the girls and analyzed them together since they were highly correlated.

Factor Analysis

From Table 4.35 the Keiser-Meyer-Olkin (KMO) for the sample from the girls and the boys responses were greater than 0.6, therefore Principal Component Analysis could be conducted on the sample. Bartlett's test of sphericity, the observed significant level are 0.000, therefore the strength of the relationships between the variables was strong, and it is a good idea to proceed with the factor analysis on the data.

Table 4.35: KMO and Bartlett's Test for Problems facing Boarding Students

		Boys	Girls
Keiser-Meyer-Olkin Measure of Sampling Adequacy		0.660	0.629
Barlett's Test of Sphericity	Approx. Chi-Square	179.722	168.180
	df	91	91
	Sig	0.000	0.000

From Table 4.36, the extracted communalities for both boys and girls on performance was very low at 0.433 and 0.280 respectively, therefore performance was removed from the factors when the analysis was carried out.

Since there were many factors the researcher decided to retain only four factors, even though there were five factors with eigenvalues of more than one. The four factors were easier to interpret than five factors.

Table 4.36: Communalities for the Problems faced by Boarding Students (n=103)

Problems	Initial	Boys	Girls
Lack of good lighting system	1	0.821	0.823
Lack of Reading space	1	0.792	0.539
Lack of reading materials	1	0.532	0.501
Interference from friends	1	0.801	0.740
A lot of school chores	1	0.770	0.837
Noise from class mates	1	0.941	0.858
Hunger due to inadequate supper	1	0.465	0.694
Disturbance from non human activities	1	0.796	0.794
Lack of proper accommodation	1	0.512	0.772
Lack of proper diet	1	0.842	0.856
Bad Company in School	1	0.587	0.639
Bullying	1	0.873	0.832
Unbearable prefects	1	0.788	0.795
Scarcity of boarding facilities	1	0.792	0.594
Performance	1	0.433	0.280

Extraction Method: Principal Component Analysis.

From Table 4.37 the four factors retained accounted for 67.171% of the total variance. The first factor had an initial eigenvalue of 4.53 accounting for 32.354% of the variance.

Table 4.37: Total Variance Explained for Problems faced by Boarding Students.

Component loading	Initial eigenvalues			Extracted sum's of square loading		
	Total	% Variance	Cumulative %	Total	% Variance	Cumulative %
1	4.530	32.354	32.354	4.530	32.354	32.354
2	1.943	13.881	46.236	1.943	13.881	46.236
3	1.757	12.548	58.784	1.757	12.584	58.784
4	1.174	8.387	67.171	1.174	8.387	67.174
5	1.021	7.296	74.467			
6	0.967	6.906	81.373			
7	0.634	4.531	85.904			
8	0.509	3.638	89.543			
9	0.408	2.912	92.403			
10	0.367	2.621	95.075			
11	0.248	1.775	96.850			
12	0.181	1.296	98.146			
13	0.142	1.016	99.162			
14	0.117	0.838	100.00			

Extraction Method: Principal Component Analysis.

Table 4.38: Rotated Pattern Matrix for Problems faced by Boarding Students

Problems	Components			
	1	2	3	4
Lack of good lighting system		0.831		
Lack of Reading space		0.887		
Lack of reading materials		0.783		
Interference from friends	-0.731			
A lot of school chores				0.669
Noise from class mates	0.884			
Hunger due to inadequate meals			-0.715	
Disturbance from non human activities			-0.771	
Lack of proper accommodation			-0.772	
Lack of proper diet			0.462	
Bad Company in School	0.795			
Bullying	0.795			
Unbearable prefects	0.782			
Scarcity of boarding facilities			0.487	

Extraction Method: Principal Component Analysis

Rotation Method: Oblim with Kaiser Normalization

From Table 4.38, schools where there was interference from friends in the same class, were likely to experience noise from the class or neighbouring classrooms. In such schools the boarders were likely to have bad company that can lead to bad influence; the

students are likely to experience bullying, with prefects given a lot of powers by the school authorities, to control other students. This factor can be known as lack of discipline in school factor. This factor 1 is mainly concerned with school indiscipline, and it accounted for 32.354% of the variance. From the respondents it can be concluded that school discipline was key to improved performance of boarding students, especially when studying at pep time. Head teachers and school's administrations should provide enough supervision for students while studying at prep, this responsibility should not be left to the prefects alone.

As can be seen from Table 4.38 boarding students who lacked good lighting system were likely to lack reading space and reading materials while studying at prep time. This factor 2 can be called inadequate reading facility factor. Factor two accounted for 13.881% of the total variance, and 1.93 of the initial eigenvalues. Schools should provide adequate facilities for boarding students in order to study properly at prep time.

The students, who were hungry due to inadequate supper, also lacked proper diet, as shown in Table 4.38. Those students were likely to be disturbed by non human activities such as mosquitoes, and they lacked proper accommodation in the dormitories. The students had scarcity of facilities such as bathrooms, toilets, adequate water. This third factor can be called inadequate boarding facilities factor. All the schools in this study were initially day schools; therefore they may have not developed adequate boarding facilities.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter is divided into four sub sections, summary of the study, conclusions of the study, recommendations and suggestions for further research.

5.2 Summary of the study

The following are the summary of the study according to the five objectives and research questions.

5.2.1 Direct private cost of educating a day and a boarding secondary school student per year

The average fee charged to boarders was 29,400/-, which was almost twice that of the day students at 16,250/-.The other direct private costs for boarding students averaged 8,241/-. This included the cost for: pocket money, private tuition, transport, textbooks and uniform. Other direct private costs for day scholars averaged 12,039/-. The cost included cost of: lunch, transport uniform, pocket money, textbooks and private tuition. Therefore the average cost of educating a form four boarding and day student was 37,641/- and 26,414/- respectively per year.

5.2.2 Direct social costs of educating day and boarding secondary students per year

The total direct social cost of educating a student was 36,499/- Teachers' salary was the greatest direct social cost at 32,984/- which was 90.1% of the total direct social cost. Other direct social costs per student per year included funds from: income generating activities, CDF, laboratory equipment, bursaries. Since the government introduced FSE

the direct social cost of secondary education is 46,764/- per student per year. The total cost of educating a day and a boarding and day student per year was 74,140/- and 62,193/- respectively.

5.2.3 The performance of day and boarding secondary students

Day students performed better than boarding students with a mean average of 8.12 and 7.41 respectively. Overall, boys performed better than girls with a mean average of 8.01 compared to the girls mean of 7.27.

5.2.4The cost effectiveness of educating day and boarding secondary students compare

The CER for day and boarding student was 7,748/- and 10,005/- respectively. This shows that it costs the society 7,748/- to improve the performance of a day student by one point compared to 10,005/- required by a boarder for the same improvement.

5.2.5 The home and school environmental factors affecting day and boarding secondary students in a bid to achieve academic excellence

It can be concluded that socio economic background of the boys was a major determinant factor than parental support as in the case of the girls, because it was the factor 1 for the boys.

Distance from school was one of the major factors affecting the performance of the day students. Distance from school affected girls more than the boys, even though the girls were staying 1 Km closer to the schools than the boys.

From the factor analysis, two factors were identified, parental support for education of the student and social economic status of the parents. The parental support was the main factor for the girls than the boys.

5.3 Conclusions of the study

Based on the findings of the study the following conclusions were made.

5.3.1 Direct private cost of educating a day and a boarding secondary school student per year

The average direct private cost for educating day and boarding form four student per year was Kshs 26, 414 and Kshs 37, 641 respectively. On average the fees charged by the schools to the boarders and the day scholars per annum was Kshs 29, 400 and Kshs 16, 250 respectively. The direct fee charged by the schools was 78.11% of the total cost for boarders and 57.44% for the day scholars.

Since the introduction of F S E in January 2008, the government allocates 10, 265/- to each secondary student annually. This money was mainly to defray the cost of tuition (35.07%) and personal emolument (38. 63%). This government subsidy only caters for 40.22% of the total cost for a day student, and 28. 23% of the cost of boarders, showing that the amount of the money provided is not adequate.

5.3.2 Direct social cost of educating a day and a boarding secondary school student per year

Direct social cost of education included monies from Free Secondary Education, income generating activities, old students association and bursaries. Ninety point one percent of the direct social cost was utilized in payment of teacher's salary. The teacher's salary was high due to the many years of teaching experience. The average teachers experience was 14.68 years which was quite high. From the regression analysis of teachers' salary against experience, it could be concluded that one percentage increase in teacher's

experience will increase teacher's salary by 0. 534%. The average total cost of educating a day student was 62,193/- and 74,140/- for a boarding student per year.

5.3.3 Performance of day and boarding secondary school students

The day students performed better than boarding students with a mean of 8.12 (B-), compared to boarders with a mean of 7.41 (C+). It can be concluded that when day and boarding students are provided with the same educational inputs, there could be no difference in their performance in KCSE. The boys performed better than girls with the boys average at 8.01 (B-) while the girl's average was 7.27 (C+). The average performance of the students was 7.68 (B-), which is above C+ grade, which is the minimum requirement for admission into the local public universities.

5.3.4 Cost effectiveness of educating a day and a boarding secondary student

The CER for day and boarding students 7,748/- and 10,005/- respectively. This shows that, to improve the performance of a day student by one point requires 7,748/- compared to 10,005/- required by a boarder for the same achievement. Educating a day student compared to a boarding student is more cost effective and efficient way of using our scarce resources.

5.3.5 Home and school environmental factors affecting day and boarding secondary school students

The major problem faced by day students was staying long distances from school. Long distances to school had more effect on girls' performance than the boys. When the distance to school is lowered by 1 Km, for the girls, their performance will increase by

0.436 percent. From the factor analysis, long distances to school had a negative correlation to performance.

From factor analysis, it can be concluded that girls who were day scholars, were mainly affected by lack of parental and family support. The girls require good environment which is conducive to learning. They should be supported by their families by providing good lighting systems, enough reading space, and minimal interference from family members or friends when doing their home work.

The boys who were day scholars were mainly affected by their parental socio- economic status. The students from disadvantaged backgrounds cannot afford proper accommodation, proper diet, and their parents were likely to delegate a lot of chores at home. The students also lacked reading materials at home, and this affected their performance.

The main problems facing boarding students was lack of discipline during prep time, lack of adequate reading facilities, and inadequate boarding facilities such as bathrooms, toilets, and water.

5.4 Recommendations

The following were recommended according to the objectives of the study

5.4.1 Direct private cost of secondary school students per year

The government should increase the amount of money allocated to each student for FSE from 10,625/- to 16,250/-. This is because 16,250/- was the average fees paid by the day secondary students.

5.4.2 Direct social cost of secondary school students per year

There is a need by the government to allocate more funds to the bursary scheme to assist more poor students in secondary schools. The bursaries should be distributed on merit, as opposed to situations where the money is awarded to children of political supporters of the politicians.

5.4.3 Performance of day and boarding secondary school students

The government and opinion leaders should encourage parents to send their children to day secondary schools since they perform well provided they provided with adequate educational facilities.

5.4.4Cost effectiveness of educating day and boarding secondary school students

The government should encourage communities to construct more day secondary schools, since they are more cost effective way of providing secondary education. The existing day secondary schools should be expanded to accommodate more students.

5.4.5 Home and school environmental factors affecting day and boarding secondary school students

Parents should ensure that there is adequate lighting system for day scholars to study after school. Members of the family and friends of day students should recognize that they need enough space for reading, and they should not interfere with them when doing private studies at home.

Parents should be encouraged to assign only light duties to day secondary students while at home, since a lot of work makes the students too tired to do their school work.

Parents Teachers Associations and other school related bodies should be strengthened so that they could contribute to the provision of physical facilities of the secondary schools. The provision of more physical facilities especially boarding facilities may improve the performance of the boarding students.

Head teachers should provide adequate boarding facilities such as bathroom, toilets, water, and lighting and they should strive to improve on school diet. In the mid of 2008, there were many strikes in boarding secondary schools in Kenya, and the major complain by the striking students was about inadequate boarding facilities and poor diet provided by the schools.

5.4 Suggestions for further research

(i) There is need to evaluate the cost-effectiveness between boys and girl's secondary schools by comparing the performance and the cost of educating boys and girls in secondary schools.

(ii) There is a need to compare the cost- effectiveness of urban and rural day secondary schools. This study will justify the expansion of day secondary schools in rural areas, since day schools were initially meant for students in urban centers and towns.

(iii) There is a need to study the impact of free secondary education on quality of secondary education in Kenya.

(iv) There is a need to study the impact of income generating activities in lowering the private cost of secondary education.

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