RELATIONSHIP BETWEEN PHYSICAL RESOURCES AND INTERNAL EFFICIENCY OF PUBLIC SECONDARY SCHOOLS IN TANA RIVER COUNTY, KENYA

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Abstract:

Education creates a platform upon which economic, social and political prosperity of any nation is founded. Investment in education can help bring about economic growth, improve productivity, contribute to social and national development and lead to reduction in social inequality. This study was therefore to affirm the above sentiments by confirming whether physical resources in any way relate to internal efficiency in secondary schools of Tana River County. The study specifically sought to establish the relationship between physical resources and internal efficiency of public secondary schools in Tana River County in terms of number of classrooms, laboratories, textbooks, furniture, toilets/latrines, and electricity among others. The research particularly sought to determine the magnitude of inefficiency in form of dropout, repetition, and completion and aimed at providing possible solutions in relation to physical resources to minimize wastage in secondary schools and establish corrective measures that can minimize dropouts and repetition. The study was guided by the cost benefit analysis theory which aims at achieving optimal output. This theory stresses that the out-put of any investment should be correlated with the in-put in order to assess profitability. The objectives of the study were to assess the adequacy of physical resources in development and enhancing internal efficiency in public secondary schools, to find out the relationship between physical resources and dropout rate, to examine the relationship between physical resources and repetition rate of public secondary schools in Tana river County, to find the relationship between physical resources and completion rate and finally to develop complimentary policies and interventions related

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to physical resources that can reduce wastage in public secondary schools of Tana river County. The study was conducted using a descriptive survey and correlation research designs and the data was collected using questionnaires, interview guide and documentary analysis from 15 secondary schools which were visited by the researcher; 1 County Director of Education, 3 District Education officers, 15 Principals and 30 teachers were contacted with the Principals being purposively selected and teachers selected randomly from the accessible population. Data generated was analyzed both qualitatively and quantitatively. Qualitative data from interview schedule and questionnaires was analyzed thematically based on research objectives. Data from documents analysis and numerical data generated from interview schedules with key informants was analyzed using mean, frequency counts and percentages. Chi-square test was used to establish relationships between physical resources, dropout, repetition, and completion rates. On the first objective, the study found out that school in Tana River County had inadequate physical resources and that those available were in poor condition. On objective two, the study found out that there was no relationship between dropout rates and condition of physical resources. On objective three and four the study found out that there was positive significant relationship between repetition, completion rates and condition of physical resources. The research also revealed that the secondary education system in Tana River County as at the period of study was inefficient with a mean dropout rate of 16.0.On the basis of findings, the study concluded that physical resources are positively correlated with internal efficiency of public secondary schools in Tana river County. It was therefore recommended that for realization of internal efficiency, there was need to equip schools in Tana River County with the necessary physical resources, adequate mechanisms and procedures for ensuring retention and high completion rates in schools. Finally, the researcher suggested that schools should be given funds directly for them to have a chance of prioritizing and acquiring essential physical resources based on their specific needs.

Keywords: internal efficiency, physical resources, wastage, input-output

1. Background of the problem

In an effort to meet the demand of education, it is necessary to determine whether the resources in education function appropriately so as to be in line with the intended education objectives. Such resources fall in three categories; human resource, financial resources and instructional materials. It is therefore vital for educationists to always

determine the expenses to be incurred on such resources. This is to justify the role education plays in improving the quality of life for the people (Magala, 2010).

Soon after independence, education was considered necessary for national development. At this time, secondary education was highly valued. This level was expected to provide the required labor force to replace the expatriates. The Ominde Commission (1964) recommended for the expansion and diversification of secondary and tertiary levels of education. This was further affirmed in the National Development Plan (1966-1977), that the highest priority in education would be rapid expansion and diversification of secondary education. This led to the rise in the number of students into secondary schools. From then the government concern to subsidize secondary education in order to increase access and efficiency has continued to rise.

Later in 1980s, the famous structural adjustment programmes were introduced by I.M.F and World Bank. These two brought about the cost sharing policy that immensely affected the education sector. This was later advocated for by Kamunge Report (1988) which proposed the idea of cost sharing in education sector. Despite these programmes, education has continued to consume an increasing share of the government's budget and other stakeholders' resources, but whether and how these resources are used remain unclear (Ndiritu, 2004).

The Government of Kenya recognizes the role the education sector plays in national development and as result continues allocating massive resources to the sector. This is evident in the report on public expenditure on education which pointed out that, the overall expenditure on education had been rising and by 1987/1988 financial year, the government allocated 37.7% of the National budget recurrent budget and 5.2% of the national development budget on education (Kamunge, 1988). Based on these above sentiments, it is clear that the education sector has continued to consume a considerable share of the national budget in most African countries. The poverty of developing states makes the provision of financial, human and physical resources to an education system burdensome than it is in the developed states.

Kenya's public expenditure on education as a percentage of her GNP was about 4%.That of America, Cuba and Germany was more than 9% while Tanzania stood at 5.8%.But although Kenya's 4% share looks meager in comparison to others, it represented 35% of the total government's recurrent budget (Momanyi,1999).This percentage spending by Kenya is so much high as compared to the other countries and therefore measures should be put in place to check whether this high spending on education commensurate with the output.

The Government of Kenya allocated the highest stake of public expenditure to education after Ghana, (Republic of Kenya (1998). However, the highest proportion

(90%) of the education budget was used in the payment of salaries for servants within the sector. This left the ministry of education with little cash to spend on other facilities like establishment of more classrooms, textbook, desks and chairs among other facilities which have a great impact on achievement educational output (Psacharopoulos and Wood hall, 1985).From this, it is vivid that secondary school education consumes a reasonably high share of the government's resources yet the resources seem not conform with high levels of efficiency expected of the sector.

In an effort to improve access and internal efficiency in secondary schools in Kenya, The government introduced Free Day Secondary Education in 2008.It had a target of raising student enrolment to 1.4 million by the end of the year (Republic of Kenya, 2008).This policy was a significant effort towards the realization of the Millennium Development Goals (MDGs) and Education for All (EFA) goals, however it did not pay consideration to the limited resources in schools. The immediate consequence of the FSDE policy has been a strain and pressure on the existing resources.

1.1 Status of internal efficiency in secondary schools in Kenya

The government of Kenya has effort in place for provision of affordable secondary education due to many market and non-market benefits which accrue both to the society and the individual. The share of recurrent expenditure to education has continued rising and by 1990 it amounted to 36% of the total government recurrent expenditure (Republic of Kenya, 1992).This share represented 6% of Gross Domestic Product that was and is deemed as very high proportion by global standards. This is an effort to affirm the government's commitment towards education. Despite these, serious concerns have been raised in regard to school dropout, repetition and non-completions in Kenya. Many secondary schools are characterized by inefficiency in form of dropout, low promotion rates, repetitions and cases of non-completion.

According to Achoka (2006), in a period of ten years, 1992-2002, every secondary school cohort suffered not less than 10% school dropout. The highest dropout rate for girls was 50% in 1997/2000 cohort. The average dropout and completion rates for girls in the period under consideration were 20% and 80% respectively. For boys, they were 14% and 87% respectively. These figures indicate high wastage within the sector bearing in mind that the government has a huge investment in education as the input does not positively correlate to the output in the sector.

United Nation Children's Fund, UNICEF Report (2008), based on Kenya Demographic Health Survey 2003 data, the national secondary school dropout was 27.4% with a rate of 25.5% for males and 29.6% for females. The national secondary

school repetition rate was 1.7% with a rate of 1.8% and 1.4% for males and females respectively. The completion rates in secondary schools have also been going down from 86.4% for the years 1987-1990 to 79.0% for the years 1997-2000.

According to Herz et al (1991), education wastage which includes repetition, low transition and dropout from school is quite high for both boys and girls in most developing countries. He categorically noted that wastage was associated with resources in school, socio-economic status and was highest in low income countries where transition rates were low and dropout and repetition rate in secondary schools were high. The aforementioned components of educational wastage have serious implication not only to the attainment of EFA goals and target as set out by the Dakar Framework for action of EFA (April 2000), but also on National development. Indeed if the government has to achieve education for all by 2015, there is no option but to seal every loop hole that leads to wastage.

In response to these problems, the Government through the Ministry of Education came up with amicable policies on promotion and continued provision of special funds for the purchase of essential facilities like furniture and even construction of tuition blocks alongside essential facilities like laboratories in schools. This was evident through *The Sessional Paper Number 14 of 2010* where the Government sought to align the establishment of secondary schools with budgetary allocation for school infrastructure and teacher requirement (Republic of Kenya, 2010). It also aimed at mobilizing resources for construction and rehabilitation of schools and provide equipment to deserving areas especially ASALs and urban slums. All these said and done were effort to put the government in the position of mitigate the various challenges facing the secondary school education sub-sector.

The main focus of this study was an appraisal of the systems efficiency as huge investment in education industry seems not to commensurate with the output. The expectation of all stakeholders is that schools should make judicious use of the few resources in ensuring that students stay for minimum number of years expected in the school system thus promoting high internal efficiency and access in the system.

A number of factors have been linked to efficiency in secondary schools in Kenya. One such factor is education resources. Republic of Kenya (1994) pointed out that grade repetition in secondary school was attributed to a number of causes one of which was inadequate learning facilities. This study examined the relationship between physical resources and dropout, repetition and completion rates in secondary schools in Tana River County. This can enable us determine whether a school is underequipped hence equip it, over equipped so that we encourage more students to enroll in it so as to

fully utilize the available resources. In other words, establish whether resources are efficiently utilized.

In short, enhancing internal efficiency in Kenya's education sector is worthwhile end that should be pursued; attempts should therefore be made to reduce dropout, repetition and low completion rate by ensuring adequacy and efficient allocation and resource utilization. The main issue that surrounds these efforts is to establish whether the available resources are efficiently utilized to accommodate the increasing demand, avert repetitions and dropouts thereby improve the quality of secondary education.

It is against this background that the researcher investigated the relationship between physical resources and internal efficiency of public secondary schools in Tana River County.

2. Statement of the problem

Despite a huge investment in secondary education in Kenya, the secondary school sub-sector continues to be crippled by the problem of wastage in form of dropouts, repetitions, low completion and transition rates. According to the Republic of Kenya (2008), at national level the 2005-2007 cohort had an enrollment of 146,645 and 127,057 for boys and girls respectively whereas the completion was 137,304 and 113,899 for boys and girls respectively. These were deemed low going by a huge investment into the sector. The Ministry of education (2010) also pointed out that the transition rate from primary to secondary schools was 55% and out of the 655,000 pupils who completed the KCPE in 2004, only 230,000 (35%) of these students completed the KCSE four years later in 2008.These figures clearly indicate that completion of secondary school is a major bottleneck in the education system.

As a product of limited and poor quality of physical resources, secondary schools in Tana River County have been characterized by high cases of dropouts, repetitions and low completion rate. The dropout rate in 2011 stood at 12.8, repetition rate at 9.4 and the completion rate was 77.8 (D.E.O. Tana Delta District, n.d.).

If this problem is not addressed, it will impede the attainment of EFA goals and target as set out by Dakar Framework for action of EFA (April 2000) and National development. This problem can be solved by ensuring adequate and quality physical resources in secondary schools. This study was therefore set out to investigate the relationship between physical resources and internal efficiency in secondary schools in Tana River County.

3. Purpose of study

The purpose of this study was to investigate the relationship between physical resources and dropout, repetition and completion rates of secondary schools of Tana River County in Kenya.

4. Objectives of study

The following are the research objectives:
1. To find out the adequacy of physical resources in development and enhancing internal efficiency in public secondary schools of Tana River County.
2. To find the relationship between physical resources and dropout rate in public secondary schools of Tana River County.
3. To find out the relationship between physical resources and repetition rate in public secondary schools of Tana River County.
4. To find out the relationship between physical resources and Completion rate in public secondary schools of Tana River County.
5. To establish complimentary policies and interventions that can improve physical resources and to curb wastage in Public secondary schools of Tana River County.

5. Research questions

The study aimed at answering the following research questions:
1. Are the physical resources in public secondary schools of Tana River County adequate?
2. What is the relationship between physical resources and dropout rate in secondary schools of Tana River County?
3. What is the relationship between physical resources and repetition rate in secondary schools of Tana River County?
4. What is the relationship between physical resources and Completion rate in secondary schools of Tana River County?
5. What complimentary policies and interventions can improve physical resources and curb wastage in secondary schools in Tana River County?

6. Hypotheses

1. There is no statistical significant relationship between physical resources and dropout rate.
2. There is a significant relationship between physical resources and repetition rates.
3. There is a significant relationship between physical resources and completion rates.

7. Significance of study

The study is significant because:
1. It came up with an up-dated data on the Magnitude of wastage in Public secondary schools in Tana River County of Coast region.
2. The findings also act as a basis for mooting policies and interventions to reduce dropout, repetition and low completion rate that characterizes schools in Tana River County.
3. The study is also of practical value in helping the government adequately subsidize secondary education to enhance access and internal efficiency in secondary schools.
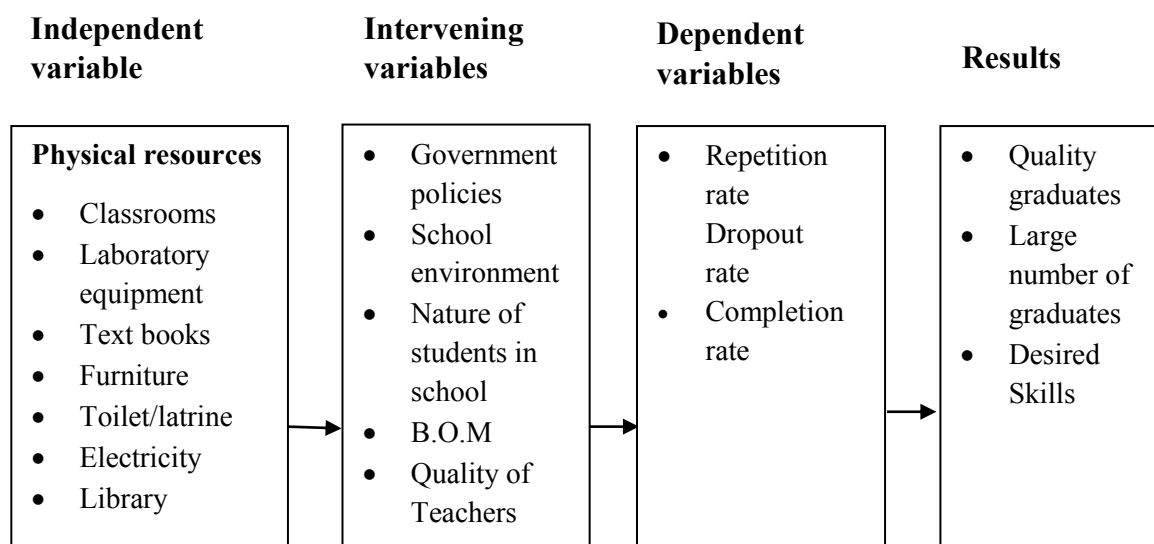
8. Theoretical framework

This study employed the economic investment theory of cost benefit analysis as the theoretical framework. Cost Benefit Analysis (CBA) serves as guide in calculating the cost of education and comparing the benefits with the cost to get the expected returns. This is in an effort to assist in the decision making process as to the future pattern of resource allocation within the education sector (Akangbou, 1987).

The operations of secondary education in Kenya rest solely on resources that are accrued from generated revenue by various stakeholders which serve as the National income of the Nation. This income is mainly from agricultural produce, taxes and tourism; it uses part of this to fund education. The County governments add some fund to whatever is received from central government through their own internally generated revenue towards sustainability of their education programmes. This calls for the need to analyze the cost benefit of any education program to ensure that the system operates with little wastage. Education is an investment which takes inputs from the environment, transforms or processes them and produces outputs to the environment.

This theory greatly orients this study due to the fact that it can be related to the school system where inputs include physical resources, financial and human resources and the enrolled students. The results of education are compared with the input so as to determine the profitability.

The school system is a process and the output refers the number of students graduating from the system. The input (educational resources) plays a big role and contributes clearly to the output that is the quality and quantity of graduates. Internal efficiency was measured by assessing the number of student dropouts, number of students repeating and the number of students completing the education cycle compared to the number that entered at the start of the cycle.

Figure 1: Conceptual framework

Independent variable	Intervening variables	Dependent variables	Results
Physical resources • Classrooms • Laboratory equipment • Text books • Furniture • Toilet/latrine • Electricity • Library	• Government policies • School environment • Nature of students in school • B.O.M • Quality of Teachers	• Repetition rate Dropout rate • Completion rate	• Quality graduates • Large number of graduates • Desired Skills

Source: Author (2014)

The conceptual diagram above shows the relationship between physical resources and internal efficiency in secondary schools.

As indicated in the model, there are various examples of physical resources which constitute the input. They include classrooms, laboratories and laboratory equipment, furniture (chairs and desks), toilets/latrines, electricity among others. This study shall entirely use these inputs to investigate the adequacy and extend of physical resource utilization.

In order to determine economic efficiency which defines the extent of resource utilization within education sector, there is need to consider the costs/expenditure incurred when financing input in education. These costs are in two categories based on cost analysis. The first category of cost is the Capital costs which covers expenditures

that are financed through grants, loans or even through harambee.It includes purchases of durable assets such as buildings, machinery among others that are expected to yield benefit over a longer period. Average capital cost is known as cost per student per place.

The second type of cost is the recurrent cost, which covers expenditure that recurs regularly and includes expenditure on inputs that bring immediate and short term benefits. This covers expenditure on inputs which are majorly consumable goods like water, electricity, stationery among others. Average recurrent cost is referred to as unit cost or pupil recurrent cost.

This study used both categories of cost/expenditures in defining and describing the relationship between physical resources and internal efficiency as the status of physical resources affects the quality of teaching/learning process within the school. All these determine the quality and quantity of the school product or the school output.

9. Review of related literature

A.   Adequacy and Importance of Physical resources in enhancement of internal efficiency in Secondary Education

Resources constitute a vital factor in the functioning of the educational system as the success of the system or otherwise depend on the manpower and materials made available (Oni, 1995).In line with this, Fabunmi (1997) identifies resources in an educational establishment to include students, personnel, physical facilities, curriculum and finance. Okumbe (1998) further defines educational resources as materials that give help, support or aid to the teaching learning process. He therefore pointed out that education resources were materials or items which aided and supported the teaching learning process in educational institutions. These are major variables that determine the rate of educational development of a given Country.

A study by UNESCO (2011), noted that secondary education is becoming a growing concern and a major challenge for education policy makers and researchers worldwide as it plays an increasingly important role in creating healthy and cohesive societies and spurs economic growth. It represents a critical stage of the system that not only links initial education to higher education, but also connects the school system to the labor market. Going by these sentiments, is pertinent to examine how efficient the school system is as physical facilities stand out as an important component in teaching-learning process according to Farrant (1980).He stressed that science equipment, audio visual equipment, school furniture and materials such as pictures, textbooks offered a vital service to teachers in the teaching process.

In the developed countries with specific example of United States of America, physical resources alongside human resources are given much focus in relation to education as they are deemed to be very important components in the development of qualitative education (Adeogun, 1999).He further asserts that the success or the failure of any education system depends on the quality and quantity of resources made available to it and the use to which such resources are engaged.

Hallak (1990) in his study on factors contributing to the academic achievement in the school system identified educational facilities as the major factor contributing to the academic achievement in the school. Such facilities include the classrooms, furniture, libraries, laboratories, recreational equipment, instructional materials and offices among others. These sentiments are in consonance with Adeboyeje (1999) who defined physical facilities as essential materials that must be put in place and into consideration for the objectives of the school system to be accomplished. He further stressed that the availability of these facilities determines the quality of instruction and performance of students in the school.

According to Akinsolu (2003) In her study on provision and management of physical facilities for primary education in Nigeria, found out that there is a gross inadequacy in facilities for Nigerian primary schools with availability to required percentage ranging from as low as 1.5% to a maximum of 35.2%.Her study stressed the importance of physical facilities in the management of education system. She opines that stakeholders need to ensure adequate provision of physical facilities in all educational system, be it primary, secondary, and tertiary levels to enhance learning and for improved productivity. She further affirms that education objectives can only be achieved with the availability of adequate and relevant physical resources in school.

Bell and Rhodes (1996) noted that in order for a school to advance the learning opportunities offered to the pupils, it has to adequately utilize the facilities available in school. Such facilities include the administrative office, staffrooms and offices, classrooms laboratories, workshops, equipment, stores libraries, hostels, staff houses and the school grounds. This is also true according to a study by Engel Hardt (1961) who in his study on assessment of the effect of physical resources on pupils' academic performance pointed out that adequate physical resources have a positive result on pupils' performance.

Combs (1968) stressed the importance of physical facilities in his identification of the major components of an education system. He noted that the acute scarcity of resources had constrained educational systems from responding more fully to new demands and hence inefficiency. Effort should therefore be made to ensure availability as such facilities are crucial in attainment of education objectives. These sentiments are

in consonance with Eshiwani (1993) who observed that maintenance of factors such as curriculum, physical facilities, school management, teacher training among other resources are some of the indicators of efficiency and quality education. In addition Gogo (2002) reported that low performance in examination could be attributed to inadequate finance which resulted to inadequate supply of teaching learning materials and equipment.

Physical resources have been identified as a crucial component of education resource and have a vital role to play in the attainment of internal efficiency in schools. This is asserted by Adeyemi (1989) who investigated internal efficiency of technical collages in Lagos state. Data was collected through the use of questionnaires. It was analyzed with the use of simple percentages and the re-constructed cohort method. The study found that the wastage rate was 2% and 3% and ratio 1.00 and 1.08 respectively for the two sets of cohort used. The performance of students was positively related to the availability and rate of utilization of the available resources that is the human and physical resources.

Although the studies have exhibited the importance and impact of physical resources on the general operation of schools, they failed to show whether physical resources allotted to education can be used to eliminate the high cases of dropout, repetition, non-completion and low cases of completion within secondary schools. Furthermore, most studies did not show the specific relationship between physical resources and internal efficiency. It was the opinion of this study that before we look for alternative ways of reducing wastage in education, we needed to find out how physical resources can be used to eliminate education wastage. In particular, it is crucial to establish how well physical resources can be used to enhance efficiency in secondary schools.

B.   Dropout in secondary schools

A considerable amount of work has been done by various stakeholders touching on wastage in schools, yet the problem still persists. Dropping out of secondary school is a serious educational and social problem. It has both negative individual and social consequences (Maeke, 2003).

Republic of Kenya (2003:4) notes that secondary schools in Kenya experience wastage. By 1999, the national dropout rate for boys was 4.6% while for girls was 5.1% making an average of 4.8%.North Eastern province which currently houses several counties in northern parts of Kenya had the highest dropout of 7.6% while Central province had the lowest dropout of 4.0%.

According to Fulk (2003) in a study conducted in United States of America to find out causes of drop out in schools, found out that continuous poor performance in internal examination among other factors can cause drop out from school by students. In response to increasing pressure to improve school performance in USA, legislation and policies regarding equipping schools with adequate facilities and grade level promotion standards have been developed at the nation, state and district level. The results has been a call for the ``end of social promotion'' and renewed emphasis on grade retention as a remedy for underachieving students. Many students who drop out from school are underachievers.

Maeke, (2003) in her study on secondary school dropout in Kilome division, Makueni District observed that the quality of the school in terms of resource base available determined student retention rate. In her study, the parents and teachers that were interviewed affirmed that where enrolment rates were decreasing the quality of the school in terms of physical and human resources led to mass exodus of students from one sampled school to another between the year 2001-2002.In concluding her study she recommended that financial assistance should be given to secondary schools to improve their physical facilities.

Ndambuki (2012) in her study on factors influencing Girl dropout in Free Day Secondary Education Programme in Mbooni West District observed that lack of facilities for the exclusive use by girls can fuel dropout from school. Such facilities include toilets. With just one latrine in a school, the experience is that this sole latrine tends to be locked and reserved for exclusive use of teachers. Where there are two latrines, one is locked for use by teachers and the other is used by both boys and girls. In such cases, girls especially during menstrual periods are often unwilling to use the latrines and make their often unhygienic arrangements or simply skip school (Qumrun & Rokeya, 2006).This is in line with Mutua (2002) who observed that one cause of girl dropout is lack adequate essential facilities such as latrines or total absence of such facilities.

Bogonko (1992) asserts that a number of factors contribute to increase in student drop out. Such factors include lack of interest in education, distance of school from home; domestic work such as periodical crop harvesting plays a leading role in student dropout. The Forum for African Women Educationalists (FAWE) 1995) report further says that circumcision and the offering of initiation rites fuels most girls in Kenya to leave school as they steadily get married.

Inadequate learning facilities in school leads to poor performance in mathematics (Mbugua et al, 2012).This is in consonance with a study by Ndambuki (2012) on factors influencing girl dropout in Mbooni west district, who found out that poor performance

and grade repetition may have played a role in influencing dropout among girls. She asserted that 59% of boys who repeated a class before dropping repeated because of poor performance.

Muriithi (2005) in his study on factors contributing to educational wastage in secondary schools in Nyeri district found out that 3.29% and 5.57% of boys and girls respectively repeated school. He found out that the reasons for dropout were mainly lack of school fees, suspension and irregular school attendance. These findings collaborated Ekstrom et al (1986) findings that behavioral problems such as absenteeism, truancy among students.

According to Mbuda (1983) In his study on causes of dropout among students in schools in Kenya pointed out that the causes and the rate of dropout may vary depending on the school and the district in which the school is found yet causes and rate of dropout among students depends on a number of factors such as the composition of student's population, the environment and community in which the school is situated. The variables that were used in his study did not factor in physical resources contribution to dropout. This study therefore intends to find out whether there exists a relationship between physical resources and internal efficiency where dropout is a variable.

Dropping out of school has numerous social consequences which range from increased demand for social services such as welfare, foregone national income, medical assistance, unemployment, increased crime, poor health levels, and reduced political participation to reduced intergenerational mobility (Levin, 1972). He estimated that the social costs of providing social services as curbing crime associated with dropping out was $6 billion per year. Today the figures would be much higher. He emphasized that dropping out from school has a serious consequence not only to the individual but also to the wider society.

It is clear from these studies on dropout that the studies concentrated more on high cost of education, expulsion, composition of students' population, truancy, cultural factor and continuous poor performance in examination as the causes of student dropout but ignored to large extent school physical resources that has a hand on status of efficiency in secondary schools. Moreover, majority of the previous studies did not show the specific relationship between physical resources and dropout in secondary schools.

C.   Repetition in secondary schools

Grade repetition is wastes to the education system as the students who tend to repeat classes spends more time within the system and hence overstretch the resource base

available in schools. Carron (1996) suggests that grade repetition alongside absenteeism and dropout are well known problems in the functioning of schools in developing countries and have disastrous consequences on the effectiveness of such system.

Abagi (1997) in his study on efficiency of primary education in Kenya asserted that the education system in Kenya experiences high wastage due to repetition and dropout. Poor resource utilization or inadequacy of such essential resources which manifests itself in wastage is a great concern to every education stakeholder. He therefore suggests that appropriate measures need to urgently undertaken to address this problem.

Republic of Kenya (2003:43) notes that grade repetition varies among the various levels of education for instance it points out that repetition in secondary schools is much lower in comparison to the primary schools. In 1999 repetition rate at secondary schools was 1.7% for boys and 1.5% for girls and girls respectively. In the same year, repetition rate at primary school level was 13.5% and 12.9% for boys and girls respectively. The highest repetition in secondary schools was reported in Nairobi at 4.8% followed by Nyanza, 2.3% and lowest repetition being reported in Central at 1.0%.The highest repetition rate for girls was 8.9% in Nairobi while the highest repetition for boys was 2.5% in Nyanza. This high repetition rate in Nairobi was due to minimal secondary school places to cater for large population of pupils joining this level. As a result, parents made their children repeat classes in primary schools for them to score high grades in KCPE for subsequent admission to National and Provincial secondary schools.

According to Republic of Kenya (1994: Xiii),Grade repetition in schools has been due to several factors some of which include too much emphasis on passing examination, involvement of pupils in wage employment, absenteeism from school leading to poor performance, and engagement in cultural activities like girl child circumcision which affect girl child education. This poor performance has been in many studies linked inadequate education resources.

The literature reviewed pointed out a number of factors as reasons for repetition. Such factors included constant absenteeism from school and continuous poor performance in examination among others. It did not to a larger extend point at physical resources yet such resources have a hand on the internal efficiency of the school system due to the fact that the day to day running of the school depends on them. The studies did not also reveal how the physical resources can be used to reduce repetition in secondary schools. This study therefore aims at finding out the relationship between physical resources and internal efficiency and how physical resources can be used to reduce repetition in secondary schools.

D.   Completion rate in secondary schools

Failing to complete school is a serious educational and social problem. The problem does not only affect those who fail to complete school but also the society at large. It has serious implications especially towards the attainment of EFA goal and target as set out by Dakar Framework of action of EFA (April 2000).

A study by Rumberger (1987) in United States of America on factors responsible for non-completion of school by students pointed out that 50% of high school students who failed to complete school cited school related reasons as having prompted them to leave school. Such reasons included: not liking school, scarce resources, and insecurity or being expelled from school. Research has also indicated that continuous poor academic achievement in school as measured by grades, test scores and grade retention is associated with low completion (Eskstrom et al, 1986).Some researchers suggest that the students' psychological attachment to school and investment in learning are key to academic and social success and consequently key to remaining in school.

Abagi & Odipo (1997) in their study on efficiency of primary education in Kenya observed that the national completion rate had been declining over the last decade for both boys and girls. They observed that it was clear that there was a lot of wastage in primary education and that more than 50% of enrolled pupils failed to complete the education cycle yet education consumed about 55% of the government's recurrent expenditure. They further observed that wastage resulting from a failure to complete primary education cost the public an estimated Ksh 5.2million between 1992 and 1996. They alluded that if the situation is not checked immediately, the dropout rate was expected to increase to 65% by 2000.They attributed the low completion rate to rising poverty, overloaded curriculum, Teacher attitude, opportunity cost, gender issues and initiation ceremonies among others.

According to the Republic of Kenya (2008), at national level the 2005-2007 cohort had an enrollment of 146,645 and 127,057 for boys and girls respectively whereas the completion was 137,304 and 113,899 for boys and girls respectively. These were deemed low going by a huge investment into the sector. The Ministry of education (2010) also pointed out that the transition rate from primary to secondary schools was 55% and out of the 655,000 pupils who completed the KCPE in 2004, only 230,000 (35%) of these students completed the KCSE four years later in 2008.These figures clearly indicate that completion of secondary school is a major bottleneck in the education system.

Failure to complete school has been due to the rise in the dropout rate at various grades in the secondary education cycle. In Kenya, national dropout rates in secondary schools for boys was 4.6% and for girls was 5.1% making a total of 4.8%.The completion rates was also declining: from 86.4% for the 1987-1990 to 79.0% for the 1997-2000 cohort

(Republic of Kenya,2003:41).A number of reasons compel students to leave school prior to completion of their courses. A large body of empirical research conducted worldwide has identified a wide range of factors that are associated with failure by students to complete school. These include high cost of education, negative student attitude and cultural factors among others.

The issue of low completion or non-completion just like dropout and repetition has for a long time been shown to have serious negative individual and social consequences. Studies conducted by Rumberger (1987) revealed that most individual consequences of this forms of wastage is low level academic skills. Failure to graduate from school renders a person unfit for successful employment and further education. Those who do not complete school have fewer opportunities to obtain additional education and training needed to make one competitive in the job market.

It is clear from these studies on completion rate just like those on dropout rate that the studies concentrated more on high cost of education, expulsion, cultural factor and continuous poor performance in examination as reason for failure of students to complete school but ignored to large extent school physical resources that seem to have a hand on status of efficiency in secondary schools. Moreover, majority of the previous studies did not show the specific relation between physical resources and completion rate. It is therefore in the opinion of this study that there is need to find out how physical resources in secondary schools can be used to boost completion rates.

E.   Existing strategies to improve physical resources and curb wastage in secondary schools

Efficiency rates of secondary school have been established on the basis of some indicators such as high cycle costs, high dropout, low quality instruction, low secondary school achievement (BPEP Master plan, 1991).The Master Plan stresses that reasons for this unsatisfactory level of efficiency are attributed to the absence of planning and appropriate program development, inappropriate process adopted for making policy decisions.

The World Bank (1995) stated that efficiency which is the flow of students-the input-output ratio can be improved by reducing repetition and dropout rates. First promotion policies must be carefully examined. So when repetition is high it can be reduced particularly in early grades either controlling the entry at each level of by modifying the standards for promotion to reflect abilities of students. It also argues that a review of research on various promotion practices provide no evidence that repetition is more effective than promotion, or that repetition practice improve either academic standards or homogeneity of classes. Rather, repetition has a negative effect on pupils'

attitude and his view of himself. Thus, it suggested that the educational policy should discourage repetition in order to improve the flow of students.

Kamunge report of 1988 in its recommendation of the cost sharing policy in education pointed out that the government was to continue paying teacher's salary while parents and the community were to provide physical facilities among other emoluments. This was an effort towards pulling resources for the school; improve quality and internal efficiency where the system would have reduced cases of dropout and repetition. However, the policy did not meet the intended objectives since children from poor households could still not meet the cost of education and therefore ended up dropping out of school.

The Sessional paper number 1 of 2005 identified the declining enrolment in secondary schools as one of the many challenges facing education. In response to these problems, the government intensified efforts aimed at reducing dropout rates in secondary schools in Kenya (Republic of Kenya, 2005). This saw the introduction of Free Day Secondary Education (FDSE) policy in 2008 that led to abolition of school fees as well as introduction of public subsidies for secondary schools. This was aimed at meeting the EFA and MDG target of universal access to education by 2015.The government had a target of raising student enrolment to 1.4 million students by the end of the year (Republic of Kenya, 2008).

The Ministry of Education has measures in place for provision of refresher courses to the secondary school Principals and their Deputies through the Kenya Education Management Institute (KEMI) to equip them with knowledge on management and effective resource creation and utilization. Such training is necessary in the light of changing world as the efficient management of school physical facilities is mandatory in order to make the schools pleasant, safe and comfortable canters for the community activities (Adeboyeje, 2000). According to him, the school administrator has to play a major task in the school, which is the management of all the physical facilities. He further stressed that the school administrators should be conversant with universal principles of managing physical facilities. Proper understanding and application of such principles will contribute to correcting deficiencies in physical facilities, management practices, which in turn facilitates instructional programmes in schools.

According to The Sessional Paper Number 14 of 2010, the government seeks to align the establishment of secondary schools with budgetary allocation for school infrastructure and teacher requirement. It also aims at mobilizing resources for construction and rehabilitation of schools and provides equipment to deserving areas especially Asals and urban slums (Republic of Kenya, 2010). It is hoped that this will create more vacancies for students by establishing a minimum of three streams in each

secondary school thereby increase access and in the long run reduce dropout, repetitions and in turn increase the completion rates in secondary education sub-sector.

Despite measures to cut down educational wastage, secondary schools in various parts of the world are still characterized by high cases of repetitions, dropouts and low completion rates. There is need to develop more stringent strategies in relation to physical resources to mitigate the challenges. This study therefore aimed at finding out the relationship between physical resources and educational wastage in secondary schools.

From the reviewed literature, it is evident that many studies have been done in developed countries and a few in developing ones especially in sub-Saharan Africa. Consequently, such a study has never been conducted in Tana River County in Kenya. This study therefore gives a justification that its findings together with those from the previous studies can be generalized to all secondary schools in Kenya.

All the studies reviewed served as the major spring board which this study took off. The study used the approach of these authors in carrying out this research. The study examined the relationship between physical resources and internal efficiency of public secondary schools in Tana River County in Kenya.

10. Methodology

The study adopted descriptive survey and correlation research designs. Descriptive survey research designs are used in preliminary and exploratory studies to allow researchers to gather information, summarize, present and interpret for the purpose of clarification (Orodho, 2002). Descriptive survey design also aims at obtaining information, which can be analyzed, patterns extracted and comparisons made (Bell,1993) while Correlation research design involves calculation of a correlation coefficient which is a measure of the extent to which variables vary in the same way (Anderson,1998).Physical resources are the independent variables while dropout rate, repetition rate and completion rate are the dependent variables which focuses on output in relation the inputs in the education system.

In this study, the researcher intended to obtain and compare information from public secondary schools in Tana River County in Kenya.

10.1 Study locale
This study was carried out in selected public secondary schools in Tana River County which is one of the 47 counties in Kenya. Tana River County borders Garissa County to

the north, Kilifi County to the west, Lamu County to the east and the Indian Ocean to the south.

The County has 15 public secondary schools with most of them being mixed day schools. Singleton (1993) advises that the ideal setting for any study should be easily accessible to the researcher and should be that which permits instant rapport with the informants. Tana River County was chosen because it is within reach by the researcher.

10.2 Target population

The target population consisted of all public secondary schools in Tana River County. According to Tana River County education office, the County has 15 Public secondary schools that formed the population of this study. The total student population was 3,854.Out of this 1341 were girls while 2531 were boys. There were a total of 125 teachers with teacher to student ratio of 1:30.The County has two County Education directors and 3 District Education Officers who also formed part of the target population.

10.3 Sample size and sample technique

A. Sample size

All the 15 public secondary schools in Tana River County were used for the study. This formed 100% of the total school population and was a reasonable study size. Gay (1983) who was cited by Mugenda (1999) suggests that for descriptive survey studies 10% of the population is enough. The study sample was higher than expected because the secondary schools in the County are few. Overall numbers of participants in this study was 49 comprising of 1 County director of education, 3 District Education officers, 15 Principals and 30 teachers who comprised of academic masters and the classmates of a cohort of student who joined form one in 2008.

B. Sampling techniques

All Principals were purposively selected because they were believed to have very good information regarding educational resources as a factor of internal efficiency in secondary schools of Tana River County. The teachers were randomly selected so as to give each one equal chance to be selected to participate. Simple random sampling involves defining population, identifying each individual or member of the population and selecting individuals basing on the chance basis. Therefore, compared to other techniques simple random sampling is the best way to obtain respective samples bearing in mind that the researcher is interested in getting specific respondents that bear attributes that can achieve the study objectives. This is in line with survey study

procedures that require inclusion of informant with information concerning the area of study (Orodho, 2005).A cohort of students who entered the 15 secondary schools in 2008 and graduated in 2011 were purposively selected for the study. This enabled the researcher to examine the flow rate of the students through the four-year school system in terms of promotion rate, repetition rate and dropout rate.

10.4 Research instruments

This study made use of three main research instruments to generate data and develop knowledge for this study. These were the questionnaires, interview schedules and the document analysis.

10.4.1 Questionnaires

These were used to collect information from the Principals and Teachers from a sample of the selected public secondary schools. The questionnaire entitled physical resources and internal efficiency (PRIEQ) was used to collect relevant data on the independent and dependent variables. It consisted of two parts A and B. Part A elicited demographic information about each school such as name of the school, its location, year founded and total number of students. Part B solicited information about physical resources and the internal efficiency level of public secondary schools; relationship between physical resources and wastage rate and how existing policies and interventions have fostered internal efficiency of public secondary schools in Tana River County. The questionnaires also captured data on a cohort of students who entered the schools in form 1 in 2008 and graduated in 2011.It also solicited data on number of promotes, number of repeaters and number of drop outs in each of the years. Finally, the respondents suggested complimentary policies and interventions that can be adopted to promote internal efficiency in Kenyan public secondary schools.

10.4.2 Interview schedule

Interview schedules were conducted to get key information from the County director of education and the District education officers. The interview schedule solicited information on all the study objectives. This enabled the researcher to know the status of physical resources; whether secondary schools in Tana River County are internally efficient, relationship between physical resources and internal efficiency and how the existing policies and interventions had promoted internal efficiency in public secondary schools in Tana River County in Kenya.

10.4.3 Document analysis

Document analysis provided additional unexpected but useful information to the researcher. It involved review of official documents such as files, memos, minutes of scheduled and unscheduled meetings, annual and quarterly reports and any other secondary documented information related to the study.

10.4.4 Pilot study

To enhance reliability and validity of the research instruments, the researcher conducted a pilot study. This was done in Gadeni secondary school as it has similar characteristics with the other public secondary schools that were selected in terms of the school physical resources. Piloting thus served the following; to check clarity of the questionnaire items, instructions and layout; to validate the instruments by cross checking their validity and reliability; to eliminate ambiguities or difficulties in wording among others (Cohen et al., (2000).After pilot, relevant adjustments, review and modifications were made to each of the items in the research instruments.

10.4.5 Validity

Validity indicates the degree to which an instrument measures what it is supposed to measure. This is a non-statistical method used in validating the content applied in research tools such as questionnaire and structured interviews (Orodho, 2008). In other words, validity is the degree to which results obtained from the analysis of the data actually represents the phenomena under study. Content validity of the research instruments was determined by experts in Test and measurement who matched each item of the instruments with the research questions in order to determine whether or not the instruments actually measured what they are supposed to measure. Their observations were used to effect necessary corrections on the instrument.

10.4.6 Reliability

Mugenda and Mugenda (2003) define reliability as a measure of the degree to which a research instrument yields consistent results or data after repeated trials. Reliability was thus established for standardization of the research instrument to be used in the study. In conducting the reliability for the questionnaire, the test re-tests reliability technique was used. In doing this the questionnaire was administered to 10 respondents outside the area of study. After the period of two weeks the questionnaire was re-administered to the same respondents. The data collected on the two tests was collated and analyzed using the Pearson Moment correlation technique correlation coefficient of 0.8 was

considered high enough to judge the instrument as reliable for the study (Orodho, 2008).

10.4.7 Data collection procedures

Data collection was organized into two main phases. The first phase was the preliminary phase. This involves obtaining official clearance both at the Ministry of Education, Science and Technology (MOEST) and university levels. The second phase consisted of the actual data collection.

10.4.8 Actual data collection

Primary data was collected from two main sources namely; Questionnaire, and interviews. Secondary data was sourced from the institutional documents and relevant learning materials. These generated both qualitative and quantitative data.

a) Administering the questionnaires

The researcher liaised with the Principals of the selected public secondary schools to get schedules for administering questionnaires to them and the teachers. The researcher then went on to administer questionnaires on the agreed schools.

b) The interview process

The researcher first made a courtesy call to the County Director of Education and the District Education Officers to book appointment with each one of them agreeing on a specific date, time and place for the interview. When booking the appointments, the researcher introduced himself and explained to each of the respondents of the need to participate in this study. The researcher promised them confidentiality of the information given.

c) Secondary data collection

Secondary data was drawn from the analysis of instructional documents and relevant learning materials.

10.4.9 Data analysis and presentation

Data collected was analyzed qualitatively and quantitatively. Data from interviews was analyzed by way of making inferences from the qualitative expressions and opinion of the respondents. It was presented thematically in narrative form. Data from the document analysis and numerical data generated from interview schedules with key informants was analyzed qualitatively using frequency counts and percentages. The data was presented in form of frequencies, tables, percentages and the chi-square.

10.4.10 Logistical and ethical considerations

The researcher obtained permission from the Ministry of Education, Science and Technology to carry out research. This is a requirement for the research of this nature. Further permission was sought at the schools in order to be allowed to collect data. The researcher conducted the interview with informants stated above and employed the services of a research assistant. After collecting the data the researcher sent an appreciation note to the respondents as a sign of goodwill. The researcher guaranteed the privacy and confidentiality of the respondents. The informed consent was also sought from the respondent before the interview. The respondents were informed of the time they were to spend in the interview.

11. Analysis, interpretation and presentation of findings

The quantitative data was analyzed using both descriptive and inferential statistics and was presented in the form of tables. Results of the data analysis provided information that formed the basis for discussion, conclusion, and interpretation of the findings and recommendations of the study. Statistical Package for the Social Science (SPSS) was extensively used by the researcher in statistical analysis. Descriptive statistics was attained through cross tabulation, frequencies, and descriptive ratio statistics. Cross tabulation involved the process of creating a contingency table from the multivariate frequency distribution of statistical variables.

11.1 Response rate

The researcher administered 45 questionnaires, 15 for school Principals, 15 for class teachers and 15 for Examination and Career masters. Four interview schedules were administered to Education officers in the County. The researcher visited the 15 sampled schools and administered the questionnaires alone.

11.2 Distribution of sample respondents according to type of school

The researcher sampled three types of schools namely mixed day, single gender and mixed day and boarding. Out of the 15 sampled public secondary schools, 10 were mixed day schools, 3 were Single gender boarding schools, and 2 were Day and boarding schools.

Figure 1.1: Respondents based on school type
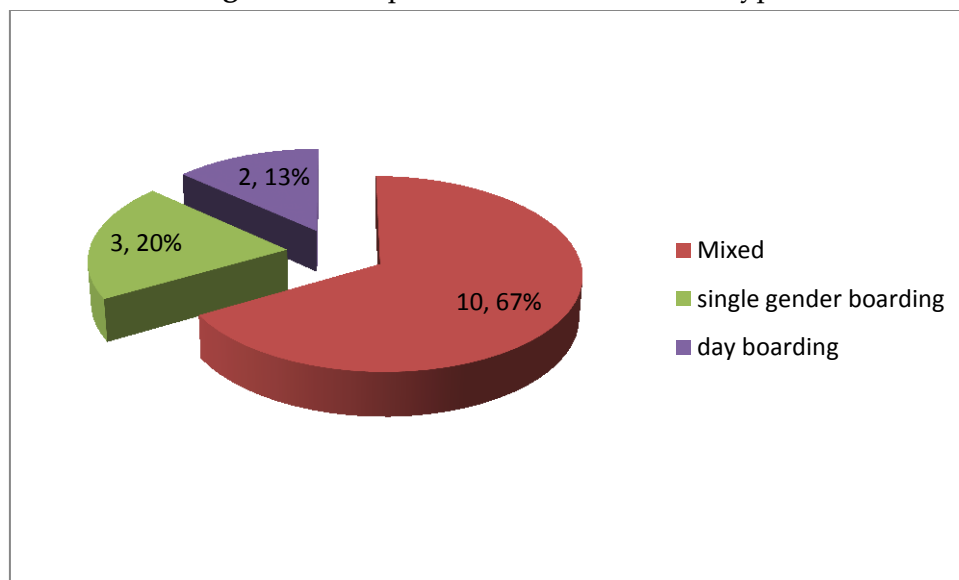
From the above data, it is clear that majority of respondents came from mixed day secondary schools at sixty six point seven percent (67%) followed by those from single gender boarding schools at twenty percent (20%) and lastly by those from day and boarding secondary schools. This results shows that Tana River County has fewer boarding schools as compared to mixed day schools.

11.3 Mean number of streams and total number of students
The researcher sought to find the total number of students in each sampled schools and the number of streams. The following table shows the mean total number of students and mean number of streams based on the sampled schools in Tana River County.

Table 1: Descriptive Statistics for number of streams and total number of students

	N	Mean
Mean number of streams	15	1.93
Mean total number of students	15	248.47

From table 1.0 the mean number of streams based on the sampled schools in Tana River County was two (2). This shows that most schools were at least two streamed schools. With the introduction of free primary schools and subsidization of secondary education in 2002, the number of students seeking secondary schools surged. This explains why most schools in the County had more than one stream. The mean number of students was 248 translating to an average of 35 students based on a two streamed schools.

11.4 Mean enrollment between 2008 and 2011 of cohort of students

The researcher endeavored to establish enrollment of students between 2008 and 2011 and the following table shows the findings.

Table 1.1: Mean Enrollment between 2008 and 2011 of cohort of students

	2008	2009	2010	2011
Mean Enrolment	48.13	43.07	38.73	35.47

From the year 2008 to 2011, it is clear that there was a decrease of enrollment of students in the sampled schools as they progressed from one grade to another based on a cohort of students. This trend can be explained by the concept of the repetition and dropout rates.

11.5 Mean dropout rates between 2008 and 2011 of cohort of students

The researcher calculated dropout rates of a cohort of students by finding the ratio between the number of students dropping from previous grade in previous year and the total number of students in the previous year. Dropout rates between 2008 and 2011 for a cohort of students were calculated and the following table shows the findings.

Table 1.2: Mean dropout rates between 2008 and 2011 of cohort of students

	N	Mean	Mean percentage dropout rates
dropout rate 2008-2009	15	.1445	14%
dropout rate 2009-2010	15	.1557	16%
dropout rate 2010-2011	15	.1637	16%
dropout rate 2011-2012	15	.1773	18%
Mean dropout rate	**15**	**0.1603**	**16%**

Table 1.2 above shows an increasing trend in dropout rates as students progresses from one grade to another based on 2008-2011 cohort of students. Between 2008 and 2009 Fourteen percent (14%) of students enrolled dropped. This translates to about seven (7) students based on the mean enrollment. Between 2009 and 2011 the dropout rate remained constant but at a high rate of sixteen percent as compared to the 2008 to 2009. Dropout rate between 2011 to 2012 stood at eighteen percent (18%).

11.6 Mean repetition rates between 2008 and 2011 of cohort of students

The researcher calculated repetition rates of a cohort of students by finding the ratio between the number of student repeaters from previous grade in current year and the

total number of students in the previous year. Repetition rates between 2008 and 2011 for a cohort of students were calculated and the following table shows the findings.

Table 1.3: Mean Repetition rates between 2008 and 2011 of cohort of students

	N	Mean	Mean percentage repetition rate
Repetition rate 2008-2009	15	.0354	3.54%
Repetition rate 2009-2010	15	.0352	3.52%
Repetition rate 2010-2011	15	.0480	4.80%
Repetition rate 2011-2012	15	.8755	8.755%
Mean repetition rate	**15**	**0.248525**	**5.15%**

It is evident that repetition rates in the sampled schools for a cohort of students between 2008 and 2011 showed an increasing trend with 2011- 2012 registering the highest repetition rate at 8.755%. This may be so due to the fact that the last year of examination registers two types of repeaters; those from the school and those from other schools. Those from other school are those that opted to repeat school after registering a dismal performance in previous Kenya Certificate of Secondary Education Examination (KCSE).

11.7 Condition of schools' physical resources

The researcher endeavored to establish the condition of schools' physical resources in Tana River County. The following physical resources were considered; classrooms, furniture, laboratories, toilets/latrines and library among others. These resources were considered basic for the smooth flow of students from one grade to another. The researcher used a scale of 1 to 4 where 1 = Very good, 2 = Good, 3 = Bad and 4 = Very bad. The following table shows the findings of the condition of physical resources.

Table 1.4: Condition of Schools' Physical Resources

	N	Minimum	Maximum	Mean
Condition of classrooms	15	1	3	1.80
Condition of furniture	15	2	3	2.53
Condition of laboratories	15	2	3	2.20
Toilets/latrines	15	2	3	2.60
Condition of library	15	1	4	2.73

From table 1.4 above, the condition of classrooms and laboratories across the sampled schools was generally good with the mean of 1.80 and 2.20 respectively. However, the conditions of furniture, washrooms and libraries across the sampled schools were bad with the mean of 2.53, 2.60 and 2.73 respectively.

These poor conditions hinder the smooth flow of students from one grade to another as many students are forced to drop or repeat as these have a direct impact on curriculum delivery within the entire school system.

11.8 Research objective one

In research objective one, the researcher sought to assess the adequacy of physical resources in development and enhancing internal efficiency in public secondary schools of Tana River County. To address the objective, the researcher collected primary data from the sampled schools. The researcher used questionnaire administered to secondary school principals to obtain pertinent information on the adequacy, inadequacy or lack of physical resources in the sampled schools. Using the collected data, the researcher developed an adequacy of physical resources index (APRI) by allocating different weights to different physical resources that were deemed important for ensuring internal efficiency. A scale of 1 to 3 was used where 3 = Adequate, 2 = Inadequate and 1 = Lacking. The table below shows the result.

Table 1.5: Adequacy of Physical Resources Index

Indicators	Weighting	Score	Weighting (Average of 1)	
	A	B	C	D=B*C
Classrooms	3	1.53	1.26	1.93
Textbooks	3	1.80	1.26	2.27
Chemistry lab	3	1.73	1.26	2.18
Biology lab	2	2.67	0.84	2.24
Physics lab	2	1.80	0.84	1.51
Furniture	3	1.87	1.26	2.36
Toilets facilities	2	1.80	0.84	1.51
Water/Electricity	2	1.60	0.84	1.34
Laboratory equipment	2	1.73	0.84	1.45
Health facilities	1	2.60	0.42	1.09
Recreational facilities	3	2.33	1.26	2.94
Library	2	2.53	0.84	2.13
Computer room	3	2.20	1.26	2.77
Average	2.38	2.01	1.00	2.02

Source: Author, 2014

A = Average Weighting assigned by all respondents for each parameter

B = Average Score assigned by all respondents for each parameter

Average Weighting

C = Weighting based on avg. of 1 = Individual Weighting / avg. Weighting

D = Weighted Score = Score * Average Weighting = B * C

Adequacy of physical resources Index APRI = Average of (Weighted Scores)

APRI = **2.02** since the scale used was 1 - 3, in terms of percentage APRI = **67%**

Table 1.5 above indicates that most secondary schools in Tana River County had inadequate physical resources with an adequacy of physical resources index of 2.02. Considering internal efficiency, the adequacy of physical resources is critical in ensuring that students learn without any hindrance that may force them to repeat due to failure or dropout. Inadequacy of physical resources decreases internal efficiency. Figure 1.3 below shows the score of each physical resource from the sampled schools.
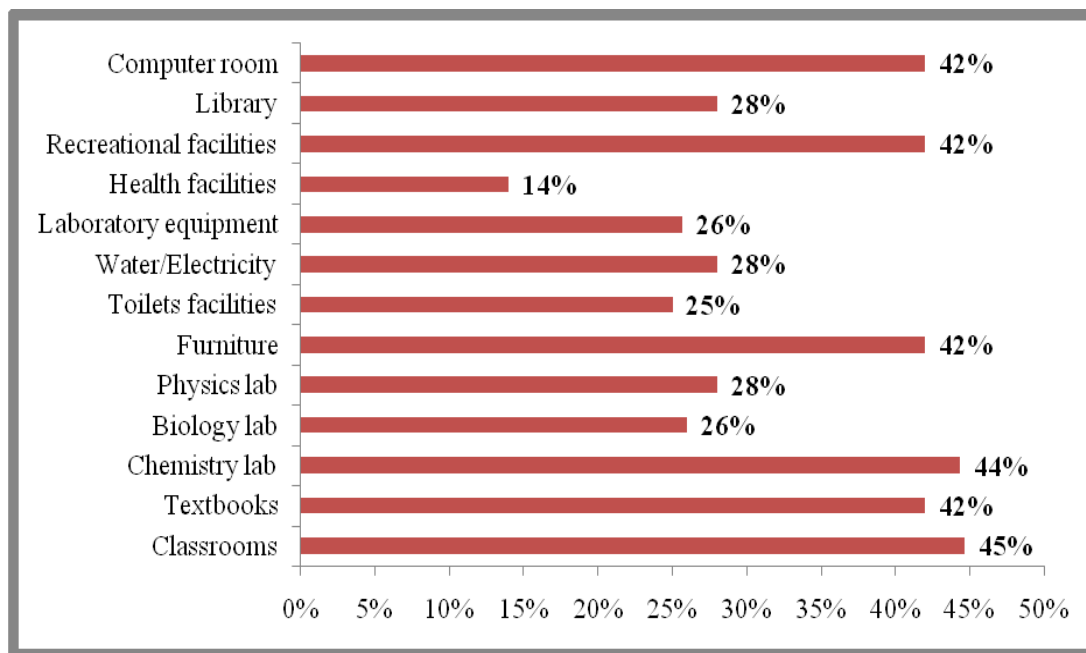

Figure 1.3: Adequacy of Physical Resources

From figure 1.3 above it is evident that most schools in Tana River County experienced inadequacies of libraries, health facilities, physics laboratories and biology laboratories. Classrooms, text books, and Chemistry laboratories were adequate in most schools. Physical resources are a vital component for the success of the education sector and their inadequacy or absence affects the achievement of the education goals. This is in agreement with Oni (1995) who in his study about education resources in an education system alleged that resources constitute a very important factor in the functioning of an education system as the success of the system or otherwise depends on the materials and manpower available.

11.9 Research objective two

In research objective two, the researcher endeavored to find the relationship between physical resources and dropout rate in public secondary schools of Tana River County. In order to address this objective, the researcher did a cross tabulation between condition of physical resources and dropout rate. Condition of physical resources was

re-coded to a dichotomous variable where 1 = Good and 2 = Bad. Dropout rates on the other hand were transformed from metric variable into a dichotomous variable where 1= Low dropout rate and 2 = High dropout rate. The researcher then employed a Chi-square test to establish the relationship between adequacy of physical resources and dropout rates. The table below shows the findings.

Table 1.6: Average dropout rate vs. Average condition of Physical Resources Cross tabulation

			Average condition of physical resources		
			Good	**Bad**	**Total**
Average dropout rate	**High dropout rate**	Observed Count	5	6	11
		Expected Count	5.1	5.9	
		Residual	-.1	.1	
		Std. Residual	.0	.1	
	Low dropout rate	Observed Count	2	2	4
		Expected Count	1.9	2.1	
		Residual	.1	-.1	
		Std. Residual	.1	.0	
	Total	Counts	7	8	15

Pearson Chi-square (0.024) P-value (0.876)

Note: The expected frequency is derived by multiplying the row total by column total and divides the result by the grand total. For example, the expected count of the first row first column was calculated as follows

$E_{11} = \frac{11X7}{15} = 5.1$ where E_{11} = expected frequency for the observed frequency in row 1 and column 1.

The residual was calculated by finding the difference between the observed count and the expected frequency whereas the standard residual was found by transforming the residual score into standard score.

The Pearson Chi-square of 0.024 and P-value of 0.876 indicates that the null hypothesis that there is no relationship between dropout rates and the condition of physical resources in the sampled schools is not rejected. These results therefore showed that there was no relationship between physical resources and dropout rate. This means that there must be other factors related to physical resources rather than adequacy that were not included in the study that have a direct influence dropout unlike physical resources. These results are contrary to a study by Ndambuki (2012) in her study on factors influencing Girl dropout in Free Day Secondary Education Programme in Mbooni West District who observed that lack of facilities for the exclusive use by girls can fuel dropout from school. Such facilities include toilets. With just one latrine in a school, the experience is that this sole latrine tends to be locked and

reserved for exclusive use of teachers. Where there are two latrines, one is locked for use by teachers and the other is used by both boys and girls. In such cases, girls especially during menstrual periods are often unwilling to use the latrines and make their often unhygienic arrangements or simply skip school.

11.10 Research objective three

In research objective three, the researcher endeavored to find the relationship between physical resources and repetition rate in public secondary schools of Tana River County. In order to address this objective, the researcher did a cross tabulation between condition of physical resources and repetition rate. Repetition rates were transformed from metric variable into a dichotomous variable where 1= Low dropout rate and 2 = High dropout rate. The researcher the employed a Chi-square test to establish the relationship between adequacy of physical resources and repetition rates. The table below shows the findings.

Table 1.7 Average dropout rate vs. Condition of physical resources Cross tabulation

			Condition of physical resources	
			Good	**Bad**
Average repetition rate	**Low repetition rate**	Count	1	6
		Expected Count	3.3	3.7
		Residual	-2.3	2.3
		Std. Residual	-1.3	1.2
	High repetition rate	Count	6	2
		Expected Count	3.7	4.3
		Residual	2.3	-2.3
		Std. Residual	1.2	-1.1

Pearson Chi-square (5.59) P-value (0.019)

The probability of the chi-square test statistic (chi-square=5.59) was p=0.019, less than the alpha level of significance of 0.05. The null hypothesis that the differences in average repetition rates are independent of differences in average condition of physical resources is rejected. The research hypothesis that there is a relationship between repetition rates and condition of physical resources was supported by this analysis.

These findings therefore reveal that physical resources have a direct influence on repetition as learners tend to repeat grades partly due to poor performance that is directly brought about by poor quality of education offered being a product of limited or absence of essential facilities in the schools. Some schools in Tana River County did

not have essential facilities like laboratories and this affected the learning of science. This was noted to have an impact on the students who perform poorly in national examination and therefore opt to repeat especially in the final grade.

11.11 Research objective four

In research objective four, the researcher sought to find the relationship between physical resources and completion rate in public secondary schools of Tana River County. In order to address this objective, the researcher did a cross tabulation between condition of physical resources and completion rate. Completion rates were transformed from metric variable into a dichotomous variable where 1= Low completion rate and 2 = High completion rate. The researcher then employed a Chi-square test to establish the relationship between adequacy of physical resources and completion rates. The table below shows the findings.

Table 1.8: Average completion rate vs. Condition of physical resources Cross tabulation

			Average condition of physical resources	
			Good	Bad
Completion Rate	Low completion rate	Count	1	7
		Expected Count	3.7	4.3
		Residual	-2.7	2.7
		Std. Residual	-1.4	1.3
	High completion rate	Count	6	1
		Expected Count	3.3	3.7
		Residual	2.7	-2.7
		Std. Residual	1.5	-1.4

Pearson Chi-square (8.04) P-value (0.005)

The probability of the chi-square test statistic (chi-square=8.04) was p=0.005, less than the alpha level of significance of 0.05. The null hypothesis that differences in average completion rates are independent of differences in average condition of physical resources was rejected. The research hypothesis that there is a relationship between completion rates and condition of physical resources was supported by this analysis. This therefore indicated that physical resources had an influence on completion rate in the secondary schools of Tana River County. This is true as inadequate number of classrooms, congestion within those classrooms alongside essential facilities like toilets/latrines limit the number of students in school. Poor learning environment

brought about by scarce resources within the schools in the County made students to drop out from school hence a few proceed and get a chance to complete the four year education cycle. Therefore, lack of sufficient facilities within the schools led to a low completion rate in those schools. This sentiments were in line with Rumberrger (1987) who investigated causes of low completion in schools in United states of America found out that 50% of high school students who failed to complete school cited scarce resources as one of the reasons that prompted them to leave school.

11.12 Research objective five

In research objective five, the researcher endeavored to develop complimentary policies and interventions to improve physical resources and to curb wastage in secondary schools of Tana River County. To address this objective, the researcher conducted interview schedule with Education officers in Tana River County and administered open ended questionnaire to the Principals. Information on how physical resources can contribute to dropout and the role played by physical resources in promotion of students' academic excellence was collected from Education officers. Principals' questionnaires included strategies and intervention to improve physical resources and curb wastage in secondary schools. The researcher also collected suggestions from the class teachers and examination masters on how existing government intervention can be used to reduce inefficiency due to physical resources and measures that can be undertaken to eliminate cases of dropout, repetition and low completion rates in secondary schools in Tana River County.

11.13 Findings from the principals' open-ended questionnaires

On the principals' open-ended questionnaires, the researcher sought to collect their suggestions on how the existing government interventions can be used to reduce inefficiency due to physical resources and what measure can be undertaken to eliminate cases of dropout, repetition and low completion rates in secondary schools. On the first question, majority of principals suggested; increasing allocation of bursaries by the ministry, Increasing allocation towards infrastructure fund and sending such funds from the government directly to schools. On the second question, majority suggested the following; Proper care and maintenance of available facilities, buying and replacing the lost and damaged facilities, upgrading school physical infrastructure, having more boarding schools, timely disbursement of free secondary fund and enhancing cooperation between the teachers and parents.

11.14 Findings from the interview schedule for educational officers

The researcher organized three interview schedules with Educational Officers from Tana River County. The interview schedule focused on policy recommendations from the Education Officers. On how physical resources affect student academic excellence in secondary schools in Tana River County, the researcher was informed that absence of physical resources compromises the quality of education, as the learners are not exposed to the right environment. This consequently hinders their performance in national examinations. On ways related to physical resources that can be used to curb internal inefficiency in secondary schools, the Education officers suggested that allocation for school infrastructure fund should be increased to create room for the establishment and acquisition of essential physical resources within the schools.

12. Summary, conclusion and recommendation

12.1 Summary of research findings

A.   Research objective one

The above research objective was formulated in an attempt to assess the adequacy of physical resources in development and enhancement of internal efficiency in public secondary schools in Tana River County.

Data analysis and interpretation of questionnaires interviews and documentary analysis revealed the following findings.

It was established that although physical resources highly influence internal efficiency in any secondary school, these resources were inadequate in almost all secondary schools visited while some schools even lacked them. The physical resources majorly observed were textbooks, furniture, classrooms, libraries laboratories, toilets/latrines, stationary as well as sports facilities and the responses indicated them greatly inadequate.

These results are in line with inspectorate report (1991) in Uganda which revealed that there was inadequate provision of resources in practical related subjects and maintenance of structures and buildings. In the report, it was found out that capitation grants provided by the government-aided schools ranged from 0% - 10%. Figures of maintenance and repairs for these teaching materials were either non-existent on the budget or were given low percentages.

With inadequacy of physical resources, quality teaching cannot be realized as well as the motivation of staff to be efficient in their classroom interactions. Farrant (1980) noted that teaching materials or instructional materials are a teaching procedure dealing with firsthand information and experiences regarding facts or materials

obtained for investigation or experimentation and therefore should be adopted and used in many areas of study as well as science. In fact, to the researcher it was observed that some classroom intercalations cannot take off or be implemented once the aids are not used. Few classrooms, latrines, libraries among others in school against large numbers of students resulted in congestion which can easily stir up dropout. Therefore, the inadequacy of physical resources was highly observed as a major obstacle to quality learning in public secondary schools of Tana River County.

Findings further revealed that although some schools had few physical resources, such resources were not in very good shape and that the maintenance of such resources was very minimal or not in existent.

Physical resources are a vital component for the success of the education sector and inadequacy or absence affects the achievement of the education goals. This is in consonance with Oni (1995) who on his study about education resources in an education system alleged that resources constitute a very important factor in the functioning of an education system as the success of the system or otherwise depends on the materials and manpower available.

In order to improve on the extent of internal efficiency of these schools and reduce wastage which manifests in terms of dropout, repetition and poor performance of students in public examination, a compromise between the needed and the available physical resources has to be reached.

B.   Research objective two

Research objective two was formulated in an attempt to find out the relationship between physical resources and dropout rate in public secondary schools in Tana River County.

Using the probability of the chi-square test statistics of the sampled schools, The study demonstrated that there was no significant relationship between physical resources and dropout rate (Pearson chi-square=0.024; P=0.876).The study also found out that the mean dropout rate between 2008 and 2011 stood at 16% which is deemed high although this was not significantly positively related to physical resources.

This results indicated that physical resources did not significantly influence dropout rate as the p-value was greater than the level of significance of 0.05 and therefore suggests that there are other factors that make up for physical resources which were not taken into consideration in this analysis. Examples of such factors are level of utilization and the standard of such resources among others.

These findings are in line with Fulk (2003) whose study on dropout in schools in United States of America revealed that students drop out of school due to a number of

varied factors an example being continuous poor performance in internal examination by students rather than the physical resources in schools. These results are however contrary to a study by Ndambuki (2012) in her study on factors influencing Girl dropout in Free Day Secondary Education Programme in Mbooni West District who observed that lack of facilities for the exclusive use by girls can fuel dropout from school. Such facilities include toilets. With just one latrine in a school, the experience is that this sole latrine tends to be locked and reserved for exclusive use of teachers. Where there are two latrines, one is locked for use by teachers and the other is used by both boys and girls. In such cases, girls especially during menstrual periods are often unwilling to use the latrines and make their often unhygienic arrangements or simply skip school. These findings are also contrary to Mutua (2002) who observed that one cause of girl dropout is lack adequate essential facilities such as latrines or total absence of such facilities. This shows that other factors other than physical resources in Tana River County contribute to the rising dropout rates recorded in the County in recent time.

Dropout has a serious consequence not only to the individual but also to the wider society. According to Levin (1972) in her study on high school dropout in United States of America, dropping out of school has several social consequences which include: foregone national income, increased demand for social services such as welfare, medical assistance, unemployment, increased crime, poorer level of health, reduced political participation and reduced intergenerational mobility. He estimated that the social cost of providing social services as fighting crime associated with dropping out was 6 billion dollars per year. Today the figures would be much higher.

One of the main sources of improving curriculum delivery in school lies in equipping such schools with adequate and necessary physical resources. The Central and County governments are quick to point at physical resources in schools in their total expenditure yet they remain inadequate as compared to other sectors of the economy. As a result curriculum delivery is compromised as this strain the few existing physical resources in secondary schools

C.   Research objective three

In research objective three, the researcher endeavored to find the relationship between physical resources and repetition rate in public secondary schools of Tana River County. The study found out that the mean repetition rate between 2008 and 2011 was 5.51%. This figure is quite high and therefore compromises internal efficiency in schools.

Using the probability of the Chi-square test statistics of the sampled schools, a positive significant relationship was found to exist between physical resources and repetition (Chi-square=5.59; p=0.019) in secondary schools within Tana River County. This suggests that as more physical resources are available and are adequately utilized the more the secondary schools' system becomes efficient. In fact a change in resource level by 100% is likely to increase the level of students' performance and retention by as much as 86% (Adedeji, 1997).

These findings therefore revealed that physical resources have a direct influence on repetition as learners tend to repeat grades partly due to poor performance that is directly brought about by poor quality of education offered being a product of limited or absence of essential physical resources in the schools. Some schools in Tana River County did not have essential facilities like laboratories and this affected the learning of science. This was noted to have an impact on the students who perform poorly in national examination and therefore opt to repeat especially in the final grade. This finding are in line with Mbugua et al (2012) who in their study on performance in mathematics in secondary school in Kenya found out that inadequate learning facilities in school led to poor performance in mathematics which in turn leads to grade repetition.

D.   Research objective four

In research objective four, the researcher sought to find the relationship between physical resources and completion rate in public secondary schools of Tana River County. In order to address this objective, the researcher did a cross tabulation between condition of physical resources and completion rate.

The probability of the chi-square test statistic (chi-square=8.04) was p=0.005, less than the alpha level of significance of 0.05. The null hypothesis that differences in average completion rates are independent of differences in average condition of physical resources was rejected. The research hypothesis that there is a relationship between completion rates and condition of physical resources was supported   by this analysis.

This study therefore indicated that physical resources had an influence on completion rate in the secondary schools of Tana River County. This is true as inadequate number of classrooms, congestion within those classrooms alongside essential facilities like toilets/latrines limit the number of students in school. Poor learning environment brought about by scarce resources within the schools in the County make students to drop out from school hence a few proceed and get a chance to complete the four year education cycle. Therefore lack of sufficient facilities within the

schools led to a low completion rate in those schools. This sentiments are in line with Rumberger (1987) who investigated causes of low completion in schools in United states of America found out that 50% of high school students who failed to complete school cited scarce resources as one of the reason that prompted them to leave school. Research has also indicated that continuous poor academic achievement which is dependent on presence and quality of resources in school is associated with low completion (Eskstrom et al, 1986). This is therefore enough evidence that physical resources which are either adequate or inadequate have an influence on completion of school by students in Tana River County and that concerted effort should be made in order to equip schools with necessary physical facilities.

E.   Research objective five

Research objective five was formulated in an attempt develop complimentary policies and interventions aimed at improving physical resources and curbing wastage in secondary schools in Tana River County. The results analyzed from questionnaires and interview schedules administered to the Principals and Education officers respectively revealed the following findings.

Majority of Principals suggested; increasing allocation of bursaries by the ministry, increasing allocation towards infrastructure fund and sending the funds from the government directly to schools. They further suggested the following ; Proper care and maintenance of available facilities, buying and replacing the lost and damaged facilities, upgrading school physical infrastructure, having more boarding schools, timely disbursement of free secondary fund and enhancing cooperation between the teachers and parents.

Based on these findings, the researchers noted that most Principals had problems acquiring certain facilities like textbooks alongside other facilities for their school due to inadequate or delay in disbursement of the government fund. This compromises the internal efficiency of the school system as a number of activities are brought to a standstill. These sentiments are in consonance with Hallak (1990) in his study entitled investing in the future: setting education priorities in developing world in Paris identified educational facilities as major factor contributing to achievement in the school system and should therefore be availed to schools on time. Indeed upgrading school physical infrastructure, proper care and maintenance of available facilities, buying and replacing the lost and damaged facilities, having more boarding schools, timely disbursement of free secondary education fund is a worthwhile course that should be pursued.

The interview schedule focused on policy recommendations from the Education officers. It revealed that absence of physical resources compromises the quality of education, as the learners are not exposed to the right environment. This consequently hinders their performance in national examinations. On ways related to physical resources that can be used to curb internal inefficiency in secondary schools, the Education officers suggested that allocation for school infrastructure fund should be increased to create room for the establishment and acquisition of essential physical resources alongside human resources within the schools.

The researcher also found out that there is urgent need for an inter-sectoral budget restructuring to release more resources for education. This will go a long way in meeting both students and teacher requirement for effective service delivery in improving the school system efficiency. These sentiments are affirmed under the Sessional paper Number 14 of 2010 where the government seeks to align the establishment of secondary schools with budgetary allocation for school infrastructure and teacher requirement. This policy further aims at creating more vacancies for students by establishing a minimum of three streams in each secondary school thereby increase access and in the long run reduce dropout, repetition and in turn increase the completion rates in secondary education sub-sector.

12.2 Conclusion

Based on the findings of the study, it can be concluded that equipping secondary schools with adequate physical resources is a worthwhile initiative as it enhances internal efficiency and access to education in secondary education sub-sector. The study established that the more the physical resources in schools, the more the students are able to go through their four year cycle with ease. This contributes to efficiency and equity in education. The first objective was to assess the adequacy of physical resources in development and enhancement of internal efficiency in public secondary schools of Tana River County. From the findings it was noted that most schools in Tana River County had inadequate physical resources and this contributed to internal inefficiency of secondary schools within the County. Large number of students against scarce physical resources stretched such resources too thin, in that there was a deficiency in such resources and utilities. For example findings on classrooms and libraries required indicated a general deficit with scores of 45% and 28% respectively of what is required in the sampled schools.

The second objective was to find out the relationship between physical resources and dropout rate in public secondary schools of Tana River County. The study established that there was no relationship between physical resources and internal

efficiency in the sampled schools. This indicated that that there are other factors related to physical resources that influence dropout rate that were not factored in this study. Such factor includes level of physical resource utilization and standard of such physical resources among others. The study however established that the dropout rate in secondary schools between 2008 and 2011 stood at 16.0%. This was deemed high and therefore a number of ways were suggested by the study to cut on this high dropout rate among them being involving all stakeholders fully in running the affair of the school, the crucial stakeholder being the parent.

The third objective was to find the relationship between physical resources and repetition rate. The findings revealed that the repetition rate for the 2008-2011 cohorts of students in Tana River County stood at 5.15%.From the findings it was also noted that there was a relationship between physical resources and repetition rate in secondary schools within Tana River County. Data collected revealed that most schools had scarce resources and that learners tended to repeat grades partly due to poor performance that is directly brought about by poor quality of education offered being a product of limited or absence of essential facilities in the schools. Some were found not in possession of essential facilities like laboratories that affects the learning of science. This has an impact on the students who perform poorly in national examination and therefore opt to repeat especially in the final grade.

The forth objective was aimed at finding the relationship between physical resources and Completion rate in secondary schools of Tana River County. The study revealed that there exists a positive significant relationship between physical resources and internal efficiency of secondary schools of Tana River County. Inadequate number of classrooms, congestion within such classrooms alongside scarce essential facilities like toilets/latrines limit the number of students in school and even create non-conducive environment that fuels non-completion. Poor learning environment brought about by scarce resources within the schools in the County made students to drop out from school hence a few proceed and get a chance to complete the four year education cycle. Therefore, lack of sufficient facilities within the schools led to a low completion rate in those schools.

The fifth objective was aimed at developing complimentary policies and interventions to improve physical resources and to curb wastage in secondary schools of Tana River County. Majority of Principals and Education officers suggested; increasing allocation of bursaries by the ministry, increasing allocation towards infrastructure fund and sending the funds from the government directly to schools. Majority of the teachers suggested the following ; Proper care and maintenance of available facilities, buying and replacing the lost and damaged facilities, upgrading

school physical infrastructure, having more boarding schools, timely disbursement of free secondary fund and enhancing cooperation between the teachers and parents.

Based on the findings, it can be concluded that the internal efficiency of public secondary schools in Tana River County was far below the expected output. The system as at the period of study was characterized by inadequacy of physical resources, high dropout, high repetition and low completion rates which make it less efficient or away from ideal situation.

The expectation of all stakeholders is that students are to be trained to be useful members of the society with minimal wastage and the situation where they dropout, repeat or fail out of the educational system without success constitute a huge wastage cost on all stakeholders.

12.3 Recommendations

Based on the analysis of the study, the researcher wishes to make the following recommendations:

The government should allocate enough funds and send such fund to schools directly and timely so as to enable such schools prioritize through their Boards of Management (B.O.M) and acquire most needed facilities in schools. The study established that lack of adequate funds compromised effort to acquiring essential physical resources like textbooks which negatively impacted on internal efficiency.

The researcher recommends that the government should develop a program of setting up more classrooms, laboratories, sporting facilities, latrines among others to ease congestion which is common in most secondary schools today. Due to scarcity of such resources in schools, some learners opt to leave school as a result of un-conducive environment for learning.

Principals should enroll students according to the physical resources available in schools to avoid overcrowding and straining the available physical resources. Overcrowding offers un-conducive environment for learning and therefore discourages learning among students and thus compromises the quality of learning.

Principals should involve the community around the school to aid in school development programmes and project. Such programmes can be aimed at identifying other possible causes of dropout, repetition and low completion rate so as to seal the loop hole that leads to these. The schools should also initiate income generating projects to subsidize government infrastructure funding.

The government should organize more capacity building programmes for both Principals and Teachers to equip them with adequate skills and abilities to handle emerging issues that compromise internal efficiency within the school system.

The directorate of quality assurance and standards within the ministry of education should be more empowered with resources to enable them carry out their roles. It is expected that their regular visits to schools would be beneficial to schools as through their guidance schools would be able to maintain the expected standards regarding school physical resources and internal efficiency for effective learning to take place.

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