

# Implementing Free and Compulsory Education Policy; Assessing the Role Of School Infrastructure In Public Day Secocndary Schools In Kitui County-Kenya

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## Abstract

Despite the government's efforts in implementing free and compulsory education policy, transition from primary school and completion rates at Kenya Certificate of Secondary Education (KCSE) rates are still below 100 percent, contrary to government efforts to boost them. This study therefore sought to assess the role of school infrastructure in implementing the 100 percent transition policy and completion rates in public day secondary schools in Kitui County-Kenya. The objectives of the study were to; establish the influence of inadequate learning rooms on implementation of free and compulsory education, determine the role of inadequate co- curricula education facilities on implementation of free and compulsory education and; assess the effect of inadequate sanitation facilities on transition and completion rates in public day secondary schools in Kitui County. This article is an extract of a research conducted in public day secondary schools in Kitui county of Kenya. The study was anchored on Liberal Educational Theory (LET),that proposes that each country's citizen should be accorded freedom and opportunity to access and acquire education without any form of discrimination. The study used descriptive survey research design and collected data from a sample of 164 public day secondary school principals, 17 Parents' Association (PA) chairpersons and the Kitui County Director of Education (CDE). Data were collected using questionnaire for principals, interview schedules for CDE and PA chairpersons and document review analysis. Qualitative data were analyzed on basis of emerging themes in line with the objectives of the study. Descriptive statistics were used in analysis of quantitative data by use of frequencies and percentages. Study null hypothesis was

tested by use of product moment correlation coefficient at the .05 level of significance. The hypothesis test result found out that there was a negative and significant relationship between inadequacy of infrastructure and transition and completion rates ( $r = -.795$ ;  $p \leq .01$ ). The findings from the study revealed that inadequacy of learning rooms such as classrooms, library and laboratories reduces number of learners a school can admit, hence compromising implementation of free and compulsory education policy. Further, it was established that inadequacy of sanitation facilities; latrines/toilets contributed to learners dropping out of school resulting in low level of completion rate. Similarly, the shortage of co-curricula facilities like play fields and games equipment led to some learners dropping out of school, especially when they were interested in games activities. In view of the fore stated findings, the study concludes that lack of or inadequate school infrastructure has the potential of lowering both transition and completion rates hence impeding implementation of free and compulsory education policy. The study recommend that the government should fund schools on need basis but not on enrolment basis to ensure uniform development of infrastructure in all schools. Further, principals of public day secondary schools could utilize other buildings in schools like dining halls, recreation halls, theatre halls and worship halls to mitigate infrastructural challenges of classrooms inadequacy.

*Key words; school infrastructure; determinants; free and compulsory education; public day secondary schools*

### **Study background**

Free and compulsory education is a form of schooling which is financed by public funds and is required of every school age child (Balestrino , Grazzimi & Luporini, 2013) . By imposing free and compulsory education, states ensure that all school going age children get education, for even children from poor families get opportunity to attend school (Heyman, 2014). Balestrino et al (2013) assert that secondary education is a critical level in the education system, for it links early childhood and primary education to higher education, besides connecting school system to the labour market. Education enhances development, builds up respect for human rights and freedoms, and enables people to participate optimally in a free society.

The Universal Declaration of Human Rights (UDHR) includes the right to education (United Nations, 1948). Article 26 (1) of the declaration stipulates that everyone has the right to free and

compulsory education, at least in the elementary and fundamental stages. The Convention on the Rights of the Child (CRC), adopted in 1989 in section 28 (a) and (b) requires every country to enact legislations that reduce social and financial barriers to primary and secondary schooling (CRC, 1989). Despite the adoption of the CRC and ratification of Education for All (EFA) 1990, Millennium Development Goals (MDGs) 2000 and Sustainable Development Goals (SDGs) 2015, by a great many countries, some of the countries have continued to levy tuition fee. The levying of tuition fee poses a great challenge to accessing secondary schooling (Heyman, 2014). This therefore means that governments need to enact legislations and policies that ensure that basic education is free, compulsory and implementable, characterized by optimal transition and completion rates.

All education institutions in Cuba are public and the education sector receives one of the highest annual budget allocations to public education in the world, currently estimated at 13 percent of Cuba's annual budget (Lopez, 2017). The Cuba's public education is entirely free, for government subsidizes cost of the public education at the tune of 100 percent. A 2014 World Bank report states that Cuba has the best education system and universal literacy in Latin America and the Caribbean regions (Lopez, 2017). The education is compulsory for all children aged 6-16 years and who attend primary school for 6 years and basic secondary or high school for 3-4 years. Completion rate at primary schools is 99.3 percent and all graduates at this level transit to basic secondary education and then higher secondary level (pre university education) or technical/vocational institutes. Those who qualify join university education and technological polytechnics respectively. This enables Cuba meet the goal of education for all (EFA).

Compulsory education in Finland was imposed in 1921 and covers pre-primary education which lasts one year and basic education (grades 1-9) covering primary and lower secondary education (Christa & Toledo, 2020). The pre-primary, basic and higher level education is offered free by government and besides, pupils get free daily meal, free health care service, free welfare service and free school transport. After lower secondary, there is non-compulsory 3 years upper secondary (grades 10-12) program that prepares students for university matriculation test or a 3 years vocational education that trains students for various careers. The free and compulsory education for pre-primary, primary and lower secondary makes Finland have one of the best

completion rates in the world, currently estimated at 99 percent. Transition from one level to the next and from education to job market is high, courtesy of high quality training at university and vocational training institutions. To help boost transition from lower secondary to upper secondary, Finland government needs to make upper secondary education compulsory.

The enactment of the Right to Free and Compulsory Education (RTE) Act, in 2009 in India led to Gross Enrolment Rate (GER) reaching 101.56 percent in the elementary education in 2014 (Mukherjee & Singh, 2015). Having enacted the RTE, the Indian government turned its attention towards achieving universal secondary education (USE). To ensure improved equitable access to and quality of secondary education, the government of India launched a centrally sponsored scheme for secondary education. This resulted in significant increase in enrolment at secondary schools from 27.6 million in 2001 to 59.6 million in 2014 (Mukherjee & Singh, 2015).

Primary level education in the Dominican Republic and which is designated for 6-11 years age children is free and compulsory, and runs for six years. Although education is free at the secondary level, it is not compulsory (World Bank, 2018). The secondary school level comprising of two years of lower secondary and four years of upper secondary is for children aged 12-13 years and 14-17 years respectively. The lower secondary level is for general education while the upper secondary level is for either vocational and technical education or arts education.

Despite the mandatory nature of primary education, there is little enforcement of attendance leading to low rates of completion at the primary level. This leads to low level of transition to the secondary schools. The non-compulsory nature of secondary education poses a significant impediment to completion of secondary schooling. The current rates of transition and completion are 93% and 62% respectively. This means that the Dominican Republic is yet to achieve universal primary and secondary education. This calls for Dominican Republic to enforce attendance at primary school level and make secondary education level mandatory and enforceable (World bank, 2018).

In Haiti, the government provides very little funds to support public education due to its low economic status (Adelman & Holland, 2015). In 2011, the Haiti government launched universal free and compulsory program for primary schools, but not in secondary schools. The funding to the primary schools is poor and there is acute shortage of teachers in the primary schools. As a result, over 80 percent of primary school learners in Haiti enroll in private primary schools. The private schools collect tuition fees to pay teachers, a situation that makes poor families not to send children to school. As such, the net enrolment rate (NER) in primary schools is 50 percent. For there is no free and compulsory secondary education in Haiti, secondary school enrolment is 20 percent of the eligible age children. This means that Haiti government needs to enact a policy on implementation of free and compulsory secondary education.

A report by European Commission (2018) on education and culture in Kosovo indicates that primary and lower secondary education (grades 1-9) is compulsory, but upper secondary (grades 10-13) is not. This is owed to poverty occasioned by persistent fighting with Yugoslavia for many years till 2017 when Kosovo gained recognition as a sovereign state. Additionally, upper secondary education is only necessary for learners aspiring to join an academic university. Besides, Kosovo has a discriminative culture, for if families are to make a decision, they prefer educating boys to girls. The non-funding of upper secondary education and the discriminative culture against girls make transition and completion rates in upper secondary remain below 100 percent. Hence, Kosovo government needs to enact a policy on funding upper secondary education and educating the girl child.

The African Charter on Human and People's Rights (ACHPR, 1986) re-affirms adherence of African countries to the principle of human and people's rights and freedoms. The rights and freedoms are contained in the declarations, conventions and other legal instruments adopted by the African Union (AU). Article 17 (1) of the charter states that; every individual shall have the right to education. The African Charter on the Rights and Welfare of the Child (ACRWC), article 11 (3) articulates provisions on the right to free and compulsory basic education for the child (ACRWC, 1990). In line with ACRWC, Uganda introduced universal primary education (UPE) in January 1997 and which led to doubling of enrolment in primary schools in a period of 2 years. The demand for secondary education by children who were successfully completing

primary schooling under UPE in Uganda led to embarking on Universal Secondary Education (USE) in 2007. Titeca and Lisa (2015), on a study of the impact of USE on enrolment in Uganda found out that USE had had a continuous positive impact on enrolment. The USE positive impact had been facilitated by the policy on automatic promotion to the next class regardless of performance in formative examinations in previous class.

Government of Ghana introduced free education in 1995 by committing to providing Free Compulsory Universal Basic Education (FCUBE) by 2005 (Melara, Ayele & Blaustein, 2014). The Ghana FCUBE covers eleven years (2 years of kindergarten, 6 years of primary schooling and 3 years of junior high school). The objective is to eliminate tuition fees, thereby increasing enrolment. Due to irregular disbursements of funds by government, parents pay mandatory extra fees in the name of Parents Teachers Association (PTA) dues to cater for school repairs, cultural activities, sports and infrastructure installation. For many low income families are unable to afford, they do not send their children to school. This resulted in 40 percent of children aged 6-11 years pushed out of school (Melara et al, 2014).

A UNESCO report, (2017) shows that primary education in South Sudan is free and compulsory, but secondary education is not, for the education at this level is not a priority as pertains to government spending. This is due to difficult economic conditions in South Sudan. Due to decades of war with former parent country – Sudan and neighboring countries, South Sudan is required to spend highly on security with consequent neglect of education (UNESCO, 2017). This has led to inadequate resources and infrastructure in secondary schools, hence low transition, retention and completion rates. This means that free and compulsory education policy at secondary school level in South Sudan needs to be enacted and implemented.

Somaliland declared free primary public education in 2011, but the government does not finance the schools effectively due to low economic status, according to UNICEF report (2017). The poor funding of schools leads to inadequacy of physical infrastructure, teaching and learning materials and poor running of schools. Learners are also required to incur extra costs in purchase of stationery. This results in high dropout rates and which makes Somaliland have one of the lowest primary school gross enrolment rates (GER) in the world at 44.3 percent. Somaliland

secondary education, and whose span is 4 years, is neither free nor compulsory. Resultantly there are very low transition and completion rates in secondary schools in Somaliland. This again makes Somaliland have one of the poorest secondary school Gross Enrollment Rates (GERs) in the world, standing at 21.3 percent in 2015 globally. To help improve on enrolment and completion, Somaliland needs to enact a policy on free and compulsory education implementation in both primary and secondary schools.

In the State of Eritrea, education is officially compulsory for children aged 7-16 years, but infrastructure is inadequate, making it difficult to accommodate all eligible children (Mengesha & Tessema, 2019). Due to low economic status, the education is only free at basic level. The low economic status is attributable to 30 years war and struggle for independence, gained in 1993 from its mother country – Ethiopia. Environmental threats also contribute to the low economic status. Due to non-funding of the education at secondary level by government and inadequacy of infrastructure, only about 57 percent and 21 percent of children attend primary and secondary schooling respectively (Mengesha & Tessema, 2019). This is indicative of huge wastage along educational system from primary to secondary despite the fact that the Eritrean government has sustained effort to build schools and supply trained teachers. Because of teacher inadequacy, learners-teacher ratios are high at 45:1 and 54:1 at the elementary and secondary levels respectively. On average, the elementary level and secondary level classrooms accommodate 63 learners and 97 learners respectively. The inadequacy of infrastructure and teachers leads to high dropout rate, hence poor transition to secondary and completion at the secondary school level.

Kenya is a signatory to the aforementioned global and regional declarations, besides EFA (1990), MDGs (2000), Universal Primary Education (UPE) 2000 and SDGs (2015) commitments. This led Kenya to reintroduce Free Primary Education (FPE) in 2003 after failure of initial attempts (Republic of Kenya, 2003) and Free Secondary Education (FSE) in 2008 (Republic of Kenya, 2008). To ensure equal opportunities for all primary school leavers, the government introduced the aspect of compulsion in 2010 and hence free and compulsory basic education in Kenya (Constitution of Kenya, 2010). Chapter 4 of the constitution of Kenya - the bill of rights, article 53 (b) provides for free and compulsory basic education for the child.

In 2017, the Kenyan government committed to pay Ksh 22,244 per year per each day student, hence making the day public secondary education totally free and compulsory. This aims at achieving SDG 4 aspect of universalizing secondary education. School head teachers, parents and county administration are required to enforce school attendance with a view to boosting implementation of the free and compulsory secondary education policy (Basic Education Act, 2013). Part IV of the Act, section 28 (1) makes provision for implementation of the right of every child to free and compulsory basic education, while sections 30 and 40 make parents/guardians and head teachers duty bound to ensure children attend school.

Educational infrastructure is a collection of all facilities inclusive of buildings and furniture required for effective implementation of set curriculum (Cuesta, Glewwe & Krause, 2015). Cuesta et al (2015), on a study of school infrastructure and educational outcomes in Latin America found out that learning rooms with roofs, walls and floors in good condition improved students learning and enrolment. Another study by Melara, Ayele and Blaustein (2014) on educational infrastructure challenges in Ayawaso, Ghana, found out that enough and quality infrastructure generally yielded improvement in learners' enrolment, completion rates and learning outcomes, besides reducing teacher absenteeism. Dilapidated infrastructure and inadequacy of classrooms resulted in over 90 and 60 percent of children eligible for secondary and primary education respectively being out of school in North Eastern Kenya (Denis, 2018). This implies that inadequacy and poor state of school infrastructure negatively affect enrolment.

### **Study objectives**

The general objective of the study was to establish the relationship between inadequacy of school infrastructure and implementation of free and compulsory education in public day secondary schools in Kitui County, Kenya.

The study specific objectives were to;

- i. Establish the influence of inadequacy of learning rooms on implementation of free and compulsory education in Kitui County.

- ii. Determine the role of inadequacy of co curricula education facilities on implementation of free and compulsory education in Kitui County.
- iii. Assess the effect of inadequacy of sanitation facilities on completion rates in Kitui County

### **Study null hypothesis**

H<sub>0</sub>: There is no statistically significant relationship between inadequacy of school infrastructure and implementation of free and compulsory education in public day secondary schools in Kitui County.

### **Problem statement**

The free and compulsory education policy in Kenya, was enacted to ensure increase of access to both primary and secondary education by providing more resources with a view to providing 12 years of basic education (Constitution of Kenya, 2010). Out of 34848 learners who did their Kenya Certificate of Primary Education (KCPE) in 2015 in Kitui County, only 23066 enrolled in form 1 in 2016 representing a transition rate of 66 percent. Similarly, 35215 candidates did their KCPE in 2016, but only 24132 of them transitioned to form one in the following year, thus representing a transition rate of 68.5 percent. Additionally, 36940 candidates did their KCPE in 2017, but only 29572 enrolled to join form one in 2018, representing a transition rate of 80 percent. Further, 37087 learners were enrolled to do KCPE in 2018, but in 2019 those who joined form one from the same cohort were 31499, representing a transition rate of 85 percent. Finally, only 34212 students joined form one in 2020 from a total of 38081 learners who sat for their KCPE in 2019, representing a transition rate of 89.9 percent.

16678 students registered to sit for KCSE in form four in 2016 from a cohort of 21909 students who had enrolled in form one in 2013 in Kitui County, thus representing a completion rate of 76.1 percent. In 2017, 18071 students completed their KCSE cycle compared to 22607 in the same cohort who had enrolled in form one in 2014, thus giving a completion rate of 79.9 percent. In 2018 however, the completion rate was 72.8 percent obtained by comparing the students who sat for KCSE in 2018 and those of the same cohort who had enrolled in form one in 2015. Similarly, in 2019, 19716 students completed out of the possible cohort of 23066 students who

had enrolled in form one in 2016, representing a completion rate of 85.5 percent. Finally, the transition rate for the 2017 cohort who completed studies in 2020 was 89.1 percent (Kitui County Education office, 2020).

The Kitui County government runs a pro-poor program to award bursaries to learners from poor families, while the National Government Affirmative Action Fund (NGAAF) provides water tanks to schools and sanitary towels to girls. Similarly, the Kitui County National Government – Constituency Development Funds (NG-CDFs) fund construction of classrooms and other physical infrastructure in schools and award bursaries to needy learners (Kitui County Government, 2013). This effort aims at ensuring continuous attendance of school by learners and improvement of transition, retention and completion rates. Despite the concerted effort by both the national and Kitui County governments, transition and completion rates in secondary schools in Kitui County remain below 100 percent.

## **LITERATURE REVIEW**

### **Inadequacy of school infrastructure and implementation of free and compulsory education**

Cohen and Bhatt (2017) define school infrastructure as elements of education that improve instruction and learning. Such elements include classrooms, libraries, laboratories, dormitories, dining halls, sanitation facilities, furniture, laboratory equipment, textbooks, teaching aids and installed Information Communication Technology (ICT) gadgets. A study by Cuesta, Glewwe and Krause (2015) on school infrastructure and educational outcomes in Latin America, found that school infrastructure characteristics had impact on students' learning and enrolment. For example, learning rooms with roofs, walls and floors in good condition improved students' learning. Cuesta et al (2015) further noted that enough learning rooms and creation of new schools made more learners access education, hence improved enrolment. This means that school study rooms should be adequate and habitable by having suitable natural light, ventilation, optimum temperature and spaciousness. Facilities for use by learners should be suitable for habitation and learning, which motivates learners to attend school without truancy and or dropping out.

Buildings, classrooms, laboratories and equipment are crucial educational infrastructure elements for effective teaching and learning environment in schools (Teixeira, Amoroso and Gresham,

2017). They say that high quality infrastructure has benefits of facilitating better instruction, improving students' outcomes and reducing dropout rates. A UK study indicated that a combination of environmental and design components of school infrastructure led to a 16 percent drop in primary school learners' progress in academics (Teixeira et al, 2017). This was attributable to poor lighting, air quality and squeezed learning rooms. The study also found out that low quality and shortage of infrastructure was more in rural schools. Further, the study found out that 72 percentage and 40 percent of the rural and urban schools were lacking laboratories and toilets respectively. Additionally, findings of the study showed that inadequacy of infrastructure and poor learning environment negatively affected learners' performance and which led to high grades repetition and dropout rates.

Wodon (2016) avers that adequate and suitable infrastructure has positive impact on students' learning. Wodon (2016) did a study on the state of school infrastructure for primary and secondary schools in Paraguay. The study found out that the schools faced deficit of physical infrastructure occasioned by budget restriction in Paraguay. The inadequacy was more noticeable in rural and poorer areas. The study also found out that inadequacy of particularly classrooms led to crowded classes and which negatively affected learning, leading to shoddy performance in the learners' examinations. The overcrowding in classrooms led to dissatisfied learners hence their dropping out, which retarded retention and completion rates.

Melara, Ayele and Blaustein (2014) note that quality infrastructure generally yields improvements in learners' enrolment, completion rates and learning outcomes, besides reducing teacher absenteeism. Melara et al (2014) further argue that enrolment and retention of girls in schools increases with access to clean water, safe, separate and private latrines for the girls. On the same note, schools that have insufficient desks, textbooks, science laboratories and audio-visual aids clearly threaten students' future success by undermining teachers' effectiveness. Melara et al (2014) did a study on education infrastructure challenges on enrolment in East and North Ayawaso Metros, Ghana. The study found out that 10 out of 23 schools in the study area were overenrolled, and with one school enrolling 359 students instead of the official capacity of 160. This greatly jeopardized learning and teaching due to tight classroom space, hence no individual attention to more needy students. This means that students who remain unattended to

for quite long may eventually drop out of school due to demotivation leading to reduction in completion rates.

According to Akhihiero (2011), school infrastructure are material things that facilitate learning and teaching in schools. Such infrastructure includes school buildings; equipment inclusive of teaching aids, books, typewriters, computers, science and laboratory equipment and games equipment. The buildings shelter learners and teachers while the equipment are required to generate manipulative skills and physical aspects of learners (Akhihiero, 2011). Inadequacy of infrastructure in Edo state – Nigeria coupled with dilapidation of the infrastructure, due to neglect leads to overcrowding in classrooms and taking lessons under trees by some learners. This results in low morale among learners and teachers hence poor education outcomes (Akhihiero, 2011).

Infrastructure is part of ecology of students' achievement. Hence, the school's infrastructure quality influences students' attendance, attitude toward school, time on task and school's climate. This then positively or negatively has impact on students' performance in academics (Amsterdam, 2010). Besides, infrastructure related variables such as furniture, ventilation and class size have influence on teaching and learning. Amsterdam (2010) notes that unsuitable and comfortless furniture in South African schools causes back pain, poor concentration and writing difficulties hence reducing learners' opportunities. The discomfort caused by unsuitable infrastructure leads to dropping out of some learners.

In Kenya, Parnwell (2015) carried out a study on influence of school infrastructure on academic performance in public primary schools in Ruiru location, Meru County. The study used descriptive survey research design and a study sample of 201 comprising of 7 head teachers, 14 teachers and 180 pupils. The study found out that insufficiency of physical infrastructure, notably classrooms and which were small sized, not plastered, not cemented, not floored and poorly ventilated negatively affected academic performance of pupils. The continued poor performance in academics would ultimately lead to dropping out of school of some learners, hence lowered completion rates.

Katiwa (2016) studied factors influencing pupils' transition rates from primary to secondary schools in Kitui Central sub-county, Kitui County. The study used survey research design and a sample of 198 respondents; 33 principals, 24 head teachers, 140 teachers and 1 Sub County Director of Education (SCDE). The study established that transition from primary to secondary schools is highly determined by availability of secondary school spaces. The study found out that there was low transition rates from primary schools to public day secondary schools within the same neighborhood occasioned by inadequacy of classrooms in the secondary schools.

A study on influence of school infrastructure on students' performance in curricular and co-curricular programs in public secondary schools in Kajiado County was done by Mokaya (2013). The Study employed descriptive research design and a sample size of 360 respondents comprising of 53 teachers, 165 form 3 learners and 142 form 4 learners. The study found out that sufficient and suitable infrastructure led to effective execution of both curricular and co-curricular programs by learners and teachers. This ensured students' retention and reduced teachers and support staff turnover, hence an uninterrupted carrying out of school teaching and learning programs (Mokaya, 2013). The learners' retention led to optimal completion rates.

While presiding over Chuka Igambang'ombe constituency education day at Chuka Girls' High School, the education Cabinet Secretary (CS) said that the Kenyan government would allocate about Ksh 6 Billion in 2017/2018 financial year to help improve the country's infrastructural facilities (Majau, 2018). Such facilities would include classrooms, dormitories, laboratories and sanitation facilities. The CS noted that sub county secondary schools would be given priority in the allocation due to notable overstretched facilities in most of them (Majau, 2018).

An address to parliamentary committee on education by the education cabinet secretary (CS) disclosed that there was good progress towards achieving the 100 percent transition rate (Daily Nation, 2020). The CS cautioned that acute shortage of infrastructure was a big impediment to the progress. The CS was emphatic that there was need for massive expansion of classrooms, dormitories, laboratories, libraries and toilets in schools countrywide, if the 100 percent transition policy to secondary schools from primary schools was to be realized. Adequacy of fundamental amenities and resources in secondary schools is key in ensuring transition of all

KCPE candidates to the secondary schools and their stay in the schools until completion. This is premised on the assumption that sufficiency of infrastructure and conducive environment make learners find joy in their studies and learning. Having all eligible children in schools ensures that they do not engage in petty crimes, idle at the villages and or get recruited by terror gangs. This would make the learners stay in school for the entire period of study and which boosts retention and completion rates. This study used descriptive survey research design and a sample of 182 respondents comprising of 164 principals, 17 PA chairpersons and 1 CDE to determine the relationship between inadequacy of school infrastructure and implementation of free and compulsory education in public day secondary schools in Kitui County.

### **Study theory**

This study was grounded on the Liberal Educational Theory (LET) as proposed by Howe (1992). The Liberal Educational Theory proposes that each country's citizen needs to be accorded freedom and opportunity to acquire education without any form of discrimination. LET emphasizes a commitment to liberal principles such as non-discrimination, non-repression and tolerance. School learners have responsibility of utilizing the opportunities by attending and completing schooling and that their parents have duty of providing school requirements and ensuring that the children attend schools.

### **Methodology**

The study used descriptive survey research design, adopting a mixed methods approach for both quantitative and qualitative data were to be collected. The target population was 655 respondents consisting of all principals in 327 public day secondary schools in Kitui County, all Parents' Association (PA) chairpersons of these schools and Kitui County Director of education (CDE). Kitui County has 327 public day secondary schools distributed in 17 Sub Counties. The schools were categorized according to sub counties they belong to and proportionate stratified sampling technique employed to give an equal representation of schools from each sub county. Gall, Gall and Borg (2007) assert that 20-50% sample size for a descriptive survey design is appropriate.

Systematic random sampling was used to get 50 percent of the schools from each sub county, hence 164 schools. The list of public day secondary schools from Kitui County education office was used and applied a sampling interval of 2, hence 1<sup>st</sup>, 3<sup>rd</sup>, 5<sup>th</sup> -----to get 50 percent of schools in each sub county. All principals of the selected schools were purposively sampled and included in the study, since they oversee implementation of the free and compulsory education at the school level. Purposive sampling is identification of subjects that satisfy certain criteria (Kothari, 2004).

One school PA chairperson was selected from each sub county, using simple random technique. The technique was executed by writing the name of each school in a given sub county on a piece of paper, then rolling the papers and putting them in a tumbler. A single paper picked from the tumbler would indicate school from which to interview PA chairperson in that sub county. Hence, 17 PA chairpersons were selected for interviewing. Interviewing 17 PA chairpersons enabled reaching data saturation and representativeness of each sub county (Guest, Bunce & Johnson, 2006). Six to twelve interviews enable reaching data saturation in both health and social sciences (Guest et al, 2006). The Kitui CDE was purposively selected for he/she oversees implementation of free and compulsory education policy in the County. The total sample was hence 164 principals, 17 PA chairpersons and 1 CDE, giving a total of 182 respondents.

The study used interview schedules, document review analysis and questionnaire for data collection. The researcher established content validity of the research instruments through expert judgment. Test re-test technique was carried out to determine reliability of the research instruments. This was done by administering the questionnaire to 16 principals and the interview schedule to 2 PA chairpersons and who were not involved during the actual data collection. Qualitative data from the research instruments was transcribed and reported in narratives, according to themes in the study objective while quantitative data were analyzed using descriptive and inferential statistics.

## **STUDY RESULTS**

Instrument return/response rate was 88.4% for principals' questionnaire, 82.4 % response rate for parents' association chairpersons' interview schedule and 100 % response rate for Kitui CDE interview schedule.

### **Treatment of Likert Type Data in the principals' questionnaire**

The interpretation of research findings by use of Likert Scale determines the accuracy of results. In order to measure the variables as used in this study, a Likert type of scale was developed using a scale of 1-5 where by a numerical value of 1=SD – Strongly Disagree; 2=D – Disagree; 3=N – Neutral; 4=A – Agree; and 5= SA – Strongly Agree was employed as recommended by Bishop & Herron (2015). Likert type of scales are sufficient to measure a desired construct where mathematical modelling is involved in data analysis, thus necessitating the need for coalescing indicators of various variables. Carifio and Rocco (2007) aver that during analysis of Likert scale data, one should adopt the schema where; strongly Disagree (SD) =  $1 < SD < 1.8$ ; Disagree (D) =  $1.8 < D < 2.6$ ; Neutral (N) =  $2.6 < N < 3.4$ ; Agree (A) =  $3.4 < A < 4.2$ ; and Strongly Agree (SA) =  $4.2 < SA < 5.0$  hence maintaining an equidistance of 0.8 units in the scale. This weighting criterion of responses of Likert-type data as advocated by Carifio and Rocco (2007) was used as an interpretation schema during data analysis in this study.

### **Inadequacy of infrastructure and implementation of free and compulsory education**

The study sought to establish the relationship between inadequacy of infrastructure and implementation of free and compulsory education in public day secondary schools in Kitui County. In this respect, the study sought to find out the effect of inadequate infrastructure (learning rooms, libraries, laboratories, chairs and lockers, sanitation facilities, play fields and games equipment) on transition and completion rates, and which were construed as the indicators of implementation of free and compulsory education. Data regarding the aforementioned aspects were collected based on a five point Likert scale whose response categories and values were given as; 5 = Strongly Agree (SA), 4= Agree (A), 3= Undecided (U), 2= Disagree (D) and 1= Strongly Disagree (SD). Analysis of this aspect is as shown in Tables 1, 2 and 3 and explained in subsequent sections.

### **Analysis of responses from principals pertaining inadequacy of school infrastructure**

Data from principals were collected using questionnaires that were designed to get views pertaining different aspects of inadequacy of infrastructure and its impact on transition and completion rates of learners. Results are shown in Table 1.

**Table 1: Inadequacy of school infrastructure and implementation of free and compulsory education as reported by principals**

	SA	A	U	D	SD	Mean	Std. Deviation
Inadequacy of learning rooms notably classrooms, library and laboratories reduces number of learners a school can admit hence below 100% transition rate from primary to secondary schools	47.6	40.7	1.4	6.2	4.1	4.21	1.04
Inadequacy of learning facilities; lockers and chairs limit number of learners a school can admit hence low transition and completion rates.	31.7	46.9	2.1	13.8	5.5	3.86	1.17
Inadequacy of sanitation facilities; latrines/toilets may make some learners dropout resulting in low level completion rate	10.3	29.0	7.6	37.9	15.2	2.81	1.29
Lack of /shortage of play fields and games equipment may make some learners dropout for their interest may be in talents/games	9.0	42.1	6.9	25.5	16.6	3.01	1.31
Valid N (list wise)	145						

From Table 1, it can be observed that 88.3 percent of the principals agreed while 10.3 percent disagreed to the statement that inadequacy of learning rooms reduces the number of learners a school can admit, thus leading to below 100% transition rate from primary to secondary schools. On average, majority of the principals (Mean = 4.21; s d = 1.04) were of the view that lack of learning rooms affected transition rates negatively, thus affecting the implementation of free and compulsory education. Majority (78.6 percent) of the principals agreed that inadequacy of learning facilities such as lockers and chairs limit the number of learners a school can admit thus leading to low transition and completion rates. Only 19.3 percent of the principals

disagreed with the statement while 2.1 percent of them were undecided. On average majority of the principals were in agreement that learning facilities affect the implementation of free and compulsory education (Mean = 3.86; s d = 1.17). This implies that inadequacy of learning facilities can lead to low transition and completion rates, thus negatively affecting implementation of free and compulsory education in secondary schools.

Regarding sanitation facilities, majority (53.1 percent) of the principals disagreed that inadequacy of sanitation facilities such as latrines/toilets may make some learners dropout resulting in low level completion rate, while 39.3 percent agreed with the statement. The Mean and standard deviation rating for this aspect was 2.81 and 1.29 respectively, implying that the principals had a divided view whether inadequacy of sanitation facilities led to dropout rates among students. Similarly, 51.1 percent of the principals agreed that lack of /shortage of play fields and games equipment may make some learners dropout of school given that their interest may be in talents/games while 42.1 percent of them disagreed to the statement and 6.8 percent of the principals were undecided. Overall there was majority number of principals who agreed regarding the aspect of shortage of play fields and games facilities being a contributor of students dropping out of school (Mean = 3.01, s d =1.31)

### **Analysis of responses by chairpersons of Parents Associations pertaining to inadequacy of school infrastructure**

Data from the chairpersons of the Parents Associations were collected using the interview schedule that was designed to solicit views regarding the various aspects that were under consideration in this research study. Further, the study sought to establish from the chairpersons of Parents Associations the status of various aspects regarding completion and transition rates of learners in schools. Some of these aspects yielded both quantitative and qualitative responses and are discussed herein. Analysis of the descriptive responses from the interview schedule is as shown in Table 2.

**Table 2: Descriptive analysis of the nominal item in PA interview schedule on inadequacy of infrastructure**

Variable	Values	Frequency	Percent
Does following factor lower or increase transition and completion rates in your school ? Inadequacy of school infrastructure.	Lowes	14	100
	<b>Total</b>	<b>14</b>	<b>100</b>

Results in Table 2 show that all the PA chairpersons agreed that inadequacy of school infrastructure lowers transition and completion rates among students in day public secondary schools.

**Analysis of responses from Kitui County Director of Education pertaining inadequacy of school infrastructure**

Analysis of responses in the CDE interview schedule indicated that inadequacy of infrastructure such as classrooms, libraries, laboratories, student lockers, chairs, tables, playfields and games facilities affected transition and completion rates negatively. This is because they contributed to some students dropping out of school, for the students were dis comfortable and dissatisfied.

**The study null hypothesis (H0) testing**

The null hypothesis for this study stated thus; there is no statistically significant relationship between inadequacy of school infrastructure and implementation of free and compulsory education in public day secondary schools in Kitui County. The null hypothesis test result is as indicated in Table 3.

**Table 3: Correlation coefficient between inadequacy of infrastructure and implementation of free and compulsory education**

	Levies	Infrastructure	Teachers	Entry behavior	Implementation
Infrastructure Pearson Correlation	.580**	1	.536**	.297**	.795**
Sig. (2-tailed)	.000		.000	.000	.000
N	145	145	145	145	145

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

It can be observed from Table 3 that the correlation coefficient between inadequacy of infrastructure and implementation of free and compulsory education was negative ( $r = -.795$ ;  $p \leq .01$ ). This means that inadequacy of school infrastructure has an inverse relationship with the levels of transition and completion rates. The implication of this finding is that when the provision of infrastructure in schools is highly inadequate, the implementation of free and compulsory education is negatively determined.

Therefore, high levels of inadequacy in terms of infrastructural development in schools contributes to low levels of transition and completion rates in schools. The coefficient of determination ( $r^2 = .632$ ) implies that inadequacy of infrastructure can explain 63.2 percent of the variance in the implementation of free and compulsory secondary education in public day secondary schools in Kitui County. Consequently, the null hypothesis that stated that there is no statistically significant relationship between inadequacy of school infrastructure and implementation of free and compulsory education in public day secondary schools in Kitui County was rejected.

## **DISCUSSION OF STUDY RESULTS**

### **Inadequacy of infrastructure and implementation of free and compulsory education**

The findings of this study established that inadequacy of infrastructure affected implementation of free and compulsory secondary education in the study area. Firstly, it was established from the principals' questionnaires that inadequacy of learning rooms such as classrooms, library and laboratories reduces number of learners a school can admit, thus leading to low transition rates. Similarly, the study established that inadequacy of learning facilities like lockers and chairs limit number of learners a school can admit, hence leading to low transition and completion rates. Further, it was established that inadequacy of sanitation facilities; latrines/toilets contributed by making some learners drop out of school resulting in low level of completion rate. Finally, the shortage/lack of play fields and games equipment led to some learners dropping out of school, especially when they are interested in games activities. These aspects of inadequacy of school infrastructure and their negative impact on transition and completion rates are shown in Table 1.

The aforementioned view was corroborated by the County Director of Education who averred that lack of infrastructure such as classrooms, libraries, laboratories, student lockers, chairs, tables, play fields and games facilities affected transition and completion rates negatively as they contributed to students dropping out of school as narrated under the section of study results. These findings from principal's questionnaire and CDE interview schedule were also corroborated by the chairpersons of parents' associations, who averred that lack of infrastructure facilities lowered both transition and completion rates in schools as shown in Table 2. The findings are further confirmed by null hypothesis (H<sub>0</sub>): There is no statistically significant relationship between inadequacy of school infrastructure and implementation of free and compulsory education in public day secondary schools in Kitui County test result ( $r = -.795$ ;  $p \leq .01$ ) as depicted in Table 3. The test result indicates that inadequacy of school infrastructure has a negative and significant correlation with implementation of free and compulsory education in public day secondary schools in Kitui County.

In general, it was established from the study findings that, the relationship between inadequacy of school infrastructure and implementation of free and compulsory education was negative. Meaning there was an inverse and significant relationship between inadequacy of infrastructure and implementation of free and compulsory education. Consequently, it was inferred from the study findings that the more there is inadequacy of school infrastructure, the lower the transition and completion rates in schools, thus affecting implementation of free and compulsory secondary education.

These findings are in conformity with those of Cuesta, Glewwe and Krause (2015) on a study of school infrastructure and educational outcomes in Latin America, which found that school infrastructure characteristics impact on students' learning and enrolment. Similarly, Cuesta et al (2015) established that enough learning rooms and creation of new schools make more learners access education, hence improved enrolment. The finding by Cuesta et al (2015) is attested by a UK study done by Teixeira, Amoroso and Gresham (2017) on impact of quality infrastructure on learners' outcome and completion rates. The study found out that low quality and shortage of infrastructure were more in rural schools and that 72 percentage and 40 percent of the rural and urban schools were lacking laboratories and toilets respectively. The Cuesta et al (2015) and Teixeira et al (2017) findings are supported by a study done by Wodon (2016) in Paraguay on

state of infrastructure for primary and secondary schools and which found out that the schools faced deficit of physical infrastructure. This led to overcrowding in classrooms hence dissatisfied learners who dropped out, retarding retention and completion rates.

Melara, Ayele and Blaustein (2014) did a study on education infrastructure challenges on enrolment in East and North Ayawaso Metros, Ghana. The study found out that 10 out of 23 schools in the study area were overenrolled with students, with one school having 359 students enrolled instead of the official capacity of 160 students. The Melara et al (2014) study finding is corroborated by Akhihero (2011) who aver that inadequacy of infrastructure in Edo state – Nigeria coupled with dilapidation of the infrastructure, due to neglect led to overcrowding in classrooms and taking lessons under trees by some learners. This resulted in low morale among the learners and teachers hence poor education outcomes which led to some learners dropping out of schools ( Akhihero, 2011).

Katiwa (2016) study on factors influencing pupils' transition rates from primary to secondary schools in Kitui Central Sub County also established that low transition rate from primary schools to public day secondary schools was occasioned by inadequacy of classrooms in the secondary schools. Additionally, Mokaya (2013) in a study on influence of school infrastructure on students' performance in public secondary schools in Kajiado County found out that sufficient and suitable infrastructure led to improved completion rates among learners, besides effective execution of both curricular and co-curricular programs by learners and teachers. These findings by Katiwa (2016) and Mokaya (2013) are further affirmed by results of a study by Parnwell (2015) on influence of school infrastructure on academic performance in public primary schools in Ruiru location, Meru County. The study found out that insufficiency of physical infrastructure, notably classrooms negatively affected academic performance of pupils ultimately leading to dropping out of school by some, hence lowered completion rates.

It is therefore important to note from the foregoing that school infrastructure plays a critical role in implementation of the free and compulsory secondary education. Without adequate infrastructure, transition from primary to secondary schools will not be high. Additionally, completion rates in secondary schools are likely to be negatively affected as alluded to by the various respondents in this study.

## CONCLUSIONS AND RECOMMENDATIONS

School infrastructure plays a central and critical role in curriculum implementation. Good learning outcomes are normally predicated on adequate infrastructure and the school learning environment. The findings from this study have shown that there is a negative and significant correlation between inadequate school infrastructure and implementation of free and compulsory secondary education in public day secondary schools in Kitui County. This implies that lack of or inadequate school infrastructure has the potential of lowering both transition and completion rates. Based on these findings therefore, the null hypothesis that stated that there is no statistically significant relationship between inadequate school infrastructure and implementation of free and compulsory education was rejected and conclusion made that school infrastructure adequacy can enhance the implementation of free and compulsory education in secondary schools in Kenya and Kitui county in particular.

## RECOMMENDATIONS

Based on the findings and conclusions of the study, the current study makes the following recommendations

- i. The government should not allocate Free Day Secondary Education (FDSE) funds on basis of learners' enrolment numbers in a school, for this disadvantages small schools for they get less funds and hence develop slowly. Therefore, the government needs to fund schools on need basis to avoid levying of development fund by upcoming schools by school administrations.
- ii. The principals of public day secondary schools could utilize other buildings in schools like dining halls, recreation halls, theatre halls and worship halls to mitigate infrastructural challenges of classrooms inadequacy.

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