

INFLUENCE OF SCHOOL TYPE ON COST EFFICIENCY IN PUBLIC SECONDARY SCHOOLS IN BOMET COUNTY, KENYA

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ABSTRACT

Kenyan public secondary schools are supposed to operate at a cost that is both reasonable and sustainable. Despite this, the cost of education in the majority of public secondary schools in Bomet County remains high in comparison. This could indicate a lack of efficiency in terms of costs in public schools. The purpose of this study was to investigate the influence of selected school type on cost efficiency of public secondary schools in Bomet County. The study employed a predictive correlational research approach. Two hundred and seventy principals of public secondary schools, as well as the five Sub-county Directors of Education in Bomet County, were the target population. Using stratified and simple random sampling approaches, a sample of 175 principals was chosen. The data was collected from the principals using a semi-structured questionnaire, and the data from the Sub-county Directors of Education was collected using an interview schedule. The Content Validity Index was used to check for validity, and it found that all variables had an S-CVI of greater than 0.9, indicating that they were all valid and could be used in the study. The findings revealed that all variables had Cronbach alpha coefficients of greater than 0.7, indicating that the variables were internally reliable enough to be used in the study. The data was analyzed and summarized using descriptive statistics, such as frequencies, means, and standard deviations. To test the hypotheses, the researchers employed simple linear regression analysis in inferential statistics to see how well school type could predict cost efficiency. Only statistical operations on data analysis were performed using the Statistical Packages for Social Sciences (SPSS) statistics software. The results show that schools incurred a huge cost on administration, guidance and counselling related costs, equipment related costs, security related expenses, and healthcare related expenses on the account of the school type. The study further found that the respondents moderately agreed that the school incurred huge expenses on extracurricular activities, account of external support services (such as motivational speakers), and subordinate staff remuneration on the account of the school type. The school type informing the costs to be incurred was attributable to different schools incurring costs on the gender basis. The study further concluded that there was a statistically significant influence of school type on the cost efficiency of the schools in Bomet County. The study further found that there was a positive relationship between the school types and cost efficiency of the public secondary schools in Bomet County. This was attributable to the costs of operating girls' schools being higher than those of boys' schools. This is due to the security, operational and health costs

incurred to mitigate security hazards such as gender-based offences in which the girls are the most targeted. The girl child often faces various gender and sexual based offences, harmful cultural practices, and safety concerns of the students in school that are more pronounced in the girls' schools compared to the boys' schools. This then leads to higher costs in respect to guiding and counselling, healthcare, security and general administration costs in girls' schools compared to the boys' schools.

Keywords: Cost Efficiency, Public Secondary Schools, School Type

1. INTRODUCTION

Education plays an important role in supporting the economic, social, cultural and political advancement of individuals, societies, nations and humanity. One of the most important duties of all governments in the world is the provision of quality education, as education contributes in many ways to improving the lives of people and reducing poverty (Somani, 2017). The values of education encompass helping people become more prosperous and earn more, improving health and nutrition, cultivating and fostering social growth by improving social cohesion and providing people with the capacity to optimize their potentials.

Education has been formally recognized as a human right since the adoption of the Universal Declaration of Human Rights (UDHR) in 1948 (Brown, 2016). This has been affirmed in numerous global human right treaties, including the United Nations Educational, Scientific and Cultural Organization (UNESCO), Convention against Discrimination in Education (CDE) (1960), the International Covenant on Economic, Social and Cultural Rights (1966) and the Convention on the Elimination of All forms of Discrimination against Women (1981) (UNESCO, 2018). These treaties established an obligation to develop secondary education, supported by measures to render it accessible to all children (Mweni, 2018). Furthermore, they affirm that the aim of education is to promote personal development, strengthens respect for human rights and freedoms, enable individuals to participate effectively in a free society, and promote understanding, friendship and tolerance (Alsaied, 2019). Education is necessary for the fulfillment of any other civil, political, economic or social right.

Debate about school type over whether single-sex schools or coeducational schools produce educational output at the lowest possible cost exists (Hek, Kraaykamp & Pelzer, 2018; Hollands & Levins, 2017). Secondary schools should focus on attaining the desired output using the lowest cost possible. Cost efficiency occurs when outputs from education such as test results are produced at the lowest level of resource (Johnes, Portela & Thanassoulis, 2017). Kirabo (2016) documented that single sex schools tend to have better observable characteristics than coeducational schools in terms of cost benefits accruing to the school per student in Trinidad and Tobago. Results show that single-sex cohort's schools score higher on national exams and are four percentage points more likely to complete secondary school. The study indicates that these benefits are achieved at zero financial cost. Survey evidence suggests that these single-sex effects reflect both direct gender peer effects due to interactions between classmates and indirect effects generated through changes in teacher behavior. These cross-school comparisons are not informative about whether schools thrive in optimal cost. Therefore, this study was an attempt to uncover the influence of school type on cost efficiency.

Efficiency variance analyzes the effectiveness with respect to staff, educational materials, machine time and other production factors. Efficiency variance is the difference between the theoretical amount of inputs required to produce a unit of output and the actual number of inputs used to produce the unit of output (Messer, 2016). The expected inputs required to produce the unit of output mimic models or experience. The difference between expected required inputs can be due to inefficiencies in labour or use of resources, or errors in the assumptions used to set input expectations. In education, efficiency variance analyses the effectiveness with respect to labour, materials, machine time and other production factors. Table 1 shows the average education unit costs for the years 2014- 2017 in Bomet County.

Table 1

The Average Unit Costs for the Years 2016- 2019 in Kenya Shillings

School type	Expected	Actual	Variance	Variance (%)
Single- sex	55,465.10	56,558.10	1,093.00	2.0
Mixed	59,397.90	62,405.20	3,007.30	5.1

Source: Ministry of Education Science and Technology, 2018

The existing variance between the expected unit costs and the actual unit cost incurred as depicted in Table 1 may be an indicator of cost inefficiency. The variance in cost is expressed in percentage. The cost efficiency levels vary according to the school type.

Public secondary schools in Bomet County and the entire country exist in categories including school type (MOEST, 2018). The categories within the school type include single sex and coeducational schools. However, there is no research study in place showing how these school characteristics influence cost efficiency in public secondary schools in Bomet County. Therefore, this study attempts to fill the existing void.

2. RESEARCH OBJECTIVE

To examine the influence of school type on cost efficiency in public secondary schools in Bomet County, Kenya.

3. EMPIRICAL LITERATURE

Studies on single- sex and coeducational schooling focus largely on bullying and exclusion in secondary schools with little attention to cost efficiency. A study conducted by Dytham (2018) to examine cross- gender bullying using observation and group interview approach found that girls are involved in teasing, bullying and intimidating other students, both verbally and physically in mixed sex secondary schools in England. However, the current study is unique in using a principal's questionnaire to collect a large amount of data from a large number of respondents in a brief span of time. The author observed that attempts to control disruptive behaviours cost considerable teachers' time at the expense of academic activities. Low academic engagements in class in view of financial costs incurred can ultimately lower academic performance which is a precursor to cost inefficiency in the entire learning and teaching processes. The study suggested that there is need to explore ways of working with teachers and schools to support students in form of reducing costs. In agreement with the results, Jenkins and Ueno (2017) found that disruption in the classroom can undermine the quality of teaching and learning activities. Disruptions in classrooms lead to wasted educational

expenses and opportunities manifested in low educational outcomes. An intervention that supports classroom academic interactions could largely reduce and save costs in single- sex and coeducational secondary schools.

A vast majority of studies have shown the effects of school type on academic performance with dearth of evidence on the direct linkage to cost efficiency. A study conducted by Maribel and Trinidad (2016) using a census of segregated schools to carry out a comparative analysis of achievement according to gender between mixed and single-sex schools in Spain indicate that differences in academic attainment was not related to school organizational factors. The study proposed the inclusion of indicators such as gender and emotional development; students' attitude and behavior; self-concept and teacher expectations; teaching practices and the effects of these on self- concept and performance in single sex schools. The recommendations seem to synchronize with Bofa and Hannula (2016) whose findings show that girls in single sex schools had significantly higher mathematics self-confidence, self-concepts, family encouragement and teacher quality than students in all other school types in Ghana. Based on the suggestions of the study, there is need to preserve existing single sex schools and even encourage their development in areas where the option does not currently exist because of the presupposed positive influence on cost efficiency in learning outcomes.

Diverse studies have largely debated the gains in cost efficiency in single sex schools. A study conducted by Kirabo (2017) in Trinidad and Tobago to analyse the impacts of single sex education on test scores using regression results found that cost efficiency advantages are associated with providing a more homogeneous student population that enables schools to provide more individualized attention. The study attributed the findings to teachers spending less time preparing lessons for two distinct audiences and handling the disengagement at any given point in time of those students whose type is not catered for. The findings reveal that coeducational schools were performing poorly in test scores owing to inability of the schools to provide individualized attention to students. The results show that cost efficiency gains in coeducational schools could be achieved through increases in school spending, class size reduction and adopting tutoring measures that promote individualized attention. The study found very high costs in adopting a mixed teaching strategy that favour both boys and girls. The study concluded that single sex education is a low-cost way of improving outcomes of low achieving students. The findings are consistent to Spencer and George (2016) whose results of a study to examine academic performance across school type in Jamaica show that single sex schools had a higher pass rates than coeducational schools. Single sex instructions can be incredibly cost effective because they only require reallocation of current resources and no added costs.

Researches show that gender segregation is institutionalized in education in the form of single sex and coeducational schooling. A study conducted by Wong, Shi and Chen (2018) using students' questionnaires indicate a higher gender salience, greater mixed gender anxiety and fewer mixed gender friendships in single sex schooling in China. The study concluded that secondary school students of single sex schools were highly gender salient, largely anxious about mixed gender situations and had fewer other gender friend and graduates of single sex schools were still more anxious about mixed gender interactions and had fewer other gender friends. These differences may have implications for academic outcomes and hence efficiency. The current study differed from this study by using principals' questionnaires and SCDEs interview guide to collect relevant data. Using multiple methods to collect data enhance the credibility of the results. The results mimic McCarey

(2017) who attributed the more effectiveness of single sex secondary than coeducational schools along measures of students' personal and academic outcomes to peer effects, decreased classrooms distractions, increases in female role models and reductions of stereotype threats. Therefore, single sex and coeducational secondary schools can affect costs differently in terms of cost reduction and cost saving.

Single- sex and coeducational school models with respect to cost efficiency in the secondary school education system have sparked discourses from researchers. A study conducted by Okafor and Mokwelu (2018) to investigate the influence of co-education on academic performance of secondary school students in Nigeria using ex post facto research design show that single sex schools performed better than coeducational schools attributable to the less attraction of the opposite sex and less likely suffering from gender stereotypes that are common in coeducational environments. Using simple linear regression modeling could have enhanced credibility of the results through specifying cause- effect and predictive relationships of variables in data analysis. The results of the study also show that classroom interactions influenced academic performance, girls did not have equal opportunities as boys in developing the potentials in coeducational schools; co-education schools exert pressure in boys to outshine the girls in academic achievement. The results suggest that there was need to set up more single sex secondary schools to enhance students' academic performance. This can imply an increase in cost efficiency. The results of the study are in consonant with Dustman, Ku and Kwak (2017) whose findings indicate that students from single-sex schools outperform their counterparts at mixed-gender schools attributable to disruptive behavior of the girls in mixed sex educational environment in South Korea. The presence of girls in the same school distracts boys in academic activities, even if not in the same cohort consequently increasing the management costs.

Studies have shown that cost of education differs by school type, but there is limited evidence in relation to cost efficiency. Results of a study conducted by Mutegei, Muriithi and Wanjala (2017) to investigate unit cost differentials by school type in Eastern Kenya using correlational research design show that the unit cost for items such as uniforms, pocket money, transport, motivation and boarding fees is higher for girls than for boys. This suggests that the chances of achieving lower cost efficiency are greater in girls' school than boys' school. The authors found that secondary schools face inefficiencies emanating from tight budgetary constraints. The research found that most girls left school and were readmitted due to pregnancy, causing the difficulty of enrolling over-aged girls in schools. The study recommended that the subsidy for girls' education be increased at secondary school level in order to optimize cost efficiency gains because the unit cost for girls' education is higher than that of the boys. The results of the study are in consensus with Naylor and Gorgen (2020), who recommended that policies supporting girls in school including reducing direct cost of schooling on items such as uniforms, registration and examination fees. Establishing subsidies in secondary schools focused on girls' schools can be an effective panacea for cost inefficiency due to high cost of items associated to girls' education.

Studies have documented that repetition and dropping out of school constitute to wastage of financial resources and increased educational costs. A study conducted in Narok South in Kenya by Njuguna (2018) to examine efficiency in public secondary schools indicate that wastage is the worst form of inefficiency because financial resources already invested in learners who repeat and drop out of school go to waste and consequently raise the cost of schooling. The results show that the completion rate for girls' schools is much higher than for boys' schools. Using ex- post facto

research design, the study cited the reasons for dropping out of schools by girls as pregnancy; negative attitude towards education and the economic background of parents; and lack of awareness of parents about the value of education. The study recommended that guidance and counseling and career advisory programmes should be strengthened in secondary schools to reduce the rate of repetition and dropout. These mechanisms could raise the cost efficiency levels in secondary schools. The study further recommended that parents should be sensitized on the value of enrolling all the children in schools notwithstanding incidences of poverty. The results resonate with Okurut (2018) who established that repetition and dropout rates were higher among schools with female students in Uganda. Grade repetition boosts the likelihood of a student dropping out of school which implies high learning costs of learning.

Studies have established that physical resources may impact cost efficiency in secondary schools. A study conducted by Musyoka (2018) to examine efficiency using descriptive research design found that teaching resources, teacher adequacy, physical facilities and headteachers' supervisory roles had positive and significant relationship with students' academic performance in single sex and coeducational secondary schools in Tana River County in Kenya. The study recommended that the ministry of education should equip public secondary schools with adequate textbooks, teachers' reference books, radios, television, computers and projectors to improve academic achievement and consequently optimize cost efficiency. In addition, among others, the study found that library and laboratory facilities were insufficient. Finally, the study found that, the principal rarely vetted lesson notes of teachers and seldom appraised teachers. Overall the study found out that teaching resource, teacher adequacy, physical facilities and head teachers supervisory roles had positive and significant relationship with students' performance at the end of form four. The findings further found out that academic scores of the students in secondary schools in the county have been declining over the years. This implies declining cost efficiency levels. The study recommended that the Ministry of Education should equip public secondary schools with adequate textbooks, teachers' reference books, radios, television, computers and projectors to improve academic performance. The findings are consistent with Obinga, Waita and Mbugi (2017) who indicated that physical resources are positively related to efficiency. The schools need to utilize the available resources in order to achieve optimal cost efficiency.

Review of coeducation and single sex education in relation to cost efficiency in schools is limited. In a study to explore the state of women's education in Western Kenya using an interview schedule and a questionnaire to collect the relevant data, Wasike (2020) established that coeducational high schools provide a variety of support services such as gender specific advice to female students. Nevertheless, the findings show that there is too much of a burden on principals and teachers of these schools to go above and beyond to provide, food, sanitary towels, learning materials, and uniforms to female students in need. Poverty immensely hampers girls' education. The study established that coeducational schools need the government to employ more female teachers to act as role models to the girls and also to increase the funds it allocates them. Findings revealed lacked the required support and motivation to make their schools efficient. The likely cause of school girls not performing well is that the majority look up to a man as a way of survival, and they do not work hard in class. The results of the study reveal that articulation of masculine power and female subordination is rampant in a mixed-sex classroom. The study recommends that there is a dire need for a sensitization campaign to teach the local community the benefits of educating women. The findings mirror Sari (2017) whose results reveal that coeducational schools are generally supported to optimize costs in academic achievement as opposed to single sex schools.

Effects of single sex and coeducational schools on costs have been widely researched in Kenya. A study conducted by Mwikya, Cheloti and Mulwa (2019) using descriptive survey research design to examine the influence of cost of girls' education on transition rates in Machakos County in Kenya found that schools were not adequately financed to accomplish their obligations and educational objectives. A choice of predictive correlational research design for the study could have enhanced the credibility and validity of the results due to its explanatory powers. The results of the study also established that the high cost of education contributed to cost inefficiencies in public girls' secondary schools. This was attributed to high cost of school uniforms, pocket money, tuition and transport and motivation fees paid to schools for remedial classes. The current study diverges from this study in examining the influence of single sex and coeducational schools on cost efficiency of public secondary schools in Bomet County in Kenya. The study concluded that the amount charged by schools for girls' uniforms, tuition, boarding, motivation and pocket money greatly influenced efficiency of schools. The study found that the education costs were unaffordable to parents and funds released to schools by the government were inadequate and never reached schools in time, thus, recommending that parents should be encouraged to initiate income generating projects and government to increase capitation to schools. The recommendations of the study coincide with Gigliotti and Sorensen (2018) who asserted that sustained financial investment in education coupled with improved educational outcome helps schools maintain efficiency in New York State. Increased government funding for girls' day schools could help with the construction and equipping of classrooms and laboratories, which could reduce the cost of girls' education.

4. CONCEPTUAL FRAMEWORK

The conceptual framework presents a diagrammatic representation of diverse variables and their indicators. The model depicts interrelationships among independent, intervening and dependent variables as set in the research objectives of the study. The research objectives are therefore the guiding principles for the conceptual framework. The conceptual framework for the study is made of several parts as illustrated in Figure 1.

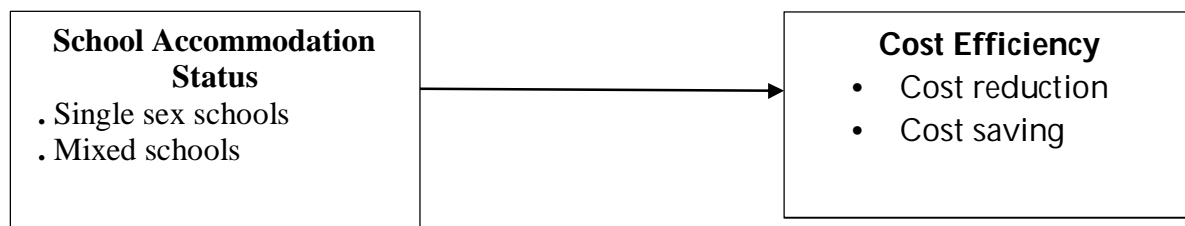


Figure 1: *Conceptual Framework of School Type and Cost Efficiency*

5. RESEARCH METHODOLOGY

The current study adopted post-positivism research philosophy owing to its flexibility in using various research instruments to examine cost efficiency of public secondary schools clearly and closely. Post-positivism world view considers both quantitative and qualitative methods to be valid in investigating a research phenomenon (Gathii et al., 2019). A post-positivist philosophical research approach advocates methodological pluralism based on the assumptions that the method to be applied in a particular study should be selected on the basis of research questions being addressed (Panhwar, Ansari & Shah, 2017). Therefore, principal's questionnaire and the SCDE

interview schedule were used in the present study to investigate the research phenomenon from various perspectives which helped to minimize the risk of biases and maximize reliability.

This study adopted predictive correlational research design in which the researcher uses simple linear regression statistical processes to predict the value of the dependent variable based on the known value of the independent variable (Pituch & Stevens, 2016). Predictive correlational design is used in those cases when there is an interest to identify predictive relationship between the predictor and the outcome/criterion variable (Lau, 2017).

In this study, the target population comprised all the two hundred and seventy (270) principals of public secondary schools and all the five (5) Sub- County Directors of Education (SCDE) in Bomet County. The target population refers to a group of individuals or entities with some common characteristics that the researcher plans to study with the aim of generalizing the findings (Asiamah, Mensah & Oteng-Abayie, 2017). There were two hundred and seventy (270) public secondary schools and five (5) Sub Counties in Bomet County at the time of the study (Bomet County Education Office Data, 2019). Therefore, there were two hundred and seventy (270) principals and five (5) Sub-county Directors of Education at the time of the study. The principals and SCDE were chosen to participate in the study because they were charged with the responsibility of effectively planning, implementing and managing the school budget in order to achieve the desired objectives of the school (Kamunge, 2016). The ability of the principals and the SCDEs having adequate and authoritative information on cost efficiency of public secondary schools influenced the validity of the research results. The target population of this study was considered as accessible population. Table 2 shows the accessible population by sub-county.

Table 2

Table 2

Accessible Population by Sub-county

Sub-county		Sotik	Konoin	Bomet East	Bomet Central	Chepalungu	Total
School type	Single sex	12	9	6	6	13	46
	Mixed	70	36	33	36	49	224
Principals		82	45	39	42	62	270
SCDE		1	1	1	1	1	5

Source: Bomet County Education Office Data, 2019

Table 2 shows that the number of principals in Sotik, Konoin, Bomet East, Bomet Central and Chepalungu sub- counties was eighty two (82), forty five (45), thirty nine (39), forty two (42) and sixty two (62) respectively totalling to two hundred and seventy (270). There was a sub- county director of education in each sub-county totalling to five (5) in the county.

A sample was chosen to represent the entire population in this study. According to Showkat and Parveen (2017), when accessible population is greater than 100 ($N > 100$), sampling is necessitated. Given that the study population comprised 270 principals, sampling was adopted. The sample size for the principals selected for the study was determined according to the formula by Krejcie and Morgan (1970) for a finite population as follows:

$$S = \frac{X^2 NP (1-P)}{d^2 (N-1) + X^2 P (1-P)}$$

Where:

S = Required Sample

X = Z- value (e.g. 1.96 for 95% confidence level)

N = Population Size

P = Population proportion (expressed as decimal) (assumed to be 0.5 (50%))

d = Degree of accuracy (5%), expressed as a proportion (0.05); it is a margin of error

Inserting the required information into the formula where X= 1.96, Z= 270, P= 0.5 and d= 0.05

$$\begin{aligned} \text{gives: } S &= \frac{1.96^2 \times 270 \times 0.5(1-0.5)}{0.05^2(270-1) + 1.96^2 \times 0.5(1-0.5)} \\ &= 158.8021311777 = 159 \text{ principals.} \end{aligned}$$

This sample was increased by 10% to cater for possible non- responses (Creswell, 2015). Therefore, the sample size increased to 175 principals. This represents the sample for the study and was obtained from the target population using proportionate stratified and simple random sampling methods. In addition, a census technique was used in selecting all the sub-counties in the study area. Therefore, all the five (5) SCDE was sampled using purposive techniques in which a SCDE was selected to participate in the study. Table 3 shows the sampling matrix of the study.

Table 3

School type

Sub- county	Single sex	Mixed	Total
Sotik	8	45	53
Konoin	6	23	29
Bomet East	4	22	26
Bomet Central	4	23	27
Chepalungu	8	32	40
Stratified Random Sample	30	145	175

Source: Ministry of Education Science and Technology, 2018

From Table 3, single sex and mixed secondary schools constitute thirty (30) and one hundred and forty five (145) respectively in number from the county. These are the schools that were used for the study in this category. The number randomly selected from Sotik, Konoin, Bomet East, Bomet Central and Chepalungu is fifty three (53), twenty nine (29), twenty six (26), twenty seven (27) and forty (40) respectively. The total number of schools was one hundred and seventy five (175).

Two instruments, namely: Principal's Questionnaire and SCDEs' Interview Schedule were used to solicit data. The description of each instrument is given in the subsequent sub- sections.

Data was collected using a structured questionnaire designed to collect the required data from the principals of public secondary schools in order to address the research objectives of the study. The choice of a structured questionnaire was informed by the fact that it gathers information over a large sample and was more appropriate when addressing sensitive issues since it offers greater anonymity. The main objective of the principal's questionnaire in the current study was to obtain relevant data in the most reliable and valid manner.

An interview schedule aimed at making it possible to obtain the data required to meet the specific objectives of the study was administered to SCDE. Respondents were probed using open ended questions. The guide solicited information covering accommodation status, school size, school type, school location, and financial management skills of the school principal and cost efficiency in public secondary schools by school characteristics.

6. DATA ANALYSIS

Data analysis means breaking down a whole data into components (Elliott, 2018). Through assembly of the parts, one comes to understand the integrity of the whole. After data collection, the researcher conducted data cleaning which involves identifying incomplete or inaccurate responses. These were corrected to improve the quality of the responses. This study combined both qualitative and quantitative approaches in such a way as to maximize their strengths and minimize their limitations.

The influence of the school type on cost efficiency was examined using a set of indicators that examined the school type in terms of gender on diverse school costs. In this context, the study examined on whether the school type in terms of gender influenced administration costs overheads, guidance and counseling related costs, equipment related costs, extracurricular activities costs, healthcare related expenses, security related expenses, external support services, extra expenses on the subordinate staff remuneration, and school equipment. The study used Likert based questions with five-point Likert scale of 1= Very Small Extent (VSE), 2= Small Extent (SE), 3= Moderate Extent (ME), 4 = Large Extent (LE) and 5 = Very Large Extent (VLE). In addition, f=frequency, M=mean and SD= Standard Deviation. The results of the descriptive statistics due to the school type were presented in Table 4.

Table 4*Descriptive Statistics of Principals' Perception on School Type*

Statements	1	2	3	4	5	Total	
	f %	f %	f %	f %	f %	M	SD
Our school incurs a huge administration costs overhead due to the school type in terms of gender	0 0.0%	30 20.8%	34 23.6%	40 27.8%	40 27.8%	3.63	1.102
Our school incurs a huge guidance and counselling related costs due to the school type in terms of gender	0 0.0%	3 2.1%	36 25.0%	57 39.6%	48 33.3%	4.04	.818
Our school incurs a huge equipment related costs due to the school type in terms of gender	9 6.2%	1 0.7%	27 18.8%	78 54.2%	29 20.1%	3.81	.975
In our school, we incur a huge cost on extracurricular activities due to the school type in terms of gender	1 0.7%	26 18.1%	50 34.7%	53 36.8%	14 9.7%	3.37	.914
We incur a huge security related expenses on the account of school type in terms of gender	3 2.1%	6 4.2%	69 47.9%	49 34.0%	17 11.8%	3.49	.836
We incur a huge healthcare related expenses on the account of school type in terms of gender	14 9.7%	2 1.4%	59 41.0%	45 31.2%	24 16.7%	3.44	1.095
Our school incur a huge expense on external support services as motivational speakers on the account of school type in terms of gender	30 20.8%	11 7.6%	47 32.6%	28 19.4%	28 19.4%	3.09	1.374
Our school incur extra expenses on the subordinate staff remuneration on the account of school type in terms of gender	3 2.1%	41 28.5%	52 36.1%	41 28.5%	7 4.9%	3.06	.922
Our school incur extra expenses on school equipment purchase on the account of school type in terms of gender	4 2.8%	0 0.0%	44 30.6%	49 34.0%	47 32.6%	3.94	.940
Average						3.54	1.00

n=144

The principals were asked on whether the school incurred a huge administration costs due to the school type as a result of gender considerations. The respondents were in agreement to a large extent (M=3.63, SD=1.102) on the school incurring a huge administration costs overhead as a result of school type due to gender considerations. The study noted that the respondents were in agreement that the schools incurred high administration costs based on the gender dynamics of the school. The gender of the schools determines the diverse respects that the school management could be dealing with alongside the requisite resources. In girls' schools, the challenges of the teenage pregnancies and cultural factors causing the girl child school dropout are noted by diverse scholars including Du Preez, Johan Botha, Rabie and Manyathi (2019) in South Africa, Ossai, Eze, Elechi, Elohi and Umeobieri (2020) in Nigeria, and Sagnia, Gharoro and Isara (2020) in Gambia amongst

others. The safety and discipline considerations also vary based on gender leading to different administration costs of the schools.

The respondents were also in agreement to a large extent ($M=4.04$, $SD=0.818$) that the school incurred a huge guidance and counselling related costs due to school type in terms of gender. The schools have different guidance and counselling needs dependent on the gender which have cost implications. Guidance and counselling needs that are more manifested alongside gender include sexual violence amongst girl child (Chirwa, Kasonde-Ng'andu & Kalimaposo, 2016) and discipline related challenges which manifest themselves differently with respect to gender (John, Wamukuru & Koros, 2020; Ondieki, 2018). These discipline challenges require guidance which sometimes has cost implications. In this context, for example, the girl child may significantly be impacted by issues such as defilement, early marriages and negative cultural practices more than the boy child. Furthermore, students may demonstrate behaviour difficulties requiring specific costly intervention education programmes to deal with antisocial behaviours.

The respondents when asked on whether the school incurred a huge equipment related costs due to school type as a result of gender were in agreement to a large extent ($M=3.81$, $SD=0.975$). The respondents were further asked on whether their school incurred a huge cost on extracurricular activities due to the school type in terms of gender which the respondents indicated that they were in agreement to a moderate extent ($M=3.37$, $SD=0.914$). On whether the schools incurred a huge security related expenses on account of school type in terms of gender, the respondents were on average largely in agreement with the metric ($M=3.49$, $SD=0.836$). The security related expenses vary dependent on the security needs of the schools based on the gender aspects. For example, Anikoh and Ayuba (2019) in a study focusing on the security issues in Nigeria noted prevalence of kidnapping of girls in Northern region of Nigeria. In this context, Anikoh and Ayuba (2019) cited the case of kidnapping of 200 school girls from Chibok region. These issues were further noted by Onoyase (2019) within the context of Nigeria where the study noted an increase in school based gender related violence including rape, sexual harassment, abortion, kidnapping or forced marriages. As a result of these security and safety related issues that are along the gender lines, there would be more security related expenses for the girls' schools compared to those for boys.

The respondents were asked on whether they incurred huge healthcare related expenses on the account of school type in terms of gender. The respondents were in agreement to a large extent ($M=3.44$, $SD=1.095$). The healthcare requirements and related expenses are often along gender lines with girls' school having greater health requirements due to the nature of their gender at adolescent age and the gender related challenges where they exist. In this context, Japhet (2019) listed some of the gender related healthcare requirements along gender lines to include pregnancy related challenges, Sexually Transmitted Infections (STIs), and psychological trauma. The sexual and reproductive health demands are more in girls' schools which raise the cost of healthcare in those schools compared to the boy's schools. Several studies including Ossai *et al.*, (2020) in Nigeria, Du Preez *et al.*, (2019) in South Africa, and Japhet (2019) in Tanzania have all documented health challenges related to reproductive health that are more prevalent in girl's school.

The respondents were further asked on whether the school incurred a huge expense on the account of external support services (such as motivational speakers) which the respondents were in agreement to a moderate extent ($M=3.09$, $SD=1.374$). On whether the school incurred extra expenses on remuneration of subordinate staff with respect to school type in terms of gender, the respondents were in agreement with this view to a moderate extent ($M=3.06$, $SD=0.922$). This result

could be attributable to the girl's oriented school requiring more subordinate staff in terms of security personnel, health personnel, and school matrons amongst others in order to mitigate various challenges that girls face. Finally, the respondents were asked on whether their school incurred extra expenses on the purchase of school equipment on account of school type in terms of gender. The results revealed that the respondents were in agreement to a large extent ($M=3.94$, $SD=0.940$) on incurring of extra expenses on the purchase of school equipment based on school type.

The respondents on average indicated that they thought the school type holistically influenced cost efficiency to a large extent ($M=3.54$, $SD=1.00$). This can be attributable to school type in terms of gender related expenses on administration; guidance and counselling; maintenance of equipment, co-curricular activities; security; health; motivation and staff salaries in secondary schools in Bomet County. The standard deviation indicated that there was no consensus amongst the respondents due to a standard deviation of above 0.5.

The study was interested in examining on whether the school type had a statistically significant influence on the cost efficiency of public secondary schools in Bomet. The study thus utilized the simple linear regression in order to examine the influence of the school type on cost efficiency of public secondary school using the following hypothesis:

H₀₃: There was no statistically significant influence of school type on cost efficiency of public secondary schools.

The model summary was used to provide the correlation coefficients, and coefficient of determination for the influence of school type on cost efficiency of public secondary schools. The results were presented in table 5.

Table 5

Model Summary of School Type

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.384 ^a	.147	.141	.19420

a. Predictors: (Constant), School Type

The study results found that the correlation coefficient stood at 0.384 which implied that there was a weak positive correlation between the school type and the cost efficiency of the public secondary schools in Bomet County, Kenya. The study further found that the coefficient of determination stood at 0.147. According to Weisberg (2005), the coefficient of determination indicates the percentage of the variance in the dependent variable that is attributable to the dependent variable. This study found that 14.7% of the variance in the cost efficiency was due to the school type aspects.

The study further examined on the overall significance of the regression model in predicting the dependent variable using the one-way ANOVA. The results were presented in Table 6.

Table 6*ANOVA^a of School Type*

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.925	1	.925	24.516	.000 ^b
	Residual	5.355	142	.038		
	Total	6.280	143			

a. Dependent Variable: Cost Efficiency

b. Predictors: (Constant), School Type

The study results indicated that $F_{0.05}(1,142) = 24.516$, $P = 0.00$, which was less than 0.05. According to Weisberg (2005), the p value of less than 0.05 indicate that the model is statistically significant in prediction of the dependent variable. Having achieved a p value of less than 0.05, a conclusion was made that the regression model was able to predict the cost efficiency of public secondary schools. This implies that the model was good fit for data.

The study further examined the t test and regression coefficients as means of determining the statistical and practical significance of the regression model. The results were presented in Table 7.

Table 7*Coefficients^a of School Type*

	Model	Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients		
				Beta		
1	(Constant)	3.521	.191		18.466	.000
	School Type	.264	.053	.384	4.951	.000

a. Dependent Variable: Cost Efficiency

The results indicated that $t_{0.025}(142) = 4.951$, p value = 0.000 ($p < 0.05$). According to Kedem and Fokianos (2002) the p value of less than 0.05 is used for the purposes of determining presence of statistically significant influence of independent variable on the dependent variable. The study having achieved p value of less than 0.05 concluded that there was a statistically significant influence of school type on cost efficiency of public secondary schools in Bomet County, Kenya. The results of this study on the statistical significance on the school type on the cost efficiency could be attributable to various school incurring diverse charges along the gender lines.

Various interviewees also gave their views on the influence of the school type on the running costs as follows:

“Single sex (School) is less costly to run unlike a mixed sex school where so many administration issues in management of schools. Of particular concern is the security of the students especially girl child in a mixed sex school. This pushes administrative costs a notch higher.” Interviewee #6.

“School type poses a humongous influence in running costs attributable to: diverse basic needs of the girls compared to boys, girls require a lot of uniform, sanitary towels, soaps and pocket money. In a mixed secondary schools, a lot has to be spend on activities especially when students are taken out for sports. Mixed schools are treated as two schools

in one. Schools have to sponsor girls and boys (separately) and it means sponsoring two different teams for each and every activity. On this end, the costs of running a coeducational school is a bit higher than a single sex school” Interview #7

The results are consistent with findings from other studies on the theme. Both Lawal (2020), Onukwufor and Chukwu (2017), as well as Yusuf, Bako, Guga and El-Yakub (2020) commenting on the context of Nigeria secondary schools noted enhanced security risks for the girls in secondary schools such as kidnapping and other gender based violence that necessitate enhanced security measures and thus security costs. Diverse scholars have noted that the costs of operating girls' schools could be higher than those of boys' school due to the security, operational and health costs incurred mitigating security hazards such as gender-based offences in which the girls are susceptible. In this context, (Nsalamba & Simpande, 2019), (Isokon, Onyema, Ede, Archibong, & Obeten, 2020), (Abuzied & Ali, 2020), (Chirwa *et al.*, 2016), and (Nsemo, Ojong, Agambire, Adu, & Dankwah, 2020) raise various issues touching on the girl child such as gender and sexual based offences, harmful cultural practices, and safety concerns of the students in school that are more pronounced in the girls' schools compared to the boys' schools. This then leads to higher costs in respect to guiding and counselling, healthcare, security and general administration costs in girls' schools compared to the boys' schools.

7. CONCLUSION OF THE STUDY

The study concluded that there was a statistically significant influence of school type on the cost efficiency of public secondary schools in Bomet County. The study further found that there was a weak positive relationship between the school types and cost efficiency of the public secondary schools in Bomet County. This was attributable to the costs of operating girls' schools being higher than those of boys' schools. This is due to the security, operational and health costs incurred to mitigate security hazards such as gender-based offences in which the girls are susceptible. The girl child often faces various gender and sexual based offences, harmful cultural practices, and safety concerns of the students in schools that are more pronounced in the girls' schools compared to the boys' schools. This then leads to higher costs in respect to guiding and counselling, healthcare, security and general administration costs in girls' schools compared to the boys' schools.

8. RECOMMENDATIONS OF THE STUDY

The school type was critical in cost dynamics as girls' schools incur higher unit costs of operations based on the security related requirements, guidance and counselling costs, and health costs amongst other cost oriented needs. These costs should be effectively factored in the budget estimates in a manner that leaves the school still operating at lower cost per student.

REFERENCES

- Abuzied, N. M., & Ali, K. M. (2020). The Prevalence of Psychiatric Morbidity (Severe Depression & Anxiety) among Adolescent School Girls Khartoum-Sudan. *International Journal of Research -Granthaalayah*, 8(1), 165–175.
- Anikoh, R. O., & Ayuba, P. (2019). Users Perception of Landscape Elements as Security Measures in Secondary School , Minna , Nigeria. *Journal of Engineering and Architecture*, 7(1), 62–67.
- Chirwa, B., Kasonde-Ng'andu, S., & Kalimaposo, K. (2016). Defilement of Girls in Selected Primary and Secondary Schools in Lusaka Province: Implications for Guidance and Counselling. *International Journal of Humanities Social Sciences and Education (IJHSSE)*, 3(12), 26–42.
- Egbe, I. B., Augustina, O. O., Itita, E. V., Patrick, A. E., & Basse, O. U. (2020). Sexual behaviour and domestic violence among teenage girls in yakurr local government area, cross river state, Nigeria. *Academic Journal of Interdisciplinary Studies*, 9(2), 101–108.
- Gathii, K. J., Wamukuru, D. K., Karanja, D., Muriithi, W., & Maina, K. (2019). *Research Methods, Data Analysis & Defences (Building Competences In Education And Social Sciences Research)* (1st ed.). Education and Social Sciences Research Association of Kenya (ESSRAK).
- Gladys, N., & Alex, S. (2019). Effect of Re-entry Policy Implementation on Readmitted Girls' Academic Performance in Mathematics in Selected Secondary Schools of Mufulira District in Zambia. *International Journal of Data Science and Analysis*, 5(5), 73. <https://doi.org/10.11648/j.ijdsa.20190505.11>
- Japhet, S. (2019). Prevalence of Sexual Violence and Health Related Effects Among Students in Co-Education Public Day Secondary Schools in Kinondoni Municipality, Dar Es Salaam. *Texila International Journal of Public Health*, 7(2), 29–39.
- John, J. M., Wamukuru, D. K., & Koros, P. (2020). *Influence Of The Headteacher ' s Management Of Pupils ' Discipline On Academic Performancein Public Primary Schools In Njoro Sub County , Nakuru County , Kenya*. 10(3), 39–47. <https://doi.org/10.9790/7388-1003073947>

- Kedem, B., & Fokianos, K. (2002). *Regression Models for Time Series Analysis*. Wiley Blackwell.
- Lawal, M. B. (2020). Social Studies Teachers' Readiness to Teach the Security Education Theme in the Reviewed Edition of Nigeria's Basic Education Curriculum. *American International Journal of Humanities, Arts and Social Sciences*, 2(1), 18–28.
- Nsemo, A. D., Ojong, I. N., Agambire, R., Adu, R., & Dankwah, M. (2020). Menstrual Hygiene Practices among Adolescent Girls in Junior High Schools in Selected Communities of Ashanti Region, Ghana. *Global Journal of Health Science*, 12(8), 38–51.
- Ondieki, D. M. (2018). Challenges Facing Headteachers in Managing Discipline of Students in Public Secondary Schools in Keumbu Subcounty, Kisii County, Kenya. *World Journal of Educational Research*, 5(1), 1–6.
- Onoyase, A. (2019). School-Related Gender Based Violence (SRGBV) and Its Consequences on Secondary School Students: Implications for Counselling. *Journal of Education and Training Studies*, 8(2), 29–37.
- Onukwufor, J. N., & Chukwu, M. A. (2017). Parenting Styles as Correlates of Adolescents Drug Addiction among Senior Secondary School Students in Obio-Akpor Local Government Area of Rivers State, Nigeria. *Journal of Education and E-Learning Research*, 4(1), 22–27.
- Ossai, E. N., Eze, I. I., Elechi, C. A., Elohi, E. A., & Umeobieri, A. K. (2020). Contraceptive Use among Senior Secondary School Students in Abakaliki Metropolis, Ebonyi State, Nigeria. *Journal of Education, Society and Behavioural Science*, 32(May), 1–9.
- Preez, A., Botha, A. J., Rabie, T., & Manyathi, D. G. (2019). Secondary School Teachers' Experiences Related to Learner Teenage Pregnancies and Unexpected Deliveries at School. *Health SA Gesondheid*, 24, 1–7.
- Sagnia, P. I., Gharoro, E. P., & Isara, A. R. (2020). Adolescent-Parent Communication on Sexual and Reproductive Health Issues amongst Secondary School Students in Western Region 1 of the Gambia. *African Journal of Primary Health Care & Family Medicine*, 12(1), 1–7.

Weisberg, S. (2005). *Applied Linear Regression* (3rd ed.). John Wiley & Sons, Inc.

Yusuf, A. W., Bako, R. B., Guga, A., & El-Yakub, S. U. (2020). Effect of Heuristic Teaching Approach on Students Performance in Economics in Senior Secondary Schools in Kano State, Nigeria. *Journal of Teaching & Teacher Education*, 8(1), 54–60.