

# Influence of board of managements' infrastructural development practices on students' academic performance in public secondary schools in Nyamira County Kenya

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## ABSTRACT

The availability of infrastructure and facilities that are up to the standards and well maintained will influence both teaching and learning of students. A progressive improvement in the standard of infrastructure of a secondary school will lead to a remarkable development in the education system as a whole. The purpose of this study was to examine the influence of Board of Management's (BOM) infrastructural development practices on students' academic performance in public secondary schools. A convergent parallel mixed-method research design was used. The study targeted students, Teachers Heads of Departments, BOM members and Quality Assurance and Standards Officers, making a total study population of 19,609. Both probability and non-probability sampling methods were used to select a sample size of 396 participants. Data was collected using questionnaires, interview guides and observation tool. Inferential statistics involved the use of multiple regression analysis and analysis of variance along with descriptive statistics. The study concluded that inadequate provision of infrastructural facilities in schools by the BOM affects the teaching and learning activities which negatively affect the students' academic performance. In the regression analysis, an improvement in BOM's infrastructural management practice by one unit would result in the improvement of the students' academic performance by 0.081 units holding other factors constant. Thus, the school BoM should ensure that there is adequate infrastructure in public schools to improve academic performance among the students. The board of management should ensure a conducive teaching and learning environment in public secondary schools by providing adequate infrastructural facilities such as classrooms, laboratories, library, teaching and learning materials/resources, workshops for technical subjects, sanitary facilities and utilities.

**Keywords:** Board of Management practices, infrastructural development practices in schools, academic students' performance.

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## INTRODUCTION

In both developed and developing countries, education is a very crucial process through which an individual's life chances are determined (Makori and Onderi, 2013; Sarker et al., 2019a). Quality education does not exist in a vacuum but in a school environment with quality physical facilities and material resources that are used in teaching and learning (Bold et al., 2013). The specifications given for the establishment, management and material resources in public secondary schools are postulated in the laws and policies that govern the

county's education system (Sultana et al., 2017). According to Alimi (2004), the goal of infrastructural system in secondary schools seeks to increase school attendance of students, enhance staff motivation and to improve academic achievement of students.

The rising challenges hindering quality academic performance in developing countries has continued to attract attention among scholars (Sarker et al., 2019b). Mokaya (2013) for example reported that well planned school with clean and safe learning environment is

important for academic achievement. Further, Mokaya observes that physical facilities play a key role in the attainment of the school's intended objectives and overall quality performance. However, that is not the case in developing countries. Public schools are often characterized by lack of infrastructure facilities such as classrooms, latrines, hostels and laboratories among others (Nyagosia et al., 2013).

In Ghana's context, unavailability of library facilities, resource centres and inadequate supply of teaching and learning materials by the government hinders academic achievement of learners in public secondary schools (Sekyere et al., 2013). Lack of a well-stocked and digitized library in a school affect students' study behaviors by denying them an opportunity to undertake individual research on new topics to advance knowledge learned in the classroom. This therefore contributes to poor academic achievement of learners.

In Tanzania, poor physical infrastructure is a common feature in many public educational institutions. Most schools are characterized by ramshackle infrastructure. In addition, new programs and expanded intake have been suggested without matching development of the physical infrastructure (Ngwaru and Oluga, 2015). The available inadequate infrastructure, due to poor management, has continued to dilapidate.

According to Education Act (2012), the Board of Management has the mandate of ensuring that the teaching and learning resources are adequate and available in schools to enhance teaching and learning. It is, therefore, the responsibility of the BOM to ensure that facilities such as libraries are available and well equipped so as to stimulate teaching and learning for good academic performance.

In Kenya, the issue of poor school infrastructure is not new. Poor state of school facilities in various schools in Kenya creates hurdles for children to get quality education and form barriers to school planning (Kerubo, 2013). Most schools rarely meet the basic standards of health and inspection, because they are poorly planned, coordinated, and maintained (Siringi, 2009). With the introduction of broad-based curriculum at all levels of education which has led to a more diversified and specialized programmes, there is need for effective planning of physical facilities and material resources (Sarker et al., 2020). Organization, coordination and supervision are required in scheduling the use of space equipment and relating availability of effective teaching and learning (Ngithi, 2013).

Ironically although the government introduced Free Primary and Secondary Education system, the system has been peddled as an accelerator of the aforementioned problems. Since its inception in 2003, more students now attend school, however a number of challenges continue to plague the implementation of these programs including overstretched facilities such as classrooms, latrines, hostels and laboratories and overcrowding. It may be a fact that dilapidated crowded

or uncomfortable school infrastructure leading to low morale among the students, teachers and the parents (Barrett et al., 2019). Therefore, this has led to the poor performance in most public secondary schools.

Other researchers conducted in Nyamira County continue to reveal its poor performance in Kenya Certificate of Secondary Education (Makori and Onderi, 2013). According to previous studies, the secondary school management system continues to face many challenges, which would compromise the quality of education provided (Nyagosia et al., 2013). Although a couple of studies have been done on the influence of school facilities on performance (Bold et al., 2013; Kerubo, 2013; Makori and Onderi, 2013; Stephen, 2002), it appears that there is little known about the influence of BOM's management practices of school infrastructural resources on students' academic performance in secondary schools. This poses a knowledge gap which this study sought to fill. Therefore, this study intended to examine the influence of Board of Management's infrastructural development practice on students' academic performance in public secondary schools, in Nyamira County, Kenya.

## LITERATURE REVIEW

A good school infrastructure includes but not limited to; well-designed buildings of good shape with adequate number of well-organized classrooms, sufficient blackboards, tables, desks, chairs and adequate space per class, adequate number of sanitation facilities, access to adequate clean drinking water, electricity, ventilation and light, fire exits and first aid kit, medical assistance, canteens, recreational facilities, library, computer facilities, and information technology among others.

The availability of infrastructure and facilities that are up to the standards and well maintained will influence both teaching and learning of students. A progressive improvement in the standard of infrastructure of a secondary school will lead to a remarkable development in the education system as a whole. Therefore, the government, relevant agencies, local bodies, and other organizations should play an active role in ensuring infrastructure development in schools, particularly secondary schools. The study recommended that there is a need for the awareness creation by the government and public support for the betterment of infrastructure in secondary schools.

Kerubo (2013) noted that infrastructure facilities in secondary schools of Assam state in Sivasagar District, India, lacked sufficient infrastructural facilities in schools affect the whole teaching and learning process. The existence of poor school infrastructure and inadequate facilities cause irritation and friction within the learning institutions – through interruption of teaching and learning activities. Lahan (2015) revealed that a planned

infrastructure in a school is the center of satisfactory students learning. Further, the study found out that a set of interconnected structural elements supporting the whole structure of development in the institution of learning. Thus, despite that the previous studies showed that infrastructure has an impact on academic performance among pupils, they did not tell how of which the current study sought to establish.

The Board of Management plays an instrumental role in the development of schools. It constitutes an important component of the school leadership, management, and governance structure. Makori and Onderi (2013) conducted a study on roles and responsibilities of Parent, Teachers Association (PTA), and BOMs in Gucha Sub County, in Kisii County. The study used a quantitative research design, and the participants were 30 head-teachers, 30 chairs of PTA, and 30 BOMs drawn from thirty secondary schools, which were purposively sampled. The study found out that BOM and PTA have a role of identifying development projects and maintaining school facilities. Thus, the current study used a mixed research method that helped the researcher to gather both qualitative and quantitative data that gave deeper knowledge on how the role of BoM in infrastructural management affect academic performance among public secondary school students in Nyamira County.

In the same line, Said (2016) conducted a study on the relationship between BOM School Management and students' academic achievement in relation to KCSE performance in Mombasa County. The study employed a descriptive survey research design. The study used a sample of 130 participants, including 26 principals and 104 BOM members. Probability sampling procedure was used in sample subjects' selection. The data collection instruments included questionnaires and an interview guide. The study revealed that the BOM always checked the physical facilities in the schools. Additionally, the majority of the participants indicated that the BOM frequently checked the physical facilities in the schools that contributed to a good study environment for students, thus improving their performance. Thus, the current study sought to investigate whether public school BOM carry out their role of school infrastructural management and whether this has any influence on academic performance among students in public secondary school in Nyamira County, Kenya.

## METHODOLOGY

This study adopted a mixed research method approach. The design helped the researcher to develop a more complete understanding of the research problem by obtaining different but complementary data from the participants (Creswell and Plano, 2011). Convergent parallel mixed method design is an approach to inquiry that combines both quantitative and qualitative methods almost equally. Both cross-sectional survey research

design for quantitative data and a phenomenological research design for qualitative data were adopted. A cross-sectional survey design was useful in describing the characteristics of a large study population, large study sample, thus making the study results significant. Equally, phenomenological research design was used to bring out an understanding people's perceptions, perspectives, and understandings of the situation about the influence of school management by the BOM on academic performance. Plano Clark and Ivankova (2016) noted that phenomenological approach enables an in-depth study of the relevant variables in order to describe the existing situation by the use of an interview guide. Therefore, phenomenological research design enabled the use of in-depth interviews for the key informants who were selected from public secondary schools. This included Heads of Departments (HODs) and Quality Assurance and Standards Officers (QASOs) in Nyamira County. Thus, the mixed method research design was selected because it was the most effective to capture the intention of the study.

In this study, the targeted population comprised of the Board of Management (BOM) members, QASOs, HODs, teachers, and students in public secondary schools in Nyamira County. These included 1,728 BOM members; 5,909 teachers; 192 departmental heads, 5 QASOs and 11,739 form four students (Nyamira County Education Office, 2018). These made up a total target population of 19,609.

The researcher used a sample size computation formula by Krejcie and Morgan (1970) to arrive at the sample of the participants that were used in the study, as follows:

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

Where:  $n$  = the required sample size;  
 $X^2$  = the table value of Chi-square for 1 degree of freedom at the desired confidence level (3.841);  
 $N$  = the population size;  
 $P$  = the population proportion (assumed to be 0.50 since this would provide the maximum sample size).  
 $d$  = the degree of accuracy expressed as a proportion (0.05).  
 Therefore, the population applicable in the formula included 1,728 BOM members, 5,909 teachers, 11,780 form four students making 19,609

$$n = \frac{3.841 \times 19609 \times 0.5(1-0.5)}{0.05^2(19609-1) + 3.841 \times 0.5(1-0.5)} = \frac{18645.17425}{48.5425 + 0.96025} = 376.6 \approx 377$$

Probability sampling procedures were used to select students and teachers who took part in the study. Probability sampling was used in this study to eliminate biases in the selection of the subjects so as to allow for

the generalization of the study findings (Shafi et al., 2019). Non-probability sampling was used to select key participants for this study: that included HODs and Quality Assurance and Standards Officers. The probability sampling procedures included stratified random sampling and simple random sampling, while non-probability sampling procedure entailed purposive sampling procedure (Cao et al., 2019; Kamruzzaman et al., 2019). Both questionnaire and interview guide were used in data collection. Closed ended questionnaire will be used to collect data from the students, while open ended interview were used to collect data from heads of Departments and the Quality Assurance and Standards Officers. Observation tool was also used to collect data on the school infrastructure.

The collected data was analyzed using both quantitative and qualitative data analysis approaches. The quantitative approach was descriptive, where frequencies and percentages were used. Qualitative data on the other hand employed qualitative data analysis procedure. The qualitative data was then reported in narratives.

## RESULTS

### Demographic characteristics of the respondents

The demographic characteristics of the respondents who took part in the study included gender, age and the status of the school that took of the students who participated in the study.

#### *Demographic characteristics of students*

The study also sought to find out the demographic characteristics of students. Table 1 shows the distribution of the students by the demographic characteristics

Regarding gender, 45.4% of the respondents were male, while 54.6% were female. When asked about their age brackets, an overwhelming majority (96.8%) was 18 years and below, while 3.2% was above 18 years of age. When asked about the category of the school, the majority (82.6%) of the students were from sub county schools, 13% from County while 4.4% were from National schools.

#### **Demographic characteristics of teachers, HODs, BOMs and QASOs**

The study also sought to find out the Demographic Characteristics of Teachers, HODs, BOMs and QASOs. Table 2 shows the distribution of the respondents by the demographic characteristics.

With reference to gender, 67.3% of the teachers that took part in the study were male, while 32.7% of them

were female. In the same line, 64.3% of the HODs were male, while 35.7% of them were female; regarding the gender distribution of Quality Assurance and Standards Officers (QASOs), all of them were male.

Regarding the age bracket, it is clear from Table 2 that teachers whose age was between 20-30 years accounted for 40.6%, another 25.0% of them were between 31 and 40 years, while 28.1% of them were between 41-50 years. Only 6.3% of the teachers were above 50 years. With reference the age bracket of the HODs, 35.7% of them were between 31 and 40 years old while, 50% of the HODs were between 41 and 50 years, and only 14.3% of them were above 50 years. Concerning the age bracket of the BoM participants 9.5% were 30 years and below and between 31 and 40 years. Nearly a half (42.9%) of them were aged between 41 to 50 years and 38.1% were above the age of 50 years.

In terms of the qualifications BoM, 66.7% had attained undergraduate education degree whereas 33.3% attained Postgraduate academic qualification. Regarding the Academic qualification of the QASOs, the study found out that, all the QASOs had Postgraduate academic qualification, which is clear indication high academic and professional qualification, which is a requirement for serving at that high level in the Ministry of Education. About the education level of teachers, 81.6% of the teachers had an undergraduate University Degree while 8.2% of them had a Diploma Certificate. The remaining 10.2% of the teachers had a Postgraduate academic qualification, which could be either a Postgraduate Diploma or a Master's Degree or a Doctorate Degree.

In terms of work experience, 50.0% of the teachers had a work experience of 1-5 years while 37.5% of them had work experience of 6 to 10 years, and 9.4% of them had 11 to 15 years. Those that had a work experience of 16 to 20 years accounted for 3.1%. About the work experience for the HODs, 71.4% of them had a work experience of between 11 and 15 years while 28.6% of them stated that they had worked for a period of between 6 and 10 years. The study also sought to establish the years of work experience among the BoM members who participated in the study. with reference to the work experience of the BOM, 57.1% of them had work experience of between 6-10 years, 23.8% of the BOM members had a work experience of between 1 and 5 years, while 14.3% of them indicated that they had a work experience of between 11 and 15 years, and only 4.8% of them had a work experience of above 15 years. Regarding the work experience of the QASOs, the study found out that, all the QASOs had work experience of more than eleven (11) years in the Ministry of education.

#### **Influence of BOM's infrastructural practices on students' academic performance in public secondary schools**

In finding out the influence of BOM's infrastructural

**Table 1.** Distribution of students by demographic characteristics.

<b>Demographic variable</b>	<b>Frequency</b>	<b>Percentage</b>
Gender		
Male	98	45.4
Female	118	54.6
Total	216	100
Age category		
18 years and below	209	96.8
Above 18 years	7	3.2
Total	216	100
School category		
National	10	4.4
County	28	13.0
Sub-county	178	82.6
Total	216	100

**Table 2.** Demographic characteristics of teachers, HODs, BOMs and QASOs.

<b>Demographic characteristic</b>	<b>Teacher</b>		<b>HODs</b>		<b>BOMs</b>		<b>QASOs</b>	
	<b>F</b>	<b>%</b>	<b>F</b>	<b>%</b>	<b>F</b>	<b>%</b>	<b>F</b>	<b>%</b>
Gender								
Male	58	67.3	9	64.3	15	70.0	3	100%
Female	28	32.7	5	35.7	6	30.0	-	-
Total		100		100		100		100
Age bracket								
20 – 30 years	35	40.6	-	-	2	9.5	-	-
31 – 40 years	22	25.0	5	35.7	2	9.5	-	-
41 – 50 years	24	28.1	7	50	9	42.9	3	100
Above 50 years	5	6.3	2	14.3	8	38.1	-	-
Total		100		100		100		100
Academic qualification								
Postgraduate	9	10.2	9	64.3	7	33.3	3	100
Undergraduate	70	81.6	5	35.7	14	66.7	-	-
Diploma certificate	7	8.2	-	-	-	-	-	-
Total		100		100		100		100
Work experience								
1 – 5 years	43	50.0	-	-	5	23.8	-	-
6 – 10 years	32	37.5	4	28.6	12	57.1	-	-
11 – 15 years	8	9.4	10	71.4	3	14.3	3	100
Above 15 years	3	3.1	-	-	1	4.8	-	-
Total		100		100		100		100

practices on students' academic performance in public secondary schools, views from different respondents were examined. The respondents who gave their

information included the students, teachers, HODs and the QASO respondents.

The infrastructural practices covered in this section

include physical resources and instructional resources

### ***Influence of BOM's physical infrastructural practices on academic performance***

The respondents were asked whether physical infrastructure had an influence on students' academic performance. Table 3 shows the distribution of the respondents.

Table 3 shows that 69% of the student participants disagreed with the statement that there were adequate classrooms in their school only 28.2% in the other hand agreed with the statement. On whether schools have adequately equipped libraries, 61.9% of the students disagreed with the statement. Only 16.7% of the respondents on the other hand felt that their school had adequately equipped libraries. On whether there was a computer laboratory in the school, 60.2% of the students strongly disagreed with the statement while 4.2% of them were undecided. However, 35.7% of the students felt that the computer laboratories were adequate for the students. With regards to whether there were adequate

science laboratories in the school, 40.3% of the respondents agreed with the statement. More than a half (55.1%) of the students on the other hand did not have science practical laboratories. Only 4.6% were undecided with the matter.

On the aspect of whether there are enough workshops for technical subjects like home-science, 62.1% of the students disagreed with the statement; a third (33.7) of the respondents had enough workshops for technical subjects. On whether there were enough and spacious offices for teachers, more than a half (57.4%) of the students disagreed with the statement. More than a third (37%) of them agreed, while 5.6% of the respondents remained undecided. Regarding the school having enough houses for the staff, more than a half (54.2%) of the students disagreed with the statement, (40.8%) of the respondents agreed with the statement, while 5.1% of them were undecided on the same item. Concurring with the same, QASO 3 indicated that "The BOM had to raise funds for building schools' infrastructural facilities like more classes and laboratories when required, and that it was what the BOMs needed undertake in school, in order to enhance good performance in the students' studies."

**Table 3.** Students' level of agreement on the influence of BOM's physical infrastructural development practices on students' academic performance.

Statements	SA		A		UD		D		SD	
	F	%	F	%	F	%	F	%	F	%
(i) Our school has adequate and spacious classrooms;	37	17.1	24	11.1	6	2.8	86	39.8	63	29.2
(ii) Our school has a well-equipped library;	11	5.1	25	11.6	3	1.4	107	49.5	70	32.4
(iii) There is a computer laboratory in the school;	17	7.9	60	27.8	9	4.2	72	33.3	58	26.9
(iv) Our school has well-equipped physics chemistry, and Biology science laboratories;	38	17.6	49	22.7	10	4.6	52	24.1	67	31.0
(v) Our school has workshops for Home Science and agriculture subjects;	36	16.6	37	17.1	9	4.2	31	14.4	103	47.7
(vi) Teachers have spacious and enough offices in our school;	32	14.8	48	22.2	12	5.6	72	33.3	52	24.1
(vii) There are adequate staff houses in our school;	44	20.4	44	20.4	11	5.1	54	25.0	63	29.2

**Key:** SA: Strongly Agree; A: Agree; UD: Undecided; D: Disagree, SD Strongly Disagree; n = 216.

### ***Influence of BOM's instructional resources practices academic performance***

The study further sought to establish the influence of instructional resources (teaching and learning) on students' academic performance. The students were asked to indicate the level of agreement on the items on the influence of the BOM's instructional resources on students' academic performance, as indicated in Table 4.

On whether the BOM's provision of instructional resources had an influence on students' academic performance, the majority (77.1%) of the students agreed

with the statement, while 18% of them indicated that learning materials such as textbooks and workbooks were inadequate in their schools.

The findings in Table 4 further show that 72.2% of the students disagreed with the statement that the libraries were well stocked with supplementary books and revision materials. Some (25.5%) of the respondents on the other hand were in agreement with the statement. Only a few 2.4% of them were undecided.

On the same item of school infrastructure, the Heads of Departments who participated in the study were asked whether the libraries were well

**Table 4.** Distribution of the students' level of agreement on items on the influence of the BOM's instructional on students' academic performance.

Statements	SA		A		UD		D		SD	
	F	%	F	%	F	%	F	%	F	%
(i) Our school has adequate teaching and learning resources such as reference textbooks and workbooks	84	41	74	36.1	10	4.9	15	7.3	22	10.7
(ii) The school library has relevant supplementary books and revision materials	32	15.4	21	10.1	5	2.4	75	36.1	75	36.1
(iii) Our teachers use laptops and tablets in teaching	17	8.4	40	19.8	7	3.5	37	18.3	101	50.0
(iv) There are sufficient blackboards, tables, lockers and chairs in class	30	14.8	22	10.8	7	3.4	88	43.3	56	27.6

Key: SA: Strongly Agree; A: Agree; UD: Undecided; D: Disagree; SD Strongly Disagree; n = 216.

stocked with reference reading and learning materials. Ssch8 HOD pointed out that:

Despite that my school performs slightly better than most schools in Nyamira, we still have problems to do with the availability of the school infrastructure such as a library, that many students get an opportunity to study in the school library or even to borrow books from the library due to its limited space and learning and revision materials respectively, but I would say the high enrolment/admission has also affected the students to facility rations (Ssch8 HOD, May 14, 2019).

With regards to whether teachers use laptops and tablets in teaching, only 28.2% of the respondents agreed with the statement. More than two thirds (68.3%) of the students on the other hand, felt that the statement was not true.

On whether there were sufficient blackboards, tables, lockers, and chairs in classes, 70.9% of the students disagreed with the statement, with 25.6% of them agreeing with the statement. This shows that there were insufficient blackboards, tables, lockers, and chairs in class among the schools in the region.

Concurring with the students, Ssch13 HOD reported the following:

...inadequacy of resources in a school set-up such as utilities can totally discourage teaching and learning activities... for instance, some students avoid taking a bath as a result of inadequate utility (water) and bathrooms, which may not only contribute to poor personal hygiene but also lead to poor sanitation/general cleanliness of the learning environment at times poor sanitation leads to poor health which

consumes learning hours as the students go to seek health services... (Ssch13 HOD, May 14, 2019).

#### Other BOM's infrastructural developments practices

The students were asked to indicate their level of agreement on the influence of other infrastructural on students' academic performance, as shown in Table 5.

On whether classrooms are large enough, well ventilated and have enough windows, slightly more than a third (34%) of the respondents agreed with the statement. only 17.2% of the students felt that the statement was not true. Regarding whether schools are connected to clean drinking water source and electricity, 38.1% of the respondents felt that the statement was not true. Only 17.1% agreed with the statement.

On whether the schools had adequate toilets that are in good condition, slightly more than a third (38.5%) of the respondents agreed with the statement. More than a half on the other hand felt that the statement was not true. The results tend to be in line with qualitative information from QASO member who reports the following:

Recently, the enrollment rates have increased greatly in public secondary schools as nearly all children are taken to school because the government announced free primary and secondary education. For instance, the campaign to achieve a 100 percent transition from primary to secondary schools has created congestion in classrooms, dormitories, school fields, and toilets, as well, learning materials are not adequate in some institutions...this has not only affected the learning environment but also has negatively affected the education quality (QASO 2, May 17, 2019).

**Table 5.** Distribution of the students by influence of other infrastructural on students' academic performance.

Statements	SA		A		UD		D		SD	
	F	%	F	%	F	%	F	%	F	%
(i) Our classrooms are large, well light and ventilated that is., have large windows;	58	27.8	71	34.0	10	4.8	34	16.3	36	17.2
(ii) Our school is connected to clean drinking water source and electricity;	31	14.8	36	17.1	12	5.7	50	23.8	80	38.1
(iii) Our school has adequate toilets that are in good condition;	30	14.1	82	38.5	16	7.5	34	16.0	51	23.9
(iv) The school playground is big, and the school hall is also big;	19	9.0	65	30.8	10	4.7	23	10.9	94	44.5

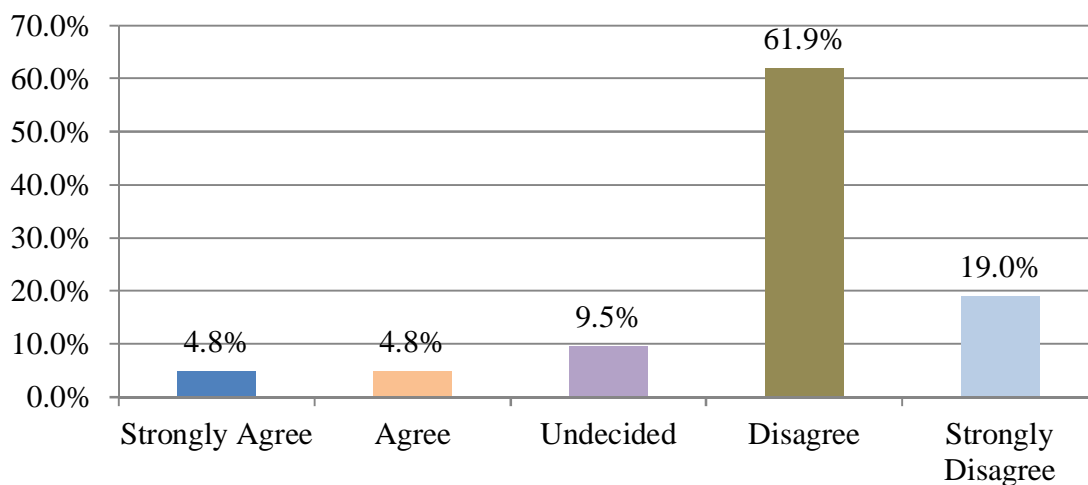
Key: SA: Strongly Agree; A: Agree; UD: Undecided; D: Disagree, SD Strongly Disagree; n = 216.

### Teachers' response on board of management infrastructural practice

When asked to indicate the extent to which they agreed that BoM carries out this practice in their school, who took part in the study 19.0% of them who strongly disagreed, nearly two-thirds (61.9%) of the teachers disagreed, 9.5% of them were undecided 4.8% agreed and 4.8% strongly agreed with the statement, as shown in Figure 1.

On the same question, one HOD stated that:

Physical infrastructure is a key determinant of both school performance and individual student's academic performance in Nyamira County...schools that perform better in the various sub-counties of Nyamira have good study environments that is., classrooms...well equipped libraries, spacious laboratories which have enough chemicals and equipment, good playing grounds, quality accommodation facilities, and enough teaching and learning materials (Ssch6 HoD, May 15, 2019).

**Figure 1.** Distribution of teachers on board of management infrastructural practice.

On whether the school had a computer laboratory, access to internet connectivity, and other ICT materials like laptops and tablets, 49% of the teachers disagreed with the statement, while 26.5% of them agreed with the statement. On the other hand, while more than half

(57.2%) of the BoM members that took part in the study disagreed with the statement that there is a computer laboratory and access to internet connectivity in their schools, a third (33.3%) of them were in consensus with the statement.



The results are in line with the views from one of the QASO respondents who reported the following:

...I know of private schools whose classrooms are equipped with digital projectors, interactive smart boards and whiteboards, and where all teachers are provided with laptops as a result of high school fees rates in the private schools, the teachers-to-students ratio is higher than the recommended of 1:30 and the students are provided with everything they need as compared to public secondary schools where most schools has a ratio of 1:60 and others 1:100...this is one of the reasons why in the recent past, the public secondary schools have been performing quite poor as compared to the private schools (QASO 1, May 17, 2019).

### Relationship between BOM's infrastructural management practice and the students' academic performance

A regression analysis was performed so as to establish whether there was a statistically significant association

between BOM's infrastructural management practice and the students' academic performance in public secondary schools in Nyamira County. Table 6 shows the regression analysis output.

The regression equation was stated as  $Y = \beta_0 + \beta_1 X_1 + \varepsilon_i$  resulting in the output equation  $Y = 2.234 + .081 X_1$

From the output, Beta had a value of .081 with a p-value of .000 implying the coefficient was significantly different from zero and thus the null hypothesis of no significant relationship between BOM's infrastructural management practices was rejected at 5% significance level in favour of the alternate. Additionally, the model shows that a unit change in infrastructural management practice resulted in 0.081 unit change in students' academic performance.

The results of R squared showed that BOM's infrastructural management practice explain only .212 (21.2%) of the variation in the dependent variable (students' academic performance) which shows a weak variability .798 (79.8%) of the variation in the dependent variable is left unexplained.

**Table 6.** Linear regression model significance of BOM's infrastructural management and academic performance.

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	2.234	.202		11.059	.000
Infrastructural management practice	.081	.0253	.936	3.205	.011

a. Dependent Variable: Students' academic performance

#### Model Summary

R	= 0.460
R-Squared	= 0.212
Adjusted R-Squared	= 0.139
Std Error of Estimate	= 0.50175
F-Statistic	= 2.894
P (F-Statistic)	= 0.0000

Note: Adapted from SPSS regression output.

From the regression results the F-ratio in the model is  $F(18, 198) = 2.894$ ,  $p(F) = .000$ , which is significant and shows that the overall regression model is a good fit for the data and that this results in a significantly good degree of prediction of the dependent variable. Since the overall F-test is significant, it is concluded that R-squared does not equal zero, and the correlation between the model and dependent variable is statistically significant.

Therefore, the study has enough evidence to reject the null hypothesis ( $H_0$ : There is no statistically significant association between BOM's infrastructural management practice and the students' academic performance in

public secondary schools in Nyamira County).

## DISCUSSION

The study established that a majority (77.1%) of the students agreed that teaching and learning materials such as textbooks and workbooks were adequate in their schools while 18% of them indicated that they were inadequate. This would be attributed to a change in Government policy in the distribution textbook directly from suppliers to schools as of opposed to disbursement

of funds to schools for purchase of textbooks and thus sealing any loopholes for misuse of funds meant for textbooks by head teachers (Muraya, 2017). The study findings revealed that the learning resources such libraries are insufficiently stocked with relevant reading materials. According to the study findings, 72.2% of the students disagreed with the statement that the libraries were well stocked with supplementary and revision materials. This implies that, majority of the public schools in Nyamira County did not have well-equipped libraries. Concurring with the study findings, Kerubo 2013 pointed out that lack of a well-equipped library at school would affect students' study behaviors by denying them a researching platform for the new topics or better understanding of content by the use of questions or a variety of books. These negative effects of lack of Infrastructure were noted by a study by Nduku (2015)) who found out that lack of sufficient infrastructural facilities in schools, affects the whole teaching and learning process.

On whether there were sufficient blackboards, tables, lockers, and chairs in classes, 70.9% of the students disagreed with the statement. Qualitative data from the principles also gave the same results. Ssch8 principal noted the following, "Availability of well-equipped and stocked library can enhance a good environment for learners. This saves a lot of time as the learner utilizes them instead of wasting time moving from one place to another, searching for the textbooks..." This shows that there were insufficient blackboards, tables, lockers, and chairs in class among the schools in the region. These findings contradict what Dolva et al. (2011) pointed out and noted that the relationship between the student and the classroom environment, more so classroom furniture, needs to be put in place in order to promote academic performance for all students in inclusive classrooms.

The study findings further revealed that proper and adequate infrastructure enhances good performance as it creates conducive environment for high concentration in studies among the students. Lack of adequate physical facilities hinders the implementation of curriculum as it affects instructional programs in the school. The study findings concur with a study conducted by Said (2016). His findings revealed that adequacy of infrastructure facilities can promote teaching and learning, to a great extent. Thus schools whose classrooms are equipped with digital projectors, interactive smart boards and whiteboards, greatly motivate teachers to prepare their students adequately national examinations. According to Mghana (2013) inadequate physical facilities like classes, laboratories, and learning resources, affects teachers motivation in their instructional roles which consequently affects students' academic performance negatively. Concurring with other studies, Ngithi (2013) in their study revealed that, as a result of the limited physical facilities in the schools and lack of adequate administrative offices made the head teachers to experience acute administrative problems, which adversely affected the

effectiveness of instructional programmes in the schools.

The study also established that most schools (68.3%) did not have well equipped computer laboratory, access to internet connectivity, and other ICT gadgets like laptops and tablets for teachers use as well as students. The findings concur with a study conducted by Kanyoi (2019) that revealed inadequate ICT infrastructure in public secondary schools hinders integration of information communication technology in teaching and learning that helps in improving the quality of instruction by the teachers as well as enhancing students. This negatively affects both teachers and students as they cannot integrate use of information communication technology in teaching and learning. These study finding relates well with a study conducted by Kairo (2013) who established that lack of ICT integration in teaching and learning hinders the teachers and students the opportunity to access different learning materials and additional information on their subject online.

## Conclusion

It is clear that high quality infrastructure in a school setting enhances better instruction by the teachers and improves student's outcomes which contributes abundantly to the county's manpower requirements. The study therefore concludes that Board of Management's infrastructural management practice affects the students' academic performance. The findings reveal a statistical significant association between the independent and the dependent variable. Regression analysis revealed that an improvement in BOM's infrastructural management practice by one unit would result in the improvement of the students' academic performance by 0.081 units holding other factors constant. The study concluded that inadequate provision of infrastructural facilities in schools by the BOM affects the teaching and learning activities which negatively affect the students' academic performance in public secondary schools in Nyamira County.

## RECOMMENDATIONS

The board of management should purpose to create a conducive teaching and learning environment in public secondary schools by ensuring adequate infrastructural facilities such as classrooms, laboratories, library, teaching and learning materials/ resources, well equipped computer lab, workshops for technical subjects, sanitary facilities, utilities e.g., continuous power source and clean water, dormitories, dining area, and playgrounds among others. This is because a conducive school environment motivates teaching and learning activities, which contribute to improved academic performance of students. In addition, a supportive and favourable school

environment enriched with enough learning facilities, and supportive board of management infrastructural practice makes students more comfortable and concentrate more on their academic activities that resulted in high academic achievement.

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