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Relationship between School Environmental Factors and Academic Performance

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Abstract: **The purpose of this study was to determine the relationship between school environment factors and academic performance in public boarding secondary schools of Nyakach sub- county, Kenya. The study was guided by two theories, Education Production Function of Hanushek (1998-2008), which states that cognitive skill of a population are powerfully related to the economic growth. The effective school model of Lezotte (2010) partly by that posits on school learning climate that is the correlates of effective schools namely: instructional leadership, expectations for success, home-school relations, frequent monitoring of students' progress, and opportunity to learn for students. The study targeted secondary schools' director of academics, teachers, and students of all the 8 public boarding secondary schools in Nyakach sub-county. A total sample size of 444 was determined. Stratified sampling technique was used to select 5 schools for the study. Simple random sampling was used to select 146 teachers and 293 students. Purposive sampling was used to select 5 deans of academics of sampled secondary schools of Nyakach sub-county. Prior to the actual data collection, a pilot study was conducted to ascertain the reliability and validity of the instruments. ANOVA results revealed that, four schools put emphasis on the seven factors, with only one school giving differences in mean significant results. Pearson Correlation Coefficient analysis revealed significant positive correlations between the KCSE mean averages (2011-2015) and the seven factors. Multiple regression analysis revealed that the two factors: school resources and parent- School relations explained 98.6% of the positive result in academic performance among the sample schools. The study recommended that secondary schools put emphasis on utility of the seven factors identified to positively influence academic performance.**

Keywords: **School environmental factors, academic performance and hypothesis.**

1. INTRODUCTION

1.1 Introduction:

Academic performance has been the major determinant that influences placement and even success or failure of students. Academic performance differs between day and boarding secondary schools each year (Ngeno, Simatwa & Soi, 2013). On the other hand, researchers for decades have been concerned with one question, why some public schools consistently perform well in examinations while others consistently perform poorly. Lezotte, Skaife and Holstead (2002), and Daggett (2005), demonstrated that public schools could make a difference – even if their student body comprises of students whose families had disadvantaged backgrounds. These researchers had discovered that the successful schools had unique characteristics and processes, which help all students, learn at high levels (Kirk & Jones, 2004). However, there has been lack of consensus on the meaning and measurement of school environment factors both in research and practice (Achieng 2012).

There are enormous variation in the school environment factors of secondary schools that carry out the function, of ensuring good student academic performance. Under school resources, the researchers covered factors such as school facilities. Usman (2007) noted that central to the education process are educational resources which play an important role in the achievement of education objectives and goals by enhancing effective teaching and learning. Pine et al (2006) found that students in the hands-on and textbook groups performed similarly on the multiple choice test and performance assessments (one of four performance assessments showed a significant advantage for the hands-on students). Students in the hands-on classes rated science higher (4.44) than those in the textbook classes (4.23). This difference is significant ($t(970) = 3.55$, $p<.001$) but small, possibly due to ceiling effects of the 5 point scale. Looking at the same data in a different way, a higher number of students rated science as their favorite subject in hands-on classes (69%) than students in textbook classes (56%) (Pine *et al*, 2006).

The literature on sustainability sees the quality of school leadership as a key to continued organizational learning and improvement Lezotte (2010) led to a conclusion that in the effective school, the principal acts as an instructional leader and effectively and continually communicates the mission of the school to staff, parents, and students. In addition, the principal understands and applies the characteristics of instructional effectiveness in the management of the instructional programme. Clearly, the role of the principal as the articulator of the mission of the school is crucial to the overall academic performance of the school.

Under monitoring student progress**,** the school policies category includes various accountability issues such as whether or not the school conducts self-evaluations and monitors student progress and whether or not the school communicates student performance information to parents or the local authorities (PISA, 2005). In the effective school, pupil progress on the essential objectives are measured frequently, monitored frequently, and the results of those assessments are used to improve the individual student behaviours and performances, as well as to improve the curriculum as a whole (Lezotte, 2001).

Opportunity to learn/Time on tasks is an important aspect of academic performance. Given that actual time-on-learning appears to be a more important determinant of student success in school, consideration should be devoted first to strategies that increase the overall *quality* of instructional time for all students. For students who may be struggling to meet standards or for priority program areas that have been targeted for significant improvement by a school district, there could be an additional benefit to extending the *quantity* of instructional time, but only if it is used effectively and productively (Aronson, Carlos & Zimmerman, 1998).

The strong relationship between expectations and academic achievement has been well established both theoretically and empirically (Johnson, Livingston, Schwartz, and Slate, 2000; Marzano, 2003). Schools with exceptional levels of academic achievement consistently demonstrate high expectations and goals supported by data-driven collaboration and ongoing assessments (Schmoker, 2001). Within the individual classroom, there was a clear correlation between teacher expectations and student achievement. “High expectations represent an overall orientation toward improvement and growth in the classroom, which has been demonstrated to be a defining characteristic of benchmark schools. Effective teachers not only express and clarify expectations for student achievement, but also stress student responsibility and accountability for striving to meet those expectations (Stronge, 2002).

High, clear, and consistent expectations also supported students’ self-confidence, their belief that their efforts led to success, and their engagement in school (Gambone, Akey, Klem, & Summers, 2004).

A series of studies by Lezotte (2010) showed that home environment is one of the key correlates of effective schools. According to Lezotte’s (2010) Effective schools model, home-school relations is a general term used to describe a myriad of activities, projects, and programs that bring parents, businesses, and other stakeholders together to support student learning and schools. Wright and Saks (2008) are of the opinion that inviting parents to identify academic goals and standards and quantify measures of progress sends the message that what students learn and how well they learn it is not an issue just for teachers and administrators but is a real priority for the community as well.

Studies have been conducted showing the status of focus on mission and vision in secondary schools in Kenya. . In the first one, the Kenya Education Management Capacity Assessment (KEMACA, 2008) conducted a survey aimed at ascertaining capacity weaknesses in the Kenyan education system, which might impede the proper execution of the Kenya

Education Sector Support Programme (KESSP). The survey established that 27% of the schools did not engage in strategic planning at all. In addition, of those who claimed they did, only 49% were able to produce the strategic plans. So, the survey (KEMACA, 2008) concluded that there is clearly a problem with school planning skills. On strategic planning, KEMACA (2008) concluded that, mission and vision statements for Kenyan schools tend to be rather general and not sufficiently focused on outputs and outcomes. The ability to strategize in order to turn the mission and vision into operational plans is not yet optimal. Plans often read more like lists, with little apparent sense of prioritization. Top leadership is clear and able to prioritize, but mid-level management does not seem to have the skills needed, or the tradition, to turn top-level visions into operational plans (KEMACA, 2008).

In Kenya, studies have reported findings on what accounts for school environment factors and academic performance. For instance, Mucai (2013), had done a study on availability and utilization of educational resources in Mbeere, Embu County. In her study availability and utility of school libraries, laboratories and textbook contributed immensely on good academic performance in boarding schools which was contrary in mixed day schools.

Lloyd, Mensch and Clark (2000), based on a study of primary schools in Kenya, established that there was more to high academic performance than the development of academic competency, and there was more to the quality of the school environment than time to learn and material resources for the basic curriculum, and pedagogical practices. The study found out that low performing schools were characterized by inadequate school facilities, lack of active participation of students in the teaching-learning process, and poor overall school atmosphere in terms of organization, rules and student-to-student interaction. In his study that focused on determinants of differential KCSE performance in Kiambu and Nyeri counties in Kenya, Nyagosia, (2011) noted that the seven correlates of effective school model by Lezotte positively influenced academic performance to an extent of 11.5%.

When it came to academic performace at KCSE among schools and the sub-counties, statistics at County level shows that Nyakach Sub-County has not been perfoming exceptional well. Nyakach Sub-County has been registering a lower mean score compared to the other six sub-counties. In addition, some boarding schools in this sub-county consistently perform well while others continously perform poorly at K.C.S.E. What were not clear were the factors that enabled some boarding schools to perform well while others kept performing poorly. This study showed how, school resources, instructional leadership, expectations for success, home school relations, monitoring of students' progress, opportunity to learn/time on tasks and clarification of vision and mission, the facets of school environmental factors, influence academic performance in Nyakach sub-county.

1.2 Statement of the Problem:

Majority of the studies focused on socio-economic factors especially on management, and psychological factors. However, studies on school environmental factors have had more on school resource factors such as textbooks, laboratory teacher resource, among others done separately from social climate factors such as instructional leadership, opportunity to learn on task, frequent monitoring of students' progress records, among others. Differences in educational outcomes of students indicate that the impact of these factors in our current public boarding school system is limited. Furthermore academic performance at KCSE in public boarding schools is mostly below average. This study therefore sought to establish the presence of school environmental factors mentioned and how these factors influenced academic performance at KCSE.

1.3 Research Objectives:

To establish relationship between school environmental factors and academic performance at KCSE of Public Boarding Secondary Schools.

To establish the extent the school environmental factors are related to students' academic performance at KCSE in Public Boarding Secondary Schools.

1.4 Research Hypotheses:

There is no significant relationship between school environmental factors and academic performance at KCSE in Public Boarding Secondary Schools.

School environmental factors are not significant regression predictors of students' academic performance at KCSE in Public Boarding Secondary Schools.

2. RESEARCH DESIGN AND METHODOLOGY

The researcher used cross-sectional survey research design. According to Cohen, Manion and Morrison (2005), cross-sectional survey research is one that engaged a specified sample of a population at a particular point in time. It is called cross-sectional because the information about independent variable and dependent variable that is gathered represents what is going on at only one point in time (Diane & Olsen, 2004).

The choice of this research design for the study is based on the fact that the researcher did not manipulate variables. The dependent variable of the study is academic performance, which was measured by the KCSE mean scores obtained by schools for the period 2011 – 2015. The independent variables of the study was school environmental factors where a sampled population of form four students, who had more information due to their longer stay in the school was used. At the same time the data was triangulated by the teachers and the deans of academics sampled.

2.1 Study Area:

This study was conducted in boarding secondary schools in Nyakach sub-county, Kisumu County. Nyakach sub-county borders Nyando to the north, Rachuonyo to the west, Kasipul Kabondo to the south and Emuen sub-county in the Rift Valley region of Kenya to the east. Nyakach sub-county is largely rural which implies that the schools face challenges arising from this kind of environment. Nyakach sub-county was selected for study because of the relatively low performance by schools located within it. Hence, knowledge of the factors that influence academic performance should lead to making recommendation to improve the situation.

2.2 Target Population:

For this research, the target population comprised of public boarding secondary schools in Nyakach sub-county, school principals, deans of academics, teachers and Form Four students. The sub-county had eight registered boarding schools with Form Four classes (Nyakach District KCSE Analysis, 2012). In the sub-county there are four boarding schools for girls, one for boys, and three mixed. The total number of form four students in the eight public boarding schools in Nyakach sub-county is 1,394 of which 681 are boys while 713 are girls. The total number of teachers is 242 with 182 males and 60 females. Eight principals and eight dean of studies was also targeted. Therefore the total target population was 1,652.

2.3 Sample Size and Sampling Procedures:

For the purpose of this study, data was collected in five public boarding secondary schools. The choice of the five schools was based on stratified sampling procedure since this was ensuring proportionality. The total sample size 439 teachers and students was sampled using simple random sampling. In simple random sampling, each item or element of the population has an equal chance of being chosen at each draw, therefore proportional allocation was used to determine each sample frame (Kothari, 2014). Purposive sampling was used to select all the five deans of studies in the sampled schools.

3. STUDY FINDINGS AND DISCUSSION.

3.1 Relationship between School Environmental Factors and Academic Performance:

This objective was to establish the relationship between school environmental factors and academic performance at KCSE in Public Boarding Secondary Schools in Nyakach Sub-County. The study objectives were accompanied by the null hypothesis that stated, "There was no significant linear relationship between school environmental factors and academic performance at KCSE in Public Boarding Secondary Schools in Nyakach Sub-County". To address this objective first, a correlation analysis was conducted to determine whether there was a significant correlation between the KCSE mean averages from 2011 to 2015 and the scores obtained on the seven correlates. Table 3.1 shows the KCSE mean scores obtained by the participating schools from 2011 to 2015, and the average mean scores for the period.

Table 3.1: Schools' KCSE Mean Scores obtained and the average Mean Scores

Schools	KCSE Mean Scores for the Years 2011 to 2015					
	2011	**2012**	**2013**	**2014**	**2015**	**Average**
SCH 1	7.50	6.80	7.00	7.20	7.50	**7.20**
SCH 2	Y	8.00	8.60	8.90	9.30	**8.70**
SCH 3	8.16	8.36	8.96	8.64	8.29	**8.48**
SCH 4	5.40	5.15	6.41	7.96	8.05	**6.59**
SCH 5	4.50	3.57	3.23	3.00	3.30	**3.52**
Grand Mean	**6.39**	**6.376**	**6.84**	**7.14**	**7.288**	**6.898**

The average mean scores for four schools were above **6.00** showing that their academic performance were average. SCH 5 had performance at KCSE was below average with a average mean score of **3.52**. This could be because of the lower entry behavior of the student in that school.

Table 3.2 below shows the correlation coefficients for average KCSE mean scores for the period 2011 to 2015 across the seven correlates of effective schools.

Table 3.2: Correlation Coefficients of Average KCSE Mean Scores across the Correlates

Schools	KCSE Mean Scores for the Years 2011 to 2015		
	Correlation co-efficient (r)	**Sig.**	**N**
School Resources	0.979	0.004	5
Instructional leadership	0.976	0.004	5
Expectations for success	0.901	0.037	5
Home-school Relations	0.926	0.024	5
Monitoring of students' progress	0.828	0.084	5
Opportunity to learn/ time on tasks	0.959	0.010	5
Clarification of vision and mission	0.623	0.262	5

***Significant at p<0.05**

As shown in Table 3.2, there were significant correlations, at $p<0.05$, between the average KCSE mean scores for the period 2011 to 2015 and the following correlates: School Resources, Instructional leadership, Expectation for success, Home-school relations, Monitoring of students' progress, Opportunity to learn/time on task and clarification of vision and mission. The correlation coefficients for all the seven factors were positive, meaning that high scores on these factors correlated with high KCSE mean scores. This implied that schools putting more emphasis on these factors recorded better KCSE mean scores than those putting less emphasis on these factors. Again this confirmed that effective schools were characterized by provision of adequate School Resources, strong Instructional leadership by the administrators, a climate of high Expectations for success/achievement, positive Home-school Relations, prompt and timely Monitoring of students' progress, Opportunity to learn/ time on tasks and outright Clarification of vision and mission of the school (Lezotte, 2010; Achieng, 2012). It should also be noted that the correlation coefficients (*r),* were high and positive, meaning that there were significant and very strong relationships between KCSE performance and each of the seven correlates. This findings contradicted the findings by Nyagosia, (2011) that showed the correlation coefficients, r, as being low, although significant, the relationships were weak.

3.2 The extent to which school environmental factors influence students' academic performance:

In order to establish the relative contribution of each effective schools factors on academic performance, the following multiple linear regression model using the backwards method was specified with the average KCSE mean scores for the period 2011 to 2015 as the dependent variable.

$Y = a_1X_1 + a_2X_2 + a_3X_3 + a_4X_4 + a_5X_5 + a_6X_6 + a_7X_7 + c$

Where:

Y = Academic performance (Average KCSE mean scores for the schools from 2011 to 2015)

X_1 =School Resources

X_2 = Emphasis on instructional leadership

X_3 = Expectations for success

X_4 = Home-school Relations

X_5 = Monitoring of student's progress

X_6 = Opportunity to learn/ time on tasks

X_7 = Clarification of vision and mission

c = Constant; and $a_1 ... a_7$ are regression coefficients

A backward regression method was adopted for this analysis. First, all the predictor variables were entered at once and then those variables with significance levels below the default criterion of 0.1 were removed. Table 3.3 shows the regression model summary.

Table 3.3: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	1.000	1.000		
2	.995	.990	.962	.06263
3	.993	.986	.971	.05408

a. Predictors: (Constant), Clarification of vision and mission, Monitoring of students' progress, Home-school Relations, School Resources

b. Predictors: (Constant), Clarification of vision and mission, Home-school Relations, School Resources

c. Predictors: (Constant), Home-school Relations, School Resources

d. Dependent Variable: Average KCSE Mean Scores for the period 2011 to 2015

Table 3.3 shows an R-Square value of 1.000, for model 1 where the four predictors (Clarification of vision and mission, Monitoring of students' progress, Home-school Relations, School Resources) were included. This means that 100% of the variance in Average KCSE Mean Scores for period 2011 to 2015 is associated with changes in all the seven variables (Clarification of vision and mission, Monitoring of students' progress, Home-school Relations, School Resources). The variables; instructional leadership, expectations for success and opportunity to learn/time on tasks are removed because they appear to be non-significant predictors as their sig. values are greater than 0.05. In model 2 when the variable (Monitoring of students' progress) is removed, then there was a very slight reduction in both R and R^2. This means the independent variables (Clarification of vision and mission, Home-school Relations, School Resources) explained 99.0% of the variation in Average KCSE Mean Scores for the period 2011 to 2015. In model 3 when the variable (Clarification of vision and mission) was further removed, again a very slight reduction in both R and R^2. Table 3.4 shows the regression coefficients for the three models.

Table 3.4: Regression Coefficients

Model	**Independent Variables**	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	.220				
	School Resources	.195	.000	.374		
	Home-school Relations	.273	.000	.365		
	Monitoring of students' progress	.255	.000	.225		
	Clarification of vision and mission	.239	.000	.177		
2	(Constant)	1.419	.656		2.162	.276
	School Resources	.339	.107	.644	3.129	.197
	Home-school Relations	.248	.143	.332	1.742	.332
	Clarification of vision and mission	.115	.164	.085	.701	.611
3	(Constant)	1.829	.256		7.132	.091
	School Resources	.364	.086	.698	4.244	.051
	Home-school Relations	.244	.123	.327	1.985	.186

Dependent Variable:

Average KCSE Mean Scores for the Years 2011 to 2015

Table 3.4 model 1 shows that the prediction equation for academic performance (Y) becomes:

Y [Average KCSE Mean Scores for the Years 2011 to 2015] = 0.195 [School Resources] + 0.273 [Home-School Relations] + 0.255 [Monitoring Students' Progress] + 0.239 [Clarification of vision and mission] + 0.220.

This means that academic performance is predicted to increase by 0.195 when School Resources goes up by one, increase by 0.273 when Home-School Relations goes up by one, increase by 0.255 when Monitoring of Students' Progress goes up by one and increase by 0.239 when Clarification of vision and mission goes up by one. The findings confirm that the effective schools model is applicable in Kenyan schools, which is in line with other studies in sub-Saharan Africa (Nyagosia, 2011; Verspoor, 2006; ADEA, 2006; Yu, 2007). The regression analysis revealed that indeed the four out of seven correlates of effective schools (Lezotte, 2010) do account for improvements in academic achievement in Nyakach Sub-County Boarding Secondary Schools. The other three correlates (instructional leadership, expectations for success and opportunity to learn/time on tasks) gave insignificant contributions and were consequently removed.

In the model 2, the four correlates (Clarification of vision and mission, Monitoring of students' progress, Home-school Relations, School Resources) that were significant in model 1 were enter and the correlate (Monitoring of Students' Progress) became insignificant and was removed. Model 2 therefore gives the following regression model;

Y [Average KCSE Mean Scores for the Years 2011 to 2015] = 0.339 [School Resources] + 0.248 [Home-School Relations] + 0.115 [Clarification of vision and mission] + 1.419.

This means that academic performance is predicted to increase by 0.339 when School Resources goes up by one, increase by 0.248 when Home-School Relations goes up by one, and increase by 0.115 when Clarification of vision and mission goes up by one.

In the model 3, the three correlates (Clarification of vision and mission, Home-school Relations, and School Resources) that were significant in model 2 were enter and the correlate (Clarification of vision and mission) became insignificant and was removed. Model 3 which is the final and is adopted gave the following regression model;

Y [Average KCSE Mean Scores for the Years 2011 to 2015] = 0.364 [School Resources] + 0.244 [Home-School Relations] + 1.829.

This means that academic performance is predicted to increase by 0.364 when School Resources goes up by one and increase by 0.244 when Home-School Relations goes up by one. The regression equation in model 3 estimates that for the sampled surveyed 98.6% of the variance in academic performance (Average KCSE Mean Scores for the Years 2011 to 2015) is explained by the two correlates; School Resources and Home-School Relations.

4. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Pearson correlation coefficient analysis revealed that there were significant correlations, at $p<0.05$, between the Average KCSE Mean Scores for the Years 2011 to 2015 and the following correlates: School Resources ((**r**) = .979; Sig=0.004), Instructional leadership ((r) = .976; Sig=0.004), Expectations for success ((r) = .901; Sig=0.037), Home-school Relations ((**r**) = .926; Sig=0.024), Monitoring of students' progress ((**r**) = .828; Sig=0.084), Opportunity to learn/ time on tasks ((**r**) = .959; Sig=0.010), and Clarification of vision and mission ((**r**) = .623; Sig=0.262). The high and positive correlation coefficients (*r)* meant that there were significant and very strong relationships between Average KCSE Mean Scores for the Years 2011 to 2015 and each of the seven correlates. This implies that schools putting emphasis on these factors record more improved KCSE mean scores than those putting less emphasis on the correlates. Linear regression analysis revealed that the two correlates (School Resources and Home-School Relations) explained 98.6% of the variation in academic performance.

The study concluded that the public boarding secondary schools in Nyakach Sub-County were characterized by students who knew their main purpose in school and are focused, teachers who attend school regularly and are punctual, keep updated professional documents and always act like winners, provide a climate conducive to teaching and learning equipped with adequate desks/lockers for students, giving students a high expectation for high performance, inviting parents regularly to discuss academic progress of students from the continuous assessment tests regularly given to students.

The study recommended that educational policy makers in the Ministry of Education should enhance school resources by ensuring that schools are equipped with all the necessary physical facilities such as science Laboratories and classrooms and other material resources. It also recommended that parent-School Relations should be more enhanced by hold academic clinics with parents of students who perform poorly to explore possible measures at the beginning of each term, discuss academic progress with individual students, ensure there are adequate instructional materials per student both for learning at school and at home and especially during the long December holidays and making sure that students set goals at the beginning of each term and that such goals are compared to their end term performance to identify causes of failure to attain targets.

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