

# Physical Facilities for Holistic Education: Lessons from Secondary Schools in Kiambu and Samburu Counties, Kenya

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## ABSTRACT

This paper is premised on the background that majority of researchers and educationists who have contributed to the discourse on education for sustainability seem to be in agreement that management of physical facilities are critical ingredients in achieving holistic and sustainable education. The study examined the application of physical facilities as determinants of holistic education in Kiambu and Samburu Counties, Kenya. The study employed an explanatory mixed methods research design, using a sample size of 707 respondents. The main research instruments used to collect data were questionnaires, interview guides and observation checklists. The findings revealed mixed results with principals attaching higher premium than the senior teachers and students on the use of physical facilities as a determinant of holistic education. The test of hypothesis revealed a significant relationship between physical facilities and holistic education. The regression analysis corroborated by qualitative data from interviews and observations led to the conclusion that the use of academic and non-academic dynamics such as physical facilities were viable and timely ingredients for sustainable and holistic educational development. It was thus recommended that educationists and school leaders and managers should adopt a well-balanced combinations of academic and non-academic variables such as physical facilities and environmental management in designing holistic education to replace the traditional use of only academic excellence.

**Key words:** Education, Environment, Physical facilities, sustainable development, Kenya.

## 1. INTRODUCTION

### 1.1. Background to the study

This paper is premised on the background that majority of researchers and educationists who have contributed to the discourse on education for sustainability have aptly argued that physical facilities are critical ingredients in achieving holistic and sustainable education. There is a large body of literature which underscores and supports the importance of physical facilities (Alimi, Batunde & Oluwole, 2012; Akafolarin, 2008; Cynthia & Mgan, 2008; Lyon, 2001; Orodho, 2013; Verndver, 2011; Timiledin, 2013). Majority of these researchers and educationists seem to be in agreement that physical facilities are important dynamics of holistic education and cannot be underestimated in any discourse related to school outcomes. In fact, some of these scholars contend that school facilities are the space interpretation and physical expression of the school curriculum and should be put at the Centre of all efforts geared towards producing meaningful education (Alimi, Batunde Oluwole, 2012; Kantim & Orodho, 2016).

The scholars emphasized that the availability, relevance and adequacy of these facilities contribute to students' achievement while unattractive school buildings, crowded classrooms, non-availability of playground and flowerbeds and surroundings that have no aesthetic beauty can contribute to poor performance. Ahunanya and Ubabudu (2006) also reiterated the provision of adequate facilities for effective teaching and learning to take place. It can be inferred from the literature that schools' facilities have a positive relationship with school effectiveness.

The school guide to environmental protection and disaster risk reduction (UN/ISDR, 2004) documents that the environment is a most precious resource that can reduce significantly the impact of disasters, and asserts that protecting the environment can also be done by school students. The Kenya Institute of Curriculum Development in collaboration with UNICEF (2012) lament that many individuals, families, institutions and sometimes entire villages, towns and cities remain vulnerable to disaster until it is too late. The vulnerability and inability to heed early warning signs and take protective measures is mainly caused by lack of awareness on the measures to be taken. The Education sector is responsible for empowering citizens with knowledge, skills, attitudes and competencies on Disaster Risk Reduction (DRR). The official position of the Ministry of Education is that the teaching of DRR, as a component of environmental education should be experiential and learner centered. The foregoing position of the Government of Kenya through the Ministry of Education emphasizes the fact that environmental education should be perceived as a lifelong process that translates into developing the learner holistically in the three main domains of cognitive, psychomotor and affective. It was against this backdrop that the choice of this topic on physical facilities and environmental education was hinged.

## 1.2. The State of the Art Review

There is a large body of literature which underscores the importance of physical facilities and environmental management (Alimi,2007; Ampofo & Orodho,2015; Alimi, Batunde& Oluwole,2012;Akafolarin,2008; Ayodele,2000;Adesola,2005; Bandele,2003;; Cynthia & Mgan,2008; Lyon,2001; Orodho.2013;Verndver,2011; Timiledin,2013). Bandele (2003) and Orodho (2013) reiterate that the importance of physical facilities cannot be relegated. School facilities are the space interpretation and physical expression of the school curriculum (Alimi, Batunde Oluwole, 2012). Facilities like modern laboratories, libraries and classrooms are to be put in place in all our schools (Orodho, 2013).

Research findings on the influences of facilities in private and public secondary schools on students' academic performance are controversial. Keeves (1978) found out that the type of school, classified as public or private did not make any difference on students' academic performance. However, Ajayi (2006), found out that school type make a difference in student academic performance. In addition, Philius & Wanjobi (2011) reiterated that the type of schools, (single sex or mixed, private or public) has effect on the academic performance of students in Mathematics..

Lyons (2001) contended that learning was a complex activity that supremely tested students' motivation and physical conditions. Teaching resources, teachers' skill, and curriculum played a vital role in a child's education (Lyons, 2001). Educators must realize that there were many elements that influenced the condition of the school facility. These elements could range from educational leadership to community involvement. There was no one element that operated in isolation (Lyons, 2001). Educators needed to be informed about the conditions of their school facilities as well as appreciate the differences that facilities could make in helping to educate their children.

The challenge facing teaching in most African countries and which also directly relates dynamics of holistic education is availability, adequacy and appropriateness of physical facilities to be used to facilitate holistic education necessary for the learner. A recent study by Bizimana and Orodho (2014) in Rwanda indicate that lack of adequate and appropriate physical facilities in the context of the heavy workload of teachers can constrain smooth interaction between the learner and learning process and threaten holistic educational development. Activities such as lesson plan and teaching aids preparation assessment of work given by the teachers and preparing charts as well as models should be motivating and relevant to the learning situation (Kinggundu Nayimili, 2009).

The other additional component of these physical facilities as one of the dynamics of holistic education is the environmental education. Bowers (1993) raises two main concerns underlining the products of our current education system and the environment. The researcher laments that the human species is in real danger of destroying its life- sustaining ecosystems, and two, that the scope of this problem challenges the adequacy of the belief systems (read education systems) and ways of thinking of the developed world. Bowers (1993) takes on the most cherished assumption of liberal humanism, modernism, and progressivism, with his critique of such taken for granted core beliefs as individualism, abstract rational thought, emancipation, progress, and the elaboration and extension of technology. Hence, the writer perceives education as one which can bring real progress as being holistic and involving active participation and focus on forces of development that are cognizant of ecological sustainability.

Adeiza (2011), Owoye (2000) and Ajayi (2002) submitted positive relationships between school facilities and school effectiveness. Hallack (1990) also highlighted facilities as a major influencing achievement in the school system. The author emphasized that the availability, relevance and adequacy of these facilities contribute to students' achievement while unattractive school buildings, crowded classrooms, non-availability of playground and flowerbeds and surroundings that have no aesthetic beauty can contribute to poor performance. Ahunanya and Ubabudu (2006) also reiterated the provision of adequate facilities for effective teaching and learning to take place. It can be inferred from the literature that schools' facilities have a positive relationship with school effectiveness. It was against this backdrop that the present study found out the relationship between school facilities and students' achievement in the affective and psychomotor domains of learning.

The study revealed that there was a significant difference in the facilities available between public and private senior secondary schools, with (t-cal 5.764 and t-table 2.021). Private schools appear to have a higher index of facilities than public schools with 68.29 and 52.42 for the private and public schools respectively. If facilities have been found to be related to academic performance, as reiterated by Akifolarin (2008), Cynthia & Megan (2008), and Philius & Wanjobi (2011), one expects a better performance in private schools than in public schools. In any case, private school proprietors appear to inject more funds on facilities than public schools. Since school facilities are related to students' achievement in the affective and psychomotor domains, efforts should be made by the government at improving upon the level of physical facilities in schools so as to improve the level of students' performance in these areas of learning.

## 1.2 The Statement of the Problem

Despite the rationale for the advocacy for the use of a combination of academic and non-academic dynamics in fostering holistic education for the learner, many researchers and educationists seem to be in agreement that a clear conceptualization of holistic education is not yet clear. It is also arguable that the concepts of holistic education and quality education have not been clearly delineated. These conceptual difficulties notwithstanding, the need to develop holistic dynamics and clear indicators of holistic education cannot be underestimated. This emphasizes a major policy lapse highlighted by DQUASO regarding the evaluation of the education system largely based on academic indicators as being certainly narrow as it does not take cognizant of other domains of education such as the affective and psychomotor which in combination constitute holistic education.

This problem is contextualized in the two counties of Kiambu and Samburu that seem to be sending mixed signals regarding the existence and magnitude of the variables of interest to this study. The two counties exhibit very diverse characteristics regarding the chosen study variables that are likely to have a significant impact on the dynamics of academic and non-academic indicators on holistic education of students in public secondary schools in the two counties. Against the background of this study isolated physical facilities to find out their likely contribution to holistic education of the learners.

## 1.3 Purpose and Objectives of the Study

The main purpose of this study was to investigate the management of physical facilities as determinants of holistic education of students in public secondary schools in Kiambu and Samburu counties, Kenya. The objective of the Study was to find out the relationship between physical facilities as determinants of holistic education for students in public secondary schools in Kiambu and Samburu Counties.

## 1.4. Research Hypotheses

The null hypothesis tested at  $\alpha = .05$  level of statistical significance was that:

H<sub>0</sub>: There is no significant relationship between physical facilities and holistic education of students in public secondary schools in Kiambu and Samburu Counties.

## 2.0 RESEARCH DESIGN AND METHODOLOGY

An explanatory sequential mixed methods research design which uses quantitative and qualitative approaches sequentially was adopted for the study (Creswell, 2005, 2012). Quantitative data was collected using questionnaires while qualitative data employed use of interviews and focus group discussions (Brooks, 2009; Orodho, 2009a, 2009b; Orodho, Nzabwirwa, Odundo, Waweru & Ndayambaje, 2016). Using Slovenes formula, a sample of 20 principals, 76 senior teachers, 533 Form III students, 76 BoM and two QUASO was drawn yielding a total sample size of 707. Stratified random with equal allocation was employed to select 624 out of 707 subjects (Orodho, Khatete & Mugiraneza, 2016). The questionnaires for principals, students and senior teachers were piloted to determine their validity and reliability prior to data collection for the first phase. The observation checklists and interview guidelines for principals, senior teachers, members of BoM as well as Quality Assurance and Standards Officers were similarly checked dependability by using overlapping methods of inquiry and credibility through interactive and tactical approaches prior to data collection (Orodho et al. 2016). Quantitative data were analyzed using the Statistical Package for Social Sciences (SPSS) Computer programme version 20 to generate both descriptive and inferential statistics (Orodho, Ampofo, Bizimana & Ndayambaje, 2015). The qualitative data were analyzed thematically (Orodho, 16).

## 3.0 FINDINGS AND DISCUSSION

### 3.1. Rating of Physical facilities and Holistic Education

Respondents were requested to rank some aspects of the status of physical facilities in their schools and state their perception regarding the contribution of such facilities to holistic education. Table 1 shows that the mean for the seven items constituting physical facilities and environmental management ranged from 2.5568 (SD= .95277 to 3.2491 (SD= 1.02816). The highly ranked aspect of physical facilities and environment considered to contribute to holistic education, with a mean of 3.2491 and standard deviation of 1.0281 was that Physical and environmental education contributes to holistic education. The results are displayed in Table 1.

The second highly ranked aspect was physical facilities should be one of the criterion for holistic education cited by a mean of 3.0860 and standard deviation of 1.02174 by all respondents. Environmental education helps the development of affective skills was the third highly ranked aspect of physical and environmental education followed closely by School has adequate physical facilities for teaching and learning at position 4, both considered to contribute to holistic education.

**Table1 : Physical facilities and Environment and Holistic Education**

Status	Mean	SD	Rank
School has adequate physical facilities for teaching and learning	3.0128	1.08117	4
Adequate physical facilities result into enhanced environment	2.5877	1.07524	6
Appropriate physical facilities foster development of affective skills	2.8755	1.02941	5
Adequate physical facilities contributes to holistic education	2.5568	.95277	7
Physical facilities should be one criterion for holistic education	3.0861	1.02174	2
Environmental education helps the development of affective skills	3.0860	1.02771	3
Physical and environmental education contributes to holistic education	3.2491	1.02816	1

Appropriate physical facilities foster development of affective skills and the contention that adequate physical facilities result into enhanced environment were ranked at position 5 and 6, respectively. At last position 7 was that adequate physical facilities contribute to holistic education.

### 3.2 Physical facilities and Holistic Education by respondent and Locale

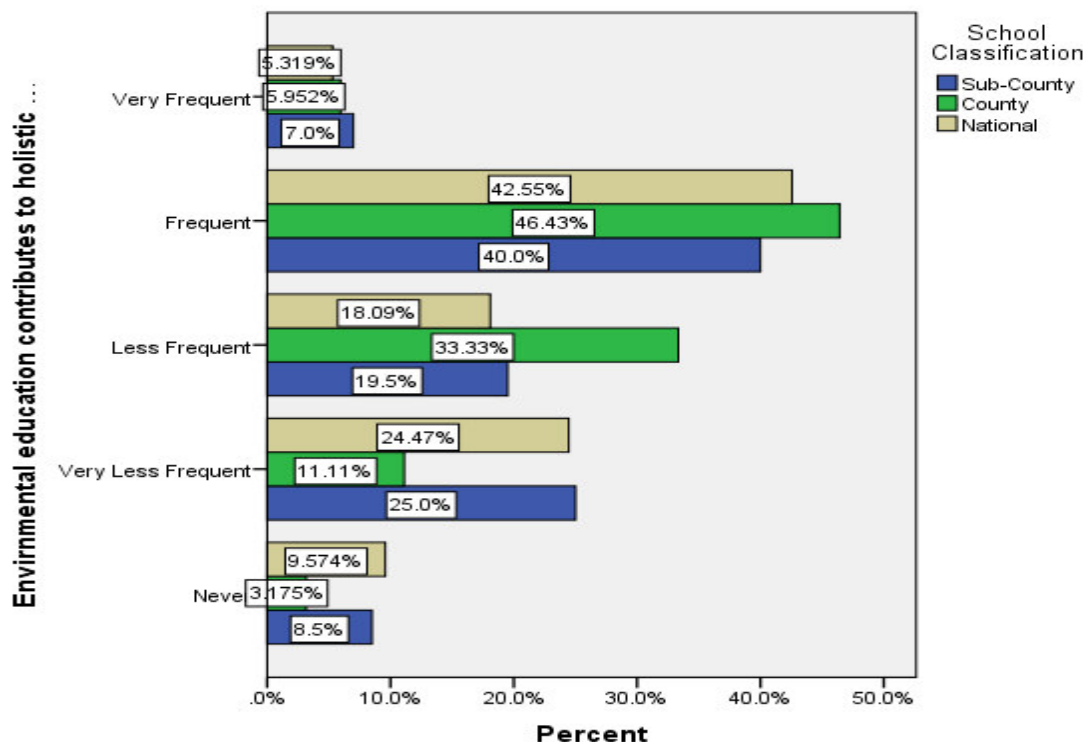
A follow up of the findings was made in an attempt to find out the extent to which the views of the respondents regarding physical facilities and environmental education to holistic education differed across the study locales of Kiambu and Samburu counties. Cross-tabulations of type of respondents by locale yielded results presented in Table 2. Table 2 carries data that revealed that all principals in Kiambu and Samburu Counties rated physical facilities and environmental education as either important or very important contributory factors to holistic education.

**Table2: Cross-tabulation of Responses regarding physical facilities by Location**

Respondent	Response	Kiambu County		Samburu County		Total	
		N	%	N	%	N	%
Principal	Important	7	58.3	7	87.5	14	70.0
	Very Important	5	41.7	1	12.5	6	30.0
	Total	12	100.0	8	100.0	20	100.0
Senior Teacher	Never	8	16.7	2	7.1	10	13.2
	Very Little Importance	21	48.7	18	64.3	39	51.3
	Little Importance	11	22.9	3	10.7	14	17.1
	Important	8	16.7	5	17.9	13	17.1
	Total	48	100.0	28	100.0	76	100.0
Student	Never	19	7.3	10	5.3	29	6.4
	Very Little Importance	102	39.2	82	43.2	184	40.9
	Little Importance	66	25.4	67	35.3	133	29.6
	Important	65	25.0	25	13.2	90	20.0
	Very Important	8	3.1	6	3.2	14	3.1
	Total	260	100.0	190	100.0	450	100.0
Total	Never	27	8.4	12	5.3	39	7.1
	Very Little Importance	123	38.4	100	44.2	223	40.8
	Little Importance	77	24.1	70	31.0	147	26.9
	Important	80	25.0	37	16.4	117	21.4
	Very Important	13	4.1	7	3.1	20	3.7
	Total	320	100.0	226	100.0	546	100.0

In contrast, only 16.7 % and 17.1% of senior teachers from Kiambu County and Samburu Counties rated highly the physical facilities and environmental education factors as contributing to holistic education. Similarly, while only 20.5 % of students from Kiambu considered physical facilities and environment as either important or very important contributing factors to holistic education, nearly half (49.6%) of their counterparts in Samburu County held similar views. Overall just about one third of the respondents considered physical facilities and environment as factors contributing to holistic education, with principals posting higher ranking than the students and teachers.

An attempt was made to examine the respondents' responses regarding physical facilities on holistic education by type of school classification. A cross-tabulation of students' responses with type of school classification was performed and the results are displayed in Figure 1.



**Figure 1: physical facilities and Environmental Education contribution to holistic education by school type**

The respondents in County and national schools tended to attach more premium to the contribution of physical facilities and environmental education than their counterparts in sub county schools as per Figure 7 on Physical facilities and Environmental education and Holistic Education by respondent and type of school. A plausible explanation would be that most county and national schools are more endowed with adequate physical facilities while their counterparts in sub-county schools are characterized with scanty physical facilities and infrastructure. Test of Hypothesis

The test of hypothesis was based on the information generated from principals, senior teachers and students' responses. The chi-square homogeneity test of association was used to test the relationship between physical facilities and holistic education. Table 4.6 indicates the results of the chi-square test. The principals results ( $\chi^2 = 1.944$ ,  $df=1$ ,  $p=.187$ ) revealed that the  $p=.187$  value generated by the SPSS Computer programme version 20 was greater than the critical alpha  $p=.05$  set to test the null hypothesis. This led to the retention of the null hypothesis that there was no significant relationship between physical facilities and holistic education of students in public secondary schools in Kiambu and Samburu Counties. The results suggested that there were no significant differences between the rating of principals regarding the contribution of physical facilities to holistic education in Kiambu and Samburu Counties.

**The chi-square test of hypothesis results at  $\alpha=.05$  level of confidence**

Respondent	N	df	X <sup>2</sup>	Significance
Principal	20	1	1.944	.187
Teachers	76	3	4.116	.249
Students	450	4	12.450	.014 (sig)
All respondents	546	4	10.197	.037

The results for Senior teachers ( $\chi^2 = 4.116$ ,  $df=3$ ,  $p=.249$ ) revealed that the  $p=.249$  value generated by SPSS Computer programme version 20 was larger than the critical alpha  $=.05$  set to test the null hypothesis. This finding led to the retention of the null hypothesis at alpha level of significance  $=.05$ . This suggested that the senior teachers held the position that physical facilities did not significantly contribute to holistic education and the views significantly differed across the study locales of Kiambu and Samburu Counties.

The results for students ( $\chi^2 = 12.450$ ,  $df=4$ ,  $p=.014$ ) similarly revealed that the  $p=.014$  generated by SPSS Computer programme version 20 was less than the critical alpha  $=.05$  set to test the null hypothesis. Consequently, this led to the rejection of the null hypothesis at significance alpha level of  $.05$ . The rejection of the null hypothesis resulted in to the adoption of the alternative hypothesis that there was a significant relationship between physical facilities and holistic education of students in public secondary schools in Kiambu and Samburu Counties. The students therefore portrayed a strong perception that physical facilities and environmental education contributed significantly to holistic education. The results for all respondents combined

yielded a value of ( $\chi^2 = 10.19997$ ,  $df=4$ ,  $p=.037$ ) indicating a significant association between all respondents and their support for using physical facilities and environmental management to develop holistic education.

The test of hypothesis indicates that contrary to the low ratings of the principals regarding the contribution of physical facilities and environmental education, senior teachers and students indicated that there were significant relationships between physical facilities and environmental education and holistic education.

Several members of the Board of Management and senior teachers seemed to see a weak link between physical facilities and environmental education to holistic education. Sentiments such as the following featured prominently during the interviews with these groups of respondents:

Learning was a complex activity that tested students' motivation and physical conditions. Teaching resources, teachers' skill, and curriculum played a vital role in a child's education. Educators must realize that there were many elements that influenced the condition of the school facility. These elements could range from educational leadership to community involvement. There was no one element that operated in isolation. Educators needed to be informed about the conditions of their school facilities as well as appreciate the differences that facilities could make in helping to educate their children (BoM 01,09.24.46 in Kiambu County & BoM 11, 25, 28, 31 37,43 in Samburu County).

The foregoing sentiments seem to reinforce the fact that physical facilities and environmental education play a vital role in developing holistic education of learners. Teaching resources that directly relate to holistic education are: availability, adequacy and appropriateness of physical facilities to be used to facilitate holistic education necessary for the holistic development of the learner.

These findings are in line with those established by Bizimana and Orodho (2014) in Rwanda that indicated that lack of adequate and appropriate physical facilities in the context of the heavy workload of teachers can constrain smooth interaction between the learner and learning process and threaten holistic educational development. Activities such as lesson plan and teaching aids preparation assessment of work given by the teachers and preparing charts as well as models should be motivating and relevant to the learning situation (Kinggundu & Nayimili, 2009).

The other additional component of these physical facilities as one of the dynamics of holistic education is the environmental education. Principals and members of BoM raises two main concerns underlining the products of our current education system and the environment.

The human species is in real danger of destroying its life-sustaining ecosystems, and two, that the scope of this problem challenges the adequacy of the belief systems (read education systems) and ways of thinking of the developed world (Principal, 04.09.23,34.53 in Kiambu County & BoM 21,27.39.43 in Samburu County).

The findings from the interviews takes on the most cherished assumption of liberal humanism, modernism, and progressivism, with his critique of such taken for granted core beliefs as individualism, abstract rational thought, emancipation, progress, and the elaboration and extension of technology. Hence, the writer perceives education as one which can bring real progress as being holistic and involving active participation and focus on forces of development that are cognizant of ecological sustainability.

The findings of this study are in line with those of studies in developed and developing countries especially in Africa. Adeiza (2011), Owoeye (2000) and Ajayi (2002) submitted positive relationships between school facilities and school effectiveness. Hallack (1990) also highlighted facilities as a major influencing achievement in the school system. The author emphasized that the availability, relevance and adequacy of these facilities contribute to students' achievement while unattractive school buildings, crowded classrooms, non-availability of playground and flowerbeds and surroundings that have no aesthetic beauty can contribute to poor performance. Ahunanya and Ubabudu (2006) also reiterated the provision of adequate facilities for effective teaching and learning to take place. It can be inferred from the literature that schools' facilities have a positive relationship with school effectiveness. It was against this backdrop that the present study found out the relationship between school facilities and students' achievement in the affective and psychomotor domains of learning.

The findings of this study regarding physical facilities and holistic education seem to get support by earlier studies by Akifolarin (2008) Cynthia and Megan (2008 and phillas and Wanjobi 92011). The study revealed that there was a significant difference in the facilities available between public and private senior secondary schools, with ( $t$ -cal 5.764 and  $t$ -table 2.021). Private schools appear to have a higher index of facilities than public schools with 68.29 and 52.42 for the private and public schools respectively.

With regards to environmental education, the results of this study seem to be in tandem with UNEP (2005, 2015). The UNEP's vision for Environmental Education and Training for Sustainable development (EETSD) in the next decade is to support the holistic approach to the protection of the environment and

improvement of peoples quality of life by developing and strengthening initiatives which are responsive, locally relevant, and aimed at transforming peoples visions and aspirations into reality for the present and future generations (UNEP, 2005).

One QUASO in Samburu County conceptualized environmental education as:

Continuous lifelong learning that emphasizes the complementarity of environmental issues and calls for the use of different and innovative educational approaches to teaching and learning. This conceptualization of environmental education is in tandem with environmental education principles which recognizes environmental education as a continuous and lifelong process, based on interdisciplinary approaches, active participation and individuals and group responsibility for environment (QUASO, Samburu County).

This study contends that working towards holistic education is the sure way to attain sustainable education which is the responsibility of every citizen, consequently making environmental education important for everyone. Recognizing this diversity, environmental education in the context of this study will focus on the holistic school learning environment and management. According to Modell, DeMiero and Rose (2008), a holistic learning environment is one that nurtures all aspects of students learning. In this context, a holistic learning environment must be safe, supportive, and provides opportunities to help students deal with non-academic as well as academic factors that impact their learning.

The official position of the Ministry of Education is that the teaching of DRR, as a component of environmental education should be experiential and learner centered. The teacher acts as a facilitator to help the learner interact with the environment as the learner acquires concepts through relevant activities.

The other QUASO from Kiambu County gave the official position of the Republic of Kenya by categorically stating that:

The assessment methods of environmental education (read DRR) should focus on the cognitive, psychomotor and the affective domains of learning. This emphasis is important for attitude and positive behavioral development or change and thus the learner is able to translate and apply what they have learnt to day-to-day life experiences (KIE/UNICEF,2012:iii).

The foregoing position of the Government of Kenya through the Ministry of Education underscores the fact that environmental education should be perceived as a lifelong process that translates into developing the learner holistically in the three main domains of cognitive, psychomotor and affective. This position is also in tandem with the findings of this study that showed that environmental education was one of the non-academic determinants of holistic education.

Overall, the findings of this study have found support in studies by several researchers and scholars across the world. There is a large body of literature which underscores the importance of physical facilities and environmental education (Alimi,2007; Alimi, Batunde& Oluwole,2012;Akafolarin,2008; Ayodele,2000;Adesola,2005; Bandele,2003;; Cynthia & Mgan,2008; Lyon,2001; Orodho.2013;Verndver,2011; Timiledin,2013). Bandele (2003) and Orodho (2013) reiterate that the importance of physical facilities cannot be relegated. School facilities are the space interpretation and physical expression of the school curriculum (Alimi, Batunde Oluwole, 2012). Facilities like modern laboratories, libraries and classrooms are to be put in place in all our schools (Orodho, 2013).

#### 4.0 CONCLUSIONS AND RECOMMENDATIONS

Despite the fact that majority of teachers and students recognized the contribution of physical facilities and environmental management as possible determinants of holistic education, most of them were not clear how this would be done. It is recommended that physical facilities should be developed in schools not only to facilitate effective instruction and learning but also for their aesthetic value to promote affective domain development.

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