

STRUCTURAL FACILITY CONDITION AND ACADEMIC ACHIEVEMENT OF STUDENTS IN GREATER ACCRA PUBLIC SENIOR HIGH SCHOOLS

A. L. DARE and W. K. AGBEVANU

Institute for Educational Planning and Administration, University of Cape Coast

Abstract

This study investigated the correlation between structural facility condition and academic achievement of public senior high schools in the Greater Accra region. A random sample of 30 public senior high schools was selected for the study. Data for the study were collected from the school administrators or heads from each school sampled. The results indicate that structural facility condition significantly correlates with the academic achievement of students in public senior high schools in Greater Accra region. The existence of strong positive and significant relationship supports several earlier empirical studies, which is an indication that public schools with good structural facility condition tend to enhance teaching and learning and for that matter academic achievement.

Introduction

The essence of education is learning, and the environment in which students learn is a critical factor of learning achievement. The earliest educational reformers in the United States of America realized the impact that educational facilities had on the learning environment. They understood that a high quality, adequate physical learning environment depended on appropriately designed and well-maintained school buildings (Monk, 2006). Teachers, textbooks, educational technology, physical facilities and administration are all means to expand and accelerate learning (Beynon, 1997). Similar conclusions were reached by Hallak (1990). Hallak identified school facilities as a major factor contributing to academic achievement in the school system. This, according to him, includes the school buildings, classroom accommodation, furniture, libraries, laboratories, recreational equipment and other instructional materials.

However, the structural physical facilities component of this interdisciplinary support system is viewed as both friend and foe by planners. Some have argued that beautiful and well-equipped buildings send a message of political support for education (Beynon, 1997). However, Beynon noted that others express dismay over the high cost of the physical facilities component which siphon resources away from teacher salaries and learning materials. Such dissenting voices, Beynon explained, try to diminish the importance of the physical environment by citing Ghandi's position that learning can take place under the trees.

While noting that the availability, relevance and adequacy of these resource items contribute to academic achievement, Hallak (1990) pointed out that unattractive school buildings, crowded classrooms and surroundings devoid of aesthetic appearance can contribute to poor academic achievement. Academic achievement of students in Ghana has not been encouraging. According to Ghana News Agency report, Madam Victoria Opoku, Director in charge of secondary education indicated that "... the performance of senior high school students in recent times was at its lowest" (2010, May 6, p. 35). Yet, we do not know whether relationship between structural facility conditions and academic achievement reported in some places holds in Ghana, especially since provision of good structural facilities is problematic. It is for this reason that this study attempted to investigate the correlation between structural facility condition and academic achievement of students in Greater Accra public senior high schools.

Previous Research

Several scholars (Bajah, 1986; Akinwumiju & Orimoloye, 1987) maintained that the availability of physical and material resources is very important for the success of any worthwhile educational endeavour. They pointed out that the availability of adequate school buildings, number of classrooms, chairs, desks and other facilities are imperative for the attainment of any educational objectives. Indeed, the condition of the school physical facility is equally important as its availability. Schools need learning environments that support and enhance student engagement. Access to quality and adequate school physical facilities, for instance, needs to be ubiquitous, implying classrooms and other special rooms be in good condition and accessible for the purpose of teaching and learning. Indeed, current thinking on educational facilities design recognizes that the spaces in which children learn impact on their academic achievement. Improved learning outcomes can be achieved by providing high levels of student and staff comfort, flexibility and control over their environment (Fisher, 2000).

In the same vein, Earthman (2002) indicated that school building design features and components have been proven to have a measurable influence upon student learning. Among the influential features and components are those impacting temperature, lighting, acoustics and age. Researchers have found a negative impact upon student performance in buildings where deficiencies in any of the aforementioned features exist (Earthman, 2002). Earthman (2002) explained further that the overall impact a school building has on students can be either positive or negative, depending upon the condition of the building. Thus, the condition of school facilities has an impact on student academic performance. In particular, research demonstrates that comfortable classroom temperature and noise level are very important to efficient student performance. In cases where students attend school in substandard buildings, they are definitely handicapped in their academic achievement.

Indeed, many factors affect the academic achievement of students. These include intelligence, motivation, gender, early childhood learning, parental support, race and ethnicity, social class, student attitude, teacher qualifications and commitment, and curriculum (Roberts, Edgerton & Peter, 2008). In other words, academic achievement of students is always associated with the many components of the learning environment. According to Roberts et al. (2008), not only is the list of factors affecting student outcomes lengthy, the effects are interacting and many are not amenable to systematic intervention. They gave socio-economic status, intelligence, race and ethnicity of students as good examples. They also stated that no one knows how to mitigate reliably the effects of these important predictors of student academic performance.

Given that many important determinants of effective learning are beyond systematic control, it has become important that school divisions optimize the effects that they can control. Roberts et al. (2008) posited that one underappreciated determinant of academic achievement is the quality of school facilities. The current literature, however, indicates that one important mediating variable in determining the academic achievement of students is the physical learning environment and for that matter the conditions of school physical facilities. They noted that school physical facilities are central to creating a positive learning environment. The classroom, laboratory and office, as well as the physical artifacts of education - all affect the quality of teaching and learning. The physical learning environment is the most apparent of the school environments to both students and teachers. In their view, when things are working, as they should, physical conditions provide a "background" against which the real work of learning can proceed.

According to Cash (1993), a school "is a promise of the future. Schools should reflect the environment of success...It is a physical representation of a public message about the value of education" (p.83). Winston Churchill said, "We shape our buildings; therefore, our

buildings shape us” (as cited in Gardner, 1981, p. 7). These comments suggest that the school environment may be just as important as the choice of methods and curriculum to ensuring a positive outcome. Several studies have shown that relationships exist between school facility condition and academic achievement. In their studies, Cash (1993), Hines (1996), Crook (2006), Schneider (2002) and Bullock (2007) found a positive relationship between school building conditions (structural and cosmetic) and student achievement. Earthman and Lemasters (1996) synthesized the results of several different studies and concluded that the condition of school facility is, in fact, positively associated with academic achievement. Crook conducted a study among Virginia high schools which corroborated the findings of Cash and Hines. Cash, Hines and Earthman, Cash and Van Berkum (1996) found that structural facility condition relates positively with student achievement.

Writing on the quality of school buildings and development of children in Ghana, Tuffour (2009) argued that there is a strong correlation between state and quality of school buildings and learning and development in schools. According to Tuffour, a child needs good environmental surroundings in order to have maximum attention of what he or she is being taught for greater educational attainment. He further stated that even though other factors come into play such as good motivated teachers, availability of tools with the required training, research supports that the physical learning environment impacts student achievement and teaching quality.

According to Tuffour (2009), studies show that students learn best in an environment that is healthy, comfortable, naturally lit, and clean and in good repair. The quality and design of school facilities affect the ability of a school to retain teachers and what and how they teach. He concluded that student and staff absenteeism are lower in school buildings that are in good condition. The educational infrastructure in Ghana has basically been a function and or responsibility of state and local authorities. While the goal of many nations has been to create learning environments where students can be properly educated and prepared for the future, reports indicated that a good number of the school facilities are in poor condition.

In a report, the Anamuah-Mensah Committee report (Republic of Ghana, 2002) asserted that school infrastructural facilities in senior high schools are inadequate and need to be improved upon. The report recommended that as a matter of necessity the Ministry of Education (MOE) should provide all senior secondary schools with basic infrastructural facilities. Some of the facilities, as indicated in the report, include adequate number of classrooms, libraries, laboratories, school clinics, canteens, administration block and playing fields. The teaching and learning environment, which is directly affected by the conditions of school physical facilities, can affect the morale and commitment of both teachers and students hence the academic achievement of students.

The Anamuah-Mensah Committee report (Republic of Ghana, 2002) indicated that public senior high schools needed to have access to quality physical facilities that are conducive to teaching and learning, and optimize opportunities for student success. The report expressed regret that while it is necessary to create an environment conducive for the delivery of quality education, “the facilities in many senior secondary schools, especially in the community day schools are inadequate” (p. 70). This, notwithstanding, very little attention has been given to improving and maintaining the conditions of the available school physical facilities. The call for increased student and teacher accountability amidst inadequate and deteriorating facilities

- which can negatively impact student and teacher motivation and commitment as well as academic achievement
- is an irony that must be firmly situated in research.

In many Ghanaian schools, students and teachers find themselves in a physical environment that positively or negatively affects their morale, and in some cases, their

effectiveness and for that matter teaching and learning. Although hard evidence is not available in Ghana, many of the American studies cited indicated that when a school building is in disrepair, student achievement suffers (Bullock, 2007; Schneider, 2002). It was the desire to investigate the association between the aesthetic learning environment and student academic achievement that provided the motivation for the present study.

Statement of the Problem

It has been established that a number of critical factors continue to threaten progress in the education delivery and for that matter the learning achievement of students in Ghana. One of these critical factors is inadequate and poor school infrastructure. In a report on the condition of permanent instructional areas, MOE (2007) revealed that a good number of the public senior high schools in Ghana are not in good condition. The report further indicates that 37.1% of the permanent classrooms of the public senior high schools in Greater Accra are not in good condition and need repairs (MOE, EMIS Report, 2007/2008). To give credence to this report, Mr. M. D. Aklorbortu reported that the “educational facilities in most districts of the Western Region are in a deplorable state” (2010, February 2, p. 20). He added that as a result, “some schools always score between 80 and 98 per cent fail in the Basic Education Certificate Examinations (BECE)” (p. 20). As shown in Table 1, the pass rates in the core subjects leave much to be desired. The indication from the report is that the average pass rates (percentage of passes) in WASSCE results in core subjects for the 2005/2006 and 2007/2008 school years were 47.4% and 41.9% respectively (see Table 1).

Table 1: WASSCE Core Subjects Pass Rates

School Year	Pass Rates			
	English Language	Mathematics	Integrated Science	Social Studies
2005/2006	28.6	35.7	48.3	76.9
2007/2008	40.0	26.7	23.4	77.3

Source: SRIMPR Division, MOESS, EMIS Project, 2007/2008

Indeed, the report did not indicate any connection between the condition of such structural facilities and the academic achievement of students. In addition, no empirical research regarding the relationship between structural facility conditions and academic achievement has been conducted among Greater Accra public senior high schools. In view of these observations, the question then is: Is there any relationship between structural facility condition and academic achievement of students in public senior high schools? As structural facility conditions may directly or indirectly influence the academic achievement of students, it is imperative to conduct this study to investigate the nature, magnitude and significance of the relationship in order to appreciate the extent to which structural facility condition is related to academic achievement of students.

Purpose of the Study

Generally, the purpose of this study was to investigate the relationship between structural facility conditions and academic achievement of Greater Accra public senior high schools. Previous studies have reported an association between the conditions of school structural facility and academic achievement are related. Thus, it is not the objective of this study to establish cause and effect but rather the existence, nature and magnitude of the relationship that exist between school facility condition and academic achievement. Specifically, the study sought to establish whether structural conditions of physical facility significantly correlate with academic achievement. In addition, the study sought to determine whether the academic achievements of upper quartile schools classified as above satisfactory

condition are significantly different from those of bottom quartile schools classified below satisfactory condition. In other words, the study sought to determine the existence and direction of the difference between the two categories of schools with different structural facility conditions.

Significance of the Study

The findings from this may provide parents, school communities, educational planners and administrators as well as policy makers with valuable information for several purposes. On the basis of information provided from this study, the structural facility needs of the schools may be assessed and addressed. The results of the study may make stakeholders conscious about the conditions of the structural facilities in which students learn. Also, the findings from this study may whip up the interest of stakeholders to renovate and maintain the structural facilities periodically to boost the motivation and commitment of both students and teachers. The Ghana Education Service (GES) could use the finding from this study to justify the upgrading of existing schools and institute a programme to improve and maintain the structural facility condition of schools. Finally, the conclusion of the study may provide a valuable and practical guide for conducting further studies and serve as a contribution to knowledge on the relationship between structural facility conditions and academic achievement.

Hypotheses

To accomplish the purpose of this study, the following research hypotheses were postulated to guide the study:

1. There would be a significant association between structural physical facility conditions and academic achievement of Greater Accra public senior high schools.
2. The academic achievement of public senior high schools with above satisfactory facility condition would be significantly different from those with below satisfactory facility condition in the Greater Accra region of Ghana.

In line with these research hypotheses, the following null hypotheses were tested:

1. There would be no significant association between structural physical facility conditions and academic achievement of Greater Accra public senior high schools.
2. The academic achievement of public senior high schools with above satisfactory facility condition would not be significantly different from those with below satisfactory facility condition in the Greater Accra region of Ghana.

Methodology

Research Design

This study used of a correlational research design also referred to as associational research design. The correlational research design, as a survey design is especially useful for exploratory studies in areas where little or no previous research has been done (Borg & Gall, 1983). Fraenkel and Wallen (1990) intimated that correlational research attempts to investigate possible relationships among variables without trying to influence those variables. The design for the present study was to correlate school structural facility conditions ratings with academic achievement scores to determine direction and magnitude of the relationship.

Sample and Sampling Techniques

The target population for the study was the public senior high schools in the Greater Accra region. Thus, the sampling unit of the study was the public senior high school. A sample size of 32 public senior high schools representing 84.2% was selected from the population of 38 schools. The sample size of 32 was considered appropriate because Frankel

and Wallen (2000) advised that the appropriate sample size for a correlational research should not be less than 30. Respondents for the study were randomly selected using the lottery method. The school administrators (heads or assistant heads) of the sampled public senior high schools constituted the subjects of the study. With the aid of the survey instruments, the school administrators evaluated the structural facility condition of the schools and provided the pass rates in the core subjects. School administrators were involved because they were in charge of the schools and familiar with the conditions of the existing school structural facilities. In addition, they were capable of appraising the structural facility conditions by responding to the survey instrument.

Instruments

The data collection instrument consisted of a questionnaire and an academic achievement form designed for the study. The questionnaire, an appraisal instrument, was named as School Physical Facility Assessment (SPFA) instrument. The 15-item questionnaire enabled the school administrators to evaluate the structural facility conditions of their schools, which helped in rating the schools. In addition, the academic achievement form designed was used to collect information on the WASSCE pass rates in core subjects of 2007/2008 and 2008/2009 school years. This information was used to determine the average academic achievement score of each school sampled.

Data Sources and Analysis

The study investigated the association between structural facility condition and academic achievement of students in public senior high schools. Thus, data were collected directly from the schools sampled and were analysed using nonparametric statistical tools as the variables were measured on the ordinal scale of measurement. The statistical tools used include median, scatter plot, Spearman r_s and Mann-Whitney U-test.

The null hypotheses were tested at 5% level of significance. The overall facility condition is the total ratings of the structural facility condition obtained by summing up the weights assigned to the responses for all the items on the SPFA instrument completed by the school administrators. Upon completion of data collection, the 30 public senior high schools that actually took part in the study were coded. The structural facility condition was determined from the responses to the 15 items on the structural facility conditions by school administrators. The items responded to consisted of the characteristics of both the structural or physical teaching and learning environments. The items on the questionnaire (SPFA instrument) required school administrators to evaluate the existing conditions of the structural facilities of the schools.

The structural facility condition refers to the rating of the physical structure of buildings, furniture and grounds. The structural facility condition was determined from 15 items on the SPFA. The elements of the structural facility condition included facility or age of building, windows, temperature, flooring and air quality. Others included computer laboratory, science laboratory equipment, lighting, library and nearby facilities (e.g., playing field). The rest were interior ceiling, roofing, walls, acoustics or noise level and structural facilities. The state of each element was evaluated by the school administrators.

Results

Hypothesis 1

Hypothesis 1 was that "There is no significant association between structural physical facility conditions and academic achievement of Greater Accra public senior high schools." This hypothesis was addressed using the structural facility condition ratings identified as independent variable and the academic achievement scores identified as dependent variable.

Table 2 shows the summary statistics of structural facility condition ratings and academic achievement scores collected from school administrators who participated in the study.

Table 2: Descriptive Statistics for Structural Facility Condition and Academic Achievement Scores

Descriptive Statistics	Structural Facility Condition (%) N = 30	Academic Achievement (%) N = 30
Minimum	37.33	56.63
Maximum	84.00	96.18
Range	46.67	39.55
Median	57.33	69.86

As shown in Table 2, the maximum and minimum total ratings of the structural facility conditions were 84.00% and 37.33% respectively. The maximum and minimum academic achievement scores were 96.18% and 56.63% respectively.

The scatter plot in Figure 1 shows a positive association between the two variables as indicated by the upward trend of the dots from left to right. Figure 1 shows that academic achievement improves with improvement in the physical facility conditions of the schools.

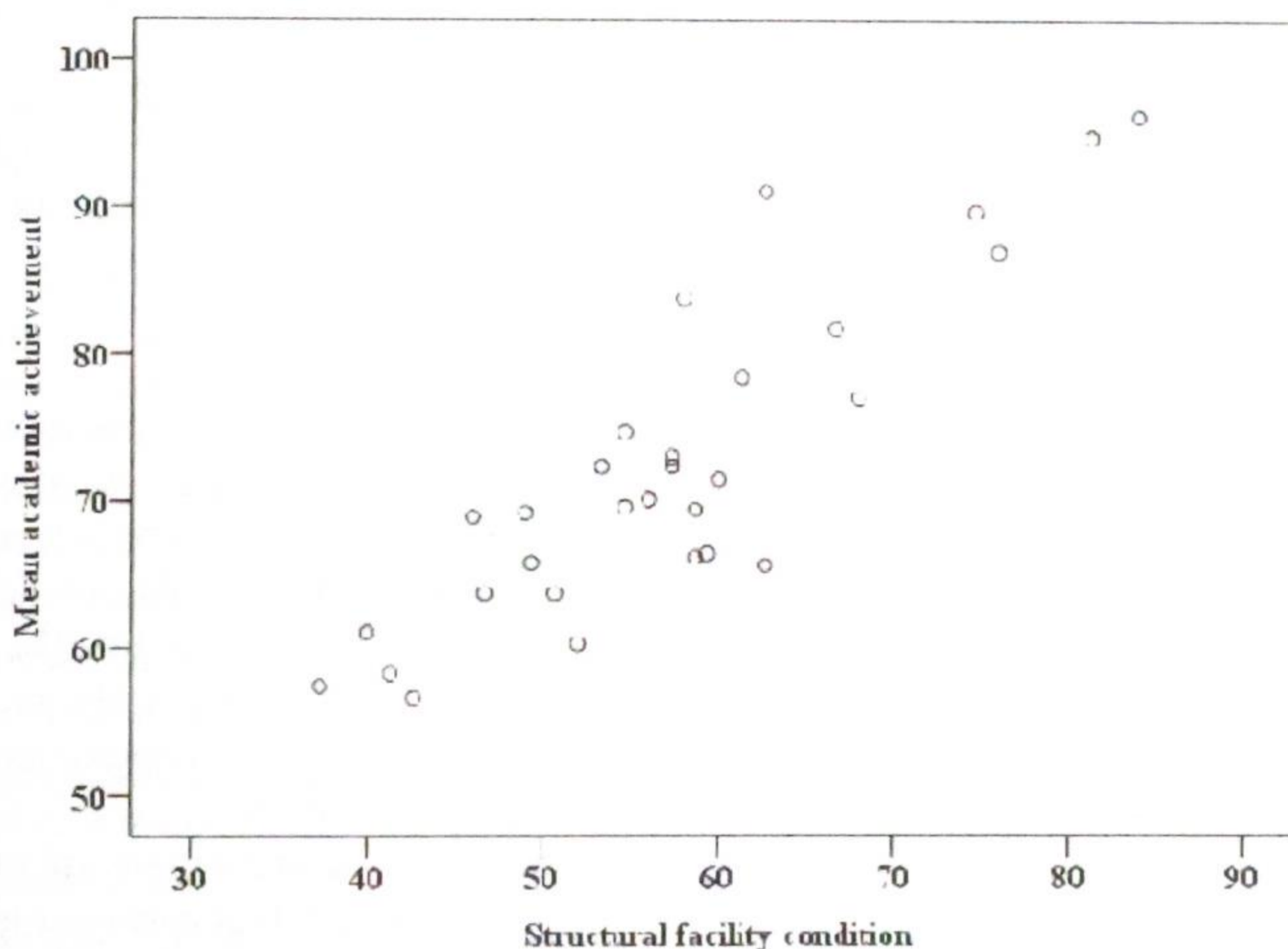


Figure 1. Scatter plot showing the relationship between structural facility condition and mean academic achievement.

The Spearman correlation coefficient of structural facility condition and academic achievement was significant, $r_s = .811$, $n = 30$, $p = .01$, two-tailed. This shows that there is a high positive association between structural facility condition and academic achievement. Also, the shared variance, $r_s^2 = .811^2 = .65772 * 100 = 65.77\%$, meaning that the structural facility condition accounts for about 65.77% of the variation in academic achievement.

Hypothesis 2

Hypothesis 2 was: "The academic achievement of public senior high schools with good structural facility condition is not significantly different from those with poor structural facility condition in the Greater Accra region of Ghana." In addressing Hypothesis 2, the public senior high schools that actually took part in the study were categorized into quartiles

based on the structural facility condition ratings. As indicated in Table 3, the schools in the upper quartile category were referred to as good structural facility condition (top 25%) schools and those in the lower quartile category were referred to as poor structural facility condition (25% bottom) schools.

Table 3: Mean Academic Achievement Scores for Two Categories of Structural Facility Condition

Variable	Categories	
	Good Facility Condition (%)	Poor Facility Condition (%)
Mean Academic Achievement	96.18	65.81
	94.75	69.21
	86.90	63.71
	89.68	68.93
	77.00	56.63
	81.71	58.29
	91.04	61.10
Median	65.65	57.43
	88.29	62.41

The mean academic achievement of schools in upper quartile with good structural facility was greater, Mdn = 88.29 than those in the bottom quartile, Mdn = 62.41. Also, there was a significant difference in academic achievement between schools in the two structural condition categories, $U = 3.00$, $p = .002$, $n_A = n_B = 8$.

Discussion

The focus of the study was to determine whether structural facility condition of public senior high schools is significantly associated with academic achievement of students. The results of the study show that there was a significant, positive association between structural facility condition and academic achievement of public senior high schools. The findings of the present study are consistent with results reported by Cash (1993), Hines (1996), Earthman and Lemasters (1996), Al-Enezi (2002) and Bullock (2007) all of which showed a positive relationship between structural facility condition and academic achievement of students. However, the magnitudes of the coefficients varied from study to study.

It can be inferred from the results that the academic achievement of students in schools with good structural facility condition improves with corresponding improvement structural or physical environment of the schools. It can be argued, therefore, that structural environment which is conducive to teaching and learning is more likely to boost the morale and commitment of both teachers and students hence improves the academic achievement of students in the school. The study also sought to determine if there was a significant difference in academic achievement of students between good structural facility condition schools and poor structural facility condition schools. The results show that there was a significant difference in academic achievement between good structural facility condition (top 25%) schools and poor structural facility condition (bottom 25%) schools.

Furthermore, the findings of this study support research findings in relation to the difference in academic achievement based on the categories of structural facility condition. Al-Enezi (2002), Cash (1993), Hines (1996), Earthman (2002) and Bullock (2007) found that there was a significant difference in academic achievement between above-standard buildings and substandard buildings. Again, the magnitudes of the percentage points varied from one study to another. They concluded that students in above-standard buildings (top 25%)

appeared to have higher achievement scores than those in substandard buildings (bottom 25%). Similarly, Crook (2006) found a significantly positive difference in student achievement between above-standard buildings and substandard buildings.

The relative improvement in academic achievement of students in public senior high schools with good structural facility condition may be attributed to the good condition of their structural facility among other factors. This suggests that public senior high schools with poor structural facility condition need to renovate and maintain their structural facility. It is plausible to conclude that if the condition of the structural physical facility is improved both teachers and students will accept the fact that school is important. On the basis of the findings of this study, it can be inferred that public senior high schools with good structural facility condition schools are likely to have better academic achievement than poor structural facility condition schools. A good and well maintained structural facility or plant may indicate that school authorities are serious with education, and this in turn may boost the morale and commitment of teachers and students to give of their best.

Conclusions

Our study has produced evidence that there is a strong positive and significant association between school structural facility conditions and academic achievement of Greater Accra public senior high schools. In comparing the results of this study and the previous related studies, several similarities were noted in terms of approach and results. Thus, it can be concluded that structural facility condition is likely to directly or indirectly affect the achievement of students. In this study the academic achievement measured by the average pass rate in the core subjects was higher for good structural facility condition schools than poor structural facility condition schools. This is consistent with the findings of several related studies which found that school building condition and student achievement are significantly related.

School structural facility is one of the several critical factors responsible for the delivery of quality education. Students exposed to the structural or environmental conditions in school facilities are influenced in one way or the other. Poor maintenance can create an environment of peeling paint, crumbling plaster, non-functioning toilets, poor lighting and inadequate ventilation. This, of course, affects both the health and the morale of staff and students. Several individual building elements which have major impact on the teaching and learning environment have been identified in the literature. It is in line of this that the condition of structural facility in public senior high schools needs to be maintained in order to boost the morale and commitment of students and teachers.

Academic success is widely recognized as a good measure of student performance. As a result, the academic achievements of students are of considerable concern not only to parents, but also to the public and educators at large. In a situation where the structural facility of public senior high schools are neglected and left to deteriorate, this sends a signal to teachers and students that school is not important. This can easily affect their morale and commitment to teaching and learning hence resulting in poor academic achievement. Finally, we conclude that our study has provided empirical support for a positive relationship between structural facility condition and academic achievement of public senior high schools and so there is an urgent need to revamp school buildings in the Greater Accra Region.

References

- Akinwumiju, J. A., & Orimoloye, P. S. (1987). Accountability in public examinations. In A. Dada (Ed.), *Mass failure in public examination: Causes and problems*. Ibadan: Heinemann Educational Books (Nig) Ltd.

- Aklorbortu, M. D. (2010, February 2). "Educational facilities in Western Region schools deplorable." *Daily Graphic* (No. 18140), p. 20.
- Al-Enezi, M. M. (2002). A study of the relationship between school building conditions and academic achievement of twelfth grade students in Kuwaiti public high schools [Electronic version]. Unpublished doctoral dissertation, Virginia Polytechnic and State University, Blacksburg, VA. Retrieved July 4, 2009, from www.emeraldinsight.com/Insight/ViewContentServlet;jsessionid.
- Bajah, S. T. (1986, April 27). Implementation of the new SSC Chemistry Curriculum. Keynote Address presented at the STAN, National Chemistry Workshop. Enugu, Nigeria.
- Beynon, J. (1997). Physical facilities for education: What planners need to know. *Fundamentals of educational planning*, 55. [Electronic version]. Paris: UNESCO, IIEP. Retrieved July 4, 2009, from <http://www.designcommunity.com/discussion/26903.html>.
- Borg, W. R., Gall, M. D., & Gall, J. P. (1996). *Educational research: An introduction*. (6th ed.). New York: Longman Publishers.
- Bullock, C. C. (2007). The relationship between school building conditions and student achievement at the middle school level in the Commonwealth of Virginia [Electronic version]. Unpublished doctoral dissertation, Virginia Polytechnic and State University, Blacksburg, VA. Retrieved June 20, 2009, from <http://wwwscholar.lib.vt.edu>.
- Cash, C. (1993). A study of the relationship between school building condition and student achievement and behaviour [Electronic version]. (Unpublished doctoral dissertation, Virginia Polytechnic Institute and State University, Blacksburg, VA. Retrieved June 20, 2009, from <http://www.cashnet.org/resource-center/resourcefiles/142.pdf>.
- Crampton, F., Thompson, D., & Vesely, R. (2004). The forgotten side of school finance equity: The role of infrastructure funding in student success. *NASSP Bulletin*, 88, 29-56.
- Crook, J. (2006). A study of the relationship between the condition of educational facilities and percentage of students scores on the standards of learning examinations in high schools in the Commonwealth of Virginia [Electronic version]. Unpublished doctoral dissertation, Virginia Polytechnic and State University, Blacksburg, VA. Retrieved October 5, 2009, from <http://www.emeraldinsight.com/Insight/ViewContentServlet;jsessionid>.
- Earthman, G. I., & Lemasters, L. K. (1996, October). Review of research on the relationship between school buildings, student achievement, and student behaviour [Electronic version]. Tarpon Spring, FL: Paper presented at the annual meeting of the Council of Educational Facilities Planners, International. (ERIC). Document Reproduction Service No. ED 416 666). Retrieved October 5, 2009, from <http://www.eric.ed.gov/ERICWebPortal>.
- Earthman, G. I. (2002). School facility conditions and student academic achievement [Electronic version]. Retrieved August 20, 2009, from University of California Scholarship Repository Website: <http://repositories.cdlib.org/idea/wws/wwsrr008-1002>.
- Edwards, M. M. (1991). Building conditions, parental involvement and student achievement in the D.C public school system [Electronic version]. Washington, D.C.: Unpublished masters degree thesis, Georgetown University, (ERIC Document Reproduction Service No. ED 338 743). Retrieved September 4, 2009, from www.eric.uoregon.edu/publications.html.

- Fisher, K. (2000). Building better outcomes: The impact of school infrastructure on student outcomes and behaviour [Electronic version]. *Schooling Issues Digest*. Australia: The Commonwealth Department of Education, Training and Youth Affairs. Retrieved October 27, 2009, from <http://www.detya.gov.au/edu/school.index.html>.
- Fraenkel, J. R., & Wallen, N. E. (2000). *How to design and evaluate research in education* (4th ed.). McGraw-Hill Companies, Inc. 26
- Frazier, L. M. (1993, May). Deteriorating School Facilities and Student Learning [Electronic version]. ERIC Clearinghouse on Educational Management, 5207 University of Oregon, Eugene: Oregon. Retrieved October 26, 2009, from <http://www.eric.uoregon.edu/publications/digests/digest082.html>.
- Ghana News Agency, (2010, May 6). "Government will improve school facilities" says Minister. *Daily Graphic* (No. 18218), p. 35.
- Hallak, J. (1990). *Investing in future setting educational practice in developing world*. Paris: Unesco/IIEP, Pergamon Press.
- Hines, E. (1996). A study of the relationship between school building condition and student achievement and behaviour [Electronic version]. Unpublished doctoral dissertation, Virginia Polytechnic and State University, Blacksburg, VA. Retrieved June 20, 2009 from <http://www.eric.ed.gov>.
- Ministry of Education Science and Sports. (2007). *Report on Basic Statistics and Planning Parameters for Basic Education in Ghana 2007/2008 academic year*. Accra: Government Publications.
- Monk, D. M. (2006). An assessment of the quality and educational adequacy of educational facilities and their perceived impact on the learning environment as reported by middle school administrators and teachers in the Humble Independent School District [Electronic version], Humble: Texas. Unpublished doctoral dissertation, Texas A&M University, TX. Retrieved June 24, 2009, from <http://www.edfacilities.org/pubs>.
- Republic of Ghana. (2002). *Meeting the challenges of education in the 21st century*. Accra: Adwinsa Publications (Gh) Ltd.
- Roberts, L. W., Edgerton, J. D. & Peter, T. (2008). The importance of place: Facility conditions and learning outcomes [Electronic version]. *Education Canada*, 48 (3), 48-51. Retrieved October 17, 2009, from <http://www.edfacilities.org/pubs>.
- Schneider, M. (2002). Do school facilities affect academic outcomes? [Electronic version]. Washington, D.C.: National Clearing House for Educational Facilities. Retrieved June 10, 2009 from <http://www.edfacilities.org/pubs/outcomes>.
- Tuffour, A. (2009, February 16). Quality of school buildings and educational development of children Ghana [Electronic version]. Retrieved October 17, 2009, from <http://www.efdicom.com/BlogEfdicom/author/atuffour.aspx>.