

The Design Standards Of Private Primary Schools In Oredo Local Government Area, Edo State, Nigeria

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Abstract: The design of primary school is an important facility in basic education that affects the educational system and development of a society. Over the years, the school building and the associated infrastructure have deteriorated to the extent of considering a possible link with the falling rate of learning. The study is on the design standards of private primary schools in Oredo Local Government Area of Edo State, Nigeria with an aim of establishing the association between learning and school infrastructure. The survey used 376 respondents who are parents or wards of the pupils. The study used 54 schools from 12 wards in Oredo Local Government Area as primary sampling units in which four wards were randomly selected; and further two schools were selected from each ward as a secondary sampling unit. The instrument used was Likert-type and was administered on the 376 respondents. The data were analyzed descriptively, and the association of learning and physical design was tested with Spearman's correlation, compliance of school design with standards was tested with Chi-square. The results showed poor organization of learning space; poor ventilation and day lighting; space standards for classrooms, parking, playing fields were not generally followed. The correlation of school design and learning was weak (.4); and Chi-square test indicating the distinction between the standards of school design elements and those observed in the schools was asymptotically significant. It was recommended that the Ministry of Education should monitor compliance with stipulated design standards; school spatial standards that are practicable should be applied in urban environment; an annual report on school design elements should be made by parent-teacher-associations.

Keywords: classroom, day lighting, learning assimilation, playfield, ventilation

I. INTRODUCTION

The design of a primary school building is an important facility for learning in modern time. The school building provides a conducive place for teaching and learning. Thus there is the need to thoughtfully consider the school building as an important aspect of the educational programme for primary education.

The National Policy on Education (2004) referred to primary education as the education given in institutions for children aged between 6 and 11 years plus. The policy emphasizes that primary education provides the bedrock for other educational programmes, and largely determines their success or failure. Because of the importance of primary

education, both the federal and state governments have made attempts to provide standards that will create the building designs that relate to the types of design expectations that will create the ideal primary schools for learning and teaching (Adepoju & Fabiyi, 2007; Obong, 2006).

Researchers regard school building as a critical infrastructure in the running of primary schools. The buildings are not only inadequate in their number, but they are also dilapidated and not sightly in appearance. The Universal Basic Education Commission (2004) opined that the provision of schools in conformity with their standards plays a critical role in economic growth, employment, and illiteracy reduction. The physical elements in the school environment can have effects on teachers and learners. This point was further

stressed by Tangri (2005) that where schools are established in conformity with design standards and educational regulations, the level of pupils' learning, staff actualizations, literacy, and productivity will be increased, if otherwise citizens will suffer. According to The Universal Basic Education Commission (2004), the design guidelines for teaching and learning spaces should be given priority with regards to orientation, day lighting, and ventilation. Part of these guidelines also referred to the provision of landscapes that are simple and cost effective and easy to maintain. The evaluation of the literature on school design and learning of pupils in primary schools in Nigeria is mainly on some support facilities like furniture, building and teaching staff (Adeyanju, 2010). There has not been much debate on the role school architecture, engineering, design, site planning, and landscaping play in learning (Brubaker, Bordwell, Christopher & , 1998; Colvin, 2001). These features are mostly regarded as optional in learning environment in Nigeria, which formed the thrust of this investigation.

The private primary schools are more than public primary schools in number in Oredo Local Government Area. They are located in nearly every major street, in any available buildings. However, the study only focused on the ones that are registered by the Ministry of Education in Edo State.

According to Ofsted 1999-2000 Annual Report, 25 percent of public primary schools and 85 percent of private primary schools fail to conform to design standards and regulations in urban areas of developing countries. Although the design aspect of the primary school building is a critical area of the provision of the primary schools, most studies on primary schools see this aspect of the provision of primary schools as optional (Dudek, 2000; Earthman, 2004). The few studies on the design of private primary schools in Nigeria are mainly exploratory and have not incisively considered the design elements in relation to learning and teaching. The present study evaluated some design aspects of some private primary schools in terms of the minimum standards set by the regulatory authorities. The investigation attempted to answer these questions: (a) Do the plot sizes of the private primary schools conform with the standards set? (b) How adequate are the school site plans? (c) Does the design of classroom block and classroom meet the standard required? The analysis of the issues raised will cast some light in the design standards of private primary schools in Oredo Local Government Area, Edo State, Nigeria.

THE STUDY AREA

Oredo is a Local Government Area in Edo State, situated in Benin City, the State Capital. It is located at latitudes $6^{\circ}14'N$ and $6^{\circ}21'N$ and longitudes $5^{\circ}33'E$ to $5^{\circ}44'E$ of the equator. It covers an area of $249km^2$ with a continuous expansion as a result of rapid urbanization. Its population stood at 374,671 in 2006 (National Population Commission, 2006). Figure 1.1 shows the map of Oredo in its setting in Edo State.

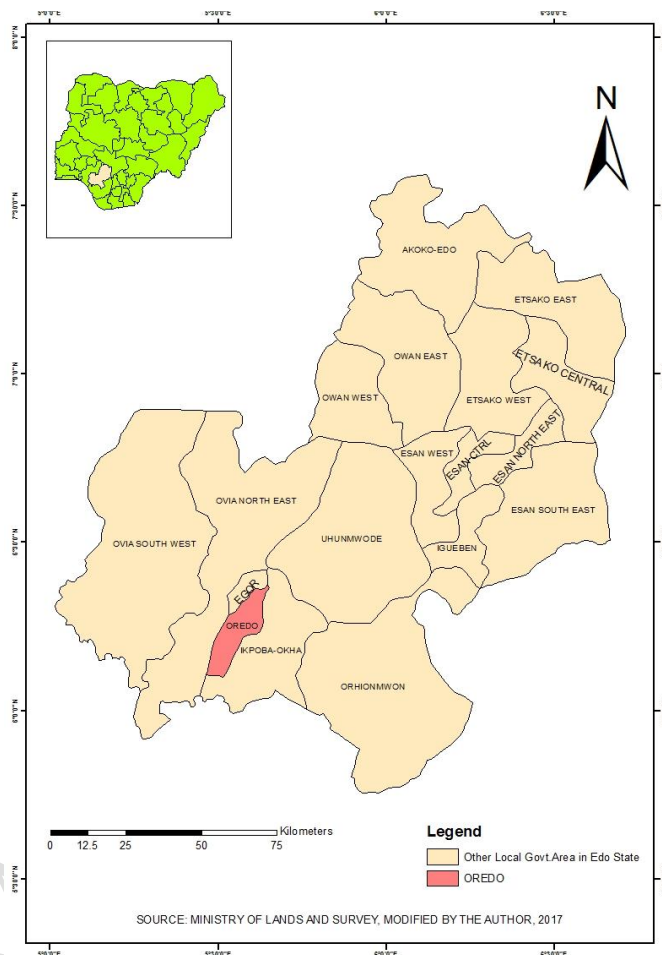


Figure 1: Edo State showing Oredo Local Government Area

II. RESEARCH DESIGN

The research design is a survey which employed questionnaire interview directed at the parents or wards of pupils from some private primary schools in Oredo Local Government Area, Edo State. This was complemented with an observation of the schools by the researchers or trained assistants on the aspect of the school design.

SAMPLING

The population size of the study area in 2006 was 374,671 (National Population Commission, 2006). This was projected from 2006 to 2017 at an average urban growth rate of 3.0 percent to 503,317 persons. A representative sample size of 383 persons was computed at an accuracy of 5% and at 95% confidence level (David Van Amburg of Market Source Inc. as cited in Mitchell and Jolley, 2007). A multistage cluster sampling was used to pick parents or wards of pupils from 54 registered primary schools in Oredo Local Government Area provided by the Ministry of Education, Edo State. Four wards were randomly selected; and each ward formed a primary sampling unit (PSU) and two schools were randomly picked from each ward, which served as a stratum. Thus the eight schools served as secondary sampling units (SSU). Figure 2 shows the wards in Oredo Local Government Area

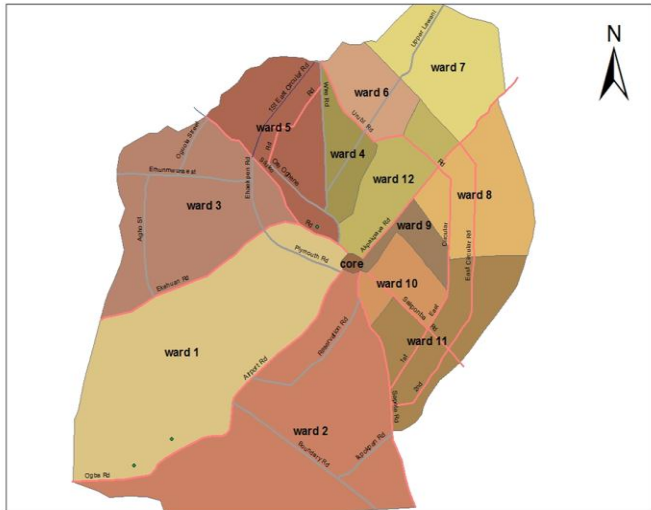


Figure 2: Wards in Oredo Local Government Area

A likert-type instrument was used to collect data. It has a five-option responses with the first item 1 the lowest value, the middle 3 is the neutral value and the fifth item, the highest value, and the other two items 2 and 4 lying within the scale. The questions were drawn from planning, site planning, architectural and Ministry of Education Design Guidelines.

ANALYSIS OF DATA

First, descriptive analysis was carried out to describe the state of being of the private primary schools using percentage and frequencies. Second, inferential analysis was carried out using chi-square, goodness –of-fit to test the disparity in standards observed in the field and those established by school design guidelines. Also, school design was correlated with learning assimilation. SPSS Version 22 was used as a tool in the analysis of data.

III. RESULTS AND DISCUSSION

A total of 376 respondents were interviewed out of 388. The respondents were equally distributed among four wards of Oredo Local Government Area. The results are as follows:

ORGANIZATION OF THE PHYSICAL DESIGN OF SCHOOLS

The respondents were asked to describe the organization of the physical design of the schools their children or wards attend. Their responses are shown in Table 1.

S/N	Organization of Design	Frequency	Percentage (%)
1.	Not organized	158	42.1
2.	Poorly organized	124	33.1
3.	Average	82	21.9
4.	Organized	7	1.9
5.	Well organized	4	1.1
Total		275	100.0

Source: Authors' Field Survey, 2018.

Table 1: Organization of Physical Design of Schools

About 42.1 percent of the respondents perceived that the physical design of the school buildings are not organized; another 33.1 percent respondents saw the buildings as poorly organized. And 21.9 percent of the respondents saw the organization of the design as average. Only about 3.0 percent of the buildings are organized. The buildings used by most of the private primary schools in Oredo Local Government Area were not originally designed for educational use. Most of these were only converted from residential use to meet the new use and are bound to be unsatisfactory in terms of educational purposes.

IMPACT OF SCHOOL DESIGN ON LEARNING IN OREDO LOCAL GOVERNMENT AREA

The survey sought to find out the impact of the design of private primary schools on children's learning. The responses of the interviewees on this are shown in Table 2.

S/N	Impact	Frequency	Percentage (%)
1.	No impact	103	27.8
2.	Little impact	84	22.7
3.	Average	75	20.3
4.	impact	58	15.7
5.	Much impact Very much impact	50	13.5
Total		376	100.0

Source: Authors' Field Survey, 2017.

Table 2: Impact of School Design on Learning

Cumulatively, 50.5 percent believed that the design of the schools which their children attend does not help the children to learn. Some 20.3 percent of the respondents claimed that the impact of the school design on learning is average. About 29.2 percent of the respondents believed that the design of the school building has positive impact on their children's learning. Many educationists believe that the school building as an important environment for learning has positive or negative impacts on learning of children (Colvin, 2001; Darmody, Smyth, Doherty, 2010).

VENTILATION OF CLASSROOMS IN SCHOOLS IN OREDO LOCAL GOVERNMENT AREA

After looking at some aspects of the general design of private primary schools in the study area, also some specific aspects of building design standards were considered. The respondents were asked to perceived how ventilated the classrooms the children learn. Table 3 shows their responses.

S/N	Ventilation	Frequency	Percentage (%)
1.	Not ventilated	112	29.8
2.	Poorly ventilated	181	48.1
3.	Average	59	15.7
4.	Ventilated	14	3.7
5.	Well-ventilated	10	2.7
Total		376	100.0

Source: Authors' Field Survey, 2017.

Table 3: Ventilation of Classroom

Some 29.8 percent of the total respondents claimed that the classrooms in which pupils learn were not ventilated. About 48.1 percent said that the classrooms were poorly

ventilated. Thus about 77.9 percent of the classroom surveyed had poor ventilation and only less than 13.0 percent were ventilated. This is a poor performance considering the role ventilation plays in making a room not to be stuffy. A room that is not properly ventilated is not ideal for living and performing any activity, especially learning (Dudek, 2000; Crosbie, 2001; De Chiara, 2001).

DAYLIGHT CONDITION IN CLASSROOMS IN OREDO LOCAL GOVERNMENT AREA

The condition of daylight is very important in the learning, especially in Nigeria where electricity supply is epileptic and poor. The respondents were asked to perceive the daylight condition in the classrooms.

S/N	Day lighting	Frequency	Percentage (%)
1.	Very poor	104	27.5
2.	Poor	169	44.7
3.	Average	85	22.5
4.	Good	16	4.2
5.	Very good	4	1.1
	Total	378	100.0

Source: Authors' Field Survey, 2017.

Table 4: Daylight Condition in Classrooms

On cumulative basis, 72.2 percent of the respondents claimed that daylight was poor (i.e the condition of visibility of an enclosed room during daytime). About 22.5 percent of the respondents said daylight of the classrooms was of average condition. Only 5.3 percent of the classrooms daylight condition was good. Daylight condition is good for the sight of the pupils and for learning which should not be compromised in any form (Brubaker, Bordwell, Christopher, 1998; Earthman, 2004).

SIZE OF PRIMARY SCHOOL PLOT IN EDO STATE

The Ministry of Education in Edo State has a standard plot size required to accommodate a primary school block and other ancillary space needs. The standard specified by the Ministry of Education is two hectares. The respondents for the survey were taught how to estimate area of plots and their estimations of school plot sizes are shown in Table 5.

S/N	Plot size (M ²)	Frequency	Percentage (%)
1.	Less than 50m	342	93.7
2.	x 50m	15	4.1
3.	50m x 100m	8	2.2
4.	100m x 100m	-	0.0
5.	150m x 150m	-	0.0
	150m x 200m		
	Total	365	100.0

Source: Authors' Field Survey, 2017.

Table 5: Plot Sizes of Private Primary Schools in Oredo Local Government Area

In Table 5 there was no private primary school in Oredo Local Government that met the standard plot size of two hectares (20,000m²). About 93.7 percent of the plot sizes were less than 50m x 50m (i.e. less than 0.25 hectares); even the largest category of plot sizes, that is, 100m x 100m (1 hectare) is less than the two hectares required by the Ministry of Education Edo State Guidelines. This requirement seems to be

stringent considering the location of Oredo Local Government Area which is mainly urban. Thus the scarcity of urban land for such relatively large-scale development makes such requirement difficult to be attained by private primary school proprietors.

CLASSROOM SIZES IN PRIVATE PRIMARY SCHOOLS IN OREDO LOCAL GOVERNMENT AREA

The learning room has a design standard aimed at achieving the goal of learning. There are no classrooms in private primary schools that met the design standard of 7.3m by 9.2m set by the Ministry of Education in Edo State. Table 6 shows the estimated measurements of the sizes of the various classrooms of the schools that were surveyed.

S/N	Classroom Sizes	Frequency	Percentage (%)
1.	Less than 4m x	282	76.8
2.	5m	58	15.8
3.	5m x 6m	23	6.3
4.	6m x 7m	4	1.1
5.	7m x 8m	-	0.0
	8m x 9m		
	Total	367	100.0

Source: Authors' Field Survey, 2017.

Table 6: Classroom Sizes in Private Primary Schools

Most of the classrooms in the schools surveyed (76.8%) had a size of less than 5m x 6m; 15.8 percent of the classrooms had a size of 5m x 6m; 6.3 percent has 6m x 7m in their area; and only 1.1 percent had area of 7m x 8m. Thus there was no single classroom among the schools surveyed that had the standard size of 7.3m x 9.2m set by the Ministry of Education in Edo State. Failure to meet the standards set by the supervising ministry could have some negative impacts on teaching and learning as classroom density could be comprised (Darmody, et al., 2010)

SCHOOL PLAYGROUNDS IN PRIVATE PRIMARY SCHOOLS IN OREDO LOCAL GOVERNMENT AREA

The presence of a school playground represents a valuable infrastructure in meeting the extra-curricular activities of school children. The respondents for the survey were asked to comment on whether if there is present anything up to 30m by 30m playfield in the schools their children or ward attend. Their responses are shown in Table 7.

S/N	Playground	Frequency	Percentage (%)
1.	Yes	157	41.8
2.	No	219	58.2
	Total	376	100.0

Source: Authors' Field Survey, 2017.

Table 7: Presence of School Playgrounds

About 41.8 percent of the respondents said that they were able to observe that some schools have playgrounds of 30m x 30m (900m²); and 58.2 percent claimed that they did not see any playground of up to the standard of 900m². This standard has to be set in order that the respondents for the survey would not regard any incidental open spaces as playgrounds.

SEPARATION OF LEARNING AREAS FROM VEHICULAR AREAS IN SCHOOLS IN OREDO LOCAL GOVERNMENT AREA

The modern primary school, especially in an urban environment has a lot of traffic nuisance because of the infiltration of vehicular traffic into the school premise. This condition can be both a hindrance to learning and accident problem to the users of the school. The respondents were asked to determine if the classrooms are clearly separated from vehicular traffic routes. Table 8 indicates their responses.

S/N	Separation	Frequency	Percentage (%)
1.	Yes	36	9.6
2.	No	339	90.4
	Total	375	100.0

Source: Authors' Field Survey, 2017.

Table 8: Separation of Learning Areas from Vehicular Traffic

The respondents claimed that only in 9.6 percent of the schools surveyed that the learning and traffic areas are separated. The bulk of the respondents (90.4 percent) claimed that there is no separation between learning and traffic areas. This condition is contrary to the design of primary school in which the two functional areas of learning and traffic ought to be separated (De Chiara & Crosbie, 2001; OECD, 2001).

ATTRACTIVENESS OF LANDSCAPE FEATURES OF PRIVATE PRIMARY SCHOOLS IN OREDO LOCAL GOVERNMENT AREA

The learning environment ought to be slightly in terms of landscape features of planting, hard elements and elements that promote attractiveness. The respondents perceived the attractiveness of the landscape features in the schools their children or wards attend. Table 9 shows their perceptions on landscape features.

S/N	Attractiveness Landscape	Frequency	Percentage (%)
1.	Very unattractive	86	22.9
2.	unattractive	127	33.9
3.	Average	123	32.8
4.	Attractive	28	7.5
5.	Very attractive	11	2.9
	Total	375	100.0

Source: Authors' Field Survey, 2017.

Table 9: Attractiveness of Landscape Features in Private Primary Schools

About 22.9 percent of the respondents perceived the landscape features as very unattractive; 33.9 percent of the respondents perceive the landscape features as unattractive; and 32.8 percent of the perceive the landscape features as average in attractiveness. Only 10.4 percent of the respondents perceived the features as attractive. Thus it is clear that majority of the private primary schools in the study area do not place any premium on having attractive landscapes. Landscape features are important in primary school design because they help to promote the curiosity and nurture learning in pupils. These features were emphasized by experts in the training of pupils (see Weinstein & David, 1987; Taylor & Fisher, 2000; Zandvliet & Straker).

THE ASSOCIATION OF SCHOOL DESIGN WITH LEARNING

The association of school design with learning was statistically tested using non parametric correlation (rho) of spearman and the result is displayed in Table 10. This link between design and learning is the thrust of the study.

Correlations

			Q9.WHAT .IS.THE.D ESIGN	Q10.DO. YOU.THINK
Spearman's rho	School design	Correlation Coefficient	1.000	.403**
		Sig. (2-tailed)	.	.000
		N	376	376
	Learning assimilation	Correlation Coefficient	.403**	1.000
		Sig. (2-tailed)	.000	.
		N	376	376

** Correlation is significant at the 0.01 level (2-tailed).

Table 10: Correlation of School Design and Learning Assimilation

The results show a positive correlation of .403 between design and learning assimilation as indicated by the respondents of the survey. The coefficient of determination is (0.162409 x 100) 16.2409%, which is the explained variance. This implies that the design of the school could be used to determine to some extent the assimilation of pupils. In summary, rho =.403, n = 375, p < 0.01 a two tailed test. Thus the relationship between design and assimilation is significant.

CHI-SQUARE ANALYSIS OF OBSERVED AND EXPECTED SCHOOL PLOT SIZES OF SCHOOLS IN OREDO LOCAL GOVERNMENT AREA

A critical requirement in the establishment of primary schools in Edo State is the size of the plot of primary school. The size of a primary school is set at a standard of two hectares or 20,000m². The urban nature of the study area makes this requirement difficult to attain owing to the scarcity of developable land. In the descriptive analysis there was no school that was surveyed that met this standard of two hectares. A Chi-square test of the significant difference between the observed and the expected is shown in Table 11.

Q13.coded.WHAT.IS.THE.SCHOOL.PLOT.SIZE

	Observed N	Expected N	Residual
LESS THAN 30M X 30M	235	75.0	160.0
30M X 40M	111	75.0	36.0
30M X 50M	2	75.0	-73.0
50M X 50M	25	75.0	-50.0
MORE THAN 50M X 50M	2	75.0	-73.0
Total	375		

Test Statistics

	Q13.coded.WHAT.IS.THE.SCHOOL .PLOT.SIZE
Chi-Square	534.053 ^a
Df	4
Asymp. Sig.	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 75.0.

Table 11: Chi-square Analysis of Observe and Expected Frequencies of School Plot Sizes

The Chi-square goodness-of-fit non-parametric analysis of the observed frequencies of school plot sizes (*fo*) and the expected frequencies (*fe*) established by the null hypothesis (*Ho*) were compared and the discrepancies were significant at 0.001 level two-tailed test. Thus in summary Chi-square goodness-of-fit test indicates that there was a significant difference between the observed plot sizes in the survey and the expected plot sizes established by the Ministry of Education in Edo State, $X^2 (4, n = 375) = 534.053, p < 0.001$.

IV. CONCLUSION AND RECOMMENDATIONS

The design standards of the schools were assessed to be substandard in terms of their planning, architectural, and landscape features. These did not have positive impact on learning of pupils (Tangri, 2005). The following are some recommendations to be used in addressing non-compliance with design standards by private primary operators.

- ✓ The plot size standard of a primary school of two hectares seems to be difficult to attain; and hardly adhered to in Edo State. There is the need for a desirable standard of one and a half hectare that will facilitate compliance by the private schools in Edo State. This is necessary for monitoring of schools for practical compliance.
- ✓ The conditions of the classrooms in the private primary schools need to be improved upon. The schools should make provision for electricity to improve on day lighting and create more openings in the windows and doors that are up to 25 percent of the floor area of a classroom.
- ✓ The proprietors of private schools must be conscious of safety standards and must separate traffic areas from pedestrian areas in their schools. This can help in preventing avoidable accidents in schools.
- ✓ The attractiveness of the school as a learning environment must be improved upon. This can be done by planting trees, ornamental flowers, seating areas and amenity lighting in school compounds. Landscape features can go a long way of impacting on the nurture study of the pupils in a school.
- ✓ Government should make it mandatory for Parent-Teacher-Associations to produce an annual objective report on the state of design standards in primary schools. This will go a long way in monitoring school learning in terms of its design and facilities.

- ✓ The monitoring of schools for compliance with design standards must be carried out by the Ministry of Education of Edo State on continuous basis.

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