

Influence of Class Size and Classroom Physical Environment on Pupils' Academic Performance: Implications for Quality Control

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Abstract

This study was carried out to examine the influence of class size and classroom physical environment on pupils' achievement in public primary schools in Ondo West Local Government Area of Ondo State, Nigeria. The study adopted descriptive survey design of correlational type. The study population comprised all primary three pupils in public primary schools in the study area. The sample comprised one hundred primary three pupils selected from ten primary schools using simple random sampling technique. Two instruments: "Checklist on Physical Environment in Primary Schools (CPES)" and "Questionnaire on Class size and pupils Academic Performance (QCSPAP)" were used for data collection. Data collected were analysed using inferential statistics. Findings from the study showed that there was a significant influence of class size on pupils' academic achievement ($df = 98$; $t = 6.692$; $p < 0.05$) and there was positive but non-significant relationship between classroom physical environment and pupils' academic performance ($N = 100$; $r = .231$; $p > 0.05$). Based on the findings, it was recommended among others that schools to abide by the recommended teacher-pupil ratio in primary schools. It was also recommended that efforts should be made by all stakeholders in early childhood and primary education in Nigeria to ensure that physical environment of classroom promote children learning and development.

Keywords: Class size, classroom physical environment, academic achievement, quality control.

Introduction

Children spend most of their waking hours in the school environment. They spend some time outside play area and occasionally go on excursions into the community. However, for many children, most of the time is spent in relatively confined space in the classroom. Research findings have shown that the quality of the environment has impact on the behaviour of children as well as adults who spend their time with the children (Gur, 2014; Obaki, 2017). Arrangement, organization, size, density, noise level and even colour of the classroom directly and indirectly invite a range of behaviour from children and teachers (Essa, 2013).

Importance of classroom in determining what a child becomes in the future has also been pointed out by scholars. For instance, Hannah (2013) asserts that the classroom is the place where children will learn the various skills deemed necessary and proper for them to achieve success in the global society. It is also in the classroom that gain an understanding of their place in the world. It is in the classroom that the learners develop what they want their future to look like, as well as knowledge of the skills needed to reach that goal. With the classroom being such an important place in the growth of a child, it is therefore important to understand the ways to set up classroom environment in a way that will guarantee proper learning and development of children. If not approached correctly, a classroom can be set up in a way that stifles creativity or does not promote a positive learning environment.

There are many things that can affect classroom environment such as physical elements which include wall art, arrangement of desks, or resources. Also, there are intangible elements such as the energy of the classroom, the rules, or the sounds within the room. Each of these can impact a child's focus, concentration, comfortability and performance in the class. They can also affect a teacher's attitude in the class. There is also the issue of emotional environment of the classroom. The way in which a teacher organizes his or her class, or how he or she controls it has the capacity to yield positive or negative consequences for pupils in his class. One of the important features of the classroom which can greatly impact on teaching learning outcomes is class size. Class size is a popular concept in educational research and is determined by dividing the number of enrolled pupils by the number of classes. It is the number of pupils a teacher teaches during a given period of instruction (Yara, 2010).

Scholars such as Esa (2013) noted that in an ideal classroom, children spend considerable amount of time on free choice activities and other routine activities such as meals. The issue of class size is therefore very crucial. Also, learner to teacher ratio relates directly to the quality of schooling and the larger the class, the harder it is for the teacher to know the circumstances of each individual learner (Lannoy & Hall, 2010; Miras, 2016). Teachers are required to provide the best learning experience for learners (Finn, Pannozzo and Achilles, 2003). A situation whereby the classroom is overcrowded makes it difficult or impossible for learners to attain the set educational goals. When a class size is reduced, it

allows for effective teaching and learning (Shah & Inamullah, 2012). In a similar vein, Mtika (2010) argues that smaller classes allow teachers to interact more with learners and give individual attention to slow learners.

Also, it has been observed that the smaller number of children, the easier it is for the teacher to monitor children progress which may increase the likelihood of effective individualization of instruction, and may make each individual more visible and connected, creating greater social and academic engagement (Finn, Pannozzo and Achilles, 2003). Furthermore, smaller classes may be quieter, with fewer children to contribute to the overall activity levels, potentially making behavior management easier and increasing the likelihood that children have freedom to engage in self-selected, developmentally appropriate activities and cooperative play.

Studies have revealed several effects of large classes. For instance, Muthusamy (2015) conducted a study to examine teachers' experiences with overcrowded classrooms in a mainstream school in Umlazi district, KwaZulu-Natal, South Africa. Findings of the research showed that teachers' experiences with overcrowded classrooms are 'stressful'. Teachers themselves identified certain conditions that are stressful in an overcrowded classroom. These conditions were inadequate classroom space, issues related to learners' safety and health, minimal learner and teacher interaction, teachers experienced emotional and psychological problems, increased workload and inadequate teaching time. Mairas (2016) asserted that when learners are placed in classes with small numbers, they are more involved in learning activities and this increases their academic achievement. This is supported by Ikediaskhi and Amaechi (2012) who pointed out that lower teacher learner ratios result in higher quality education.

However, some research findings have shown that reduction in class size had little or no impact on student achievement. For instance, Corak and Lauzon (2009) analysed scores of Canadian 15- year olds in the Programme for International Student Assessment. They found that class size made no consistent impact on student achievement. In a similar vein, Owoye and Yara (2011) found that there was no significant difference in students' achievement between large and small classes.

The National Policy on Education (2014) recommends teacher pupils ratio of 1:10, 1:25 and 1:35 for creche, nursery and primary classes respectively. These recommended standards seem to be unrealistic. Most schools in Nigeria have large class size, thereby making them increasingly unmanageable and leaving the teachers with the impossible task of giving individual attention to the learner's needs (Jacob, Olawuyi and Jacob, 2016).

Aside class size, impact of the general classroom physical environment on children competency and development had also been studied. For example, Maxwell (1996) developed a rating scale to assess the physical environment's role in children's

development of cognitive and social competency. He found that the physical environment is related to measures of competency. In his own study, Mashburn (2008) examined associations between quality of social and physical environments in pre-schools and children's development of academic, language, and literacy skills, and the extent to which pre-school quality moderated the associations between child risk and development. He found that high-quality environments were positively associated with children's academic and literacy skills at the end of pre-school.

The extent to which children are actively engaged have been found to be determined by the physical nature of the classroom. For instance, Essay (2013) opined that children growing sense of independence is supported when they can confidently and competently use equipment and when materials are arranged so that they can see what is available. At the same time, children develop a sense of stability when the environment makes it clear on how and where materials are to be returned when they finish using them. Also, children are dutifully involved in activities when the purposes of classroom space are well defined and when materials are developmentally appropriate (Essa, 2013). All these underscores the importance of classroom physical features in children learning and development as they are essential indicators of quality control in any early childhood classroom.

Quality control is an essential component of every organization or programme. Indices of quality in early childhood education include those that relate directly to the quality of learning activities in the curriculum content, physical environment, quality of teaching and non-teaching staff, as well as evaluation. Quality in early childhood and primary education means ensuring that children are cared for in a safe and nurturing environment. Therefore, essential factors such as group size, teacher-pupil ratio and physical features (playground facilities, toys and stimulating materials are considered (Olaleye and Omotayo, 2009). As posited by Melhiush (2001), quality reflects what is beneficial to children development. Scholars such as Olaleye and Omotayo (2009) and Esa (2013) have posited that children exposed to high quality settings have the tendency to exhibit better language and mathematical skills, better social skills and better relationships with classmates than those exposed to lower quality. The subject of quality control in early childhood and primary education therefore becomes very crucial.

The education sector generally and early childhood in particular in Nigeria has always been faced with challenges relating to quality (Omoera, 2013). This is why the issue of quality control has always been a thing of great concern to educators in the field of early childhood and primary education in Nigeria. Of important note among these glaring challenges of early childhood education and primary education include those related to school physical environment, especially within the classrooms which have been found to be consistently in poor condition (Omoera, 2013). How this influence academic achievement of pupils should as well be of interest to child educators and researchers. Although scholars have conducted studies to determine the influence of class size and

other physical features of the classroom on pupils academic, most of their findings have been inconclusive on this issue as some studies found positive influence of these variables on pupils' academic achievement while other studies found it to be otherwise. These conflicting findings no doubt call for further research efforts in this area. Also, there seems to be dearth of empirical studies on this subject in Ondo West Local Government Area of Ondo State. This study therefore examined influence of class size and classroom physical environment on pupils academic achievement as well as its implications on quality control in early child hood education.

Hypotheses

The following hypotheses were generated for the study:

1. There is no significant difference between the academic achievement of primary three pupils from small and large classes.
2. There is no significant relationship between physical environment and primary three pupils' academic achievement.

Methodology

The study adopted descriptive design of correlational type. Study population comprised all primary three pupils in public primary schools in Ondo West Local Government Area of Ondo State, Nigeria. Simple random sampling technique was used to select ten (10) public primary schools from the study area while ten (10) pupils were randomly selected from primary three in each of the ten schools making a total of one hundred (100) pupils. Two instruments developed by the researcher were used for data collection. The first one was a checklist titled "Checklist on Physical Environment in Primary Schools (CPES)." The instrument was designed to elicit necessary information on how the physical environment of the classrooms were. The checklist contained a list of items that are expected to be present in an ideal children classroom. Response format adopted for the checklist were at four levels of "Not Present", "Present A Little", "More Present" and "Very Much Present" rated at 1, 2, 3 and 4 respectively. The second instrument was a questionnaire titled "Questionnaire on Class size and pupils Academic Performance (QCSPAP)" which had two sections A and B. Section A contained demographic information of the pupils which are basically gender and class size. Section B contained Pupils' Academic Performance Score Sheet which has three columns of Subject, Total and Average. CPES was administered on 20 pupils who were not part of the study so as to test its reliability using Intra Class Correlation Coefficient and a value of 0.76 was obtained. Data collected were analysed using T-test and Pearson Product Moment Correlation.

Results

H₀1: there is no significant difference between the academic achievement of primary three pupils from small and large classes.

Table 1

Summary of T-test of showing difference between Academic Achievement of primary three pupils from Small and Large Class Size.

ACADEMIC ACHIEVEMENT	Class size	N	Mean	Standard Deviation	df	T	Sig (p)	Remark
	Small	66	53.68	9.52				
	Large	34	40.91	7.99	98	6.692	.000	Significant

Table 1 shows the difference in the academic achievement of pupils from small and large class size. The table shows that the mean score of pupils in small class size is 53.68 while that of those in large class size is 40.91. Therefore, there was significant influence of class size on pupils' academic achievement ($df = 98$; $t = 6.692$; $p < 0.05$). Hence, hypothesis 1 was rejected.

H₂: There is no significant relationship between physical environment and primary three pupils' academic achievement.

Table 2

Summary of Pearson Product Moment Correlation showing Influence of classroom Physical environment on Primary three Pupils' Academic Achievement.

Variables	Mean	Std. Deviation	N	R	Sig (p)	Remark
Physical Environment	31.30	17.48				
Academic Environment	56.30	10.11	100	.231	.520	Not Significant

Table 2 shows the influence of physical environment on primary three pupils' academic achievement. The table shows that there is no significant influence of physical environment on pupils' achievement ($N = 100$; $r = .231$; $p < 0.05$). Hence, hypothesis 2 was not rejected.

Discussion

The first finding of this study revealed that there was a significant difference between the academic achievement of primary three pupils from small and large classes. This finding is consistent with the opinion expressed by (Mairas, 2016) that when learners are placed in classes with small numbers, they are more involved in class activities and academic achievement increases. The finding also agrees with the assertion of Ikediaskhi and Amaechi (2012) that lower teacher learner ratios result in higher-quality education. It

however contradicts the findings of Corak and Lauzon (2009) as well as that of Owoeye and Yara (2011) who found no significant influence of class size on students' academic achievement.

The second finding of this study showed that there was no significant relationship between physical environment and primary three pupils academic achievement. This could be as a result of the fact that there was no much difference in the physical features of all the classrooms used for this study as they are all from public primary schools. This finding is not consistent with the findings of some studies that were conducted on these variables such as Marxwel (1996) who found that the physical environment is related to measures of competency in children. The finding also disagrees with that of Mashburn (2008) that found high-quality environments to be positively associated with children's academic and literacy skills at the end of pre-school.

Findings of this study have serious implications for quality control in early childhood and primary education in Nigeria. As pointed out earlier, class size and other physical features of the classroom are among the most important indices of any programme in early childhood education. Quality early childhood education programme can only be guaranteed in classroom that support development. Physical features of the classroom have direct effect on how children behave towards each other, how learning activities are structured and extent teacher pupils' interactions among others. Children are more likely to follow classroom rules when the physical features of the classroom allow it. (Essa, 2013). All these are important features that translate to quality early childhood and primary education programmes.

Conclusion

Based on the findings of this study, it was concluded that class size and classroom physical environment are important indices for quality control in early childhood and primary education programmes in Ondo West Local Government Area particularly and Nigeria in general, and if not properly addressed, there can never be quality early childhood and primary education.

Recommendations

The following recommendations were made based on the outcomes of this study:

1. The recommended teacher-pupil ratio for pre-primary and primary levels of education in the education policy document should be strictly adhered to. This could however be made possible and realistic by government employing more caregivers and teachers into the government owned early childhood centres and schools.
2. Government should make efforts to build more classroom in the public primary schools across the country as a way of bringing the teacher-pupil ratio to the recommended standard.

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