PRINT: ISSN 0975-1122 ONLINE: 2456-6322
Int J Edu Sci, 11(2): 128-136 (2015)
DOI: 10.31901/24566322.2015/11.02.01

A Comparative Study of Class Size and Academic Achievement of Pupils in Boarding and Non-Boarding Schools

D. Mahlo

Department of Inclusive Education, University of South Africa, South Africa
E-mail: mahlofd@unisa.ac.za

KEYWORDS Learner-Teacher Ratio. School Environment. Certification. Extracurricular Activities. Rural. Additional Support

ABSTRACT This study compares class size (learner-teacher ratio) between boarding and non-boarding schools, along with the correlation between them and academic achievement of Grade 12 learners of the Capricorn District in the Limpopo Province of South Africa. A simple random sample was drawn from the population of 339 schools, comprising of 51 principals, 158 teachers and 290 learners from 51 schools. The School Environmental Questionnaire (SEQ) collected data on the school environment, while the Capricorn District Academic Summary Report of the Grade 12 collected data on academic achievement. The data analysis technique used was the t-test. The results showed no significant difference in learner-teacher ratio between boarding and non-boarding schools. It also revealed no significant difference in class size exists between low and high achieving schools indicating that the class has no significant relationship with academic achievement. The implications of this study are that sending a child to boarding school in order to take advantage of learner-teacher ratio may not yield intended results.

INTRODUCTION

Small class sizes are one of the reasons why parents send their children to boarding schools (Kennedy 2014). Wahlig (2014) maintains that in boarding schools teachers are expected to provide additional support to students through extracurricular activities and the students have an opportunity to form genuine relationships with mentors and build bonds. Maphoso and Mahlo (2015) investigated whether the teachers' qualifications have an influence on academic achievement of learners, they found that there is no relationship between the qualification of teachers in boarding and non-boarding schools on learner achievement. The experience of the teachers, age, gender, attitudes and social behavior contribute to the students' academic achievement whether in boarding schools or non-boarding schools. According to Currie (2014), benefits of a high ratio include more than one-to-one contact time between teachers and pupils and since teachers get to know students very well, they can tailor their lessons to an individual's strengths and weaknesses. Class size or learner-teacher ratio is important in the organization of learning activities. The process of planning the classroom space is one of the higher-level tasks of teaching (Nash 1997). MacAulay (1990) is of the opinion that the structure and organization of a classroom indicates that the physical setting of learning influences the pupils' outcomes. The improvement brought about by Class-size Reduction Programs (CRP) is noticeable in the decline in the number of disciplinary referrals, improved teacher morale, a focus on prevention rather than remedial and higher levels of classroom participation by students (United States Department of Education 2000).

Class size, according to Schwartz et al. (2012), Olatunde (2010) and Baloyi (1996) has a relationship with academic achievement, and this study will investigate if there is any difference in this learner-teacher ratio between boarding and non-boarding schools and if this learner-teacher ratio has any relationship with academic achievement of Grade 12 learners in the District of the Limpopo Province in South Africa.

Literature Review

For the purpose of this paper, literature review focused on aspects of class size and academic achievement of pupils in boarding and non-boarding schools and studies related to this topic.

Advantages of Boarding Schools

The Camp Recovery Centre (CRC) (2014) mentioned advantages of boarding schools as

among others, individualized attention, academic improvement and positive impact on teachers. The CRC further mentions that most boarding schools boast about the small ratio of students to teachers at the average size of 8-10 students per teacher, which boosts the quality of teaching, promotes parents involvement and provides a renewed sense of self and strong character. Classroom settings are often specifically designed to encourage student participation and eye contact with everyone in class. Furthermore, the academy says that academics at boarding schools operate at high standards, and students are pushed to "ask why," become inquisitive, and tackle challenging problems.

Pritzker (2011) declares that one of the advantages of boarding schools is that the class size in there is intentionally small to allow students with learning disabilities and/or slow processing speeds to get individualized attention and a learning pace they can manage. Traditional boarding schools according to Pritzker, keep class sizes to 12 or less, which helps difficult student to find themselves with much more (positive) adult interaction and cannot fall through the cracks in small classes. On the other hand, the small class sizes mean that all pupils have to participate, and if a child starts to fall behind, he/she will be noticed quickly and be brought back up to speed (Heart Content of a Mama 2012).

The Recommended Ratio of Learners and a Teacher

The 12thcentury rabbinic scholar Maimonides proposed a maximum class size of 40 and same maximum induces a nonlinear and non-monotonic relationship between grade enrollment and class size in Israeli public schools (Angrist and Lavy 1999). Maimonides' rule of 40 is used to construct instrumental variables estimates of effects of class size on test scores. The estimates from Angrist and Lavy show that reducing the class size induces a significant and substantial increase in test scores.

On the other hand, School (2010) indicates that many non-boarding schools have class sizes that range from 20-30 students and that at boarding schools the typical class size is 10-15. School further says that with smaller class sizes, students not only get individual attention, but the teacher is able to quickly learn each student's strengths and weaknesses. This will allow teachers to challenge each student, reinforce areas that need improvement and encourage the child to pursue their individual strengths. Blatchford and Martin (1998) supported this ratio by maintaining that a class of above 30 learners decreases the teachers' morale, causes stress, and decreases enthusiasm.

Although class size of 30 to 40 seems to be appropriate for effective learning and teaching, most of the researchers argue that there is no fixed number or percentage of subjects to determine the size of the adequate sample (Best and Kahn 1993). That is why this study seeks to investigate if the school's size has any influence in performance of learners, and whether boarding and non-boarding schools have different class size or learner-teacher ratio.

Empirical Findings

The most comprehensive investigation of class size has been conducted with elementary school children where 163 classrooms were evaluated. The results were contradictory. At some grade levels, small classes seemed to improve academic performance, while at others it did not (Yussen and Santrock 1982). Yussen and Santrock concluded that the classroom environment influences child development, while Muennig (2008) from Virginia Commonwealth University found that graduation rates were higher among students from smaller classes. This was also supported by descriptive findings of Milesi and Gamoran (2003), which are a triangulation of the data gathered from the various instruments of data collection that concluded that class size and school factors such as teacher effectiveness can influence student achievement.

Schwartz et al.'s (2012) study used a randomized experimental design to examine the relationship between learner-teacher ratio and literacy learning outcomes for experienced intervention teachers working with the most at-risk first-grade students. The 1:1 instruction yielded significantly higher outcomes than the combined small group conditions. The study further revealed that small group conditions did not differ significantly from one another, but a trend analysis

indicated a reduction of literacy performance as group size increased. Arshad et al. (2009) found that there is much variation and misallocation in student-teacher ratio, class size and per student expenditure among schools. Their study found that the misallocation of student-teacher ratio and class size leads to the wastage of resources and lower levels of academic achievement. They also discovered that reduction in student-teacher ratio and class size is very expensive although their allocation can be equalized within the scarce funds. This equal allocation of these resource inputs may lead to the effective use of school resource inputs and produce higher level of academic achievement.

Chung (2009) investigated class size and student achievement in the United States using a meta-analysis approach and came to the following conclusions:

1. Effect sizes were higher in published studies than in unpublished studies.
2. In terms of school subjects, the results of Class Size Reduction (CSR) were generally positive.
3. The effect of CSR on student achievement was larger in elementary schools than in secondary schools.
4. The results of CSR were generally positive, except for the 10th grade.
5. The results of CSR are mixed, but generally positive by location of states.

The purpose of the paper by Howsen (2005) was to investigate the effect of class size on student achievement, and their results also suggest that the relationship between class size and student achievement is not only non-linear, but also non-monotonic. Schwartz et al. (2012) used a randomized experimental design to examine the relationship between teacher-student ratio and literacy learning outcomes. In this study, the small-group conditions did not differ significantly from one another, but a trend analysis indicated a reduction of literacy performance as the group size increased.

African Findings

In order to investigate the class size and the students' mathematics achievement of senior secondary schools in Southwestern Nigeria, Olatunde's (2010) results showed that the performance of students in large classes was very low (23%) compared to those students in smaller classes (64%). Olatunde then recommended that policymakers and the government should ensure that more classrooms are built and the number of students in a class should not be greater than 30. Still in Nigeria, the results of Owoeye and Yara (2011) showed that there was no significant difference in the academic achievement of students in small and large classes from urban schools ($t = 1.49$; $p < 0.05$) and there is also no significant difference between performance of students from rural large and rural small classes ($t = 0.58$; $p < 0.05$).

In South Africa, Baloyi (1996) indicated that a teacher in most Black schools has to teach 45 children or more. The actual number in some African schools was as high as 75 per class. Individual attention to pupils' problems and individual counseling becomes a nightmare for the few qualified counselors. A teacher in such a class is unable to pay attention to all his/her learners on a daily basis. This leads to a situation where a teacher is not in a position to know all his/her learners or to identify problems that an individual learner has.

To reiterate what Baloyi indicated, Papo (1999) in his research used 45 lecturers consisting of 32 males and 13 females from the faculties of Arts, Education, Theology, Management Sciences, and Law, and 246 students consisting of 95 males and 151 females from the faculties of Arts, Education and Management Sciences. The aim was to attest whether or not the Large Class Teaching (LCT) is a problem for students. Student and lecturer questionnaires to measure teaching effectiveness and teaching strategies in large classes were used and the results of the research were as follows:

1. Male and female lecturers from different faculties teaching large or small classes are affected by the class size in the same way.
2. The majority of lecturers from different faculties have problems in employing their teaching strategies in a large class.
3. The majority of lecturers from different faculties have problems with a large class.
4. Teaching can be effective despite conditions of a large class by students of different genders.
5. Male and female students have no problems with a large class teaching.
6. Male and female students have no problems with a large class environment.

Bakasa (2012) also investigated the effect of class size on academic achievement at a selected institution of higher learning in South Africa. Descriptive findings, which were a triangulation of the data gathered from the various instruments of data collection, pointed towards a conclusion that class size and school factors such as teacher effectiveness can influence student achievement. In other studies, the class size promoted opposite results. This is evidenced in the work of Drake (2013) who found that that class size negatively correlated with academic achievement for fourth and eighth grade students in rural El Salvador.

Findings that Do Not Support Effect of Class Size on Academic Achievement

Although class size seems like it impacts academic achievement, many findings do not agree with that. For instance, even though the results show that smaller classes raised mathematics and reading achievement, they also highlight that the increase in the share of teachers with neither prior experience nor full certification dampened the benefits of smaller classes, particularly in schools with high shares of economically disadvantaged, minority students (Jepsen and Rivkin 2009). The analysis of Stecher et al. (2003) found no strong association between achievement and exposure to Class Size Reduction (CSR) for groups, after controlling for pre-existing differences in the groups.

In another study Hoxby (2000) identified the effects of class size on student achievement, using a longitudinal variation in the population associated with each grade in 649 elementary schools. The estimates indicate that the class size does not have a statistically significant effect on student achievement. Milesi and Gamoran's (2003) findings also did not present any evidence of direct effects and only few indirect effects of class size on students' achievement in reading and mathematics. The analysis was based on nationally representative data from the Early Childhood Longitudinal Study-Kindergarten Class of 1998-1999.

Johnson and Seriven (1967) also reveal no consistent effect of class size on academic gain from examinations in English and Mathematics in Grades 7 and 8. Hancok (1996) supports Johnson and Seriven when his chi-squared test for independence failed to show any significant difference in student achievement between two section types. The first section type consisted of a class of 39 students from 6 schools, and the second section consisted of a 118-student class from 36 schools. Lastly, Hoxby (1998) discovered that reductions in class size from a base of 15 to 30 students have no effect on student achievement.

The Study Focus

From the presentation above, it is clear that there are mix findings on the effect of class size or learner-teacher ratio on academic achievement of students. While some condone a reduced class as effective, some demonstrated that there is no relationship between the two variables. This is what prompted this study to investigate if any relationship exists between the class size and academic achievement of learners in the Capricorn District of the Limpopo Province in South Africa. The research questions for this study therefore are:

1. Is there a significant difference in the learner-teacher ratio between boarding and non-boarding schools?
2. Is there a significant difference in the learner-teacher ratio between low and high academic achievement schools?

The above research questions lead to the formulation of the following hypotheses:

$H_0$1: There is no significant difference in the learner-teacher ratio between boarding and non-boarding schools.

$H_1$1: There is a significant difference in the learner-teacher ratio between boarding and non-boarding schools.

$H_0$2: There is no significant difference in the learner-teacher ratio between low and high academic achievement schools.

$H_1$2: There is a significant difference in the learner-teacher ratio between low and high academic achievement schools.

METHODS

The sample consisted of 51 schools selected from six areas, randomly selected from a population of 339 schools of the Limpopo Province's Department of Education in the Capricorn District. The District was made up of six areas, with 10 of the 51 schools accommodating boarders, and the remaining 41 did not (See Table 1). The sample of 51 principals, 158 teachers, and 290 learners were respectively selected from 339 prin-

cipals, 4,915 teachers, and 144,518 learners in the District to participate in this research. The schools that participated were those that had written the matriculation examination of the South African Certification Council the previous year. All areas had at least one or more boarding schools, except the Zebediela Area, which had none (See Table 1).

Table 1: Sample of schools from the Capricorn District

Name of area	*No. of schools*	*Schools participating*	*Percentage participation*		*Total*
			Non-boarding	*Boarding*	
1. Bochum	74	6	1	7	8
2. Konekwena	58	8	1	9	15
3. Mankweng	59	7	3	10	12
4. Mogodumo	53	6	3	9	17
5. Polokwane	60	6	2	8	13
6. Zebediela	34	8	0	8	23
Total	339	41	10	51	15

The School Environmental Questionnaire (SEQ) was used to establish whether the school was a boarding school or not. The respondents to this section were the principals (See Table 2).

Section 3(b) of the SEQ was used to collect data related to the learner-teacher ratio. The respondents to this section were the principals. They responded to items 5, 6, and 8 (See Table 3). The researcher worked out the learner-teacher ratio (Item 7) by dividing the number of learners by the number of teachers.

The questionnaires were forwarded to academics in the field of Research and Educational Psychology in the Faculty of Humanities of the University of Limpopo for evaluation, who confirmed that the contents of the questionnaire seemed to be relevant. Educators and research officials confirmed that the SEQ could measure the environment of the school, which included the learner-teacher ratio.

Table 3: Section 3(b) of the School Environmental Questionnaire (Learner-teacher)

3(b) learner-teacher ratio
5. How many teachers do you have?
6. How many learners do you have?
7. Learner-teacher ratio?
8. Any additional information you would like to add?

RESULTS

The Capricorn District had a summary of the Grade 12 results for all its areas, each of which was submitted to the district office by the areas themselves, and in turn submitted to the Provincial Head Office. The researcher worked out the percentage passed with exemption per school, which represents the academic achievement. If a school had obtained a high percentage pass with exemption it had obtained high academic achievement.

Pilot Study

The pilot study was conducted before the schools closed for the winter vacations, and the schools that participated were Thutong High from the Zebediela area, Matiri High from the Mankweng area, and Mampho High in the Polok-

Table 2: Section 1 of the School Environmental Questionnaire (Type of school)

Type of School(Principals)
Name of School: .....
Name of Area: .....

1. Type of school	*Boarding*	*Non-boarding*	
2. Is it boarding or non-boarding?	*Boarding*	*Boarding and Non-boarding*	*Non-boarding*
3. Number of boarders and non-boarders (write number next to appropriate block)	*Boarders*		*Non-boarders*
4. Learners gender	*All boys*	*All Girls*	*Boys and Girls*
5. Number of boys and girls	*Boys*		*Girls*
6. Are you satisfied with the type of school?	*Yes*	*No*	
7. Any additional information you would like to add:			

wane area. The principal, one teacher, and three learners completed the questionnaires (See Table 4). The outcome of the pilot study was that on the questionnaire, under the section of "Others?", the participants gave irrelevant answers so the question was changed to "Any additional information you would like to add?"

Main Study

After conducting the pilot study, it was necessary to change one question and an improved version of the question was added so that the researcher could obtain the envisaged responses.

Statistical Analysis

This research study used a t-test to determine if there was a significant difference in the learner-teacher ratios between boarding and non-boarding schools (research question 1). It also determined if there was a significant relationship between learner-teacher ratios and academic achievement (research question 2).

Research Question 1

Is there a significant difference in the learner-teacher ratio between boarding and non-boarding schools?

Hypotheses 1

H_{01}: There is no significant difference in the learner-teacher ratio between boarding and non-boarding schools.

$H_1 1$: There is a significant difference in the learner-teacher ratio between boarding and non-boarding schools.

The t-test compares the mean of the learner-teacher ratios between boarding and non-boarding schools (See Table 5). It indicates that the p-value is greater than the 0.05 level of significance. Consequently, the null hypothesis is accepted and the research hypothesis rejected. The study therefore signifies that there is no significant difference in the learner-teacher ratio between boarding and non-boarding schools. To put it in different way, it can therefore be concluded that the learners and teachers or class size of boarding schools and those of non-boarding schools do not differ.

Table 5: Learner-teacher ratio between boarding and non-boarding schools

	N	*Mean*	*SD*	*P-Value*
Boarding	10	25.28	10.44	0.114
Non-boarding	41	30.55	8.99	

Both boarding and non-boarding schools had more than thirty students for one teacher (30:1), (See Table 6). Forty-four percent of both boarding and non-boarding schools have an acceptable ratio of less than 30:1.The average learner-teacher ratio for the Capricorn District was 29:1, which is acceptable according to the literature review. In the Limpopo Province, the ratio is 31:1. These findings differ with the discovery of Angrist and Lavy (1999) and the view of School (2010) who supported differences in learner-teacher ratio between boarding and non-boarding schools.

Table 6: Percentage response on learner-teacher ratio between boarding and non-boarding schools

Item	*Response*	*Type*	
		Non-boarding	*Boarding*
		%	*%*
Q7. Learner-teacher ratio?	> 30:1	55.6	55.6
	=<30:1	44.4	44.4

Research Question 2

Is there a significant difference in the learner-teacher ratio between low and high academic achievement schools?

Table 4: Sample of pilot study

School profile	*Participation*						
Name of school	*No. of learner*	*No. of teacher*	*No. of principals*	*No. of learners*	*No. of teachers*	*No. of principals*	*Total filled*
1. Thutong	927	36	1	7	4	1	12
2. Matiri	514	12	1	8	2	1	11
3. Mampho	350	8	1	3	1	1	5

Hypotheses 2

$H_0 2$: There is no significant difference in the learner-teacher ratio between low and high academic achievement schools.

$H_1 2$: There is a significant difference in the learner-teacher ratio between low and high academic achievement schools.

To compare the mean of learner-teacher ratio and schools' academic achievement, the t-test was used (See Table 7). It indicates that the p-value is greater than the significance level. The null hypothesis is accepted and the research hypothesis rejected. This signifies that there is no significant difference in the learner-teacher ratio between low and high academic achievement schools. This indicates that the learner-teacher ratio or class size has no influence on academic achievement of schools, being the Grade 12 learners in the Capricorn District of the Limpopo Province, South Africa.

Table 7: Relationship between learner-teacher ratio and academic achievement

	N	*Mean*	*SD*	*P-Value*
Low academic achievement	30	27.5825	8.92124	0.077
High academic achievement	19	30.5364	9.98617	

Table 8 indicates that the learner-teacher ratio of low and high achieving school do not differ significantly. Both types of schools with a ratio of greater than 30:1 are nearly fifty percent. Similarly even for those whose ratio is equal to or less than 30:1 there is no significant difference at nearly forty-four percent each. This finding differs with the work of Yussen and Santrock (1982), Muennig (2008), Milesi and Gamoran (2003), Schwartz et al. (2012), Arshad et al. (2009), Howsen (2005), Olatunde (2010), Owoeye and Yara (2011), Baloyi (1996), Papo (1999) and Bakasa (2012) who supported that a class of above 30 learners decreases the teacher's morale, causes stress and decreases enthusiasm thereby affecting academic achievement of learners. It however, concurs with the views and findings of the United States Office of Education (2000:70), Hancok (1996:479), Jepsen and Rivkin (2009), Stecher et al. (2003); Hoxby (2000), Milesi and Gamoran (2003) and Johnson and Seriven (1967) who discovered that learner-teacher ratio or class size has no relationship with academic achievement. The findings of this study confirms the positives and the negatives that were highlighted in the literature review for an example in a study by Olatunde (2010), where he or she found out that the performance of students in large class sizes was very low, on the contrary in Bakasa's study it was revealed that class size and teacher effectiveness can contribute to improved academic performance, while in a study by Owoeye and Yara (2011) highlighted that there was no significant difference in the academic achievement of students in small and large classes. Maphoso and Mahlo (2015) highlighted that the experience of teachers, age, gender, attitudes and social behavior contributes to the students' academic achievement whether in boarding schools or non-boarding schools. This implies that all the variables used in this study are not the determinants of academic achievement in schools but it depends on the determination of learners and teachers to improve the performance.

Table 8: 5 Percentage response on learner-teacher ratio between low and high academic achievement

Item Response		*Academic Achievement*	
		Low A.A %	*High A.A %*
Q7. Learner-teacher ratio?	>30:1	55.7	55.6
	=<30:1	44.4	44.4

CONCLUSION

This study reveals that there is no significant difference in the learner-teacher ratio between boarding and non-boarding schools. This may differ with some suggestion where parents send their children to boarding schools with a view that their children will get an opportunity to interact significantly with their teacher. Otherwise, they may get this interaction equally so even at non-boarding schools. The study also demonstrated that there is no significant relationship between learner-teacher ratio or class size and academic achievement. Class size in this study was demarcated by an average of 30 learners per one teacher. The implication of this study is that even if the teacher is teaching less or more than thirty learners in one class, this will not affect the academic results of those learners. There may be other factors contributing towards the differences that might have occurred.

RECOMMENDATIONS

It can be recommended that teachers and learners need to be committed and determined to succeed in order to improve academic achievement. The implications of this study are that sending a child to boarding school in order to take advantage of the learner-teacher ratio may not yield intended results. Since the class size cannot guarantee better academic performance at boarding and non-boarding schools, parents should not send learners to boarding schools hoping for improved academic performance.

ACKNOWLEDGEMENTS

The researcher would particularly like to thank Dr. LST Maphoso, for his guidance and support in the completion of this article.

REFERENCES

Angrist JD, Lavy V 1999. Using Maimonides' rule to estimate the effect of class size on scholastic achievement. *The Quarterly Journal of Economics*, 114(2): 533-575.

Arshad M, Ahmed R, Tahira R 2009. Mis-allocation of Student Teacher Ratio, Class Size and Per Student Expenditure Leads to the Wastage of School Resource Inputs and Lower Academic Achievement: An Issue of Resource Management. From <http://ideas.repec.org/p/pra/mprapa/27835.html.> (Retrieved on 26 August 2014).

Bakasa L 2012. *The Effect of Class Size on Academic Achievement at a Selected Institution of Higher Learning.* Theses and Dissertations (Teacher Education) [86] Unisa ETD.

Baloyi DK 1996. *Career Development in High Schools: A Systemic Cross-cultural Perspective.* Masters Dissertation, Unpublished. SA: University of Pretoria.

Best JW, Kahn JV 1993. *Research in Education*. Boston: Allyn and Bacon.

Blatchford P, Martin C 1998. The effect of class size on classroom process: "It's a bit like treadmill - working hard and getting nowhere fast". *British Journal of Educational Studies*, 46: 118-137.

Chung JY 2009. Class size and student achievement in the United States: A meta-analysis. *Journal of Educational Policy,* 6(2): 3.

Camp Recovery Centre (CRC) 2014. Sizing Up Class Size: Why Smaller Is Better. From <http://www.crchealth.com/youth-programs/sizing-class-size-smaller/> (Retrieved on 1 July 2015).

Currie A 2014. The Importance of Class Size and Teacher: Pupil Ratios. From <http://www. mypremiumeurope. com/private-school/what-is-a-boarding-school/class-size.htm> (Retrieved on 3 June 2015).

Drake T 2013. "Reducing the Achievement Gap: Class Size and Academic Performance in Rural El Salvador" Paper presented at the Annual Meeting of the 54th Annual Conference of the Comparative and International Education Society, Palmer House Hotel, Chicago, Illinois <Not Available> From <http://citation.allacademic.com/meta/p400427_ index. html> (Retrieved on 29 December 2013).

Hancok TM 1996. Effect of class size on college student achievement. *The College Student Journal*, 30: 479-481.

Heart Content of a Mama 2012. 5 Reasons Why Boarding School Might be a Good Idea for Your Child. From <http://www.heartscontentofamama.com/2012/10/5-reasons-why-boarding-school-might-be-a-good-idea-for-your-child.htm> (Retrieved on 14 July 2014).

Howsen R 2005. An investigation of the effect of class size on student academic achievement. *Journal of Education Economics*, 10(1): 73-83.

Hoxby CM 1998. The Effects of Class Size and Composition on Student Achievement: New Evidence from Natural Population Variation. Paper provided by National Bureau of Economic Research, Inc in its series NBER Working Papers with Number 6869. From <http://www.nber.org.> (Retrieved on 2 March 2009).

Hoxby CM 2000. The effects of class size on student achievement: New evidence from population variation. *The Quarterly Journal of Economics*, 115(4): 1239-1285.

Jepsen C, Rivkin 2009. Class size reduction and student achievement: The potential tradeoff between teacher quality and class size. *J Human Resources*, 44(1): 223-250.

Joshua D, Lavy V 1999. Using Maimonides' rule to estimate the effect of class size on scholastic achievement." *The Quarterly Journal of Economics*, 114(2): 533-575.

Kennedy R 2014. Why Small Class Sizes Work? From <http//www.boardingschoolreview .com/articles/73> (Retrieved on 26 July 2015).

MacAulay D J 1990. Classroom environment: A literature review. *International Journal of Experimental Educational Psychology*, 10: 239-253.

Maphoso LST, Mahlo D 2014. Basic facilities and academic achievement: A comparative study between boarding and non-boarding schools. *International Journal of Educational Sciences (IJES)*, 6(2): 309-315.

Maphoso LST, Mahlo D 2015. Teacher's qualifications and academic achievement: A comparative study among boarding and non- boarding schools. *Journal of Social Sciences (JSS)*, 42(1,2): 51-58.

Milesi C, Gamoran A 2003. "Effect of Class Size and Instruction on Kindergarten Achievement." Paper presented at the annual meeting of the American Sociological Association, Atlanta Hilton Hotel, Atlanta, GA Online <.PDF>. From <http://www.allacademic.com/meta/p108001_ index. html> (Retrieved on 26 May 2009).

Muennig P 2008. Small class-size benefits extend beyond school. *American Teacher,* 92(4): 5.

Nash C 1997. *The Learning Environment: A Practical Approach to the Education of the Three, Four, and Five-Year Old.* London: Collier Macmillan.

Olatunde YP 2010. Class size and students' mathematics achievement of senior secondary schools in southwestern Nigeria. *The Social Sciences*, 5(2): 108-112.

Owoeye JS, Yara PO 2011. Class size and academic achievement of secondary school in Ekiti State, Nigeria. *Asian Social Science*, 7(6): 170-175.

Papo WD 1999. Large class teaching: Is it a problem to student? *The College Student Journal*, 33: 354-357.

Johnson M, Seriven E 1967. Class size and achievement gains in seventh and eighth grade English and Mathematics. *School Review*, 75: 300-310.

Pritzker L 2011. 8 Reasons why Boarding School is Goo Choice for Difficult Kids. From <www. iecaonline. com/blog/2011/11/29/8-reasons-why-boarding-school.> (Retrieved on 22 January 2012).

School B 2010. Why Class Size is Important at Boarding Schools. From <http://www .admissionsquest. com/onboardingschools/2010/11/why-class-size-is-important-at-boarding-schools.html.> (Retrieved on 15 March 2012).

Schwartz MS, Schmitt MC, Lose MK 2012. Effects of teacher-student ratio in response to intervention approaches. *The Elementary School Journal*, 112(4): 547-567.

Stecher BM, McCaffrey, DF, Bugliari D 2003. The Relationship between Exposure to Class Size Reduction and Student Achievement in California. Education Policy Analysis Archives, 11(40). From <http://epaa.asu.edu/epaa/v11n40/.> (Retrieved on 12 June 2012).

United States Department of Education 2000. *The Class-size Reduction Program: Boosting Student Achievement in Schools across the Nation*. Washington, DC: U.S. Government Printing Office.

Wahlig H 2014. What are the Benefits of Teaching at Boarding School? From <http://www.ehow.com/list_6671435_benefits-teaching-boarding-school_html.> (Retrieved on 13 August 2015).

Yussen SR, Santrock JW 1982. *Child Development: An Introduction.* Dubanque, Iowa*:* Wm. C. Brown Company Publishers.