Should Schools be Smaller? The Size-Performance Relationship in relation to Tanzania's Advanced Certificate of Secondary Education Results of 2004 to 2009

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Abstract

The study explored whether students in advanced certificate of secondary education perform better, in small, medium or large schools. Using data from 2004 to 2009 examination results of advanced certificate of secondary education published by the National Examinations Council of Tanzania and the use of analysis of variance as well as chi-square tests indicate that there are significant differences in terms of performance in different school sizes, where small schools perform better than medium or large schools. Furthermore, the performed analyses show that there is an association between school size and performance. The same results were obtained when the analysis were done by years of study and subject combinations. The study recommends having small schools in order to improve students' performance.

Introduction

There is little evidence of the effect of school size on the performance of its students (Spielhofer, Benton, & Schangen, 2004). In the academic arena, there are advantages and disadvantages in both small and large schools. For example, while there may be good follow-up on students in small schools, there may be difficulties in attracting good teachers to small schools due to their smallness. In relation to management, the issue of specialization is discussed. Specialization is only possible in large organizations. While large schools can easily attract trained specialized professionals, this might be challenging for small schools.

A number of studies attempted to explore the effect of size on performance up to the early 1990s (Calvo & Wellisz, 1978; Hanushek, 1986; Fowler & Walberg, 1991; Hanushek, 1992; Blatchford & Martmore, 1994; Luyten, 1994). The interest continued in the mid-1990s (Lamdin, 1995; Fowler, 1995; Hanushek, 1998; Hanushek, 1999; Rice, 1999), during the early 2000s

(Hanushek, 2000; Barnett, Colin Glass, Snowdown, & Stringer, 2002; Blatchford, 2003; Driscoll, Halcoussis, & Svony, 2003; Hanushek, 2001; Iacovou, 2002; Hoxby, 2000) and even within the last five years (Borland, Howsen, & Trawick, 2005; Finn, Gerber, & Boyd-Zaharias, 2005). Various issues have been looked at like effects of school size (Finn, Gerber, & Boyd-Zaharias, 2001; Nye & Hedges, 2001a; Nye & Hedges, 2001b), intra-school variations in class sizes (Boozer & Rouse, 2001), class size and students' achievement (Ehrenberg, Brewer, Gamoran, & Williams, 2001), and policies (Mishel & Rothstein, 2002), while others compared school locations (Bengtsson, 2004). These previous pieces of research on school size indicate that larger schools can adversely affect academic performance (Fowler, 1995). However, other research has noticed differences (Hanushek, 2000; Krueger, 2000).

This research was conducted to evaluate individual students' performance in the Tanzanian Advanced Certificate of Secondary Education Examination (ACSEE). These examinations are set by the National Examination Council of Tanzania (NECTA). It was an exploratory study.

Background Information

In the Tanzanian education system, a pupil joins non-compulsory nursery school at three or four years of age for three to four years. Thereafter, a pupil is required to enter standard one for seven years of primary education. The pupil may then join form one for ordinary certificate of secondary education (OCSE) for four years, where he/she is supposed to take seven or more subjects. A student may proceed to form five and six for advanced certificate of secondary education (ACSE) for two years, where he/she will take three principal subjects. However, it is possible to find a student taking more than three principal subjects. Thereafter, a student may join a university or any institution of higher learning that normally lasts between three to five years, depending on the degree programme selected. There are two main subsidiary subjects at ACSE, namely basic applied mathematics (BAM) and general studies. All ACSE students are expected to take general studies, while BAM is for all students who are taking science subjects and a few arts-related subjects like economics, provided that the student is not taking advanced mathematics as one of the principal subjects.

At OCSE and ACSE, students' performance is aggregated and measured, using divisions (performance level) and number of points scored. There are five divisions in both cases. These are divisions one, two, three, four and fail (commonly known as division zero), in descending order. Points range from 3 to 21, where low points mean good performance. All points are integers.

Examinations at OCSE and ACSE are administered by NECTA, which was established by an Act of Parliament in 1973.

The research wanted to answer the following questions:

a. *Is there any difference in performance among students in different school sizes?*
b. *Will the same results be obtained if the results were segregated by year of study?*
c. *Will the same results be obtained if the results were segregated by subject combinations?*

Rationale for the study

A number of efforts have been made to increase student enrolment in secondary schools in Tanzania. The study empirically evaluates the contribution of school size to academic performance. Moreover, students' performance is one of the critical elements when parents select a school to which to send a child.

The government has introduced a number of policies which make assumptions on the availability of manpower to facilitate developments. Most of these assume the availability of trained personnel. The trained personnel can only be available if secondary education system is functioning well.

Literature Review

A number of studies have attempted to explore the effect of size on performance as already mentioned. Some studies have shown that small schools perform better than large schools (Tucker, 1997; Pittman & Haughwout, 1987; Eberts, Kehoe, & Stone, 1984; Fowler, School Size and Student Outcomes, 1995; Mok & Flynn, 1996; Texas Education Agency, 1999; Howley, 2002; Fowler & Walberg, 1991; Walberg & Walberg, 1994). However, other studies have shown that the size of the school either does not matter or students can perform poorly in smaller schools (Cotton, 1996; Greenward, Hedges, & Laine, 1996; McMillen, 2007; Lindsay, 1984; Jewell, 1994; Gardner, 2001; Mirza & Hameed, 1994).

From the above literature, there is clear evidence that the effect of school size on performance is still vague, and so a gap still exists in the knowledge. This study wanted to find out the effect of school size on performance.

Methodology

ACSEE results for 2004 to 2009 were downloaded from the NECTA website. The results were in hypertext mark-up language. The downloaded data contained the names of the schools, examination numbers, sex and performance (points, divisions and subjects and the corresponding grades) of each student. The examination year was then added as one of the fields in the data.

The results were converted into an electronic spreadsheet, with all incomplete student results in terms of abscondment and withheld results being deleted from the sample. Furthermore, the number of schools was counted. There were 372 schools. All schools without student data for the six years 2004 to 2009 were also excluded from the sample. Due to economies of scale, schools with only 100 students for the six years were excluded from the sample, leaving 170 schools, which were arranged in descending order of the total number of students in the six years divided into five groups with an equal number of schools in each group. Therefore, each group had 34 schools. The first group had schools with students numbering between 3248 and 960. This group was considered to contain large schools. The second group had students numbering from 917 to 646. This group was excluded from the sample so as to avoid having a few differences in the number of students between one group and another. For example, with this analysis, schools with 960 and 959 pupils would have been classified differently. The third group contained schools with 646 to 449 students. This third group comprised medium sized schools. The fourth group had 432 to 265 students in 33 schools, not 34 because two schools had 262 candidates. The last group contained 35 schools had 262 to 100 students and were considered small schools. Table 1 summarizes the data of the sample which was used for this study.

Table 1: Descriptive Statistics of Sample Used for Research

School size	*Number of Schools*	*Total number of students*	*Minimum number of students*	*Maximum number of students*	*Standard Deviation*	*Average*
Large	34	52505	960	3248	659.41	1,544.26
Medium	34	18632	449	643	58.37	548.00
Small	35	6554	100	262	51.58	187.26
Grand Total	*103*	*77691*	*100*	*3248*	*689.35*	*754.28*

Source: Research Data (2009)

Another field, that of subject combination, was introduced into the database.

Data Analysis Techniques

Two main data analysis techniques were adopted in this study. These were analysis of variance (ANOVA) and chi-square tests.

ANOVA

ANOVA is an extension of the t-test for analyzing the reliability of experiments with several levels of one or more variables. The method compares variance estimates within groups and between groups by using a Fisher test (F-test). F-test is a ratio obtained by dividing between group variance and within group variance. This study used one-way ANOVA (one independent variable), which is an analytical technique that requires multiple experiments or readings to be taken from a source that can have two or more different input settings. Then, arithmetical means are compared when one factor is altered. For this research, experiments were on the size of school. All outputs of one-way ANOVA tests are presented in Table 2, where the variations are partitioned into two components.

Table 2 ANOVA Results Presentation

Variable	Source of variations	Sum of Squires	Degrees of Freedom	Mean Squire	F values	Significance level
	Between Levels	SS_L	df_L	MS_L	$F_0 = \frac{MS_L}{MS_E}$	
	Error (within levels)	SS_E	df_E	MS_E		
	Total	SS_T	df_T			

Where

Variable is school size

SS_L the sum of squares due to levels

SS_E the sum of squares due to errors

SS_T the total sum of squares

df_L degrees of freedom associated with levels

df_E degrees of freedom associated with errors

df_T total degrees of freedom

MS_L mean squares from levels

MS_E mean squares from errors

F_0 value that follows Fisher distribution degrees of freedom df_L and df_E

Significance level – Significance indicates the significance level of the F-test.

Measures of Association: Chi-Square and Contingency Tables

Measures of association for normal data do not depend on the particular order in which categories are listed. There are several measures of associations; however, most of them depend on the chi-square statistic. Liebetrau summarizes the common measures of association (Liebetrau, 1976). For more details of these measures the reader is asked to consult the book as the mathematical knowledge required is beyond the requirements of this paper. Some of the measures are Pearson's coefficient of mean square, Pearson's Contingency Coefficient, Sakoda's Modification, and Tschuprow's Contingency Coefficient. Generally, the chi-square test statistic checks whether the two data sets are related, that is associated. This means that after finding out characteristic one can discover the second one. This is also known as the test of independence, whereby two data sets are shown to be independent of one another.

Other measures of association are Goodman-Kruskal λ and Goodman Kruskal τ (for measuring the relative usefulness of one variable in predicting the other variable); Cohen's κ; Weighted κ; and Coleman-Light's Measures of conditional agreement (measures of agreement). This study did not use these statistics due to their characteristics and these are just extensions of the chi-square statistic.

A chi-square requires a chi-statistic in order to be calculated from observed and expected variables in a contingency table. This research presents only tables of observed results and their respective chi-statistic, degree of freedom and significance levels.

There are two ways in which the conclusions drawn from chi-square should be interpreted. These are based on the minimum value in each cell. One argument is that all values in each cell in a contingency table should be greater than 5. The second line of thought is that all the values in the contingency table should have an expected value that is greater than the one in each cell when either the number of rows or columns is two (Everett, 1977; Slakter, 1966; Lewontin & Felsentein, 1965). This study presents both the values. If either of the values is not met, the test is discarded.

A major weakness of the chi-square test is its dependence on sample size. If the sample is too small the chances of failing to reject null hypotheses increase. On the other hand, if the sample is too big, the chances of always accepting competing (alternative) hypotheses increase. Several modifications are proposed in order to rectify this problem (Joreskog & Sörbom, 1982). As the sample size for this study was large, the hypotheses were set in such a way that whenever competing hypotheses were accepted, further analyses were performed.

Answers to Different Research Questions

a. Is there any difference in performance among students in different school sizes?

In order to answer the above question, descriptive statistics of students in the three categories and ANOVA tests were conducted. Table 3 provides a summary of these results. Arithmetical means to obtain the total number of points declines as one moves from a large school to a small school, while standard deviation increases as one moves from a large school to a small school. One must observe that the lower the number of points, the better the performance. From Table 3, small schools seem to perform better than medium and large schools. The differences in performance are significant using the ANOVA test.

Table 3: Descriptive Statistics and ANOVA test on Points Obtained

School Size	Number of students	Minimum points	Maximum points	Mean points	Standard Deviation
Large	52505	3	21	13.89	3.55
Medium	18632	3	21	13.27	3.62
Small	6554	3	21	12.75	3.74
	70961	3	21	13.44	3.73

ANOVA

Points

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	11042.2	2	5521.1	429.498	.000
Within Groups	998658.5	77688	12.9		
Total	1009700.7	77690			

Source: Data Analysis (2009)

Moreover, in order to ascertain if there is any association between school type and performance, a cross-tabulation of the results was carried out on divisions obtained at ACSE and the type of school. Results of this cross-tabulation are presented in Table 4, which shows that the probability of passing is higher in small schools, followed by medium sized schools and finally large schools. The chi-square test (to check if the association is significant) shows that it is significant at 0.000.

Table 4: Cross-Tabulation of School Type and Performance

a. Cross-Tabulation

		Division Obtained					
		I	II	III	IV	FLD	Total
School Size	Large	5942	12,477	22,456	8380	3250	52505
	Medium	2919	4,974	7,442	2381	916	18632
	Small	1331	1778	2457	702	286	6554
	Total	10192	19229	32355	11463	4452	77691

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	836.5(a)	8	.000
Likelihood Ratio	811.4	8	.000
N of Valid Cases	77691		

a 0 cells (.0%) have an expected count of less than 5. The minimum expected count is 375.57.

Source: Data Analysis (2009)

b. Will the same results be obtained if results were segregated by Year of Graduation?

Table 5 presents descriptive and ANOVA tests of school size and students' performance and the data were divided into years of graduation by students. The same trend in terms of arithmetical means and standard deviation as in the research question (a) was observed. In all cases small schools performed better than medium or large schools. ANOVA tests done by years indicate that the differences are significant.

Table 5: Data Analysis Based on the Year Students Graduated

a. Performance –School Size Descriptive Statistics

Year	School Size	N	Minimum	Maximum	Mean	Std. Deviation
2004	Large	5504	3	21	12.23	3.29
	Medium	1949	3	21	11.83	3.40
	Small	682	3	21	10.87	3.62
2005	Large	6842	4	21	12.97	3.36
	Medium	2209	3	21	12.06	3.42
	Small	823	3	21	11.96	3.91
2006	Large	8491	3	21	13.20	3.36
	Medium	2767	4	21	12.36	3.33
	Small	1019	4	21	12.42	3.52
2007	Large	9296	3	21	15.19	3.36
	Medium	3541	3	21	14.40	3.48
	Small	1096	3	21	13.61	3.60
2008	Large	10767	4	21	14.57	3.57
	Medium	3910	3	21	13.68	3.57
	Small	1354	3	21	13.22	3.61
2009	Large	11605	3	21	14.05	3.50
	Medium	4256	3	21	13.82	3.63
	Small	1580	4	21	13.18	3.68

ANOVA: Points

Year		Sum of Squares	df	Mean Square	F	Sig.
2004	Between Groups	1210.9	2	605.5	54.200	.000
	Within Groups	90841.4	8132	11.2		
	Total	92052.4	8134			
2005	Between Groups	1842.1	2	921.1	78.663	.000
	Within Groups	115577.5	9871	11.7		
	Total	117419.6	9873			
2006	Between Groups	1770.4	2	885.2	78.131	.000
	Within Groups	139058.8	12274	11.3		
	Total	140829.2	12276			
2007	Between Groups	3485.8	2	1742.9	149.950	.000
	Within Groups	161912.1	13930	11.6		
	Total	165398.0	13932			
2008	Between Groups	3816.040	2	1908.0	149.329	.000
	Within Groups	204794.7	16028	12.8		
	Total	208610.8	16030			
2009	Between Groups	1087.4	2	543.7	43.073	.000

	Within Groups	220115.1	17438	12.6		
	Total	221202.5	17440			

Source: Data Analysis (2009)

c. Will the same results be obtained if results were segregated by subject combinations?

All major subject combinations (with more students) were considered for analysis. For the analysis nine subject combinations were considered. They were Basic Applied Mathematics, Economics, Commerce and Accountancy subject combinations (BECA), Geography, Advanced Mathematics and Economics subject combinations (GME), Geography, Chemistry, Biology and Basic Applied Mathematics subject combinations (GCBB), History, Geography, Basic Applied Mathematics and Economics subject combinations (HGBE), History, Geography and English language subject combinations (HGE), History, Geography and Kiswahili subject combinations (HGK), History, Kiswahili and English Language subject combinations (HKL), Physics, Chemistry and Advanced Mathematics subject combinations (PCM) and Physics, Chemistry and Biology and Basic Applied Mathematics subject combinations (PCBB).

Table 6 presents data in terms of the performance–size relationship based on subject performance. An interesting aspect is that in BECA and HKL there are no significant differences in performance among schools. In GME, students perform better in medium sized schools. Table 7 shows the cross-tabulation of subject combinations and school size. Except for HKL, the remaining subject combinations show that there is an association between subject combination performance and school size. HGBE combination has one cell less than five making interpretation of the data difficult.

Table 6: *Data Analysis Based on Subject Combinations*

Descriptive Statistics

Combi	School Size	N	Minimum	Maximum	Mean	Std. Deviation
PCM	Large	8255	3	21	15.13	3.64
	Medium	2327	3	21	14.55	3.87
	Small	1171	3	21	12.27	4.19
PCBB	Large	7842	3	21	15.14	3.43
	Medium	3227	3	21	14.10	3.67
	Small	1024	4	21	13.38	3.56
GCBB	Large	2470	5	21	15.64	2.86
	Medium	1078	6	21	15.39	3.13
	Small	683	3	21	11.57	4.17
BECA	Large	4513	4	21	14.05	3.48
	Medium	1106	4	21	14.13	3.71
	Small	642	5	21	14.25	3.75
GME	Large	4972	3	21	14.07	3.37
	Medium	1049	3	21	13.63	3.40
	Small	119	9	21	16.37	2.49
HGBE	Large	5237	3	21	12.77	3.27
	Medium	1401	3	21	12.27	3.20
	Small	128	6	21	13.89	3.33
HGK	Large	4681	3	21	12.74	3.16
	Medium	1718	3	21	11.93	3.38
	Small	543	6	21	13.38	3.00
HGL	Large	6322	3	21	13.08	3.29
	Medium	4383	4	21	12.43	3.24
	Small	769	4	21	12.56	3.15
HKL	Large	6822	3	21	12.42	3.33
	Medium	2228	3	21	12.40	3.40
	Small	1087	4	21	12.55	3.27

ANOVA

Points

Combi		Sum of Squares	Df	Mean Square	F	Sig.
.	Between Groups	3746.4	2	1873.204	143.167	.000
	Within Groups	24742.0	1891	13.084		
	Total	28488.4	1893			
PCM	Between Groups	8485.9	2	4242.954	302.770	.000
	Within Groups	164661.9	11750	14.014		
	Total	173147.8	11752			
PCBB	Between Groups	4427.2	2	2213.610	180.394	.000
	Within Groups	148356.4	12090	12.271		
	Total	152783.6	12092			
GCBB	Between Groups	9167.3	2	4583.648	454.229	.000
	Within Groups	42664.9	4228	10.091		
	Total	51832.2	4230			
BECA	Between Groups	25.7	2	12.868	1.022	.360
	Within Groups	78801.9	6258	12.592		
	Total	78827.6	6260			
GME	Between Groups	826.0	2	413.013	36.546	.000
	Within Groups	69356.2	6137	11.301		
	Total	70182.3	6139			
HGBE	Between Groups	460.0	2	230.000	21.718	.000
	Within Groups	71620.7	6763	10.590		
	Total	72080.7	6765			
HGK	Between Groups	1191.9	2	595.953	58.056	.000
	Within Groups	71230.0	6939	10.265		
	Total	72421.9	6941			
HGL	Between Groups	1143.0	2	571.512	53.623	.000
	Within Groups	122258.5	11471	10.658		
	Total	123401.6	11473			
HKL	Between Groups	18.3	2	9.158	.823	.439
	Within Groups	112775.1	10134	11.128		
	Total	112793.5	10136			

Source: Data Analysis (2009)

Table 7: Data Analysis Based on Year Students Graduated

Subject Comb.	School Size	Division Obtained					
		I	II	III	IV	FLD	Total
PCM	Large	560	1180	3573	1901	1041	8255
	Medium	240	427	936	472	252	2327
	Small	340	272	374	125	60	1171
		1140	1879	4883	2498	1353	11753
PCBB	Large	472	1199	3593	1804	774	7842
	Medium	380	669	1392	557	229	3227
	Small	144	286	413	131	50	1024
		996	2154	5398	2492	1053	12093
GCBB	Large	36	333	1233	645	223	2470
	Medium	33	169	516	243	117	1078
	Small	228	189	170	57	39	683
		297	691	1919	945	379	4231
BECA	Large	470	1029	1992	739	283	4513
	Medium	132	228	465	193	88	1106
	Small	62	139	282	86	73	642
		664	1396	2739	1018	444	6261
GME	Large	460	1102	2346	810	254	4972
	Medium	117	281	469	131	51	1049
	Small	1	9	60	37	12	119
		578	1392	2875	978	317	6140
HGBE	Large	835	1732	2055	454	161	5237
	Medium	267	494	520	92	28	1401
	Small	11	36	52	22	7	128
		1113	2262	2627	568	196	6766
HGK	Large	719	1483	1966	428	85	4681
	Medium	442	550	579	124	23	1718
	Small	53	161	251	66	12	543
		1214	2194	2796	618	120	6942
HGL	Large	862	2026	2493	742	199	6322
	Medium	832	1471	1630	370	80	4383
	Small	134	239	318	68	10	769
		1828	3736	4441	1180	289	11474
HKL	Large	1359	2127	2616	601	119	6822
	Medium	462	650	890	183	43	2228
	Small	208	317	454	90	18	1087
		2029	3094	3960	874	180	10137

Chi-Square Tests

Subject Comb.		Value	df	Asymp. Sig. (2-sided)
PCM	Pearson Chi-Square	745.0(b)	8	.000
	Likelihood Ratio	616.9	8	.000
	N of Valid Cases	11753		
PCBB	Pearson Chi-Square	357.5(c)	8	.000
	Likelihood Ratio	349.5	8	.000
	N of Valid Cases	12093		
GCBB	Pearson Chi-Square	1039.4(d)	8	.000
	Likelihood Ratio	796.0	8	.000
	N of Valid Cases	4231		
BECA	Pearson Chi-Square	31.7(e)	8	.000
	Likelihood Ratio	29.5	8	.000
	N of Valid Cases	6261		
GME	Pearson Chi-Square	65.8(f)	8	.000
	Likelihood Ratio	71.3	8	.000
	N of Valid Cases	6140		
HGBE	Pearson Chi-Square	40.7(g)	8	.000
	Likelihood Ratio	39.1	8	.000
	N of Valid Cases	6766		
HGK	Pearson Chi-Square	139.5(h)	8	.000
	Likelihood Ratio	135.6	8	.000
	N of Valid Cases	6942		
HGL	Pearson Chi-Square	106.7(i)	8	.000
	Likelihood Ratio	107.8	8	.000
	N of Valid Cases	11474		
HKL	Pearson Chi-Square	8.6(j)	8	.374
	Likelihood Ratio	8.6	8	.376
	N of Valid Cases	10137		

b. 0 cells (.0%) have an expected count of less than 5. The minimum expected count is 113.58.

c. 0 cells (.0%) have an expected count of less than 5. The minimum expected count is 84.34.

d. 0 cells (.0%) have an expected count of less than 5. The minimum expected count is 47.94.

e. 0 cells (.0%) have an expected count of less than 5. The minimum expected count is 45.53.

f. 0 cells (.0%) have an expected count of less than 5. The minimum expected count is 6.14.

g. 1 cells (6.7%) have an expected count of less than 5. The minimum expected count is 3.71.

h. 0 cells (.0%) have an expected count of less than 5. The minimum expected count is 9.39.

i. 0 cells (.0%) have an expected count of less than 5. The minimum expected count is 19.37.

j. 0 cells (.0%) have an expected count of less than 5. The minimum expected count is 19.30.

Source: Data Analysis (2009)

Conclusions and Recommendations

This paper investigated the relationship between school size and students' academic performance. School size was measured by the number of students who graduated in that year. Performance was measured by either total points obtained or division attained. As it stands, the paper provides evidence that school size matters in relation to students' academic performance. Specifically, the paper shows that:

a. There are significant differences in performance based on the school where one studies, in that small schools enable students to perform better than medium or large schools;
b. Performance in terms of academic division decreases from higher to lower as one moves from small to large schools, while the probability of failing increases as one moves from smaller to larger schools; and
c. The same results are obtained when performance results are segregated by year of study and subject combinations, except for economics-based subject combinations.

From the foregoing observations, it is clear that for a greater impact on achievement, it is better to have small schools for the purpose of improving performance. The current big schools could be broken down into two or three schools. In the sample, one school had more than 3000 students in the six years. If they were combined with those in ordinary secondary schools, there would be a lot more students in the school, which could complicate the process of managing the schools.

The study appreciates the cost implications of small schools. However, one should not ignore the complications of managing big schools, which may contribute to their poor performance. In the case of day schools, large schools may attract students from far away, causing them to commute long distances daily. This makes students tired and able to concentrate less on their studies.

Study Limitations

The study used school size and not class size which would be more appropriate. Such data were not available. For example, the size of classes would keep on changing, depending on the number of subject combinations. A typical example is that PCBB and GCBB could have been combined for Chemistry, Biology and Basic Applied Mathematics, while the same GCBB could have been combined with GME for the Geography course. Therefore, no standard class size would have been obtained.

Other contextual factors could also not be ignored in such a study. Some of these are schools' effectiveness like school leadership, (Sanday, 1990) and adopted systems (Gorald, Taylor, & Fitz, 2003). However, these and other factors were not easily measurable. Such factors could also reduce the reliability of the derived conclusions but not the data themselves. Other factors, which cannot be ignored, are academic potential, student support systems and motivation.

The study used individual performance and not aggregate school performance in the analysis. One would like to know whether or not school size determines school performance.

Areas for Future Research

It might be important to answer the following research questions:

Why do school sizes not matter in some subject combinations?

Which determines students' performance: class size or school size?

What is the effect of school leadership on schools' performance?

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