Effect of Type of School Management and School Factors on Educational Performance of Primary School Children in Navi Mumbai: Multiple Classification Model

Rita Abbi
Head, statistics Department
City and Industrial Development Corporation of Maharashtra Ltd

Abstract - The multiple classification model was constructed to measure the educational performance schools based on the academic achievement of primary students studying in class 1 to 7. In the present paper, Multiple Classification Analysis (MCA) model 'Quality of Education' is a dependent variable and type of school management, student-teacher ratio, class size percentages of trained teachers are predictors. The percentage of permanent teachers and number of years of experience in teaching were covariates.

The study was carried out in Navi Mumbai – the satellite town of Mumbai (India), has been planned and developed to ease population pressure on the primate city. The primary data has been collected by the author during 2012. The city has three types of management of primary schools, namely, Zilha Parishad (ZP); Navi Mumbai Municipal Corporation (NMMC) and Private. A representative sample of 20% of primary schools has been randomly selected from the list of each of the three types of schools of Navi Mumbai using random number tables.

The findings revealed that type of school management is dominant variable affecting quality of education followed by student-teacher ratio and class size after controlling the remaining predictors and covariates in the model. However, percentage of trained teachers had little effect on quality of education. It has been also observed that students-teacher ratio and class size were low in ZP schools and the performance of students was better in ZP public schools. Nevertheless, despite better infrastructure in private schools, the final results were far impressive in ZP schools.

Keywords: Multiple Classification Analysis; school; management; educational performance;

1. Introduction

Apart from providing the primary education to masses in India, its quality has been a major cause of concern for the Government. "Among several development indexes used to measure societal growth, the most important for us are those proposed for measuring quality of education" [2]. "The expansion of primary education in India over the last decade has been phenomenal. But, by all accounts, the expansion of the Indian education system has led to deterioration in the quality of education" [14]. Good management plays an important role in academic achievement of schools. The key function of school management is to supervise administration system. Enrolment of students, appropriate curriculum, schedule the classes, allocation of teachers to each class, is also part of school

management. It enables all the staff in the school to contribute most efficiently to its purpose in the performance of their duties. School management makes the necessary arrangements for teachers' training, refresher courses, skill up gradation seminars and orientation programmes to enhance teachers' learning and expertise, better teaching methods. This helps the teacher in teaching by making the topic more interesting and simple so that student can easily understand and learn the subject. It promotes individual development in various ways and means, encourages mutual confidence and understanding among teachers and students.

Most of the studies and surveys on quality of education, not only in India but world over have shown that quality of education is influenced by several factors. Of late, some researchers opined that though enrolments have increased, the quality of primary education in India is very poor [18]. The increase in enrolments is greatly affected by type of school management. The present study therefore, attempts to take a stock of the situation with respect to quality of primary education in Navi Mumbai. The study focuses on quality of education in primary schools run under three types of managements. Navi Mumbai is systematically designed modern city with beautiful landscapes [8]. The city can hold up to 4.0 million population. Its present population has crossed two million mark. The majority of schools were set-up during the last two decades to meet the school needs of rapidly growing population of the city.

In the present paper, in order to know the contribution of each of the above selected variables/factors, Multiple Classification Analysis[1] has been used with quality of education as dependent variable and the four variables/factors, namely, type of school management and student-teacher ratio were also considered because of multicollinearity and in addition to this two more variables namely percentage of trained teachers, class size as are considered as predictors. The quality of education was assessed by percentage of marks obtained by students in final examination. All the factors assumed to affect the quality of primary education were displayed in Figure 1.

Figure 1: Factors Affecting the Quality of Primary Education

---
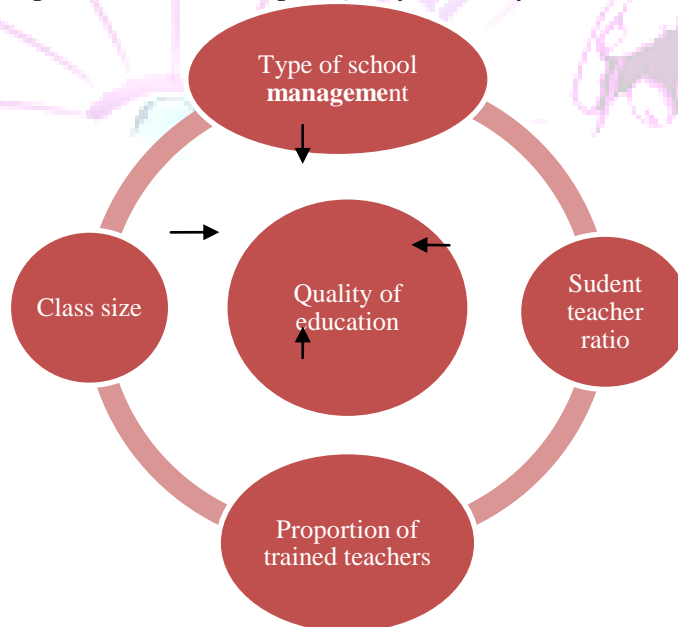
[1] Multiple Classification Analysis (MCA) can easily be explained as multiple regression with dummy variables [20].

II.   Methods and Material

This paper analyse academic achievement of students of primary schools of Navi Mumbai- a planned city adjacent to financial capital of India –Mumbai. Among the primary schools in the city, there are 121 schools having class 1 to class 7. A representative sample of 20% of schools has been selected using random number tables from the list of each of the three types of schools management. The data of 11078 students who appeared in exam was collected from class 1 to class 7 from each 24 schools through structured questionnaire. There were 3699 students from 7 Navi Mumbai Municipal Corporation (NMMC) school, 2677 students from 10 Zilha Parishad (ZP) schools and 4702 students from 7 private schools. After obtaining the subject wise grade for each student, the overall marks obtained by the students was calculated by the author.

1. Rationale of Selection of Variables

(a) Dependent variable

(i) Quality of Educational

Result of school is a good indicator of quality of education. The final result of schools is the best indicator to judge quality of school, which is measured using final results of students.Therefore the dependent variable, quality of education of primary schools was measured on the interval scale by taking actual marks obtained by students. The final results from 24 schools having 11,078 students (class1 to class 7) were analyzed for the academic year 2010-2011. The results of final examinations have been analyzed. Quality of education of schools was measured based on the percentage of students who secured 60% or more marks in each type of school management in Navi Mumbai;

(b) Predictors

The list of the predictors hypothesised to influence the quality of primary school education and rationale of their selection was given below

(i) *Type of School Management*

Good management in school plays a vital role in the quality of education. It enables teachers to contribute most efficiently by providing training, introducing skill improvement programmes, which may increase their knowledge that helps making their students grasp the subject more effectively. It may also promote individual development, discipline and may raise their self confidence and understanding. The main role of school management is effective planning, strategy and vision to improve the academic, physical and social development of students. School managements' responsibility is to develop a positive culture that helps to enhance the quality of education. Therefore school management is very important factor in facilitating quality education in schools.

(ii) Trained Teachers:

The teachers training is another important parameter for determining the quality of school education. It has been observed that in this new city there was shortage of trained teaches. The salaries of untrained teachers were often considerably lower than those of trained teachers. The present study, therefore, considered the percentage of trained teachers working in the school as one of the predictor of quality of primary education;

(iii) Class Size:

The class size is defined as the actual number of students in a class assigned to an individual teacher. Information on class size is extremely valuable for assessing the quality of school education. Smaller classes allow teachers to concentrate on the needs of individual students and reducing the amount of class time they spend dealing with disruptions. Class size may affect students' academic achievement and influence the current practical teaching situation. In this respect, class size may be viewed as an indicator of quality of school education;

(iv) Student-teacher Ratio:

Student-teacher ratio is considered a good indicator of quality of education. A low student-teacher ratio suggests greater opportunity for students and teachers to be more interactive in the class. Also, students can discuss their problems and difficulty in their courses with their teachers quite often. The ratio of students to teaching staff is obtained by dividing total number of students in a school by the total number of teaching staff.

c) Covariates:

First, a regression analysis was carried out to identify the factors that had a greater influence (although not necessarily statistically significant) on quality of education. These factors were introduced into the multiple classification analysis. Furthermore, as set of covariates 'percentage of permanent teachers' and 'number of year of experience in teaching' was selected on the basis of regression analysis and were included as covariates in the model to study quality of primary school education after controlling the effects of the selected covariates. The rationale of including the two covariates in the model was given below:

(i)   Percentage of Permanent Teachers in the School:

The employment status (permanent/temporary/contract basis) is a critical variable, which may influence the quality of education of school. Normally in schools the vacant posts are filled by appointing teachers on temporary or contract basis by the school management. More often, teachers are kept on temporary basis for longer time. Such teachers may not be entitled of the benefits like those who were regular employees such as, approved pay-scale, yearly increment in salary, and job security which may indirectly affect teaching. This could cause poor quality of education.

(ii)   Teaching Experience:

Experience of a teacher was another variable which may have influence on quality of education. Students' academic achievement score may have bearing on the duration of teaching experience. With long teaching experience a teacher may quickly assess student's requirement and can easily identify his/her difficulties in the subject.

2. Dummy Variables:

Dummy variables are vehicles which permit the researcher to handle qualitative data as a predictor in the regression model to find its effect on the dependent variable. In MCA model dummy variables are used to represent categorical/qualitative variables.

Creation of Dummy Variables[2] :

The four categorical variables included in the MCA model were (a) Type of School Management; (b) Percentage of Trained Teacher; (c) Class Size; and (d) Student-teacher Ratio. For each of these four categorical variables, the dummy variables have been created as follows:

a) Type of School Management: Let S denotes the type of school. The three categories of types of school defined as

---

[2] In general, if a particular variable has r categories, we need to construct $r - 1$ dummy variables (Dillon and Goldtein 1984).

Private school: S_0 (reference category),

NMMC School: S_1

ZP school: S_2

The three categories of school have 2 (i.e. 3-1) dummy variables which were defined as

$$(S_1, S_2) = \begin{cases} S0 = (0,0) \ if \ private \ school \\ S1 = (1,0,) \ if \ NMMC \ school \\ S2 = (0,1) \ if \ ZP \ school \end{cases}$$

b) *Percent of Trained Teachers*:

Again, let T denotes the percentage of trained teachers. The percentage of trained teachers was segregated in two parts:

(i)   Schools having percentage of teachers less than or equal to 98% and

(ii)   Schools having percentage of teachers more than 98%.

The dummy variables of percentage of trained teachers were created as follows:

T_0 = (0, 0) if percent of trained teachers is less was than or equal to 98%

T_1 = (1, 0) if percent of trained teachers was more than 98%

c) *Class Size*

Let C denote the class size. The entire range of the class size has been partitioned in three categories as under:

C_0: if number of students > 50, (reference category);

C_1: if number of students are between 40-50;

C_2: if number of students < 40;

The three category of class size have 2 (i.e. 3-1) dummy variables which have been created as follows:

$$(C_1, C_2) = \begin{cases} C0 = (0,0) \ if \ if \ number \ of \ students \ > 50 \\ C1 = (1,0,) \ if \ number \ of \ students \ between \ 40 - 50 \\ C2 = (0,1) \ if \ number \ of \ students \ < 40 \end{cases}$$

d) Student-teacher Ratio (STR):

The entire array of student-teacher ratio was divided into two categories namely;

STR$_0$: students- teacher ratio was less than or equal to 50 (reference category), and

STR$_1$: students- teacher ratio was more than 50.

The dummy variable of student-teacher ratio has been defined as

STR $_0$: = (0, 0) if student-teacher ratio was less than or equal to 50

STR$_1$ = (1, 0) if student-teacher ratio was greater than 50

The variables namely type of school management, trained teachers, class size and student-teacher ratio were categorical and used as predictors in the model where quality of primary education has been taken as a dependent variable. Firstly, the interaction between the variables was checked. The process of detection and treatment of interaction factor (if found statistically significant) was given below.

3. Interaction[3]

Let us consider a simple model with quality of education (Q) as the response variable and type of school management (S) and Class size (C) as predictor variables. Before applying MCA, it is necessary to first examine whether there was any statistically significant interaction between two predictors or not. If interaction(s) is/are found statistically significant, than it is essential to include interaction term(s) in the MCA model, as another predictor in the model affecting the dependent variable.

4. Some Theoretical Consideration

Model Specification and Estimation

The usual way of specifying interaction between S and C was to add a multiplicative SC term to the model:

$$\hat{Q} = a + b\,S + c\,C + d\,SC \qquad (1a)$$

The pair wise relationships were examined among the predictor variables. Although this is the usual specification of interaction, if we don't know the precise mathematical form of the

---

[3]What is interaction?

Interaction between two predictors S and C   means that the effect of S on the dependent variable Q depends on the level of C, and the effect of C on Q depends on the level of S.

interaction, choose a simple if it is possible. This approach is in keeping with a general goal of modeling which is to simplify reality down to its essentials so that we may more easily comprehend it.

In estimating the model (1a), SC is considered as if it were a third predictor variable, which is denoted by W. Thus W= SC. The usual way of specifying the interactions between two predictors is to add multiplicative term to model. Then the model is

$$\hat{Q} = a + b\,S + c\,C + d\,W$$

What is the effect on Q of increasing S by one unit? Denoting the new value Q by $\hat{Q}*$, the equation (1a) can be written as

$$\hat{Q}* = a + b\,(S+1) + c\,C + d\,(S+1)\,C$$

$$= a + bS + b + c\,C + d\,SC + d\,C$$

$$= \hat{Q} + (b + dC) \qquad\qquad (1b)$$

The software package namely Statistical Package for Social Sciences (SPSS) examines the interaction and consider the phenomena in terms of an additive model. The complete procedure is firstly to determine a set of suspected interacting predictors. Secondly, it forms single "combination variable" using these predictors, recode the variables and performs MCA analysis. Thereafter it perform one MCA analysis with the "combination variable" as the control in a one-way analysis of variance to get adjusted eta squared, which will be greater than or equal to adjusted R square. Then it use the difference, adjusted eta square-adjusted R square (the fraction of variance explained which is lost due to the assumption of additive model), as a guide to determine whether the use of a combination variable in place of the original predictors is justified.

The test for interaction is based on the same sample as the normal MCA execution. If interactions are detected, then the combination variable is used as predictor variable in place of the individual interacting variables.

III.   Application of the MCA Model

The findings of MCA were given in Table 1. The notation used in Table for unadjusted and adjusted multiple correlation coefficient, namely R, was not the notation conventionally used in MCA analyses. Conventionally η (eta) was used in place of unadjusted R, and β (beta) was used in place of adjusted (i.e. partial). These notations were used in Table 1. Statistical significance was examined between the two predictors using Analysis of Variance (ANOVA). None of the interaction between the selected predictors was found statistically   significant. So it was not necessary to include any interaction term in the present MCA model.

IV.   Results

Table 1 presents the results of multiple classification analysis among the four factors namely type of school management, trained teachers, class size and student-teacher ratio. The results were generated by the MCA program in SPSS. The results were obtained by substituting appropriate combinations of ones and zeros and mean values of S_1, S_2, C_1, C_2, T and STR in the regression equations.

Table 1 MCA table of the effect of type of school management, class size, trained teachers and students- teacher ratio on quality of education of schools

Predictor variable	N	Unadjusted		Adjusted for factors and covariates	
		Quality of education of schools	Eta(η)	Quality of education of schools	Beta(β)
Type of school management**			0.77		0.75
S_0	24	87.91		90.16	
S_1	14	70.11		64.65	
S_2	17	75.81		94.44	
Trained Teachers			0.11		0.06
T_0	24	80.70		82.68	
T_1	18	88.79		82.84	
Class Size**			0.52		0.47
C_0	24	75.59		82.82	
C_1	7	78.81		80.84	
C_2	12	89.84		82.62	
Student Teacher Ratio **			0.79		0.62
STR_0	24	89.18		84.11	
STR_1	15	71.95		80.40	
R^2 (ANOVA) **			0.88		0.84
R^2 (MCA)			0.89		0.87

**** Statistically significant at p<0.001**

The type of school management has evidently come out as a dominant variable affecting the quality of education (performance of students). The next variable which had affected the quality of education was student-teacher ratio after controlling the remaining predictors and covariates in the model. The class size appeared as another significant predictor in determining the quality of education. However, percentage of trained teachers had little effect on quality of education. Trained teachers could be the contributory factor in the quality of education in terms of performance of school. The results indicate that there was less effect in case trained teachers as compared to other variables/factors.

The variable with maximum explanatory power was the type of school management which explained 75% of variability after adjusting the effects of the remaining factors and selected covariates. The analysis showed that the amount of variance explained by 4 variables considered in the analysis of variance was 87%. The finding revealed that 3 out of 4 factors contributed significantly to explain the variability in quality of education of schools; the results were found in expected direction.

V.   Discussion

The findings demonstrated that there was effect of student-teacher ratio, type of School management, class size on quality of school education. The performance of ZP schools was better than private and NMMC schools. All the four variables in an analysis of variance accounted for 87 percent of overall variance in quality of school education. The student-teacher ratio was lower in ZP schools and higher in private and NMMC schools respectively. The factor wise effect on quality of education was discussed below.

Type of School Management

The three types of school management cater the needs of primary school going children in Navi Mumbai. All the ZP schools which were located in Navi Mumbai belong to Raigadh district of Maharashtra; whereas, NMMC schools of Navi Mumbai are situated in Thane district. There are considerable differences in both Thane and Raigadh districts. Due to this, the public schools in this study were divided into two types of schools, namely, ZP schools and NMMC schools. Private schools of Navi Mumbai were located in both the districts. The result showed that type of school management was a salient governing factor which had significant effect on quality of education in primary schools. The performance of ZP schools was better than NMMC and private schools.

It seems that ZP school management may have more effective administration as compare to other school managements. The source of finance was not depending on fees, it was funded by government. The requirement of teachers, and teacher's development policy, work load of teachers may be the priority in these schools. There was a cooperation and inspection from management to get desired performance. School management was accountable about responsibilities of principal, school services and resources, student-teacher relationship, class size and professional development of teachers. Therefore performance of ZP school may be better than other school.

Thus our study supported the findings of other researchers that student teacher ratio influence the performance of students (see [15], [17]. The findings had clearly brought out that the students' performance had strong bearing on type of school management.

According to Tennessee's STAR (Student-teacher Achievement Ratio) Study in 2007, class size and pupil teacher ratio are not the same and that arguments using these two terms as synonyms are flawed. Class size is the number of children in a teacher's room daily for whom the teacher is accountable; while the pupil-teacher ratio is generated by dividing the number of pupils in one school by all educators, including administrators. Thus, the terminology used by the author was not in conformity with that of the present study. The results were therefore, not comparable.

Student-teacher Ratio

The results proved that the schools having lower student-teacher ratio performed better as compared to the performance of schools which had higher student-teacher ratio. Low student-teacher ratio benefits students in many ways. Students may get more chance for one to one discussion with teacher. The teacher gets to know the individual student better which allows them to identify the areas where student needs help, also better and frequent one-to-one communication between teacher and student. This may probably keep the students more attentive and encourage them to be more interactive in the class. Teacher may give individual attention to each student if he/she finds that the students are receptive and had a good grasp of the subject. As found in the present study, ZP schools had better school performance as compared to that of NMMC and Private schools despite the fact that ZP schools lacked in infrastructural facilities in comparison to other two types of schools. The MCA clearly identified the student-teacher ratio to be the dominant factor responsible for students' performance in final examination. The reason for lower student-teacher ratio in ZP schools in Navi Mumbai was due to the fact that during last two to three decades the growth of private schools was

quite high (32%) in Navi Mumbai [7]. These schools made efforts to provide more infrastructure facilities like sports, indoor games and gymnasium etc. which attracted the parents of children of a section of the society to send their wards to these schools. Thus, mushrooming of Private schools in almost all the parts of Navi Mumbai might have retarded the growth of school children in ZP schools over the years. This development might have resulted in lowering the student-teacher ratio in ZP schools. Another factor which might have further lowered the student-teacher ratio in ZP schools was the mass recruitments of new teachers in ZP schools in recent years. In fact, the Government has provided additional teaching posts in public schools during last few years. The average student-teacher ratio in ZP: NMMC: Private schools were 31:64:46 respectively. The higher student-teacher ratio in NMMC schools was due to population migration. During the last decade the population in NMMC area had increased from 0.7 million [6] to 1.1 million [4] including urban slum population. Average age of the population in the city was 29 years which resulted in the youth bulge of migrants in Navi Mumbai. The numbers of NMMC schools had not increased in comparison to population growth.

Class Size

The results of Multiple Classification Analysis further revealed that 'class size' of primary school had significantly influenced on the quality of education. Smaller classes are often perceived as allowing teachers to focus more on the needs of individual students and reducing the class time they wasted during the period of disturbance or interference, if any. Smaller class sizes may also influence parents' choice when they choose schools for their children. During the past few decades, the measures of reducing the class size are prioritized in the educational policies of different countries to improve the quality of educational outcomes [3].

The average class size of in ZP, NMMC and Private Schools was 27, 61, and 44, respectively. During the data collection, researcher had found some interesting explanation given by teachers and parents that a large section of the society preferred to send their ward to English medium school. All the public schools in Navi Mumbai had Marathi (local language) medium of instruction. Therefore, parents who could afford the fees of private schools preferred to send their child in private schools. All the land owners[4] (villagers) who had better economic conditions shifted their children from ZP school to private school. This could be another reason for lower class size in ZP schools. The main factor behind large class size in NMMC schools was population growth and expanded access to education. The shortage of schools could be reason for larger class size and this could have hampered the quality of education.

However, the effects of differences in class size upon students' performance are mixed [9], [19]. Bonesronning [5] found that the effect of class size was larger in schools with a higher proportion of students from intact families.

A number of studies found that there was inverse relationship between average class size and educational outcomes. They found that reducing the class size contributes to minimizing the negative consequences of social inequality, improving students' achievement, enhancing the basic skills and competencies of students in the first few years of schooling, etc. [1].

---

[4]The land is acquired from the 95 villages for development of Navi Mumbai. As a compensation package, 12.5% share of developed land with 1.5 FSI was returned to land owners/ project affected Person (PAP). They are legally permitted to sale/develop the plot. This has improved the economic conditions of PAPs to great extent.

A few studies have reported that there was positive impact of reduced class size on student's achievement. [13],[16], [10], [12].

Trained Teachers

From the multiple classification analysis, it was found that the training of teachers had little effect on the quality of education in primary schools. Proportion of trained teacher had influenced quality of primary education (may not be statistically significant at 5% level of significance) in schools. Majority of teachers of public schools were trained teachers. The private schools had large proportion of untrained teachers compared to public schools. The private schools were relatively new, had comparatively young staff. They may like to change the job due to better pay package. Private schools were lacking in trained teachers, though the teachers in these schools may be more qualified (graduate or post graduate) but with no formal training in education.

Many people teach, some are effective, they maintain students' interest in subject matter and then a few are truly great they have spent much time in learning to be effectively. Effective teaching is bail of bright future whereas ineffective depress the environment Teachers take help of different methods for their proper working. These methods are pattern of teacher behaviour that recurrent, applicable to various subject matter, characteristics of more than one teacher and relevant to learning [11].

VI. Conclusion

To sum up, it was found that type of school management, student-teacher ratio and average class size affected the quality of education. It has been also observed that students- teacher ratio and class size were low in ZP schools than that of other schools. The performance of students was better in ZP public schools. Nevertheless, despite better infrastructure and physical facilities in private schools, the final examination results were far more impressive in ZP public schools.

VII.   Acknowledgement

VIII.   References

1. Achilles C. M., Finn J. D. & Pate-Bain H. (2002). *Measuring Class size: Let Me Count the Ways.* Educational leadership, Vol. 59(5), pp. 24-26.

2. Banerjee A, Cole S., Duflo E. and Linden L. (2003). *Improving the Quality of Education in India: Evidence from Three Randomized Experiments;* Preliminary project report in collaboration with ICICI corporation, the World Bank, and MacArthur Foundation Network, pp 1-34.

3. Bascia N. and Fredua-Kwarteng E. (2008), *Class size reduction: What the literature suggests about what works*, Toronto: Canadian Education Association, pp. 1-32.

4.   Census of India (2011), Registrar general of India, New Delhi.

5.   Bonesrønning H. (2003), *Class Size Effects on Student Achievement in Norway: patterns and Explanations,* Southern Economic Journal Vol. 69 (4), pp. 952-965.

6.   Census of India (2001), Registrar general of India, New Delhi.

7.   CIDCO (2010), *Primary and Secondary Schools in Navi Mumbai,* A report published by City and Industrial Development Corporation of Maharashtra Ltd. Navi Mumbai pp 2-68.

8.   CIDCO (2007), *Salient Features of Nodes in Navi Mumbai*, A report published by City and Industrial Development Corporation of Maharashtra, pp 1-90.

9.   Cuseo J. (2007), *The empirical case against large class size: Adverse effects on the teaching, learning, and retention of first-year students*, The Journal of Faculty Development, Vol. 22 (1), pp. 5-21.

10. Dillon W. R. and Goldtein M, (1984), *Multivariate Analysis Methods and Applications,* pp 210-250 Publisher: John Wiley & Sons Inc, ISBN 10: 0471083178 / 0-471-08317-8.

11. Farooq S. Husain A. and Mehmood A. (2005), Comparison of impact of activity based and traditional methods of teaching on achievement in mathematics. Bulletin of Education and Research. 27(2). pp. 57-64.

12. Fies C. and Marshall J. (2006), *Classroom response systems: A review of the literature,* Journal of Science Education and Technology, Vol. 15 (1), pp 101-109.

13. Gleason J., (2012), *Using technology-assisted instruction and assessment to reduce the effect of class size on student outcomes in undergraduate mathematics courses*, College Teaching, Vol. 60(3), pp. 87-94.

14. Grover S. and Singh N. H. (2002), *The Quality of Primary Education: A case study of Madurai and Villupuram District in Tamil Nadu, India*, Publisher Harvard Graduate School of Education, pp 1-77.

15. Ikediashi, Nwanneka N. Amaechi and Oliver N.C., (2012),   *Pupil – Teacher Ratio: Implication for Quality Education in Nigeria Primary Schools,* An International Journal of Arts and Humanities, Vol. 1 (1), pp. 257-264.

16. Kokkelenberg E. C., Dillon M. and Christy S. M. (2008), *The effects of class size on student grades at a public university*, Economics of Education Review, Vol. 27, pp. 221-233.

17. Mahmood S. and Khatoon T. (2011), *Influence of School and Students Factors on Mathematics Achievement* , Indian Educational Review, Vol. 49(2) , pp 80- 98.

18. Mehta A. C. (2000), *Education For All in India with Focus on Elementary Education: Current Status, Recent Initiatives And Future Prospects,* www.educationforallinindia.com/page101.htm, retrieved on November 17, 2012.

19. OECD (2009), Education at a Glance, Paris. pp. 1-96.

20. Retherford D. R. and Choe M. K. (1993), *Statistical Model for Causal Analysis*, copyright John Wiley & Sons, Inc. New York, Published Online: 17 MAY 2011.