CHAPTER — 4

QUANTITATIVE ANALYSIS OF THE DATA

4.0.0 INTRODUCTION:

In the preceding chapter, a full account of the research design was given. Both the process of data collection and the method to be applied in analysing and interpreting the data yielded by the various tools were presented in the preceding chapter. This chapter presents the analysis of data which were collected during the period from March 1991 to November 1991. The analyses are done at both the individual and the school levels. Both univariate and multivarite analyses are used to analyses the data. The quantitative analyses are done in four steps. The steps are as follows.

STEP ONE : IDENTIFYING THE RELATIONSHIP OF THE FACTORS TO THE ACADEMIC ACHIEVEMENT

The relationship between the academic achievement and certain variables are analysed by 'Correlation Analysis' and 'Multiple Regression Analysis'. So the level of each independent variables (i.e. Predictor Variables) and the extent of its relationship with other dependent variables (Criterion Variables) are determined by 'Correlation' and 'Multiple Regression Analysis'. The data are analysed into two sections:

A) Correlation and

B) Multiple regression analysis.

4.1.0 IDENTIFYING THE DEGREE OF ASSOCIATION OF EACH VARIABLE BY CORRELATION ANALYSIS

Correlation analysis is generally used when the intent is to measure the degree of association between independent and

dependent variables. An analysis of the relationship between independent and dependent variables is in fact an examination of the co-variance between the two sets of variables. In this study a total of 21 variables relevant to explain students' academic achievement were taken into consideration (section 3.1). The 21 independent variables selected to explain students' academic achievement are of three types: Individual, Home Environment and School Characteristics. The single dependent variable is the academic achievement of the students of 5 primary grades of two types of schools. The analysis begins by calculating 'correlation' between the independent and dependent variables. From the correlation matrix (Appendix 8a, 8b, 8c) table 4.1, 4.2 and 4.3 are prepared. These analyses are expected to answer the questions raised in the first objective and to verify the hypotheses 1, 2, and 3.

Table 4.1 Co-efficient of Correlation Between the Independent Variables & Dependent Variables of Non-Government Schools.

INDEPENDENT VARIABLES	DEPENDENT VARIABLES (Academic achievement of the Students)				
	Grade ONE	Grade TWO	Grade THREE	Grade FOUR	Grade FIVE
Creativity	.532*	.616*	.611*	.535*	.535*
Motivation	.33*	.335*	.205 NS	.038 NS	.252 NS
Nutrition al level	.147 NS	.313*	.20 NS	.471*	320*
Home Environment	.337*	.144 NS	.532*	.581*	.560*
Father's Education	.471*	.489*	.603*	.539*	.599*
Father's Occupation	.324*	.468*	.443*	.65*	.597*
Father's Income	.132 NS	.384*	.624*	.458*	.576*
Mother's Education	.469*	.488*	.631*	.623*	.562*
Mother's Occupation	.284 NS	.446*	.338*	.302*	.240 NS
Mother's Income	.331*	.409*	.307*	.293NS	.224 NS
Tutor	.074 NS	.431*	.282*	.437*	.600*

*   Significant at 0.05 level.

Analysis of the Data of Table 4.1

The findings of correlation analyses of variables for non-government schools are presented below variable wise and grade wise.

1. The predicting variable **Creativity** is significantly related to students' achievement in each grade. The range of correlation was .53 to .61.

2. The predicting variable **Motivation** is significantly related with academic achievement only in first two grades i.e grade one & grade two, but the degrees of correlation are very low: 0.33 in both of the cases, motivation is found non-significant in the upper grades i.e. grades 3 to 5.

3. Predicting variable **Nutrition** is significantly related to students achievement is grade two, four and five, although the degrees of correlation are in the range of .31 to .47. In grade one and three the correlations are non-significant.

4. The predicting variables **Home Environment** is significantly related to students achievement in all grades, except grade 2.

5. The predicting variables, **Father's Education, Occupation** are significantly correlated to academic achievement in all grades. So these two variables may be considered as good predictors of achievement. Fathers' Income is also significantly correlated to achievement in each grade except grade one. The variables are also intercorrelated. The correlation between Father's Education and Occupation is .86 and between Fathers Education and Income is 0.66 for class one. In other grades, the

correlations are also very high. (Appendix 8a)

6. **Mother's Education** is significantly correlated to students' achievement in each grade. So it is a good predictor of academic achievement. Mother's Occupation and **Income** show significant correlation in **three** grades(except in grade one and five). The inter correlation between Mother's Education and Income is 0.48, and between Mother's Education and Occupation is 0.56 in grade one. But the correlations are higher in upper grades (see appendix 8a, 'correlation matrix.')

7. The other very important predicting variable is 'Tutor' (i.e who teaches the child at home). Tutor is significantly correlated with the academic achievement of students in each grade (except grade one).
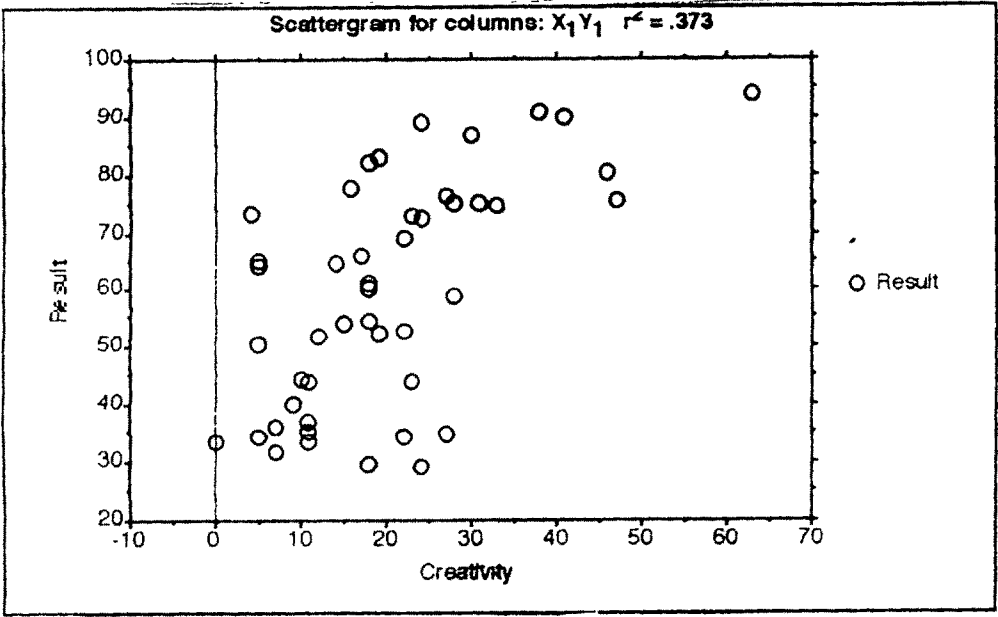
Conclusion of the findings of table 4.1

So in conclusion on the findings on non-government primary schools it can be said that **Creativity, Father's Education, Father's Occupation, Mothers' Education** are the best predicting variables to explain academic achievement, as these are significant in each grade. The next best predicting variables are Tutor (i.e who teaches the child at home), Home Environment and Father's Income, as these variables are found significant in four grades. The Scatter diagrams of the best three predicting variables (i.e Creativity, Father's Education and Mother's Education) are shown in the following pages. The rest of the Scattergrams are in the appendix 9 .
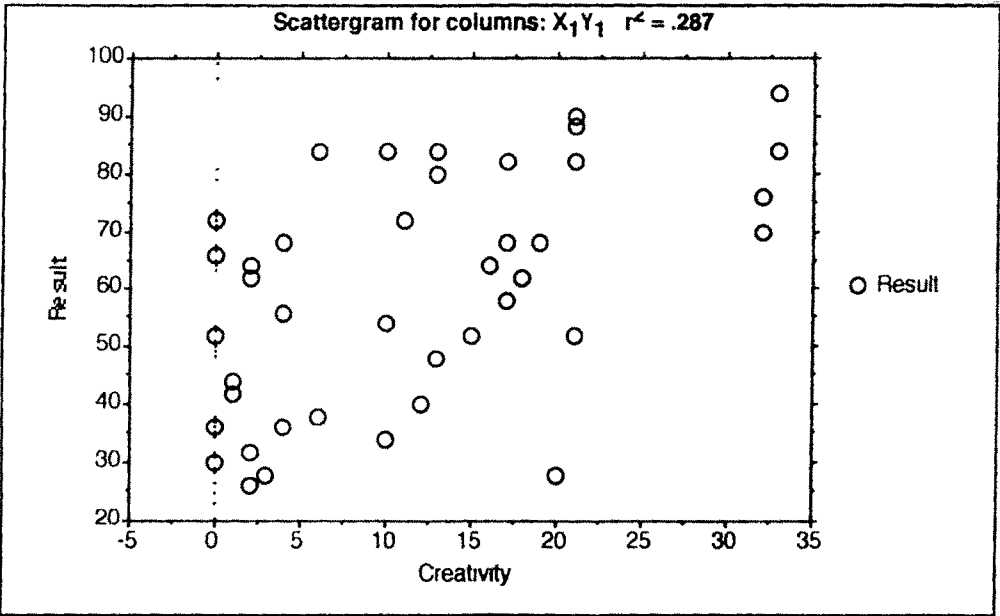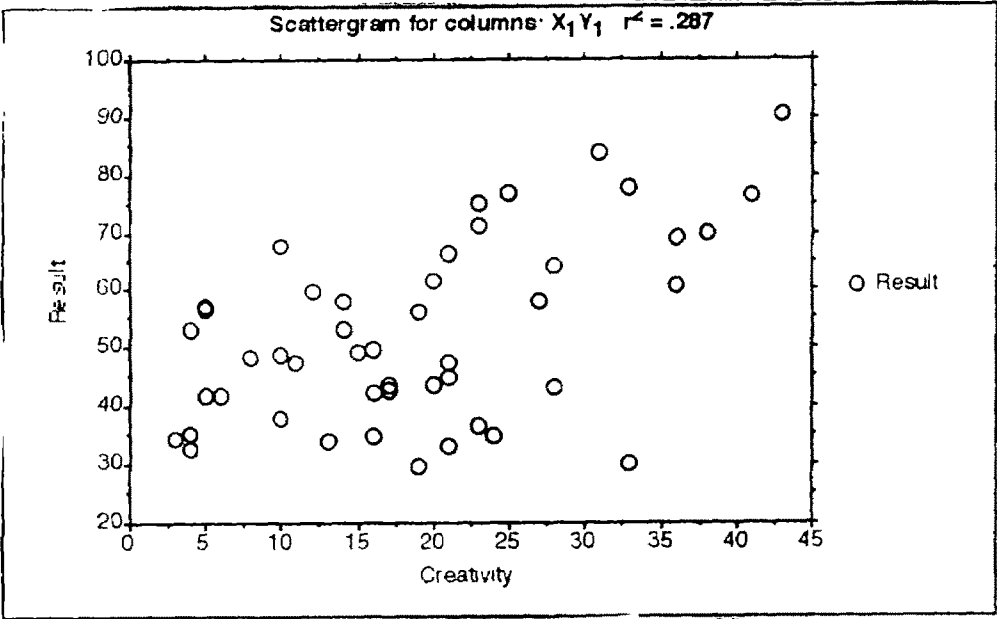
1. Non-government School Grade One
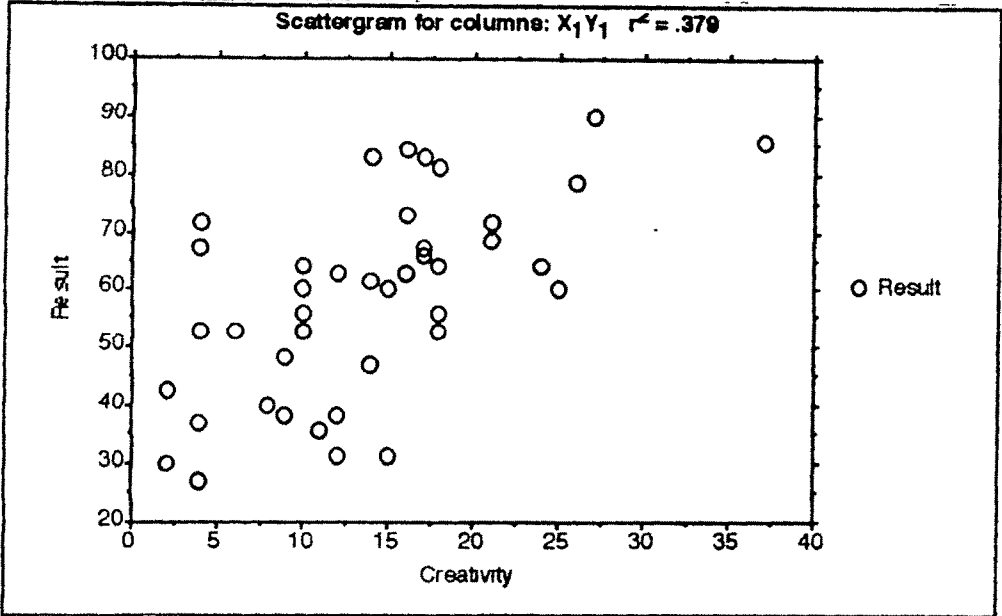
2. Non-government School Grade Two

3. Non-government School Grade Three

Scattergram for columns: X_1Y_1 $r^2 = .287$

4. Non-government School Grade Four

Scattergram for columns: X_1Y_1 $r^2 = .21$

5. Non-government School Grade Five

Scattergram for columns: X_1Y_1 $r^2 = .221$

6. Non-government School Grade One

Scattergram for columns: X_1Y_1 $r^2 = .239$

7. Non-government School Grade Two
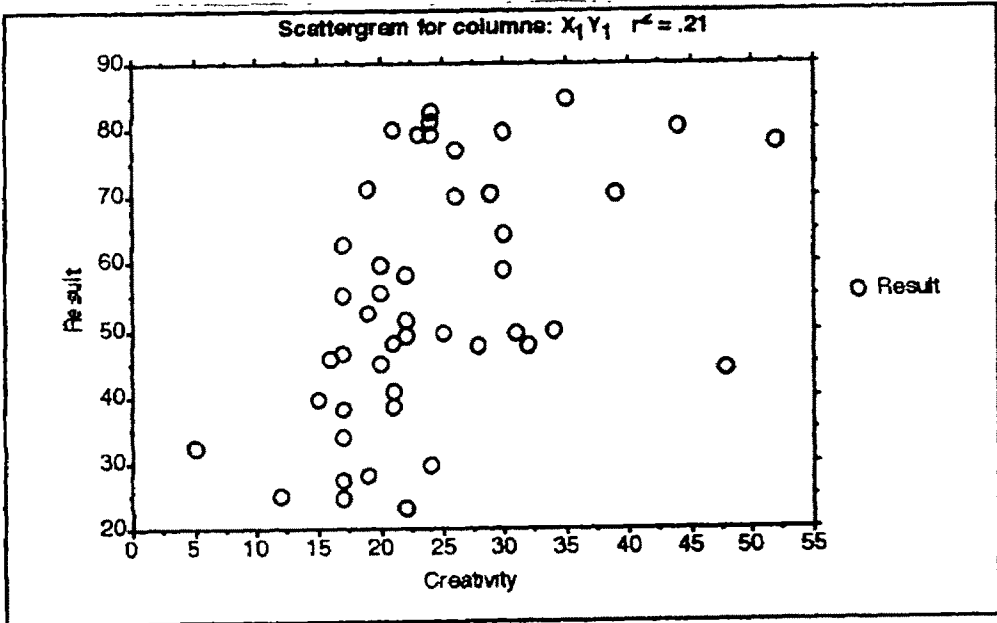
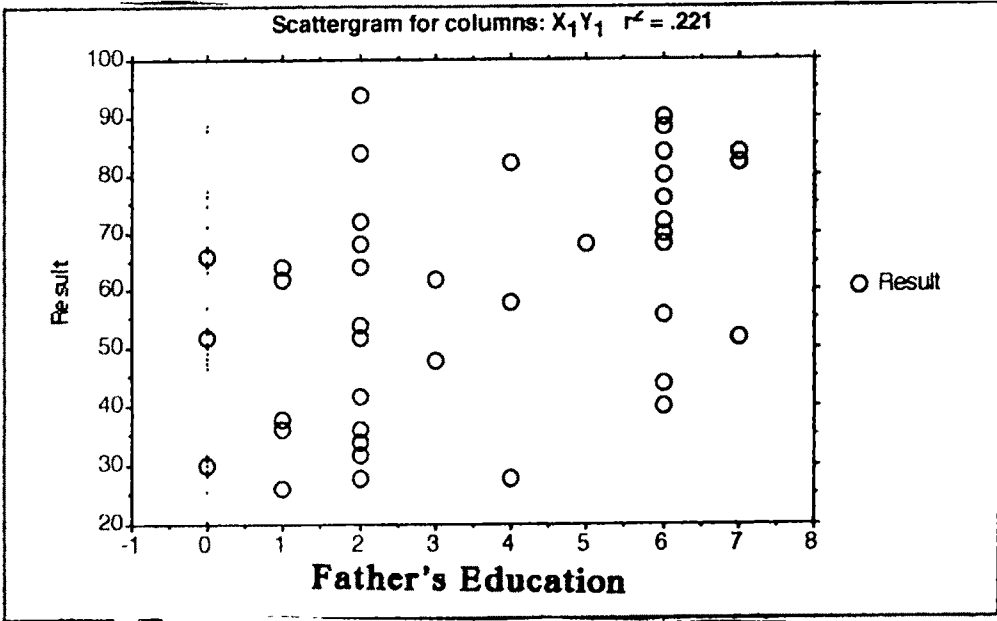Scattergram for columns: X_1Y_1 $r^2 = .364$
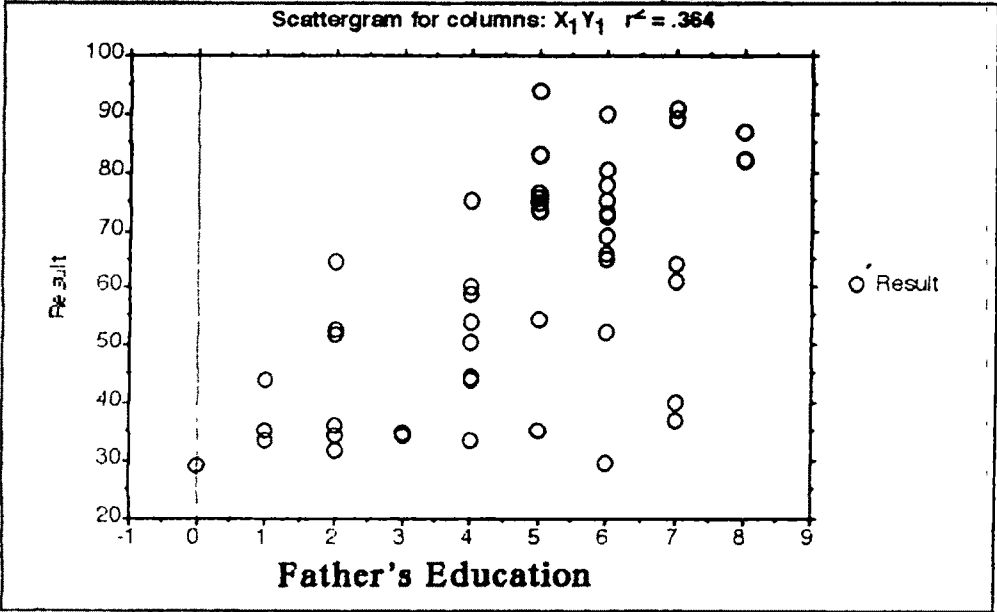
8. Non-government School Grade Three

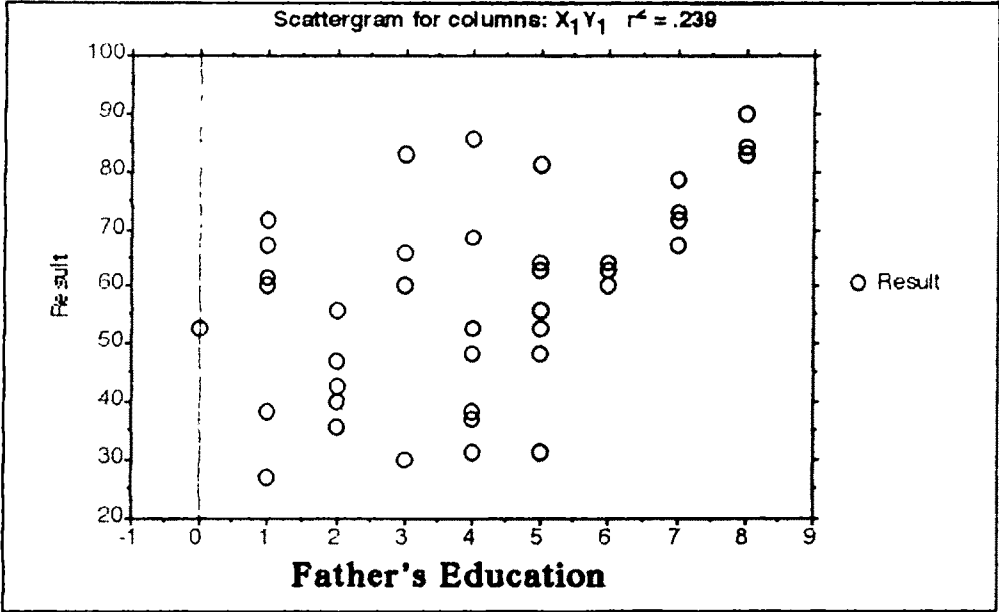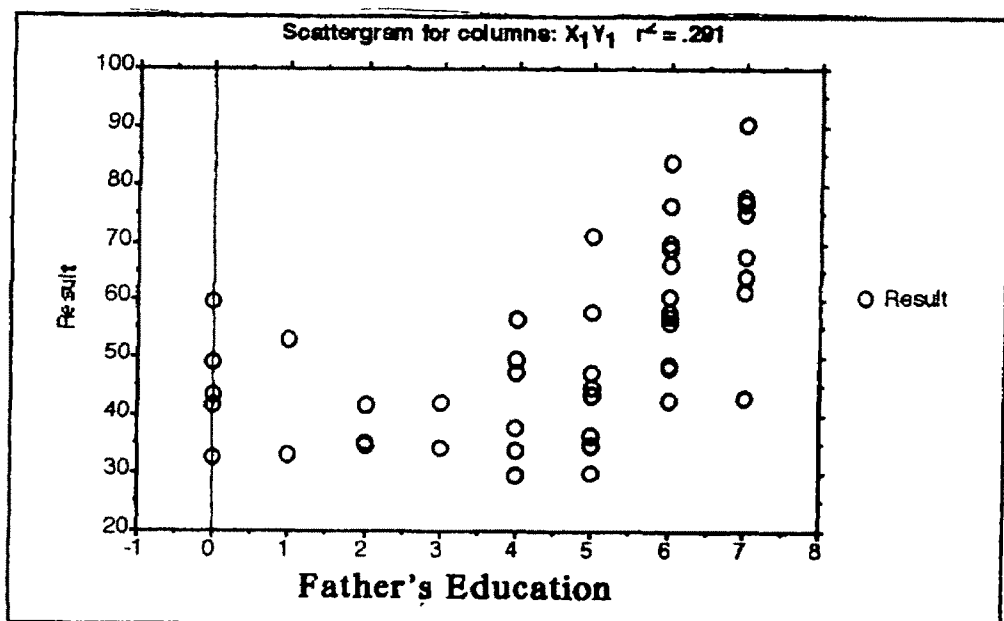9. Non-government School Grade Four
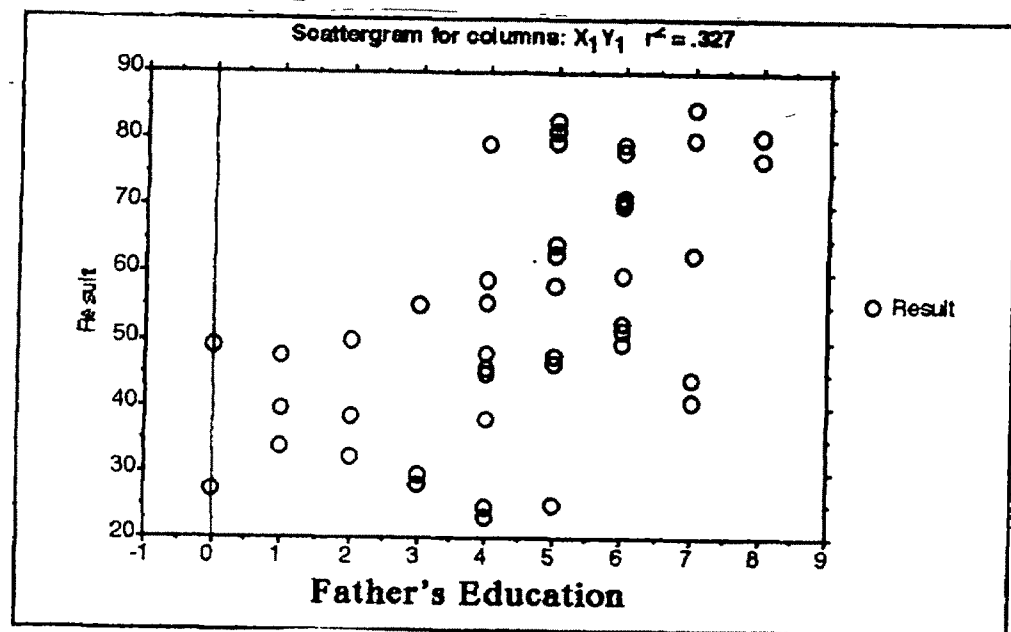
10. Non-government School Grade Five

Scattergram for columns $X_1 Y_1$ $r^2 = 216$

11. Non-government School Grade One

Scattergram for columns: $X_1 Y_1$ $r^2 = .238$

12. Non-government School Grade Two

Scattergram for columns. X_1Y_1 $r^2 = .398$

13. **Non-government School Grade Three**

Scattergram for columns X_1Y_1 $r^2 = .388$

14. **Non-government School Grade Four**

Scattergram for columns: X_1Y_1 $r^2 = .304$
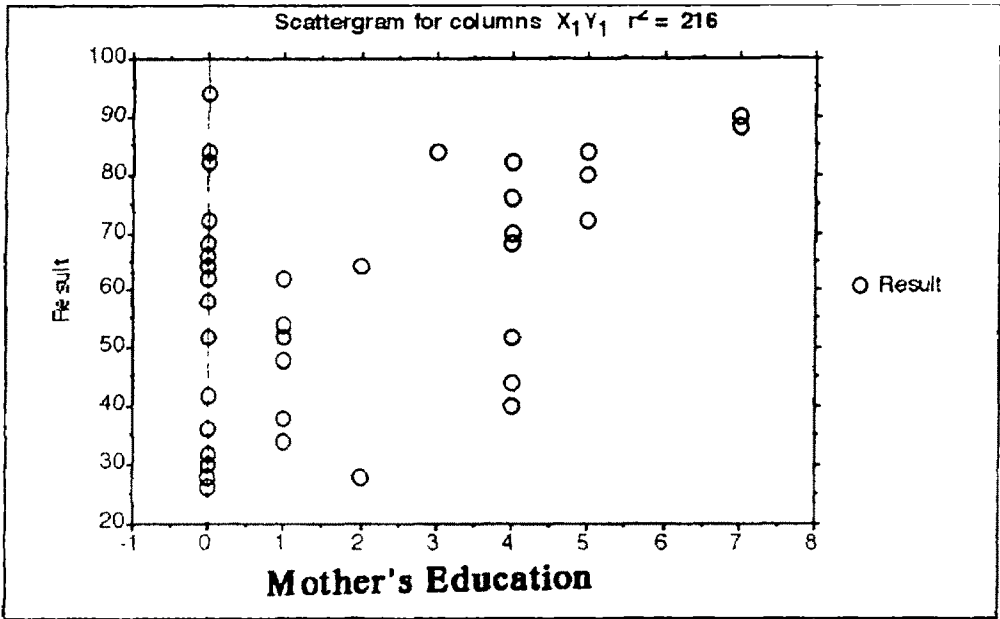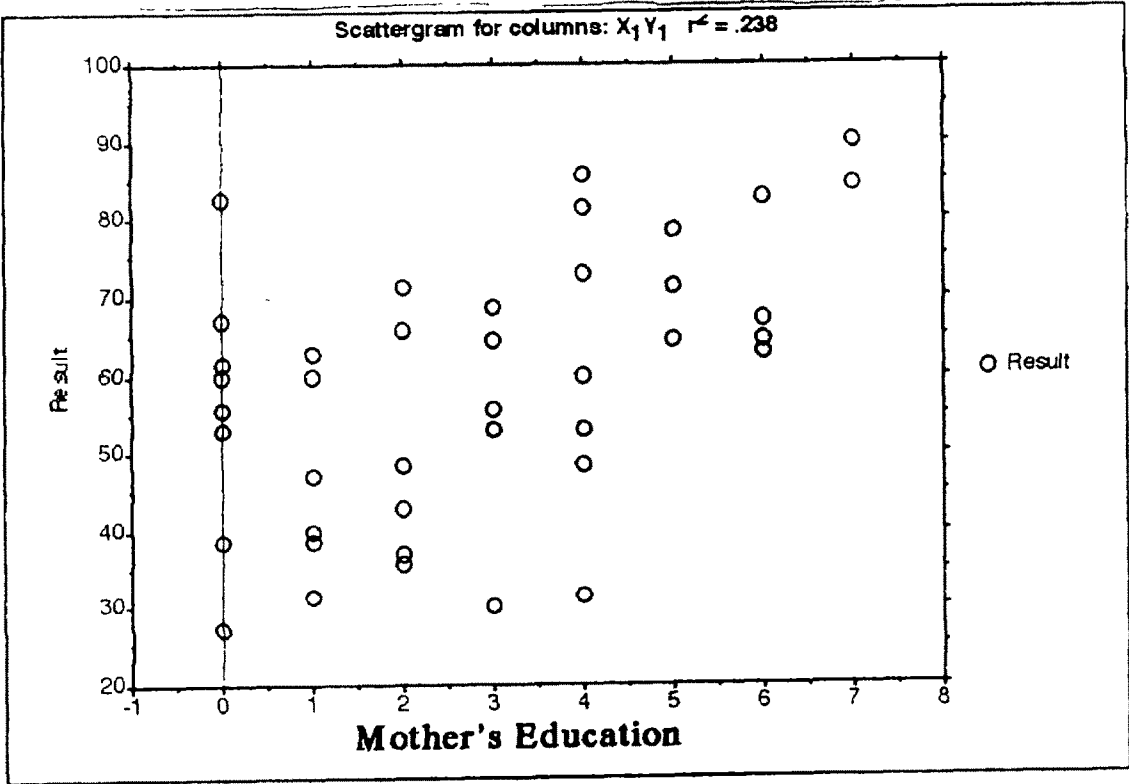
15. **Non-government School Grade Five**
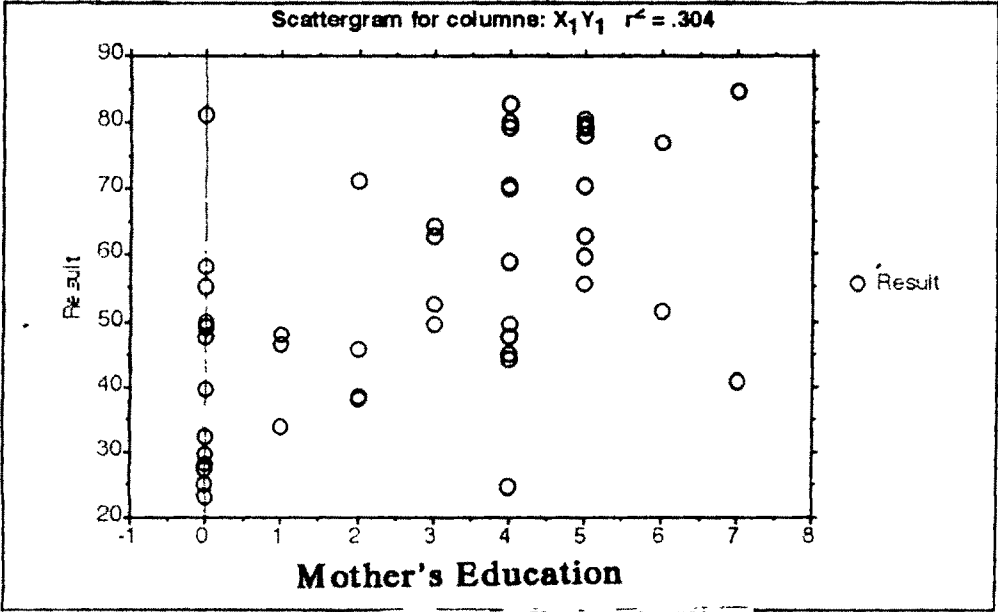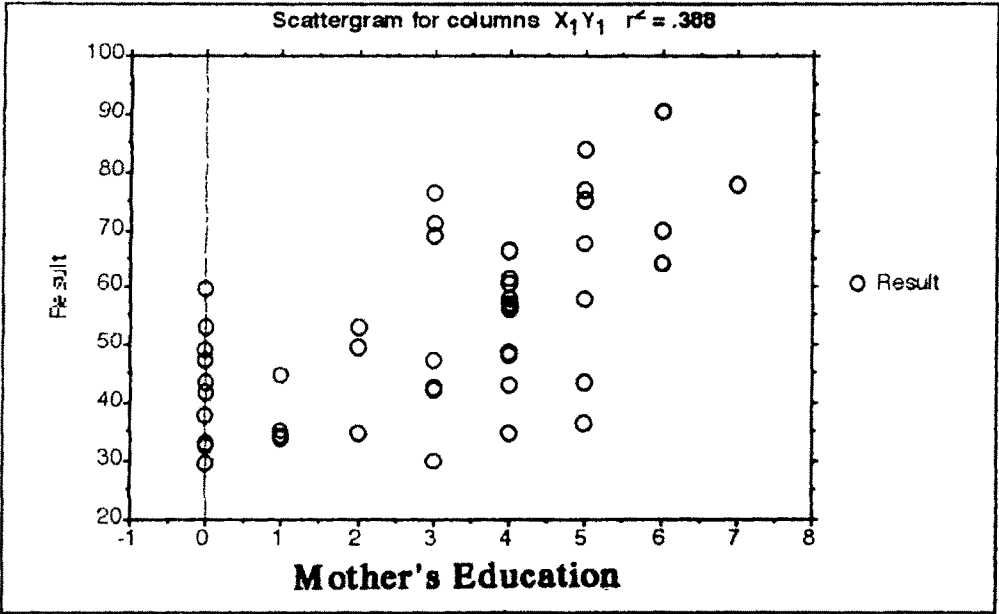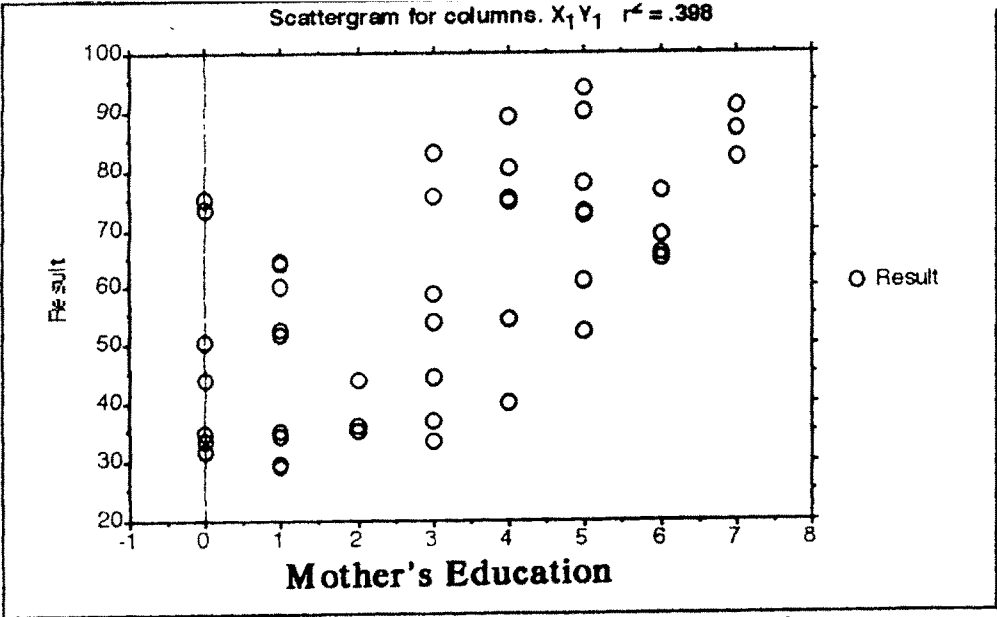
Out of eleven Independent variables (belonging to the categories of Individual & Home Variables)seven variables have significant relationship with the academic achievement of the primary school children. These variables are significantly related to the achievement of the pupils almost in each grade of the non-government schools. This analysis verified the first hypothesis.

Table 4.2   Co-efficient of correlation between the Independent Variables & Dependent Variables of Government Schools.

INDEPENDENT VARIABLES	DEPENDENT VARIABLES (Academic achievement of the Students)				
	Grade ONE	Grade TWO	Grade THREE	Grade FOUR	Grade FIVE
Creativity	.568*	.697*	.078 NS	.356*	.424*
Motivation	.375*	.375*	.140 NS	.202 NS	.133 NS
Nutritional level	.546*	.207 NS	.437*	.4699*	.40*
Home Environment	.422*	.144 NS	.532*	.581*	.560*
Father's Education	.471*	.553*	.528*	.757*	.441*
Father's Occupation	.59*	.555*	.524*	.689*	.75*
Father's Income	.509*	.522*	.44*	.653*	.638*
Mother's Education	.599*	.570*	.70*	.685*	.684*
Mother's Occupation	.145 NS	.390*	.529*	.442*	.420*
Mother's Income	.145 NS	.408*	.643*	.465*	.4429*
Tutor	.209 NS	-.034 NS	.423*	.496*	.51*

*   Significant at 0.05 level.

Analysis of the Data of Table 4.2

The findings of correlation analyses of variables for government schools are presented below variable-wise and grade-wise.

1.   The predicting variable **Creativity** is significantly related to students' achievement in each grade (except grade three).

2.   The predicting variable **Motivation** is significantly

correlated with achievement only in grade one and two, but the degree of correlation is low. It is found non-significant to achievement in the upper three grades i.e. grade 3 to 5. The same result was also found in the case of non-government schools.

3. The predicting variable **Nutrition** is significantly correlated with achievement in all of the grades (except grade two). **Home Environment** is **significant in four grades**.

4. **Fathers' Education, Occupation and Income** are significantly correlated with academic achievement of primary stage students of all grades. Same result was seen in the case of non-government schools. So it can be said that Father's Education, Father's Occupation and Father's Income are good predictor of academic achievement. The inter correlations of Fathers' Education and Father's Occupation is 0.91 and Fathers' Education and Father's Income is also 0.91 for grade one. It is 0.80 and above in upper grades. (Appendix 8b, correlation matrix)

5. **Mother's Education** is significantly correlated with academic achievement in each grade of government primary schools. So it is a good predictor of academic achievement. Mother's Occupation, Mather's Income are also correlated with academic achievement in four grades. It is non-significant only in grade one. The coefficient of inter-correlation of Mother's Education and Occupation is 0.42 and Mothers' Education and Income is also 0.42 in grade one. The inter correlations are higher in upper grades. Same result can be seen in the case of

non-government school. (Appendix: 8b)

6. The important predicting variable **Tutor** (who teaches the child at home) is significantly correlated in upper three grades i.e. grade three to five but it is non-significant in first two grades.

Conclusion of the findings of table 4.2

So in the conclusion of the findings on government primary school it can be said that Father's Education, Father's Occupation, Father's Income, Mother's Education are the best predicting variables to explain academic achievement in each grade. The next best predicting variables are Mother's Occupation and Income This analysis verified hypothesis second.

Scatter diagrams of the best four (i.e. Fathers' Education, Occupation, Income & Mother's Education) predicting variables are shown in the following pages. The rest of the scattergrams are in the appendix 9

Table 4.3 Coeffecient of Correlation Between the School Variable and the Academic Achievement.

INDEPENDENT VARIABLES	CORRELATION	CO VARIANCE	R^2
Staff Composition	.87*	16.26	.76
Teachers' Qualification	.84*	14.99	.71
Teachers' Experience	.50	1.36	.25
Teaching Method	-.23	-19.77	.05
Evaluation Procedure	.85*	12.89	.72
Instructional Materials	.16	4.83	.03
Library Facilities	.57*	30.12	.32
Equipment for Cultural Programmes	.78*	16.95	.61
Co. Curricular Activities	.34	14.03	.12
Physical Facilities	.80*	45.78	.64

* Significant of .05 level.
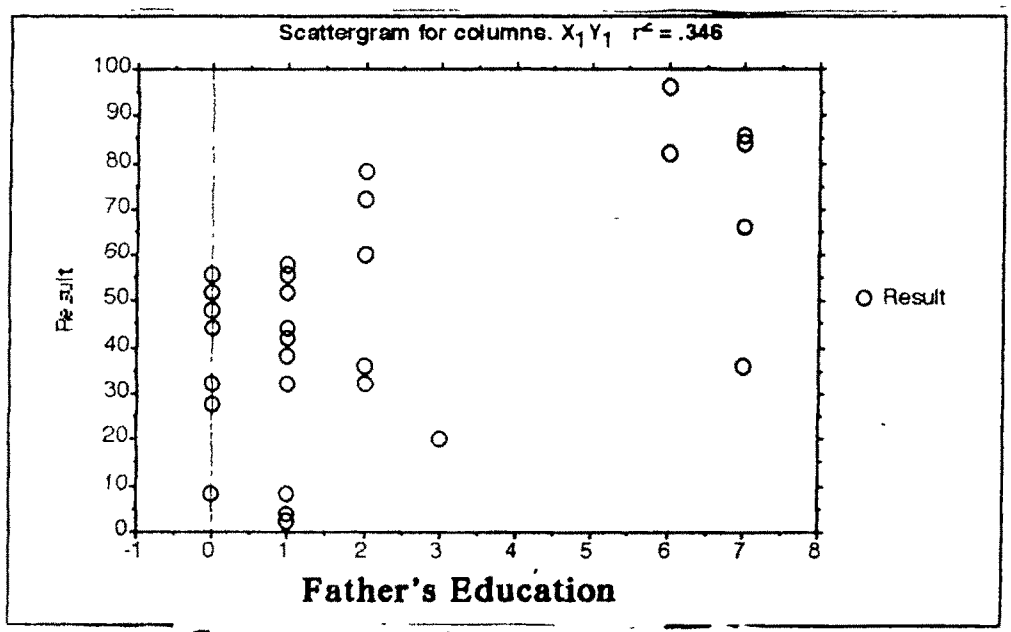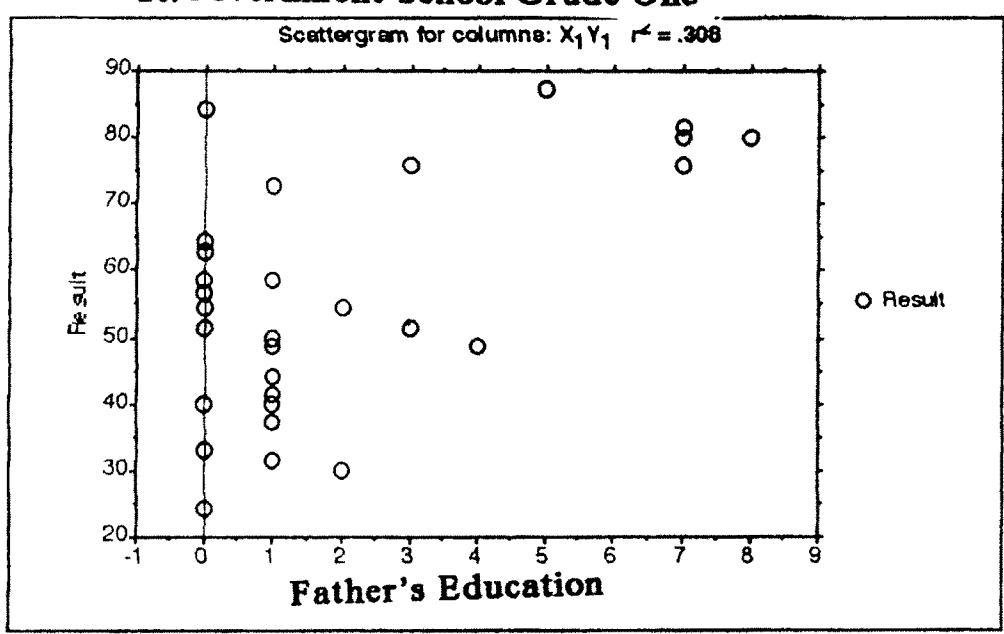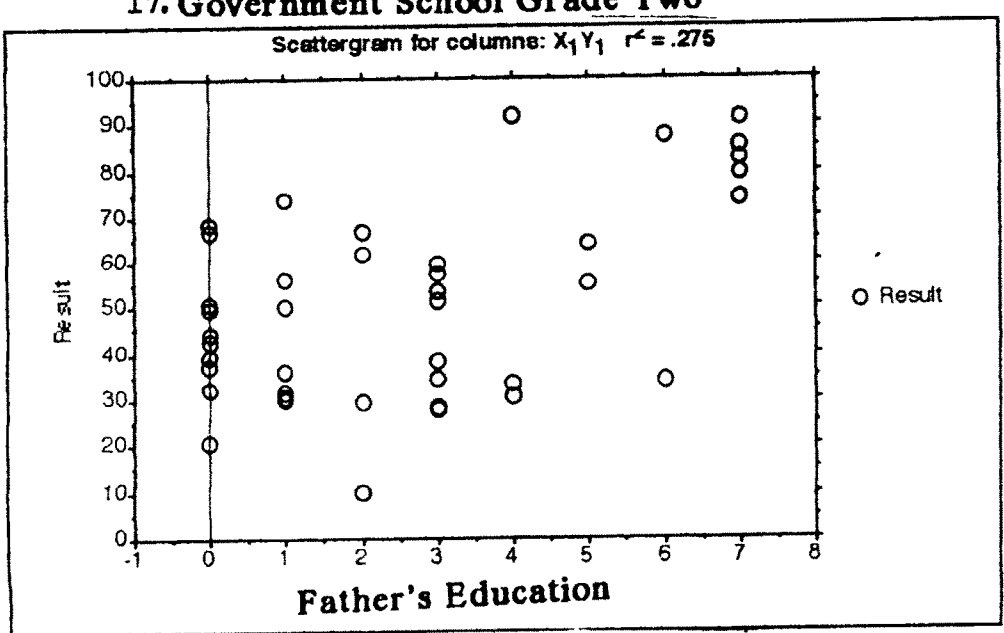
Scattergram for columns. $X_1 Y_1$ $r^2 = .346$

16. Government School Grade One

Scattergram for columns: $X_1 Y_1$ $r^2 = .308$

17. Government School Grade Two

Scattergram for columns: $X_1 Y_1$ $r^2 = .275$

18. Government School Grade Three

Scattergram for columns X₁Y₁ r² = 477

19. Government School Grade Four

Scattergram for columns: X₁Y₁ r² = .571

20. Government School Grade Five

Scattergram for columns: $X_1 Y_1$ $r^2 = .307$

21.Government School Grade One

Scattergram for columns: $X_1 Y_1$ $r^2 = .293$

22.Government School Grade Two

Scattergram for columns: $X_1 Y_1$ $r^2 = .232$

23.Government School Grade Three

Scattergram for columns X_1Y_1 $r^2 = 4$

24.Government School Grade Four

Scattergram for columns X_1Y_1 $r^2 = 346$

25.Government School Grade Five

Scattergram for columns: $X_1 Y_1$ $r^2 = .259$

Father's Income

26 . Government School Grade One

Scattergram for columns: $X_1 Y_1$ $r^2 = .273$

Father's Income

27. Government School Grade Two

Scattergram for columns: $X_1 Y_1$ $r^2 = .193$

Father's Income

28. Government School Grade Three

Scattergram for columns: $X_1 Y_1$ $r^2 = .427$

29•Government School Grade Four

Scattergram for columns: $X_1 Y_1$ $r^2 = .423$

30.Government School Grade Five

Scattergram for columns: $X_1 Y_1$ $r^2 = .36$

Result — Mother's Education

31. Government School Grade One

Scattergram for columns: $X_1 Y_1$ $r^2 = .326$

Result — Mother's Education

32. Government School Grade Two

Scattergram for columns: $X_1 Y_1$ $r^2 = .489$

Result — Mother's Education
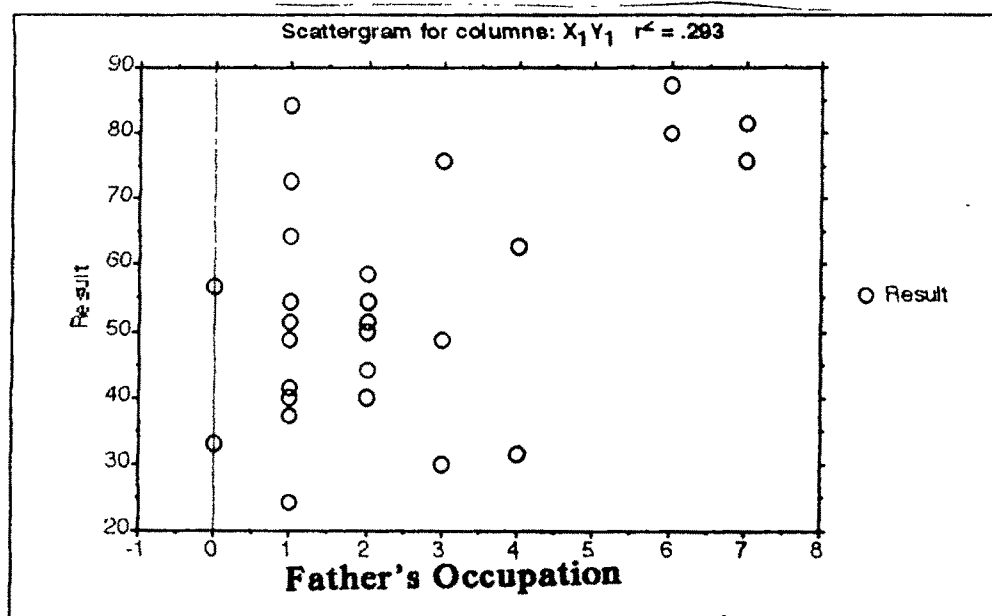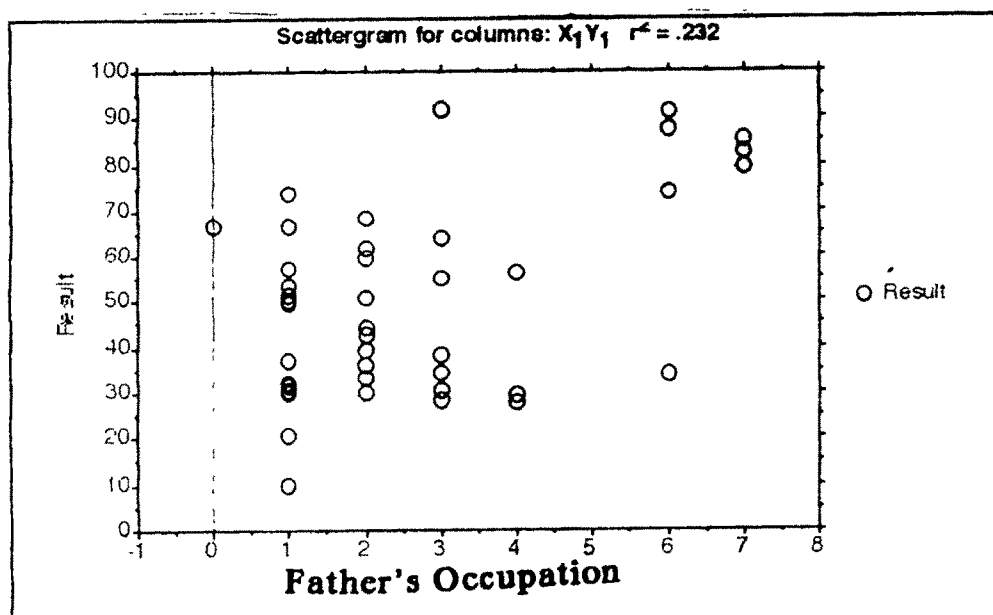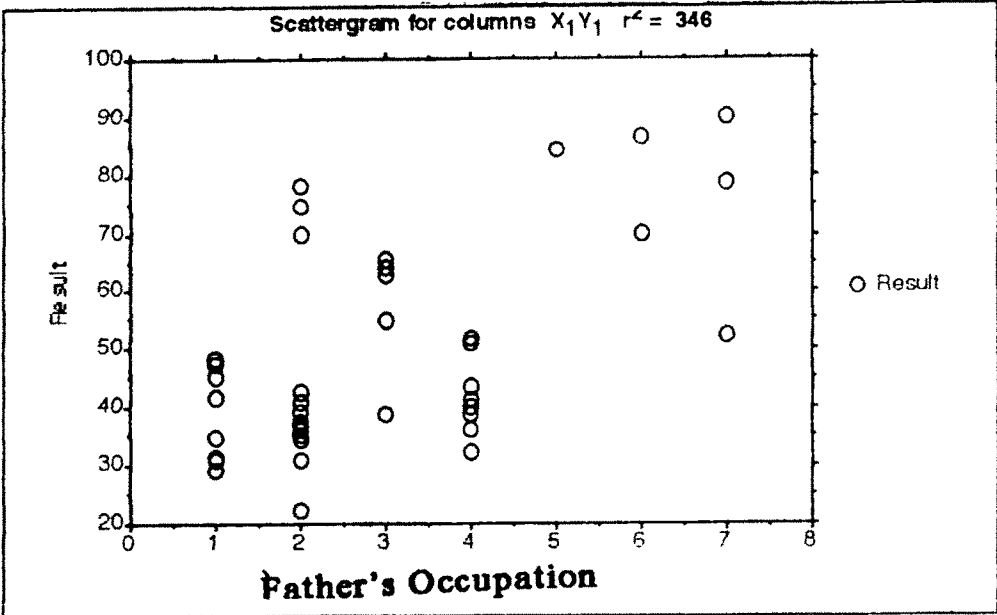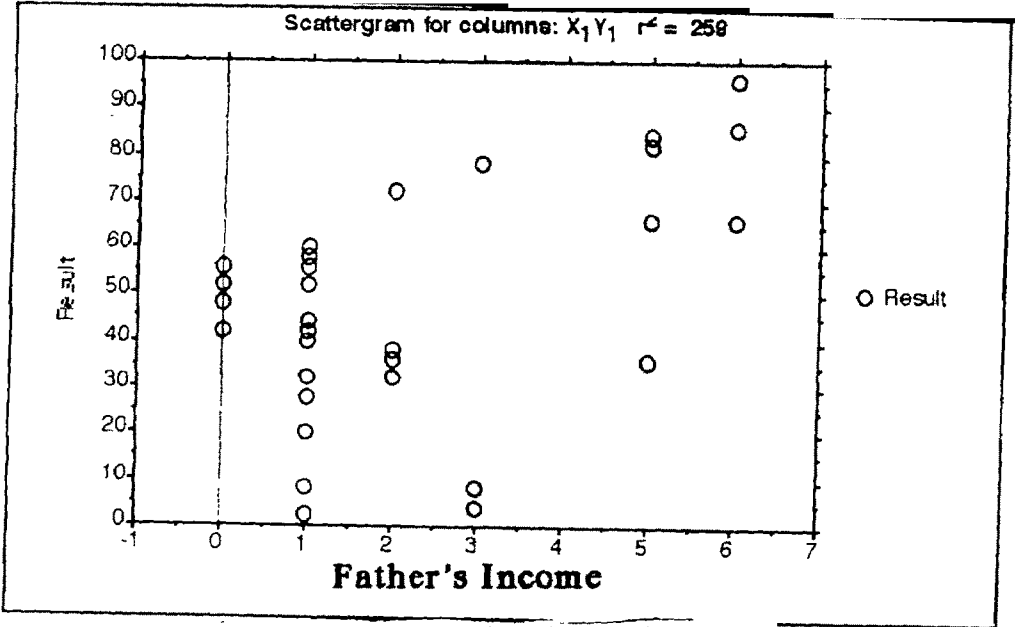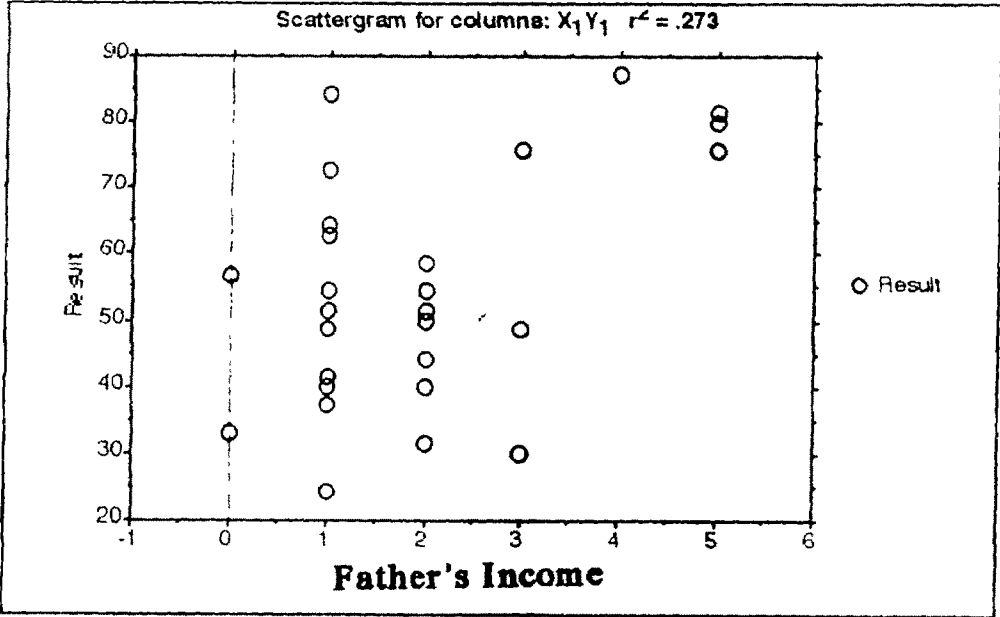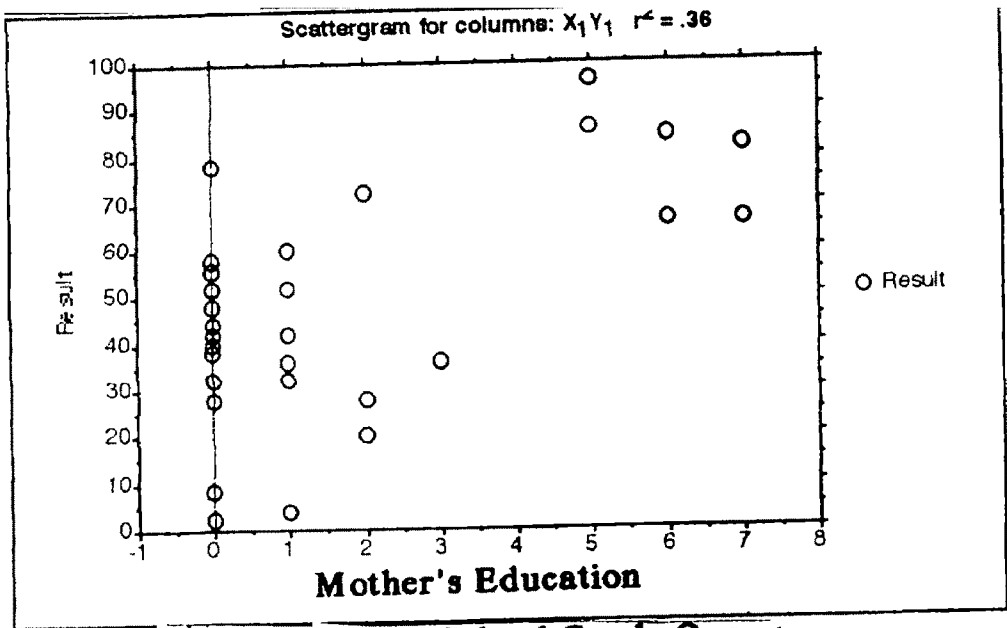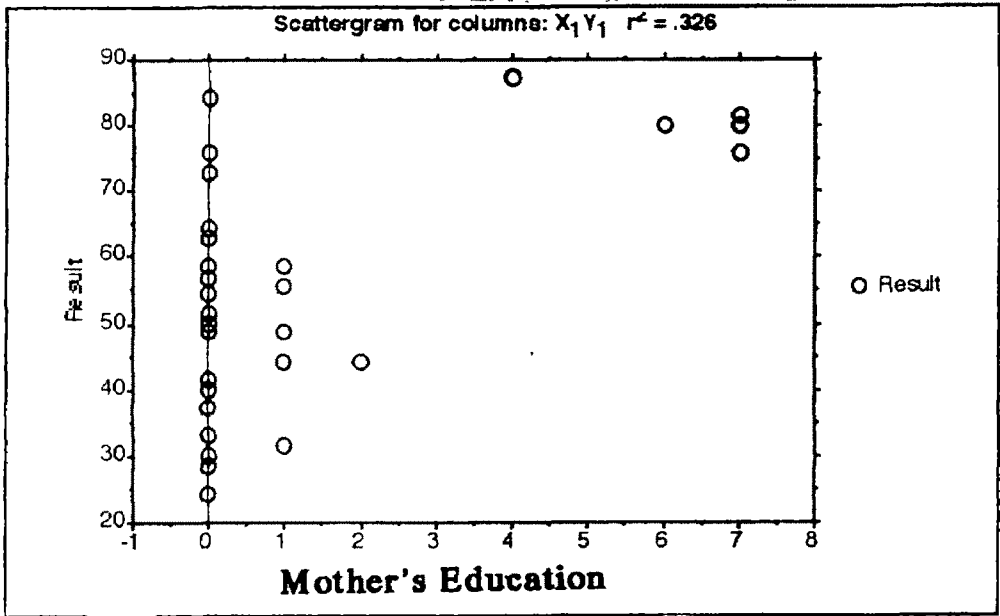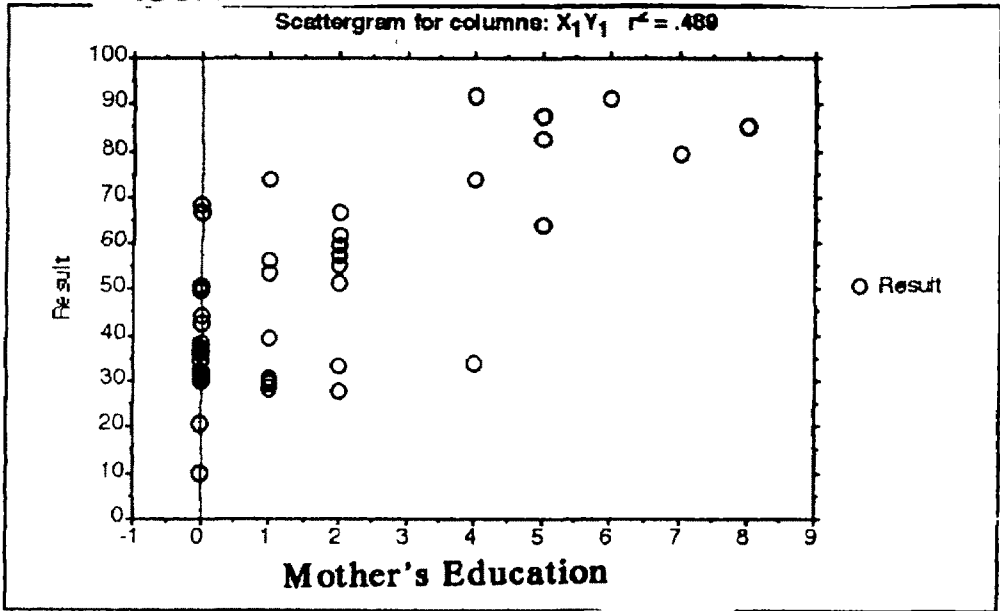
33. Government School Grade Three

34.Government School Grade Four
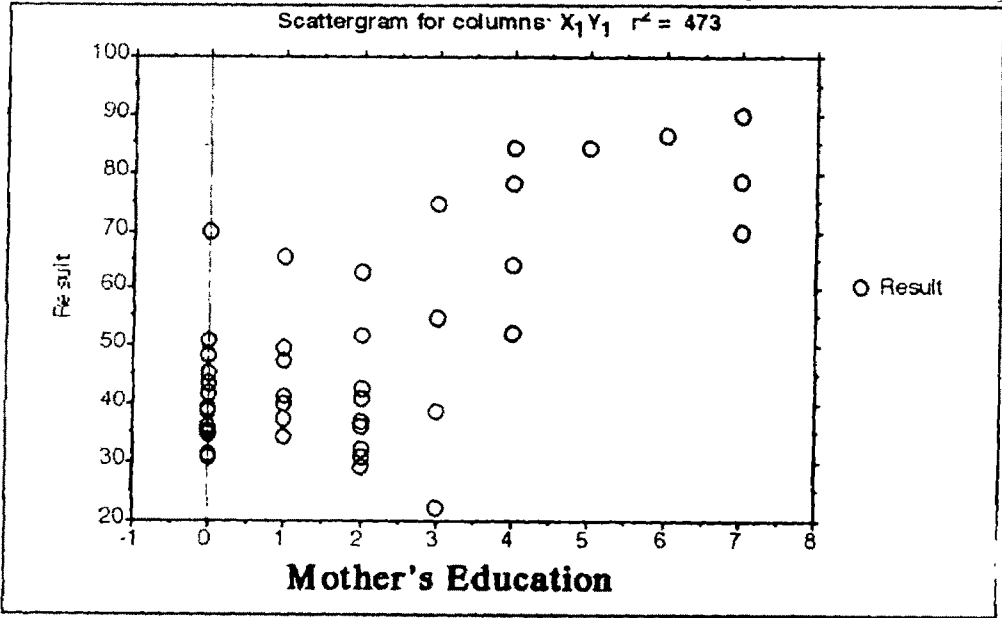
35.Government School Grade Five

Analysis of the Data of table 4.3

The findings of the data of table 4.3 are analysed as follows

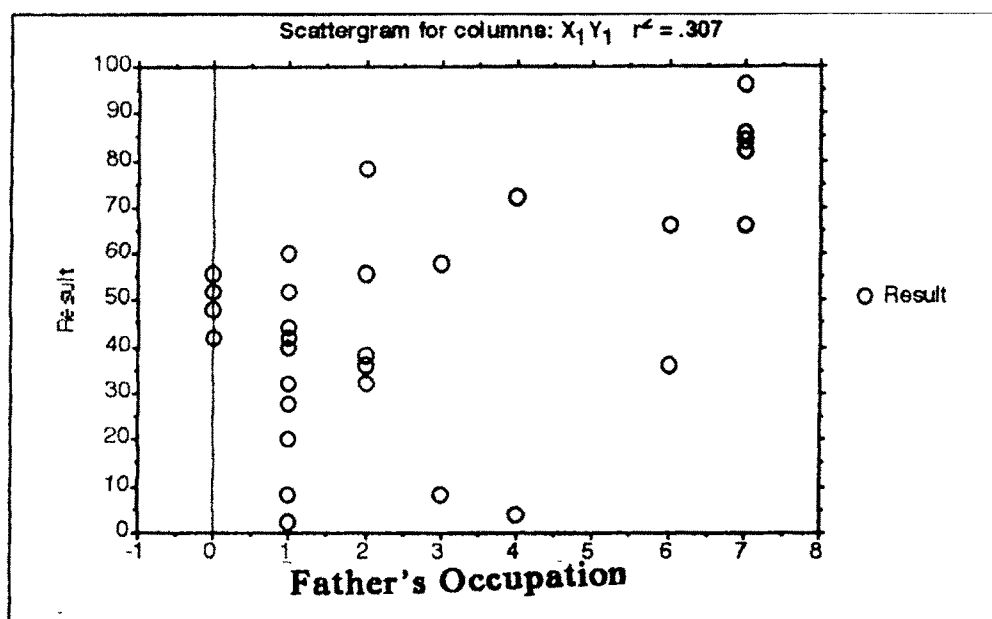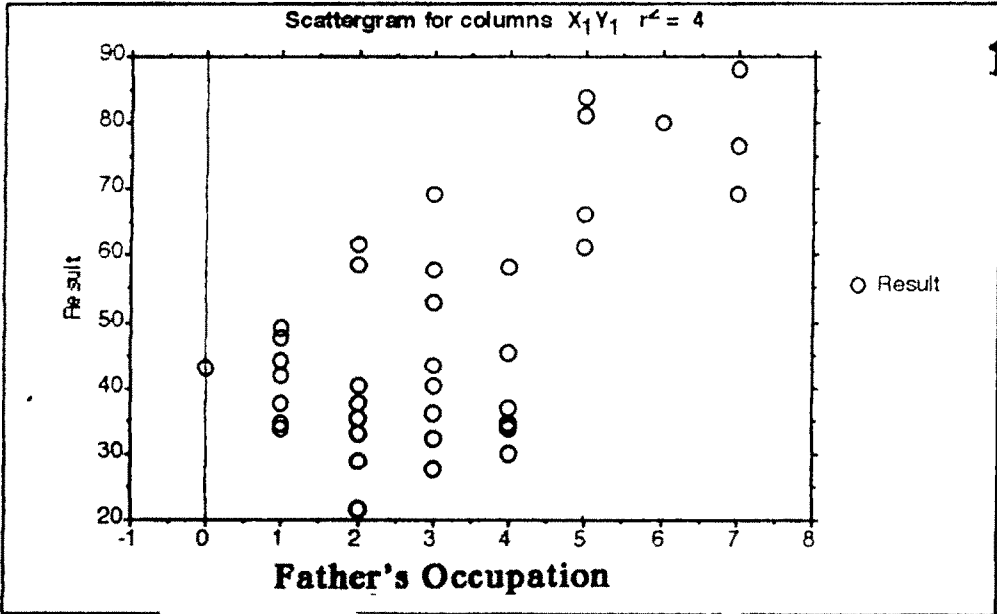1. The predicting variables Staff Composition, Evaluation Procedure, Teachers'Qualificationare higly correlated with the academic achievement of the primary school children. The correlation co-efficients are 0.87, 0.85, 0.84 respectively.

2. 'The other important predicting variables to predict achievement are Physical Facilities, Equipement for Cultural Programme, Library Facilities, the correlations are 0.80, 0.78. 0.57 respectively.

3. The Other variables teachers' Experience, Instructional materials, Co-curricular Activities did not show any significant relationship.

This analysis verified the third hypothesis and is discussedin chapter 7.

Conclusion on the Findings from Correlation Analysis :

An analysis of correlation indicates that students' Father's Education, Father's Occupation, Mother's Educatin, Creativity,

are correlated with academic achievement almost in each grade and each type of schools. When school variables are taken into account then it is seen that significant correlation exist between academic achievement and the variables, Staff Composition, Evaluation Procedure, Teachers' Qualification, Physical Facilities, Equipment for Cultural Programme and Library Facilities.

4.2.0   IDENTIFYING THE CONTRIBUTION OF THE VARIABLES SINGLY AND JOINTLY BY BETA COEFFICIENT OF REGRESSION EQUATION

The degree of correlation of two or more combined variables with another variable is generally unpredictable. Correlations will not necessarily be changed, decreased or increased by the

addition of variables. Multiple regression analysis is a method for studying the effects and the magnitudes of the effects of more than one independent variable on one dependent variable using the principles of correlation and regression. Regression generally used when the intent of the analysis is prediction and correlation used when the intent is to measure degree of association. The result of applying multiple regression techniques to a data set is an equation that represents a best fit line between a continuous DV and several continuous or dichotomous IVs. The regression solution takes the form of the general linear model

$Y = A + B_1 X_1 + B_2 X_2 \ldots \ldots \ldots + B_k X_k$, where Y is the predicted value on the DV, the X's represent the various IVs, the A is a constant representing the Y intercept and the B's are the weights assigned to each of the IVs by the regression solution. The value of multiple regression (R) can be tested for significance by calculating `F` which is given by the following formula (Ferguson, 1959, p.301)

$$F = \frac{R^2}{1 - R^2} \qquad df = \frac{n-k-1}{k}$$

Where, R = Multiple correlation co-efficient.
        N = Number of observation
        K = Number of independent variables

In this study, multiple regression are employed to determine the predictors of correlates of students' academic' achievement of different types of schools (e.g government and non-government) and five different grades (i.e grade one to five). These analyses are expected to answer objective two and will verify hypotheses 4,5 and 6.

It can be seen in Tables 4.1 and Table 4.2 that Father's Education is a significant correlate of academic achievement of all five grades of both government and non-government schools. Similarly Father's Occupation, Mother's Education also have significant correlation in all 10 cases. On the otherhand, Creativity, Home Environment, Father's Income have significant correlations in 9 cases. The variables are arranged below in order of the number of cases in which significant correlation have been found.

Table 4.4 : Individual and Home Variables Indicated Significant by Correlation.

Independent Variables	Number of Cases in which Significant Correlation found
Father's Education	10
Father's Occupation	10
Mother's Education	10
Father's Income	9
Home Environment	9
Creativity	9
Mother's Income	8
Mother's Occupation	7
Tutor	7
Nutritional level	7
Motivation	4

These variables have been taken into the equations for regression analysis in the same sequence as shown in table 4.4, Beta co-efficient for 10 regression equations has been determined with the addition of one more independent variable at the end of each equation. Table 4.5 to Table 4.14 show Beta coefficients in regression equations explaining students achievement. Table 4.5 to 4.15 present the Individual and Home Variables, Table 4.16 present the School Variables.

Table 4.5 Beta Coeffecients of Regression Equations Explaining Achievement of Grade One Students of Non-Government Schools.

REGRESSION EQUATION NUMBER

INDEPENDENT VARIABLE	1	2	3	4	5	6	7	8	9	10
Father's Education	6.73*	5.08	3.58	3.12	1.64	1.63	1.24	1.18	1.15	.72
Father's Occupation	-2.95	-6.1*	-1.57	-1.21	-.85	-.72	-.95	-.69	-.74	-.30
Mother's Education		5.28*	5.76*	5.23*	4.95	5.01	5.77	6.12	6.15	6.21
Father's Income			-6.14	-6.44	-5.52	-5.65	-5.65	-5.78	-5.66	-5.39
Home Environment				.76	.49	.49	.49	.53	.53	.46
Creativity					.60	.62	.62	.58	.59	.55
Mother's Income						.38	.41	.16	.1	.42
Mothers Occupation							-1.11	-1.09	-1.06	-1.81
Tutor								-2.6	-2.66	-2.74
Nutritional level									-.21	.11
Motivation										.82
R	.51	.58	.61	.64	.69	.68	.68	.69	.69	.69
R²	.26	.33	.37	.41	.47	.47	.47	.47	.47	.48
F	6.46	5.95	5.23	4.47	4.93	3.84	3.28	2.89	2.51	2.25

* Significant at .05 level

Analysis of the Data of Table 4.5

Table 4.5 presents Beta coeffecients for 10 regression equations related to students achievement of grade one of non-government Schools, with addition of one more independent variable at the end of each equation. The beta coeffecients in Table 4.5 shows that Father's Education, Mother's Education are siginificantly related to students achievement. Among the variables Mother's Education (with a beta coeffecient of 5.28) has the greatest explanatory power relative to other variables. In equation 2 it is seen that R^2 has increased from 0.26 to 0.33 with the addition of the variable Mother's Education. So it contributed in the equation, and a good predictor of academic achievement.

Table 4.6 Beta Coeffecients of Regression Equations Explaining Achievement of Grade Two Students of Non-Government Schools.

INDEPENDENT VARIABLE	REGRESSION EQUATION NUMBER									
	1	2	3	4	5	6	7	8	9	10
Father's Education	2.40	1.29	1.21	1.67	.33	-.27	-.47	-.66	-.38	-.11
Father's Occupation	2.30	1.99	1.93	1.53	1.70	.52	.57	-.01	-.38	-.31
Mother's Education		1.56	1.49	1.58	1.87	.76	.55	-.73	-.52	-.58
Father's Income			4.0	1.47	-.26	.99	1.01	2.6	2.05	.71
Home Environment				-.56	-.57	-.71	-.62	-.69	-.71	-.67
Creativity					1.15*	1.32*	1.32*	1.20*	1.18*	1.1*
Mother's Income							2.16	-2.36	-2.59	-3.75
Mothers Occupation							5.38	6.47	6.60	7.49
Tutor								4.63*	4.13	3.96
Nutritional level									1.85	2.26
Motivation										1.18
R	.53	.53	.53	.55	.71	.76	.76	.80	.80	.81
R^2	.27	.28	.28	.30	.50	.56	.58	.64	.65	.66
F	7.23	4.98	3.64	3.15	5.94	6.21	5.59	6.25	5.64	5.28

* Significant at .05 level

Analysis of the Data of Table 4.6

The beta coeffecients in Table. 4.6 show that Creativity, Tutor are significantly related to students achievement. Among the Variables Creativity has the greatest explanatory power. In equation 5, addition of the variable Creativity has increased R^2 from 0.30 to 0.50. The variable Creativity is significant in every equations. In equation 8, R^2 has increased from 0.58 to 0.64 as the variable Tutor has entered. So the Variables Tutor can also be considered as a variable with a great explanatory power.

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Table 4.7 Beta Coeffecients of Regression Equations Explaining Achievement of Grade Three Students of Non-Government Schools.

REGRESSION EQUATION NUMBER

INDEPENDENT VARIABLE	1	2	3	4	5	6	7	8	9	10
Father's Education	7.16*	4.56*	4.68*	4.37*	3.77	3.59	3.94	3.94	3.88	3.94
Father's Occupation	-1.54	-1.85	-4.81	-4.07	-2.51	-2.36	-2.91	2.91	-2.7	-2.83
Mother's Education		3.75*	2.60	2.07	1.81	1.46	1.58	1.57	1.81	1.74
Father's Income			7.91*	7.25*	4.81	4.92	5.15	5.15	5.04	5.17
Home Environment				.46	-4.10	.01	-.08	-.08	-.02	-.02
Creativity					.50*	.52*	.49*	.49*	.49*	.48*
Mother's Income						1.07*	-3.16	-3.19	-1.33	-1.85
Mother's Occupation							3.29	3.30	1.83	2.14
Tutor								.06	-.16	-.28
Nutritional level									-1.27	1.35
Motivation										.36
R	.61	.68	.73	.76	.80	.80	.80	.80	.80	.80
R²	.37	.46	.57	.57	.63	.64	.64	.64	.64	.64
F	13.05	12.29	13.80	11.03	11.49	9.70	8.42	7.29	6.47	5.77

* Significant at .05 level

Analysis of the Data of Table 4.7

The beta coeffecients in regression equations of Table 4.7 show that Father's Equation, Mother's Education, Creativity are good predictor of students' academic achievement. Among the variables Mother's Education have the greatest explanatory power compared to other variables, as R^2 increased from 0.37 to 0.46 when Mother's Education was added in equation 2. Here, Creativity is a very stable variable as it comes in every equation with 64 percent of the variance.

Table 4.8 Beta Coeffecients of Regression Equations Explaining Achievement of Grade Four Students of Non-Government Schools.

INDEPENDENT VARIABLE	REGRESSION EQUATION NUMBER									
	1	2	3	4	5	6	7	8	9	10
Father's Education	-.06	-2.97	-2.80	-3.02	-3.05	-3.24	-3.24	-3.21	-3.68	-4.08
Father's Occupation	4.95*	4.8*	4.86*	4.63*	4.35*	4.43*	4.38*	4.26*	4.06*	4.14*
Mother's Education		4.03*	4.11*	3.39*	2.97*	3.39*	3.36*	3.03	3.67*	3.81*
Father's Income			-.61	-1.16	-1.31	-1.4	-1.42	-.72	-.54	-.38
Home Environment				.94	.84	.83	.85	.69	.54	.59
Creativity					.29	.31	.31	.36	.25	.25
Mother's Income						-1.12	-3.11	-5.16	-2.66	-3.29
Mother's Occupation							1.58	2.85	.42	.89
Tutor								2.74	1.70	1.85
Nutritional level									3.77*	3.72*
Motivation										-.24
R	.65	.72	.72	.74	.76	.76	.76	.77	.81	.81
R²	.42	.51	.51	.55	.57	.58	.58	.60	.66	.66
F	16.10	15.15	11.14	9.93	8.97	7.61	6.51	6.06	6.97	6.21

* Significant at .05 level

Analysis of the Data of table 4.8

The beta coefficients in regression equations of Table 4.8 show that Father's Occupation, Mother's Education are good predictors of students' academic achievement, as these variables are significant in every equations in which they are added. The variable Nutritional level also contributes in the equations which is indicated by the fact that both R and R^2 increased in equations 9 and 10

Table 4.9 Beta Coeffecients of Regression Equations Explaining Achievement of Grade Five Students of Non-Government Schools.

REGRESSION EQUATION NUMBER

INDEPENDENT VARIABLE	1	2	3	4	5	6	7	8	9	10
Father's Education	2.51	1.27	.46	-.05	1.25	1.25	1.23	.79	.83	1.14
Father's Occupation	3.32	2.82	2.38	3.34	1.73	1.70	1.79	2.52	2.47	2.43
Mother's Education		2.04	1.48	.59	.53	.46	.42	-.50	-.48	-.59
Father's Income			3.57	1.75	1.22	1.35	1.21	1.49	1.41	1.3
Home Environment				1.22*	-.48	.87	.85	.33	.31	.37
Creativity					.51	.50	.56	.47	.48	.49
Mother's Income						.43	4.07	4.59	4.23	5.10
Mother's Occupation							-3.22	-3.09	-2.85	-3.37
Tutor								6.53*	6.64*	6.58*
Nutritional level									-.3	-.10
Motivation										-.41
R	.60	.62	.65	.71	.73	.73	.73	.80	.80	.80
R²	.36	.39	.42	.50	.53	.53	.53	.64	.64	.64
P	12.44	9.10	7.49	8.06	7.40	6.19	5.30	7.07	6.19	5.53

* Significant at .05 level

Analysis of the Data of Table 4.9

Beta coefficients is regression equations of Table 4.9 show that the variable Tutor is the most important variable to explain students academic achievement, because both R and R^2 have increased 0.73 to 0.80 and from 0.53 to 0.64 respectively. The variable Home Environment also contributed positively and significantly in equation, because R^2 has increased from 0.42 to 0. 50.

Table 4.10 Beta Coeffecients of Regression Equations Explaining Achievement of Grade One Students of Government Schools.

REGRESSION EQUATION NUMBER

INDEPENDENT VARIABLE	1	2	3	4	5	6	7	8	9	10
Father's Education	4.85	2.29	4.1	3.07	2.19	2.34	2.14	1.74	2.21	2.19
Father's Occupation	.95	.03	5.0	5.84	3.21	2.51	2.24	2.43	4.53	3.53
Mother's Education		4.03	3.16	2.67	1.36	2.17	2.84	1.52	-.18	.19
Father's Income			-7.8	-7.94	-3.51	-3.27	-3.05	-2.16	-4.67	-3.67
Home Environment				.53	.39	.32	.36	.26	.11	.11
Creativity					1.33*	1.31*	1.33*	1.28*	.95	.86
Mother's Income						-2.19	-2.33	-1.84	-1.52	-1.13
Mother's Occupation										
Tutor							-1.97	1.95	-.97	-.95
Nutritional level								2.95	4.97	3.95
Motivation									1.64	1.06
R	.59	.61	.63	.64	.71	.71	.71	.72	.73	.73
R^2	.35	.37	.39	.41	.50	.50	.51	.52	.53	.53
F	7.99	5.65	4.49	3.68	4.29	3.60	3.11	2.74	2.40	2.40

*   Significant at .05 level

Analysis of the Data of table 4.10

The beta coeffecients in regression equations of Table 4.10 show that the variable Creativity has the greatest explanatory power to explain academic achievement of the students. When the variable Creativity was added to the equation 5, R^2 increased from 0.41 to 0.50. Creativity is significant in every equation (except in equation 9) in which it is added.

Table 4.11 Beta Coeffecients of Regression Equations Explaining Achievement of Grade Two Students of Government Schools.

REGRESSION EQUATION NUMBER

INDEPENDENT VARIABLE	1	2	3	4	5	6	7	8	9	10
Father's Education	2.47	1.23	1.85	.52	-3.11	-3.12	-3.09	-3.42	-1.12	-.97
Father's Occupation	2.06	1.05	1.99	1.38	-.75	-.66	-.84	-3.02	-3.14	-2.74
Mother's Education		2.31	2.21	1.46	2.1	1.87	2.13	1.86	2.21	3.24
Father's Income			-2.21	-.24	4.45	4.45	4.73	7.33	7.24	4.19
Home Environment				.80	.67	.68	.71	.73*	.69	.57
Creativity					.98*	.97*	.92*	.92*	.90*	.94*
Mother's Income						.26	11.19	7.43	7.23	11.62
Mother's Occupation							-7.72	-6.34	-6.30	10.12
Tutor								-6.43	-6.40	-5.41
Nutritional level									-1.09	-.63
Motivation										1.38
R	.57	.58	.58	.64	.79	.79	.80	.84	.84	.87
R²	.32	.34	.34	.41	.62	.62	.63	.71	.71	.75
F	6.91	4.77	3.50	3.6	6.84	5.65	4.95	5.86	5.09	5.52

* Significant at .05 level

Analysis of the Data of table 4.11

The Beta coeffecients in Table 4.11 show that Home Environment, Creativity and Tutor are significantly related to students' achievement. Creativity has the greatest explanatory power compared to other variables as indicated in the equation 5 to 10 R^2 has also changed from 0.41 to 0.62 when Creativity entered in the equation.

Table 4.12 Beta Coeffecients of Regression Equations Explaining

Achievement of Grade Three Students of Government Schools.

REGRESSION EQUATION NUMBER

INDEPENDENT VARIABLE	1	2	3	4	5	6	7	8	9	10
Father's Education	3.56	-3.17	-2.97	-4.53	-4.62	-4.98	-5.42	-5.31	-5.06	-5.06
Father's Occupation	1.62	-1.48	-.14	-1.30	-1.19	-1.76	-1.04	-.86	-1.13	-.86
Mother's Education		11.03*	11.03*	10.94*	11.0*	9.54*	9.74*	9.13*	8.76*	8.45*
Father's Income			-2.42	-.47	-.72	1.17	1.57	1.29	1.26	1.03
Home Environment				1.63*	1.64*	1.32*	1.27*	1.17*	1.11	1.07
Creativity					.08	.04	.02	-.01	-.06	-.04
Mother's Income						4.63*	10.14*	9.15*	9.16*	9.08*
Mother's Occupation							-4.96	-3.77	-3.67	-3.47
Tutor								2.32	2.49	2.58
Nutritional level									1.11	1.46
Motivation										.37
R	.53	.73	.73	.79	.79	.81	.83	.83	.83	·83
R²	.28	.53	.54	.62	.62	.66	.69	.69	.69	·69
F	7.64	14.56	10.78	11.89	9.68	9.34	8.98	7.99	7.03	·70

* Significant at .05 level

Analysis of the Data of Table 4.12

The beta coeffecient in regression equation of Table 4.12, show that Mother's Education, Father's Education, Home Environment, Mother's Income are significantly predicting students' academic achievement. But Father's Education shows negative contribution. The variable Mother's Education has the greatest explanatory power, as R and R^2 have increased 0.53 to 0.73 and 0.28 to 0.53 and it is found significant in every equations. The F value is greatest in equation 2. The next important variable is Home Environment with a greater F value.

Table 4.13 Beta Coeffecients of Regression Equations Explaining Achievement of Grade Four Students Government Schools.

REGRESSION EQUATION NUMBER

INDEPENDENT VARIABLE	1	2	3	4	5	6	7	8	9	10
Father's Education	4.03*	2.27	2.3	1.56	2.37	2.37	2.38	1.65	.68	-.02
Father's Occupation	2.48	2.06	2.09	1.56	2.37	2.37	2.38	1.65	.68	-.02
Mother's Education		2.18	2.20	1.35	.73	.68	.70	1.45	2.12	2.4
Father's Income			-.10	-.71	-1.01	-1.15	-1.14	-2.17	-2.39	-1.34
Home Environment				2.03*	1.93*	1.87*	1.88*	1.39*	1.05*	.73
Creativity					.23	.22	.23	.33*	.32*	.29*
Mother's Income						1.55	.26	.85	.50	4.86
Mother's Occupation							1.30	.01	.40	-4.31
Tutor								6.01*	6.07*	5.47*
Nutritional level									3.69*	4.09*
Motivation										1.12
R	.71	.72	.72	.86	.87	.87	.87	.91	.93	.93
R²	.50	.52	.52	.73	.76	.76	.76	.83	.86	.87
F	18.13	12.52	9.12	18.20	16.61	14.31	12.13	15.41	16.65	16.71

*   Significant at .05 level

Analysis of the Data of Table 4.13

The Beta Coefficients in regression equations of Table 4.13 show that the significant variables are Fathers' Education, Home Environment, Creativity, Tutor and Nutritional level. Among the variables Home Environment is the most dominating variable, since it came in every equation. R^2 has increased 0.52 to 0.73 in equation 4, when Home Environment entered in the equation. The next important variable is Tutor, the R^2 has increased 0.76 to 0.83 when this variable entered in the equation.

Table 4.14 Beta Coeffecients of Regression Equations Explaining Achievement of Grade Five Students of Government Schools.

REGRESSION EQUATION NUMBER

INDEPENDENT VARIABLE	1	2	3	4	5	6	7	8	9	10
Father's Education	8.03*	6.88*	7.41*	6.72*	9.83*	11.69*	12.0*	10.29*	10.1*	10.25*
Father's Occupation	-.88	-.92	-.4	-.72	.58	.53	.48	1.15	.1	.17
Mother's Education		1.22	1.22	1.71	.43	-.9	-1.13	-.93	-1.23	-1.25
Father's Income			-1.41	-1.71	-6.16	-8.38	-8.58	-8.58	-7.82	-8.02
Home Environment				.38	.09	.09	.09	.01	.1	.09
Creativity					.42*	.45*	.45*	.45*	.47*	.47*
Mother's Income						2.9	2.31	3.11	3.04	2.95
Mother's Occupation							.6	.45	.44	.47
Tutor								2.93	2.95	2.99
Nutritional level									1.94	1.98
Motivation										-.1
R	.76	.76	.76	.77	.80	.81	.81	.82	.83	.83
R^2	.57	.58	.58	.59	.64	.66	.66	.68	.69	.69
F	25.52	16.87	12.40	10.14	9.49	8.62	7.31	6.70	6.10	3.35

* Significant at .05 level

Analysis of the Data of Table 4.14

The beta coeffecients in regression equation of Table 4.14 show that Father's Education and Creativity are significantly explaining students' achievement. The F-value is.highest in the case of Father's Education. R^2 has changed .59 to .64 when the variable Creativity entered in the equation. Father's Education and Creativity are significant in every equation.

Table 4.15 Individual and Home Variables Indicated

Significant by Multiple Regression Equations.

Grade	Non-Govt. School	Govt. Schools
Grade ONE	Father's Education Mother's Education	Creativity
GRADE TWO	Creativity, Tutor	Creativity, Tutor
GRADE THREE	Father's Education Mother's Education Creativity	Father's Education, Mother's Education, Mother's Income, Home Environment
GRADE FOUR	Mother's Education Father's Occupation Nutritional level	Father's Education Home Environment, Creativity, Tutor
GRADE FIVE	Home Environment Tutor	Father's Education Creativity

* Significant at .05 level

Analysis of the Data of Table 4.15

In the case of non-goverment schools the variables Mother's Education, Father's Education, Creativity, Tutor contributed singly and jointly in three or two grades. Father's Occupation, Home Environment, Nutritional level contributed only in one grade. Motivation, Father's Income, Mother's Income and Occupation did not contribute in any grade.

In the case of government schools Creativity, Father's Education, Home Environment contributed singly and jointly in four, three and two grades respectively. Mother's Education and Income, Tutor contributed in only one grade. Father's occupation and Income, Mother's Occupation, Nutritional level, Motivation did not show any contribution to the equations. Hypotheses 4 and 5 are tested by this analysis

Table 4.16 Beta Coefficients of Regression Equations Explaining Achievement in terms of School Variables.

INDEPENDENT VARIABLE	1	2	3	4	5	6	7	8	9
Physical Facilities	1.00	.99	.97	.76	.66	.66	1.63	1.55	-1.15
Staff Composition	5.17*	6.31	9.83	10.72	8.48	1.12	-3.28	-1.86	-1.11
Teacher's Qualification		-1.20	-4.04	-3.92	-4.54	-.17	7.88	6.97	-16.39
Teacher's Experience			-8.87	-10.44	-14.44	-6.63	.82	1.47	-2.99
Teaching Method				-.22	.12	.72	.12	-.03	3.94
Evaluation Procedure					4.51	10.09	4.48	3.06	40.46
Instructional Materials						-1.82	-1.69	-1.49	-10.21
Library Facilities							-1.37	-1.48	1.91
Equipment for Culture								.66	-2.95
Co-Curriculum Activit.									5.08
R	.91	.91	.92	.92	.93	.96	.97	.97	.99
R²	.83	.83	.84	.85	.87	.92	.94	.94	.98
F-test	22.32	13.31	9.34	6.96	5.76	5.76	5.67	3.40	4.53

Analysis of the Data of Table 4.16

The beta coeffecients in regression equations of Table 4.16 show that out of nine variables only one variable, the Staff Composition, can explain the students' academic achievement. The F value is significant and highest in equation 1 where the variable Staff Composition entered. This is verified later by Step Wise Regression Analysis. Hypothesis six is tested and is discussed in chapter 7

Conclusion of the Findings from Regression Analysis:

It can be concluded that staff composition (i.e teachers qualification and experience) is the best predictor of academic achievement of the students when the school variables are considered. When home and individual variables are considered then it is seen that Father's Education, Mother's Education, Creativity, Tutor and Home Environment can significantly predict students' academic achievement.

STEP TWO :
4.3.0 IDENTIFYING THE VARIABLES WHICH CONTRIBUTE MOST TO THE ACADEMIC ACHIEVEMENT BY STEPWISE REGRESSION ANALYSIS

In the first step of analysis of data, in section A and B correlation and regression analyses were done. Correlation showed the relationship between each Independent variable and each Dependent Variable separately. The advantage of multiple regression analysis is that it gives information about the joint and relative contribution of each independent variable to the prediction of the dependent variable. But the number of predicting variables obtained in step one is still too great and needs to be reduced to facilitate the final analysis i.e. to identify the variables that are contributing most. So in step two, "Step Wise Regression" of all the independent variables are done to determine which of these variables will best predict the academic achievement of primary school children.

Step wise regression technique is typically used to develop a sub-set of Independent Variables that is useful is predicting the Dependent Variables and to eliminate those Independent Variables that do not provide additional prediction. In step wise regression where order of entry of variables is based on statistical rather than theoretical criteria, at each step the variable that adds most to the prediction equation in terms of increasing R^2 is entered. The process continues until no more useful information can be gleaned from further addition of variables. The calculations were done with the help of a computer programme. Table 4.17 to 4.27 are shown the step wise regression of grade one to five of government and non-government schools. (As a sample the calculation of step wise regression for grade one government school is shown in the Appendix 13 . These analyses are expected to answer objective three and verify the hypotheses 7,8,9.

Table 4.17 Step-Wise Regression of Eleven Variables for Grade One Non-Government Schools.

VARIABLES IN EQUATIONS

Variables	Co-efficient
Intercept	54.58
Creativity	.76
Father's Education	5.58
Mothers' Education	5.90

VARIABLES NOT IN EQUATIONS

Variables	Partial Correlation
Motivation	.1
Nutritional Level	-.02
Home Environment	.16
Father's Education	.10
Father's Occupation	.02
Mother's Occupation	-.09
Mother's Income	-2.95 F-3
Tutor	-.08

Analysis of the Data in the Table 4.17

This step-wise regression was done in three steps taking 11 variables. Only three variables entered in the equation. The variables are Creativity, Mother's Education, Father's Education. Eight other variables with partial correlation from -0.02 to 0.16 were not found in equation.

Table 4.18 Step-Wise Regression of Eleven Variables for Grade Two Non-Government Schools.

VARIABLES IN EQUATIONS

Variables	Coefficient
Intercept	30.71
Creativity	1.16
Mother's Occupation	3.78
Tutor	3.69

VARIABLES NOT IN EQUATIONS

Variables	Partial Correlation
Motivation	.17
Nutritional level	.16
Home Environment	-.27
Father's Education	-.12
Father's Occupation	.03
Mother's Education	-.10
Mother's Income	-.12

Analysis of the Data in the Table 4.18

This step-wise regression was done in three steps. Finally only three variables entered in equation. The variables are Creativity, Mother's Occupation, Tutor with Co-efficient 1.16, 3.78 and 3.69 respectively. The other variables with partial correlation -.10 to .27 were not in equation.

Table 4.19 Step-Wise Regression of Eleven Variables for Grade Three Non-Government Schools.

VARIABLES IN EQUATIONS

Variables	Coefficient
INTERCEPT	23
Creativity	.75
Fathers' Education	4.57

VARIABLES NOT IN EQUATIONS

Variables	Partial Correlation
Motivation	.08
Nutritional level	-.05
Home Environment	.15
Father's Occupation	7.54 E-4
Father's Income	.25
Mother's Education	.24
Mother's Occupation	.17
Mother's Income	.15
Tutor	.12

Analysis of the Data in the Table 4.19

This step-wise regression was done in four steps. Finally, only two variables entered in equation: Creativity and Father's Education and with Coefficient 0.75 and 4.57 respectively. The other variables with partial correlation from — 0.05 to 0.25 were not in equation.

Table 4.20 Step-Wise Regression of Eleven Variables for Grade Four Non-Government Schools.

VARIABLES IN EQUATIONS

Variables	Coefficient
INTERCEPT	28.55
Nutrition	1.35
Father's Occupation	2.60
Mother's Education	2.39

VARIABLES NOT IN EQUATIONS

Variables	Partial Correlation
Creativity	.16
Motivation	.12
Home Environment	.17
Father's Education	-.29
Father's Income	-.11
Mother's Occupation	-.09
Mother's Income	-.08
Tutor	-.08

Analysis of the Data in the Table 4.20

This step-wise regression was done in three steps. Out of eleven variables in the equation only three variables were selected in the equation. Other variables with 0.08 to 0.16 partial correlation were not entered in the equation.

Table 4.21 Step-Wise Regression of Eleven Variables for Grade

Five Non-Government Schools.

VARIABLES IN EQUATIONS

Variables	Co-efficient
INTERCEPT	16.05
Father's Occupation	4.62
Tutor	8.17

VARIABLES NOT IN EQUATIONS

Variables	Partial Correlation
Creativity	.29
Motivation	.01
Nutrition	2.18 E-3
Home Environment	.25
Father's Education	.08
Father's Income	.19
Mother's Education	.07
Mother's Occupation	.09
Mother's Income	.09

Analysis of the Data of the Table 4.21

This step-wise regression was done in two steps and finally

selected only two variables, Father's Occupation and Tutor, with

Co-efficient 4.62 and 8.17 respectively. Other variables with

partial correlation .01 to .29 were not found in the equation.

Table 4.22   Step-Wise Regression of Eleven Variables for Grade One Government Schools.

VARIABLES IN EQUATIONS

Variables	Coefficient
INTERCEPT	27.03
Mother's Education	4.55
Creativity	1.42

VARIABLES NOT IN EQUATIONS

Variables	Partial Correlation
Father's Education	.14
Father's Occupation	.10
Father's Income	.07
Home Environment	.13
Mother's Income	-.4
Mother's Occupation	-.14
Tutor	-.11
Nutritional level	.17
Motivation	.14

Analysis of the Data of Table 4.22

This step-wise regression was done in two steps. Out of 11 variables only two variables, Mother's Education and Creativity entered in the equation. The Co-efficient of Mother's Education and Creativity are 4.55 and 1.42 respectively. Other variables with partial Correlation 0.07 to 0.14 could not enter in the equation.

Table 4.23 Step-Wise Regression of Eleven Variables for Grade Two Government Schools.

VARIABLES IN EQUATIONS

Variables	Coefficient
INTERCEPT	18.49
Home Environment	.73
Creativity	1.01
Tutor	4.26
Motivation	1.33

VARIABLES NOT IN EQUATIONS

Variables	Partial Correlation
Father's Education	.19
Father's Occupation	.18
Mother's Education	.25
Father's Income	.24
Mother's Income	-.01
Mother's Occupation	-.04
Nutritional level	.13

Analysis of the Data of Table 4.23

This step-wise regression was done in four steps and out of eleven variables four variables were entered. The variables entered in the equation are Home Environment, Creativity, Tutor, Motivation with Co-efficient .73, 1.01, 4.26, 1.33 respectively. Other variables could not enter in the equation with partial correlation -.01 to .19.

Table 4.24 Step-Wise Regression of Eleven Variables for Grade Three Government schools.

VARIABLES IN EQUATIONS

Variables	Coefficient
INTERCEPT	.48
Father's Education	5.24
Mother's Education	10.42
Home Environment	1.64

VARIABLES NOT IN EQUATIONS

Variables	Partial Correlation
Father's Occupation	-.12
Father's Income	-.11
Creativity	.04
Mother's Income	.31
Mother's Occupation	.07
Tutor	.21
Nutritional level	4.02 E-3
Motivation	.14

Analysis of the Data of Table 4.24

This step-wise regression was done in five steps. Out of eleven variables three variables entered in the equation. The variables are Father's Education, Mother's Education, Home Environment with Co-efficient 5.24, 10.42, 1.64 respectively. Other variables did not enter in the equation whose partial correlations were 0.07 to 0.21.

Table 4.25 Step-Wise Regression of Eleven Variables for Grade Four Government Schools.

VARIABLES IN EQUATIONS

Variables	Coefficient
INTERCEPT	18.28
Creativity	.38
Nutritional level	4.05
Home Environment	1.20
Father's Education	2.48
Tutor	4.79

VARIABLES NOT IN EQUATIONS

Variables	Partial Correlation
Motivation	.23
Father's Occupation	.27
Father's Income	.01
Mother's Education	.27
Mother's Occupation	.18
Mother's Income	.18

Analysis of the Data of Table 4.25

This step-wise regression was done in five steps. Five variables entered in the equation. Those are, Creativity, Nutritional level, Home Environment, Father's Education, Tutor. Other variables could not enter in the equation with partial correlation 0.01 to 0.27.

Table 4.26 Step-Wise Regression of Eleven Variables for Grade Five Government Schools.

VARIABLES IN EQUATIONS

Variables	Coefficient
INTERCEPT	18.39
Creativity	.33
Father's Education	6.89

VARIABLES NOT IN EQUATIONS

Variables	Partial Correlation
Motivation	.05
Nutritional level	.14
Home Environment	.02
Father's Occupation	-.13
Father's Income	-.27
Mother's Education	.05
Mother's Occupation	.05
Mother's Income	.10
Tutor	.17

Analysis of the Data of the Table 4.26

This step-wise regression was done in two steps and two variables were entered in the equation. The variables are Creativity, Father's Education with Co-efficient .33 and 6.89. The other variables with partial correlation 0.92 to 0.27 could not enter in the equation.

Table 4.27 Step-Wise Regression of School Variables.

VARIABLES IN EQUATIONS

Variables	Coefficient
INTERCEPT	14.07
Staff Composition	7.33

VARIABLES NOT IN EQUATIONS

Variables	Partial Correlation
Physical Facilities	.54
Teacher's Qualification	-.10
Teacher's Experience	-.12
Teaching Method	-.41
Evaluation	.49
Instructional Materials	-.32
Library Facilities	.12
Equipment for Cultural Program	.51
Co-Curricular activities	-.15

Analysis of the Data of the Table 4.27

This step-wise regression was done in one stage and only one variables was entered. The variables was Staff Composition (Teachers' Qualification & Experience together) with a Co-efficient of 7.33. Other variables, with partial correlation of 0.10 to 0.54 could not enter in the equation.

This analysis verified hypothesis nine and is discussed in chapter 7.

Table 4.28 Variables found Significant through Step-Wise Regression

| GRADE | NON-GOVERNMENT SCHOOLS | | GOVERNMENT SCHOOLS | |
	VARIABLES	COEFFICIENT	VARIABLE	COEFFICIENT
ONE	Creativity Mother's Education Father's Education	.76 5.90 5.58	Mother's Education Creativity	4.55 1.42
TWO	Creativity Mother's Occupation Tutor	30.71 3.78 3.69	Home Environment Creativity Tutor Motivation	.73 1.01 -4.26 1.33
THREE	Creativity Father's Education	.75 4.75	Father's Education Mother's Education Home Environment	-5.24 10.42 1.64
FOUR	Nutritional level Father's Occupation Mother's Education	4.35 2.60 2.39	Creativity Nutritional level Home Environment Father's Education Tutor	.34 4.05 1.20 2.48 4.99
FIVE	Father's Occupation Tutor	4.62 8.17	Creativity Father's Education	.33 6.89

Discussion of the Summary of the Findings:

In the case of non-government schools the variables Father's Education and Occupation, Mother's Education, Tutor and Creativity contributed most in two to three grades. Mother's occupation, Nutritional level contributed only in one grade. Father's Income, Mother's Income and Motivation did not contribute in any grade.

In the case of government schools the variables Tutor, Mother's Education, Father's Education, Home Environments, Creativity contributed most in two to four grades. Nutritional level and Motivation Contributed only in one grade. Father's Occupation and Income, Mother's Occupation and Income, did not contribute in any grade.

Hypotheses7 and 8 are tested here and is discussed in chapter 7.

Conclusion of the Findings from Step-Wise Regression Analysis

Out of eleven 'Home and Individual' variables Father's Education, Mother's Education and Creativity contributed most in almost all grades and in each type of schools. The next important variable was Tutor (who teaches the child at home). Home environment came out as an important variable only in the case of government schools.Among the ten 'School variables' the most important variable was 'Staff-composition (i.e teachers' qualification and experience together.)

STEP THREE :
4.4.0 TESTING THE DIFFERENCE BETWEEN THE HIGH ACHIEVERS AND LOW ACHIEVERS IN THE SAME SCHOOL SITUATION BY t-test.

The "Top three students" (High achievers in achievement tests) and the "Bottom three students" (Low achievers in achievement tests) of each school and each grade are compared in terms of home and individual variables. To test significance of the difference between the means of high achievers and low achievers Student's t-test is used.

Tables 4.29 to 4.37 present a comparison between the means of high achievers and low achievers of each grade and each sampled schools. This analysis is able to answer the fourth objective whether there is any significant difference present between the high achievers and low achievers in the same school situation and it will verify the 10th hypothesis.

Table 4.29 Comparison Between Means of Creativity of High Achievers and Low Achievers.

GRADE	Mean (X̄) Top three Students	Mean (X̄) Bottom three Students	t-Value
ONE	11.3	9.1	1.44
TWO	16.3	12.0	2.41*
THREE	17.5	16.3	.64
FOUR	25.1	16.7	3.23*
FIVE	26.5	22.7	1.32

*   Significant at .05 level.

Analysis of the Data of Table 4.29

Table 4.29 shows that the means ($\bar{X}$) of creativity score of Top three students of all sampled schools (government and non-government) are greater than the Bottom three students in each grade (I to V), but significant difference is found only in grade two and four.

Table 4.30 Comparison Between Means of Motivation of High Achievers & Low Achievers.

GRADE	Mean (X̄) Top three Students	Mean (X̄) Bottom three Students	t-Value
ONE	7.63	7.22	.79
TWO	8.12	6.97	1.93*
THREE	9.39	7.43	3.00*
FOUR	9.32	8.11	1.64
FIVE	10.02	8.16	2.40*

*   Significant at .05 level.

Analysis of the Data of Table 4.30

It is seen from the table 4.30, that means ($\bar{X}$) of Top three students are greater than the mean ($\bar{X}$) of bottom three students in each grade. The difference of mean found significant in grade two, three and five.

Table 4.31 Comparison Between Means of Nutritional Level of High

Achievers and Low Achievers.

GRADE	Mean (X) Top three Students	Mean (X) Bottom three Students	t-Value
ONE	2.11	1.73	1.04
TWO	1.73	1.28	2.26*
THREE	1.42	1.53	-.39
FOUR	1.77	1.19	2.14*
FIVE	1.57	1.36	.88

*   Significant at .05 level.

Analysis of the Data of Table 4.31

It is seen from the table 4.31, that mean ($\overline{X}$) of Top three students are greater than the mean ($\overline{X}$) of bottom three students in each grade except grade three. The difference between the mean is found significant only in grade two and four.

Table 4.32 Comparison Between Means of Home Environment of High

Achievers and Low Achievers.

GRADE	Mean (X) Top three Students	Mean (X) Bottom three Students	t-Value
ONE	29.25	26.98	1.67
TWO	29.63	26.23	3.37*
THREE	30.30	29.12	1.59
FOUR	32.33	28.97	3.33*
FIVE	32.61	29.52	2.81*

*   Significant at .05 level.

Analysis of the Data of Table 4.32

It is seen from the table 4.32, that mean ($\overline{X}$) of Top three students are greater than the mean ($\overline{X}$) of bottom three students in each grade i.e. grade one to grade five. The difference between the mean is found significant in grade two, four and five.

Table 4.33   Comparison Between Means of Mother's Education of High Achievers and Low Achievers.

GRADE	Mean (X) Top three Students	Mean (X) Bottom three Students	t-Value
ONE	2.36	1.66	1.84
TWO	2.49	1.89	.87
THREE	2.97	1.75	3.75*
FOUR	2.60	1.83	2.50*
FIVE	3.10	1.95	3.05*

*   Significant at .05 level.

Analysis of the Data of Table 4.33

It is seen from the table 4.33, that mean $(\overline{X})$ of Top three students are greater than the mean $(\overline{X})$ of Bottom three students in each grade. Significant difference is found in grade three to grade five.

Table 4.34 Comparison Between Means of Mother's Occupation of High Achievers and Low Achievers.

GRADE	Mean (X) Top three Students	Mean (X) Bottom three Students	t-Value
ONE	.35	.25	.97
TWO	.85	.32	1.33
THREE	.90	.60	.90
FOUR	.66	.08	1.71
FIVE	.54	.60	.14

*   Significant   at .05 level.

Analysis of the Data of Table 4.34

It is seen from the table 4.34 that the mean $(\overline{X})$ of Top three students are greater than the mean $(\overline{X})$ of bottom three students in each grade except grade five. But the difference between the mean did not appear significant in any grade.

Table 4.35 Comparison Between Means of Father's Education of High Achievers and Low Achievers.

GRADE	Mean (X) Top three Students	Mean (X) Bottom three Students	t-Value
ONE	3.12	2.56	1.30
TWO	3.77	2.37	3.80*
THREE	4.19	3.30	3.98*
FOUR	3.97	3.11	2.24*
FIVE	4.62	3.36	3.86*

* Significant at .05 level.

Analysis of the Data of the Table 4.35

It is seen from the table 4.35, that mean $(\overline{X})$ of Top three students are greater than the mean $(\overline{X})$ of Bottom three students in each grade. Significant difference is found in each grade except at grade 1.

Table 4.36 Comparison Between Means of Father's Occupation of High Achievers and Low Achievers.

GRADE	Mean (X) Top three Students	Mean (X) Bottom three Students	t-Value
ONE	3.16	2.62	1.27
TWO	3.11	2.56	1.56
THREE	3.56	3.02	1.14
FOUR	3.56	3.02	1.18
FIVE	3.88	3.26	2.14*

* Significant at .05 level.

Analysis of the Data of Table 4.36

It is seen from the table 4.36 that mean $(\overline{X})$ of Top three students are greater than the mean $(\overline{X})$ of Bottom three students in each grade. But significant difference is found in only grade five.

Table 4.37 Comparison Between the Mean of Tutor of High Achievers and Low Achievers.

GRADE	Mean (X) Top three Students	Mean (X) Bottom three Students	t-Value
ONE	2.50	2.25	1.39
TWO	2.33	2.00	1.48
THREE	2.75	1.67	5.61*
FOUR	2.76	1.92	4.18*
FIVE	2.50	1.92	2.55*

*   Significant at .05 level.

Analysis of the Data of the Table 4.37

It is seen from the table 4.37, that mean $(\overline{X})$ of Top three students are greater than the means $(\overline{X})$ of Bottom three students in each grade. Significant difference is found in grade three to grade five.

Table 4.38 Grade-wise Comparison Between the Means of High Achievers and Low Achievers.

INDEPENDENT VARIABLES	t-value Grade 1	t-value Grade 2	t-value Grade 3	t-value Grade 4	t-value Grade 5
Creativity	1.44 NS	2.41*	64 NS	3.23*	1.32 NS
Motivation	.79 NS	1.93NS	3.00*	1.64 NS	2.40*
Nutritional level	1.04 NS	2.26*	-0.39 NS	2.14*	.88 NS
H o m e Environment	1.67 NS	3.37*	1.59 NS	3.33*	2.81*
Mother's Education	1.84 NS	.87 NS	3.75*	2.50*	3.05*
Mother's Income	1.04 NS	.97 NS	.41 NS	.62 NS	1.59 NS
Mother's Occupation	.97 NS	1.33 NS	.90 NS	1.71 NS	.14 NS
Father's Income	1.18 NS	1.37 NS	1.56 NS	1.28 NS	3.04*
Father's Education	1.30 NS	3.80*	3.98*	2.24*	3.86*
Father's Occupation	1.27 NS	1.56 NS	1.14 NS	1.18 NS	2.14*
Tutor	1.39 NS	1.48 NS	5.61*	4.18*	2.55*

*   Significant of .05 level

The findings of the Table 4.38 are analysed as follow;

1. The High achievers and Low achievers of grade two and grade four differ significantly in terms of 'Creativity'. But the differences of means are not significant in grades one, three and five.

2. The High achievers and Low achievers of grades two, three, four differ significantly in terms of Motivation. But the differences of means are not significant in grades one, two and tour.

3. The High achievers and Low achievers of grades two and four differ significantly in terms of Nutritional level. But the differences of means are not significant in grades one, three, five.

4. The High achievers and Low achievers of grades two, three, five differ significantly in terms of Home Environment. But the differences of means are not significant in grades one and three.

5. The High achievers and Low achiever of grades three, four, five differ significantly in terms of Mother's Education. But the differences of means are not significant in grade one and two.

6. The high achievers and Low achievers do not differ significantly in any grade in terms of Mother's Occupation and Income.

7. The High achievers and Low achievers of grades two, three, four, five differ significantly on the predicting variables

Bar Chart 1 : Creativity of High Achievers and Low Achievers

■ Mean of High Achievers   □ Mean of Low Achievers
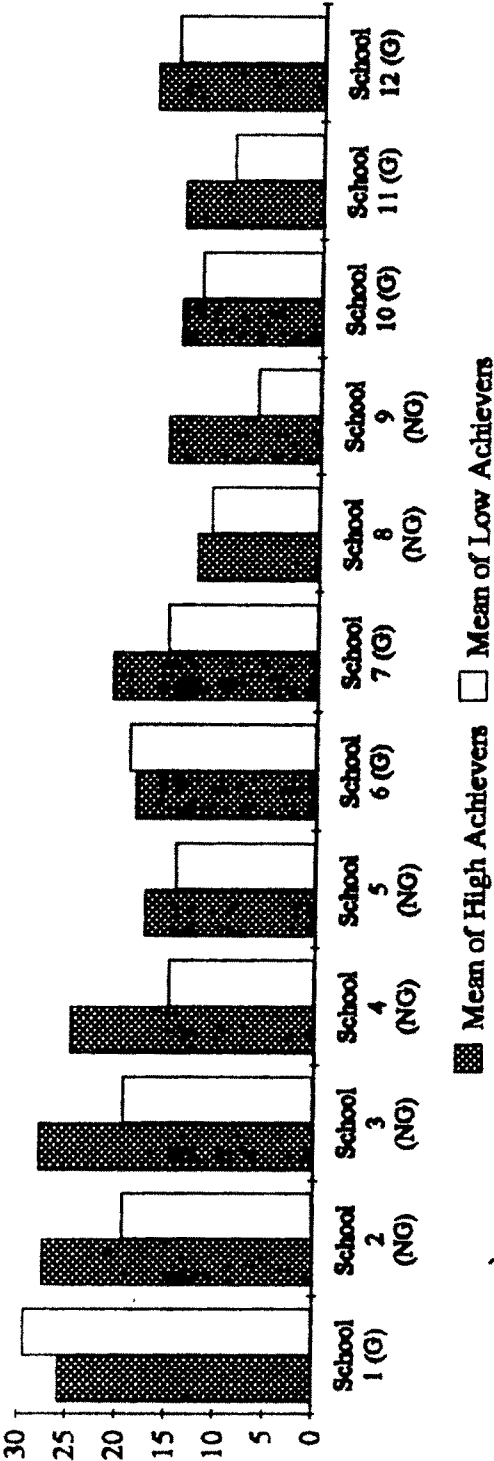
Bar Chart 2 : Motivation of High Achievers and Low Achievers

■ Mean of High Achievers □ Mean of Low Achievers

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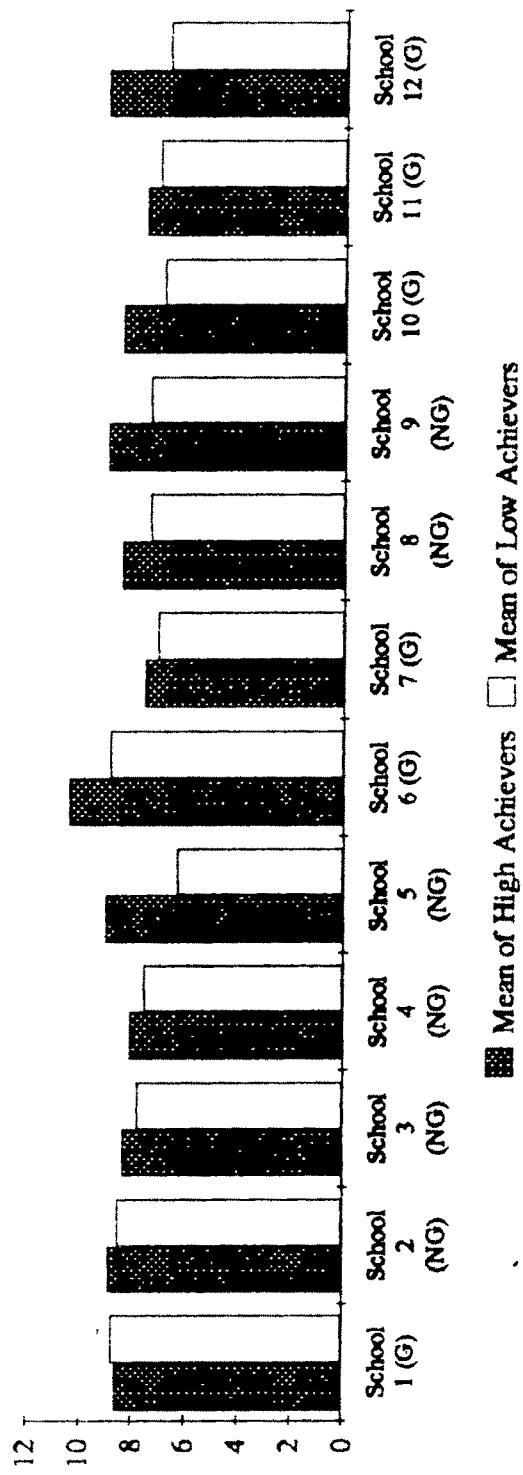
Bar Chart 3 : Nutritional Level of High Achievers and Low Achievers

■ Mean of High Achievers   □ Mean of Low Achievers
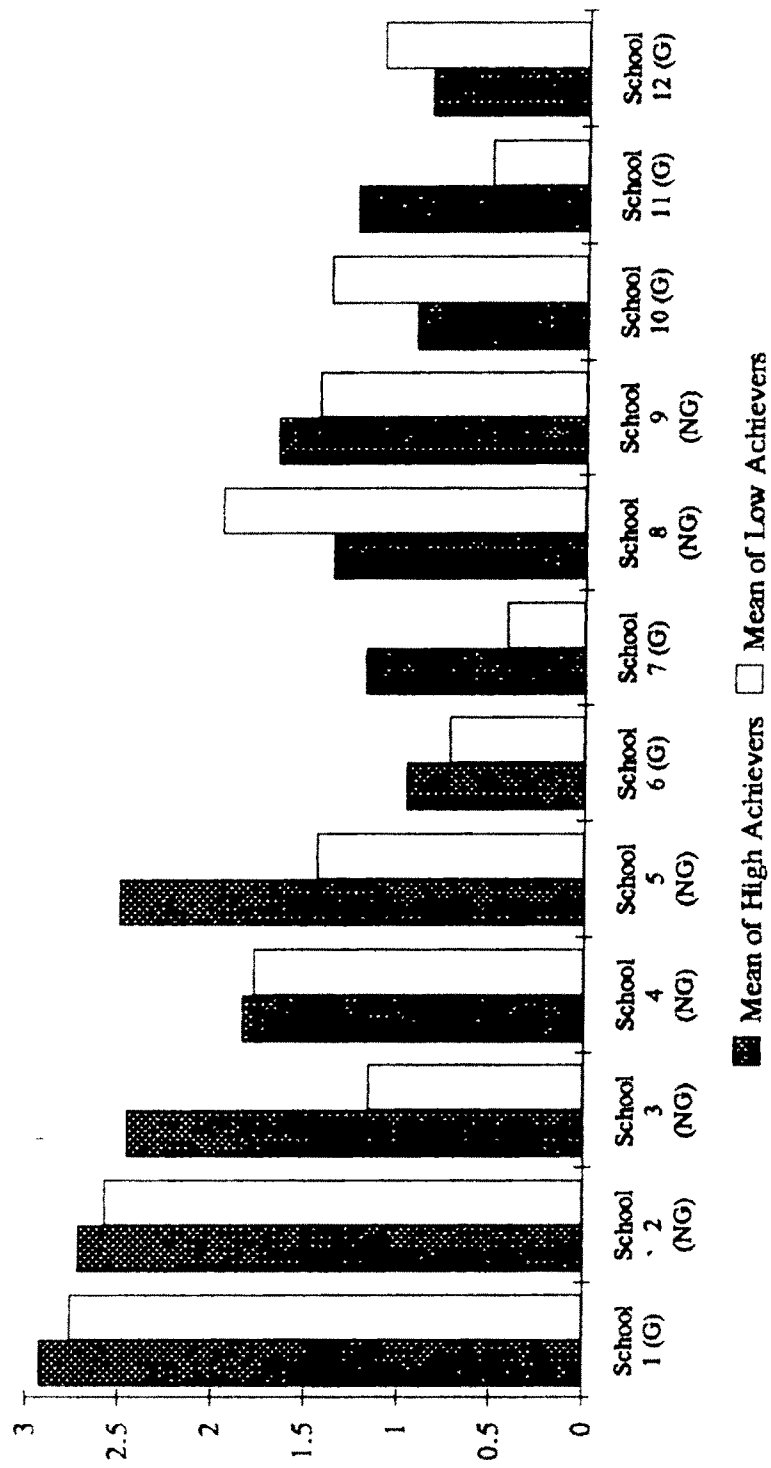
Bar Chart 4 : Home Environment of High Achievers and Low Achievers

■ Mean of High Achievers ☐ Mean of Low Achievers
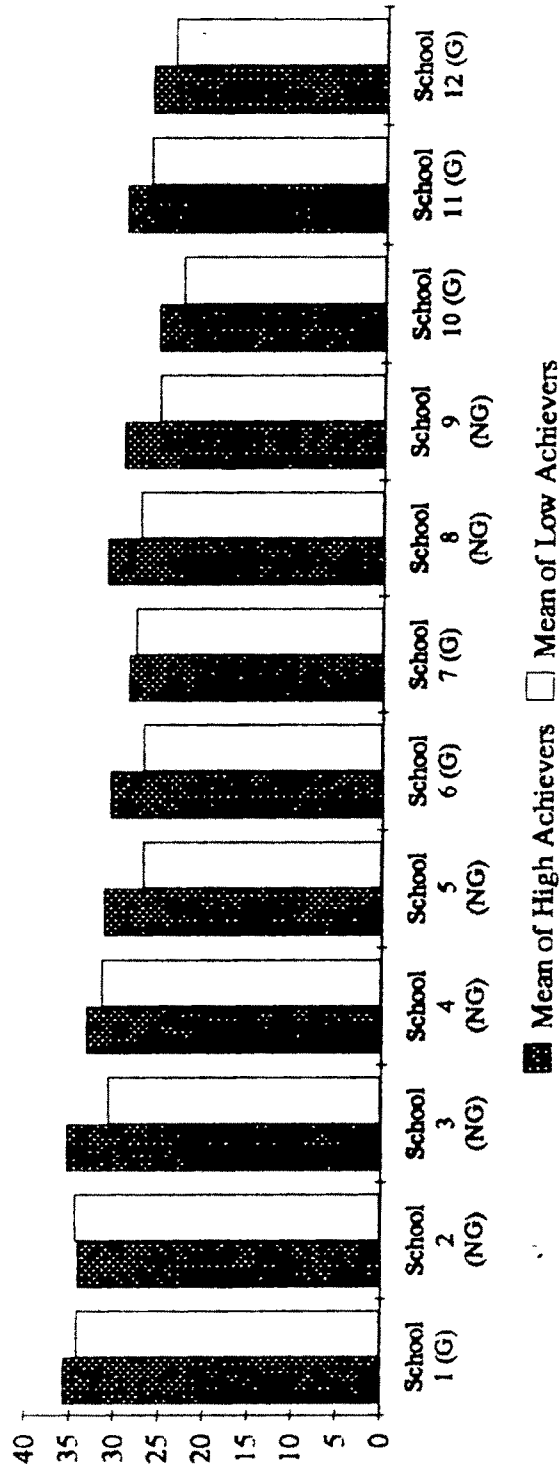
Bar Chart 5 : Mother's Education of High Achievers and Low Achievers

■ Mean of High Achievers ☐ Mean of Low Achievers
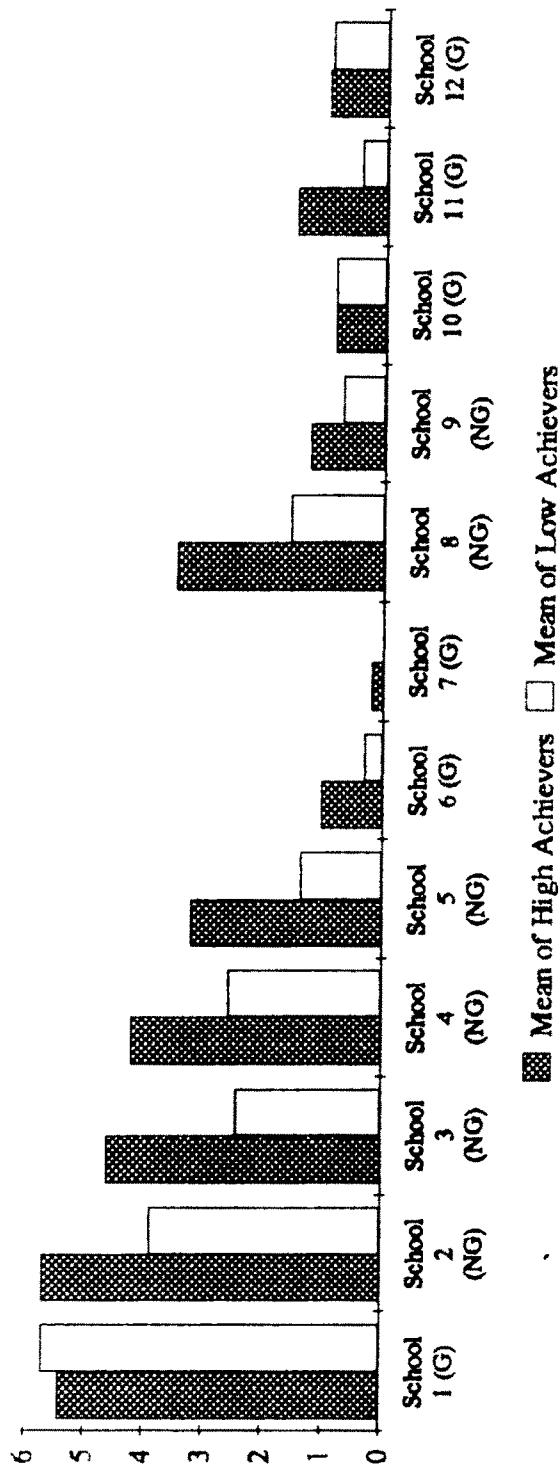
Bar Chart 6 : Mother's Occupation of High Achievers and Low Achievers

■ Mean of High Achievers   □ Mean of Low Achievers
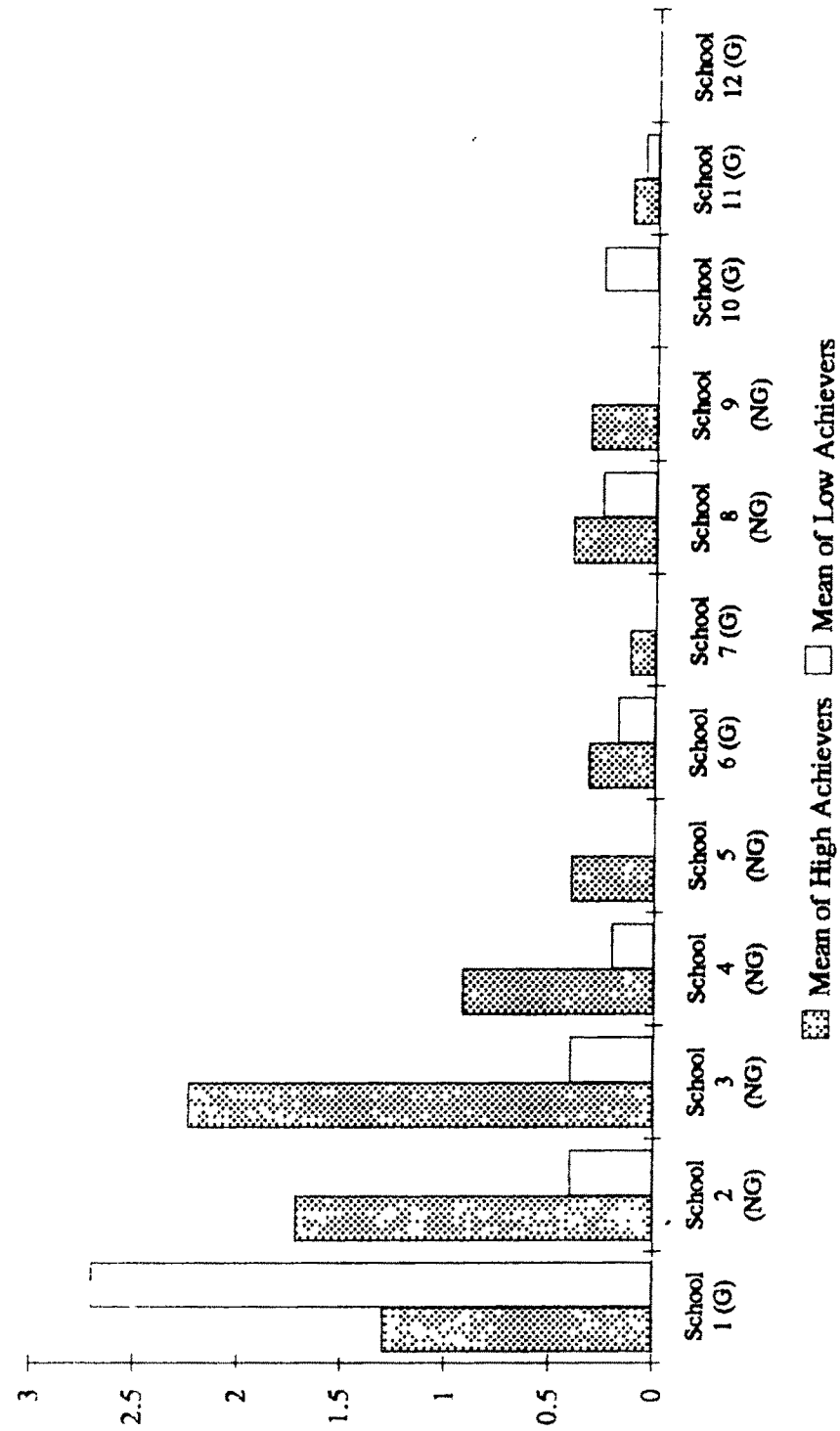
Bar Chart 7 : Father's Education of High Achievers and Low Achievers

■ Mean of High Achievers ☐ Mean of Low Achievers
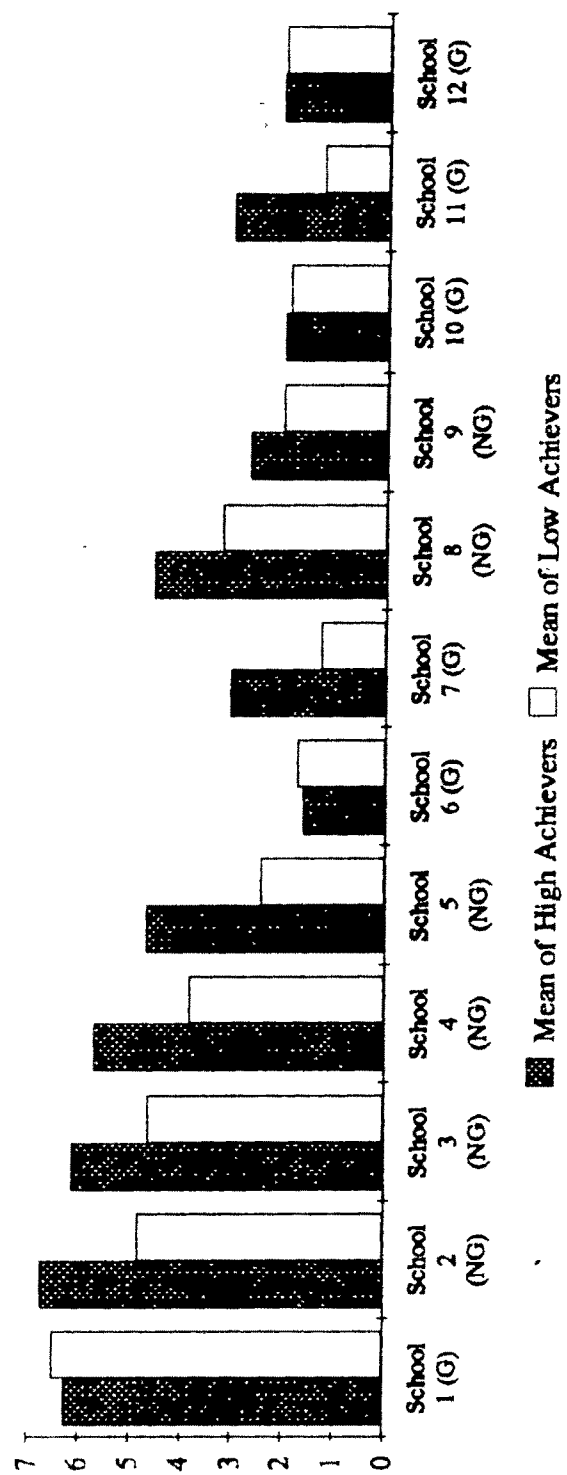
Bar Chart 8 : Father's Occupation of High Achievers and Low Achievers

■ Mean of High Achievers   □ Mean of Low Achievers
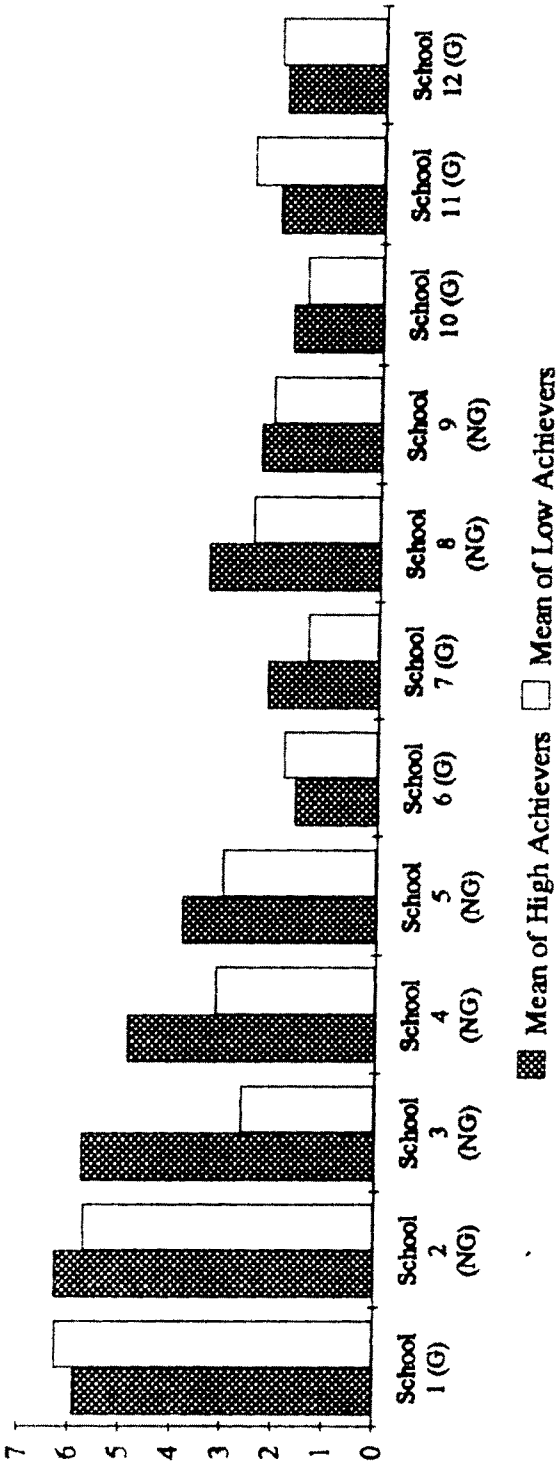
Bar Chart 9 : Tutor of High Achievers and Low Achievers

■ Mean of High Achievers   □ Mean of Low Achievers
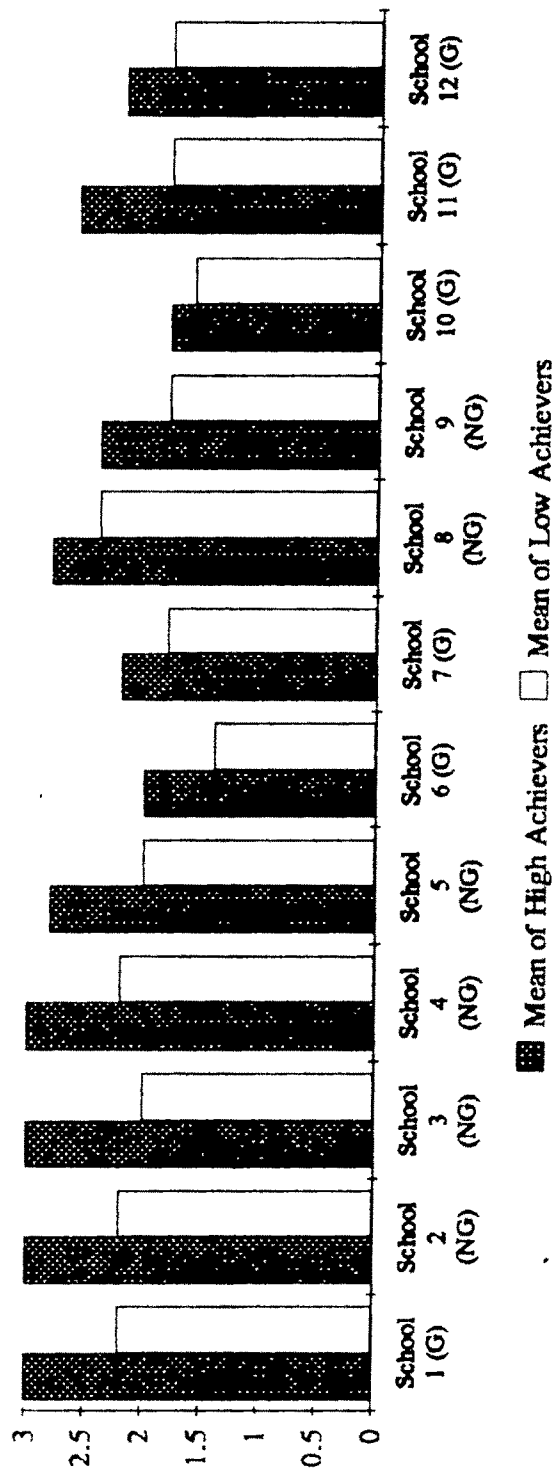
Father's Education. But the differences of mean is not significant in grade one.

8. The High achievers and Low achievers of only grade five differ significantly in terms of **Father's Occupation**. But the students of grades one to four do not differ significantly.

9. The High achievers and Low achievers of grades three, four, five differ significantly on **Tutor** (i.e. Who teaches the child at home). But the students of grade one and two do not differ significantly.

10. The Bar Charts 1 to 10 present the comparison between the high achievers and low achievers in terms of the Home and Individual variables in the same school and among the schools.

a) In Bar Chart 1 Creativity of high achievers and low achievers are compared. It can be seen from the Bar Chart 1 that in all schools, except school 1 and school 6, the mean of Creativity scores of high achievers are found greater than that of low achievers. It is also observed that the students of the top three schools (both high and low achievers) are more creative than the students of the bottom three schools.

b) In Bar Chart 5 comparison is made between the Mother's Education of the high achievers and low achievers. The mean level of Mother's Education of high achievers were found to be greater than that of low achievers in every school, except school 1. When comparison is made between the `top three schools' and `bottom three schools', the mothers of the top

schools (both high achievers and low achievers) are much more educated than the mothers of the bottom schools.

c) In Bar Chart 7 comparison is made between the Father's Education of the high achievers and low achievers. The mean level of Father's Education of the high achievers was found to be greater than that of low achievers in each school, except the school 1.

When comparison is made between the top schools and bottom schools, the fathers of the top schools (both high achievers and low achievers) are much more educated than the fathers of the bottom schools.

d) In Bar Chart 8 comparison is made between Father's Occupation of the high achievers and low achievers. Within the Same school, differences in fathers' occupational levels do not seen to have any impact on pupils' academic achievements.

But when the top three schools are compared with the bottom three schools it is seen that the fathers of the top three schools are in high occupations and the fathers of the bottom three schools are in low occupations.

e) In Bar Chart 6 comparison is made between Mother's occupation of the high and low achievers. In Bangladesh the proportion of mothers in employment is very low. This is particularly true for the lower socio-economic groups. So the comparison is meaningless.

f) In Bar Chart 3 comparison is made between the Nutritional

level of the high achievers and the low achievers. Within the same school the Nutritional level of the high achievers are much better than the low achievers. Again the nutritional level of the students of the top schools are much better than the bottom schools.

g)   In Bar Chart 9   comparison is made between Tutor (who teaches the child at home) of the high achievers and the low achievers. Within the same school high achievers are usually taught by the parents, and the low achievers are taught by the private tutors.

But among the schools the comparison is inconclusive.

h)   In Bar Chart 2 and 4   comparisons are made between high achievers and low achievers on the variables 'Motivation' and 'Home Environment'. Within any school, the mean values of Motivation and Home Environment factors of the high achievers were greater than the low achievers but the differences were very low.

The differences between the top schools and the bottom schools were also very low.

Conclusion from the Findings of Testing Significance of Means of High Achievers and Low Achievers

In the conclusion on the findings of Table 4.38 it can be said that the high and low achievers in the same school differ significantly in the case of Father's Education, Mother's Education, Motivation, Home environment and Tutor. One important

point to be noticed is that t-value of these variables are significant in higher grades. Mother's Occupation and Father's Occupation, Mother's Income & Father's Income did not show any significant difference between the two groups. This analysis verified hypothesis ten and is discussed in chapter 7. But from the bar chart it can be said that the differences between the top schools and bottom schools are·as follows:

i) the students of the top three schools are more creative than the students of the bottom three schools.

ii) the mothers and fathers of the top schools are much more educated than the mothers and fathers of the bottom schools.

iii) the nutritional level of the top schools are much higher than the bottom schools.

STEP FOUR :
4.5.0 TESTING THE DIFFERENCES BETWEEN THE SCHOOLS WITH GOOD RESULT AND POOR RESULT IN TERMS OF SCHOOL VARIABLES by t-test.

The 'Top three schools' (i.e. schools with high achievement scores in the standardized achievement tests) and the 'Bottom three schools' (i.e. schools with low achievement scores) are compared in Table 4.39 in terms of all school variables. Mean and t-test are used to compare the two types of schools (i.e. schools with good result and schools with poor result). This analysis is able to answer the fourth objective of the study, which is: whether there is any significant difference between the schools with good result and poor result in terms of school variables and it will also verify the eleven hypothesis.

Table 4.39 Comparison Between the Means of the School Variables of Top Three Schools and Bottom Three Schools.

INDEPENDENT VARIABLES	Mean (X̄) Top three Schools	Mean (X̄) Bottom three Schools	t-Value
Staff Composition	7.27	4.27	5.86*
Teachers' Qualification	4.40	1.59	4.25*
Teachers' Experience	2.83	2.63	1.51 NS
Teaching Method	18.16	20.33	-.55 NS
Evaluation Procedure	10.33	8.0	7.0*
Physical Facilities	23.33	14.33	4.32*
Instructional Materials	7.0	7.33	-1.00 NS
Library Facilities	7.33	0	3.95*
Equipment for Cultural programme	4.33	0	13.0*
Co-Curricular Activities	9.67	8.33	1.11 NS

* Significant at .05 level.

Analysis of the Data of Table 4.39

(1) In the case of the predicting variable "Staff composition" the mean of Top three schools is 7.27 and the Bottom three schools is 4.27. t-value is significant at .05 level of significance. Staff Composition is a composite of 'Teaching experience' and 'Teachers' qualification'.

(2) In the case of the predicting variable "Teachers' Qualification" the mean of Top three schools is 4.40 and the Bottom three schools is 1.59. t-value is significant at .05 level.

(3) In the case of the predicting variable "Teachers' Experience" the mean of Top three schools is 2.83 and the Bottom

three schools is 2.63. The t-value is not significant at .05 level.

4)   In the case of the predicting variable 'Teaching Method' the mean ($\overline{X}$) of the top three schools is 18.16 and the bottom three schools 20.33 but the t-value is non-significant.

(6)   In the case of the predicting variable 'Evaluation Procedure' the means ($\overline{X}$) of the top three schools is 10.33 and the bottom three schools is 8.0, t-value is significant.

(7)   In the case of the predicting variable 'Physical Facilities' the mean of top three schools is 23.33 and bottom three schools is 14.33, t-value is significant at .05 level.

(8)   In the case of the predicting variable 'Instructional Materials' the mean of top three schools is 7.0 and the bottom three schools 7.33, t-value is Non-Significant.

(9)   In the case of the predicting variable 'Library facilities' the mean of top three schools is 7.33 and the bottom three schools 0, t-value is significant at .05 level of significance.

(10) In the case of the predicting variable 'Equipment for cultural programme' the mean of the top three schools is 4.33 and the mean of the bottom schools is 0, t-value is significant at .05 level of significance.

(11) In the case of the predicting variable 'Co-curricular Activities' the mean of the top three schools is 9.67 and the bottom three schools 8.33, t-value is not significant.

(12) In the Bar Chart 10 to 19 differences can be seen between the 'Top three schools' and 'Bottom three schools' on the
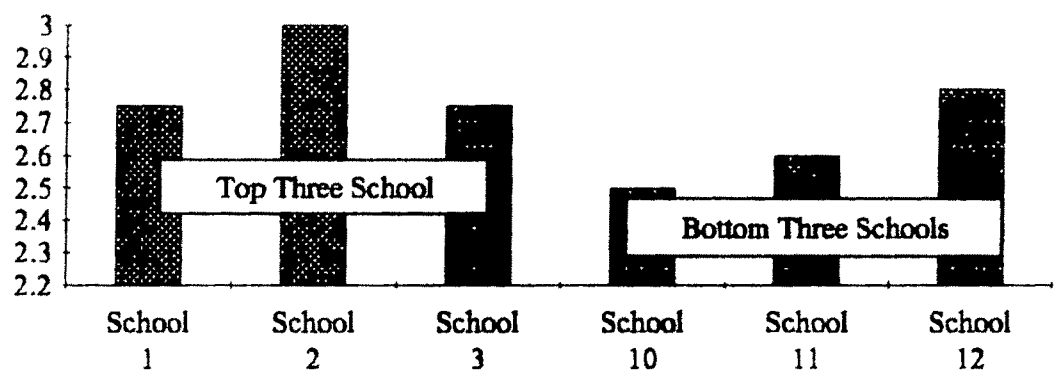
Bar Chart-10 Comparison Between Staff Composition of Top
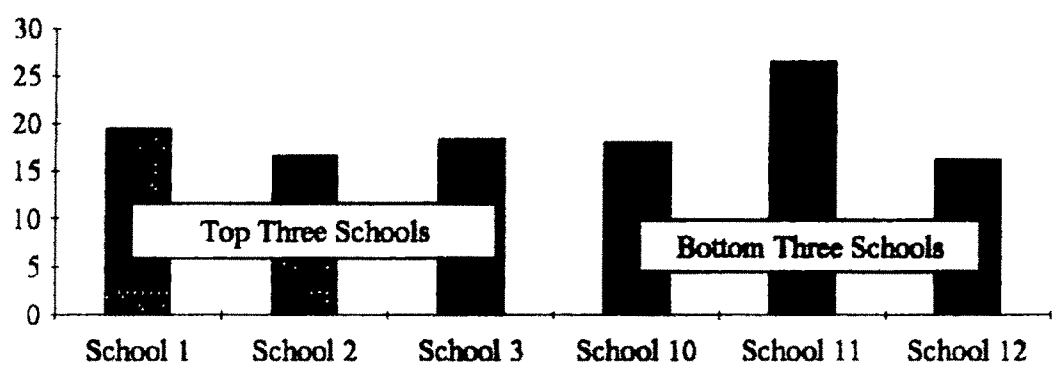Three and Bottom Three Schools
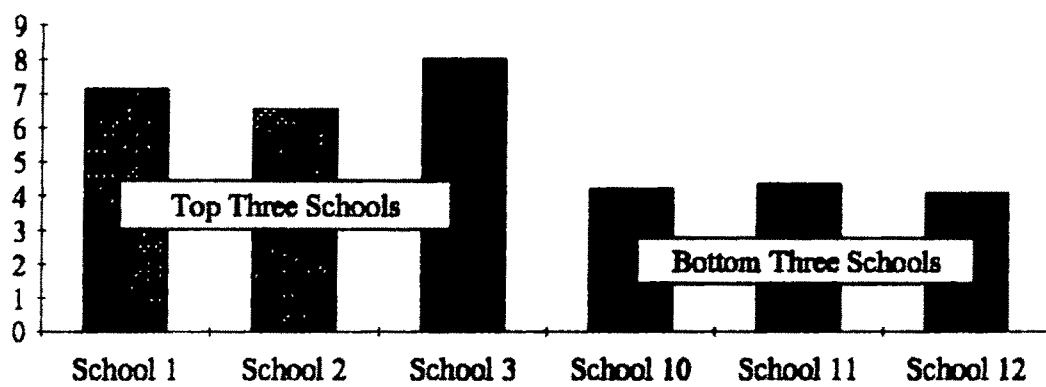
Bar Chart-11 Comparison Between Teachers' Qulification of
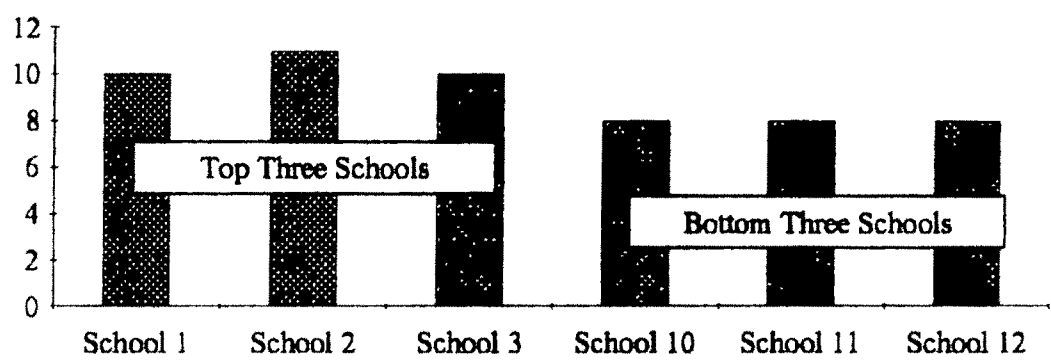Top Three and BottoøThree Schools
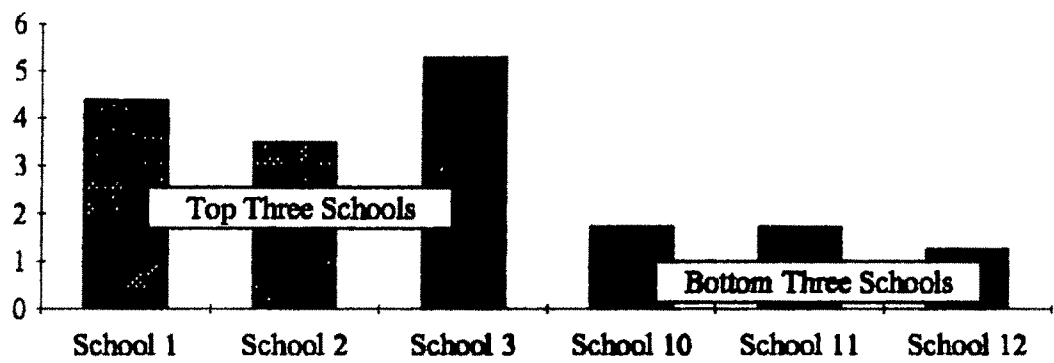
Bar Chart-12 Comparision Between Teachers' Experience of
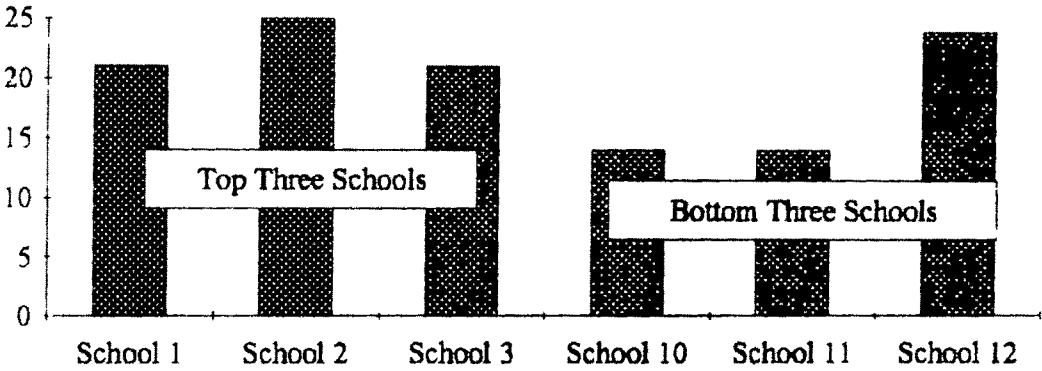Top Three and Bottom Three Schools

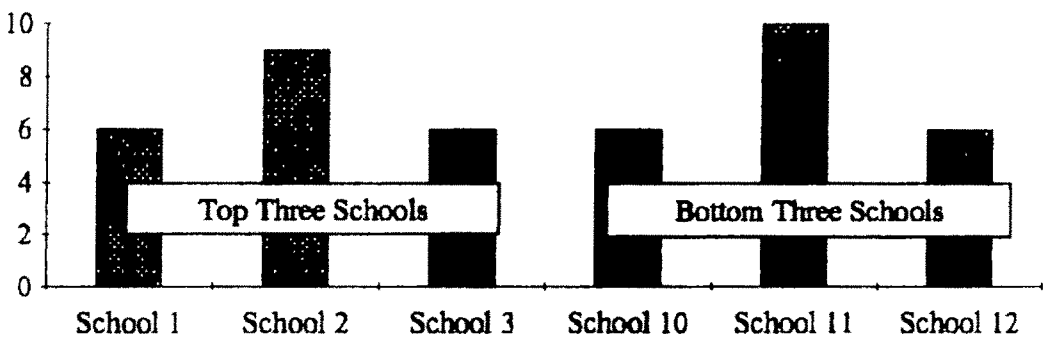Bar Chart-13   Comparison Between Teaching Method of Top
Three and Bottom Three Schools

Bar Chart-14   Comparison Between Evaluation Procedure of
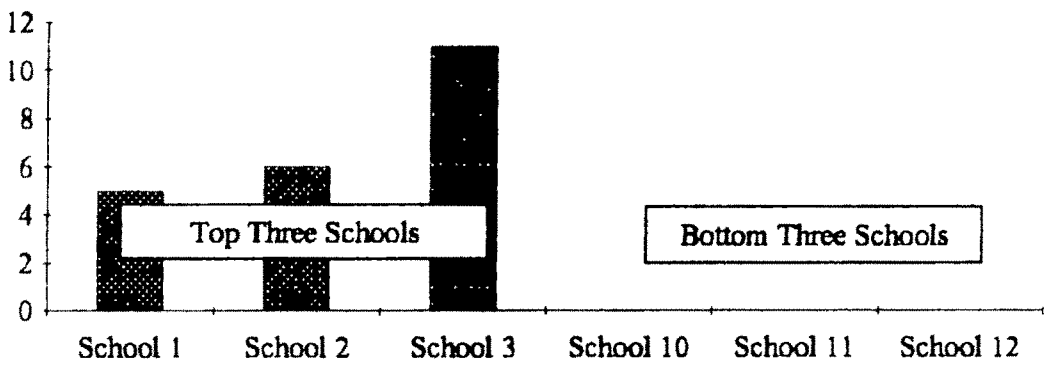Top Three and Bottom Three Schools

Bar Chart-15 Comparison Between Physical Facilities of Top
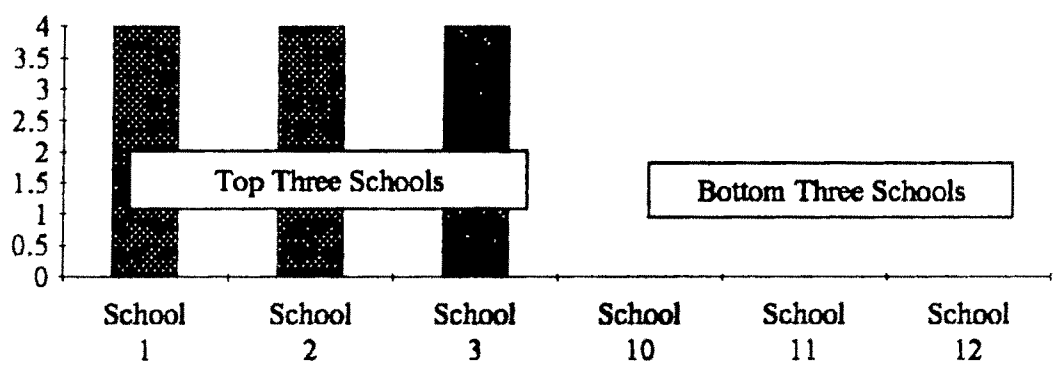Three and Bottom Three Schools

Bar Chart-16 Comparison Between Instructional Materials of
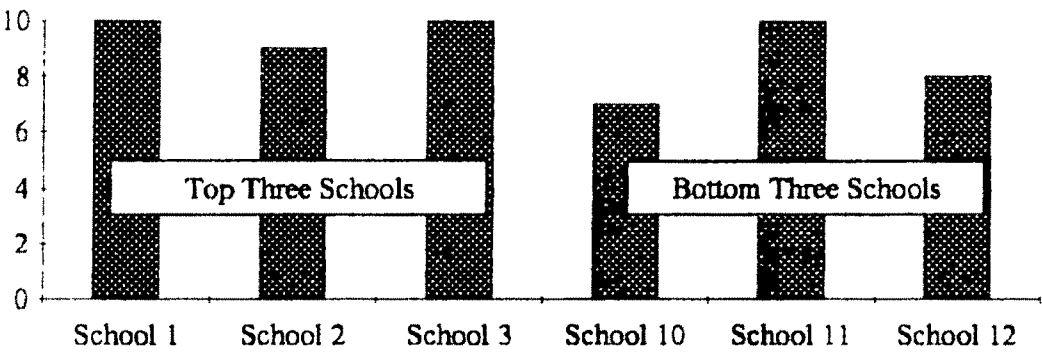Top Three and Bottom Three Schools

Bar Chart-17   Comparison Between Libary Facilities of Top
three and Bottom Three Schools

Bar Chart -18   Comparison Between Equipment for Cultural
Programme of Top Three and Bottom Three Schools

Bar Chart-19   Comparison Between Co-Curricular Activity of
Top Three and Bottom Three Schools

school variables 'Staff composition', 'Teachers' qualification', 'Evaluation procedure' 'Library Facilities' and 'Equipment for Cultural programme'. In fact the bottom three schools have no library and equipment for cultural programmes. It can be seen from the bar chart 13 that 'frequency of using different Teaching Method' is same between the two tops and one bottom school , but the frequency of using the different types of Teaching Method was found highest in the case of second bottom school. Same result can be seen in the case of the use of Instructional Materials (Bar Chart 16).

Conclusion from the findings of Table 4.39

In the conclusion on the findings of Table 4.39 it can be said that the Top three schools and the Bottom three schools differed significantly on six variables out of ten variables, the variables are Staff Composition, Teachers' Qualification, Evaluation Procedure, Physical Facilities, Library Facilities, Equipment for Cultural Programme. The bar chart show the difference very distinctly. Hypothesis 11 is tested and is discussed in chapter 7.

4.6.0 CONCLUSION

In this chapter both univariate and multivariate analyses were done to test the hypotheses by quantitative analysis. The hypotheses are tested. Summary and Interpretations of quantitative analyses are presented in the chapter 7 (section 7.2.1).