CHAPTER - 3

PLAN AND PROCEDURE OF THE PRESENT STUDY

3.0.0. INTRODUCTION

The main focus of the present investigation is on identification the 'Correlates of academic achievement of the primary school children' and to search the contribution of the schools to the academic achievement of the children. In Chapter-1, an attempt was made to present a detailed and comprehensive theoretical model and a reference frame in regard to all the three main factors or components of the study i.e. (i) Individual factors of academic achievement (Creativity, Motivation, Nutritional level) (ii) Home factors (iii) School factors. A review of the previous research on this issue was also given in depth in chapter 2. In the present chapter detail of the plans and procedure are presented.

3.1.0 OPERATIONAL DEFINITIONS OF THE VARIABLES USED IN THE PRESENT STUDY

The basic terms used in the statement of the problem and the variables used in the present study are discussed in the previous chapters. The operational definitions of the variables used in the present study are as follow.

3.1.1 Operational Definition of 'Creativity':

For this study the definition of Creativity means the 'Capacity of the individual child as measured by tests of Creativity (non-verbal)'. The term implies the capacity of producing 'something unique' but it must be adaptive i.e. it must serve to solve the problem, fit a situation or accomplish some recognizable goal. Here the 'Capacity' of Fluency, Originality, Abstractness,

Elaboration, Resistance to premature closure together are taken as a measure of creativity.

3.1.2 Operational definition of `Achievement Motivation'

Achievement motivation means the desire of the children towards learning that come from the thought processes of the individuals. The term `Achievement motivation' is the desire of the pupil to learn. The term `Achievement Motivation' in this study has been used in the same sense as Frymier (1965) defined. The term is defined and discussed in detail in chapter one.

3.1.3 Operational Definition of `Nutritional level'

In this study the Nutritional Level of the children was assessed on the basis of weight, height and midarm circumstances using the `US National Centre for Health Statistics (NCHS) reference' data.

3.1.4 Operational Definition of `Home Environment'

In this study `Home environment' means the `Educational Environment of the children at home'. It includes parental value on education, emotional climate in home, parental encouragement, educational facilities provided at home.

3.1.5 Operational Definition of `Socio-Economic Status'

The term Socio-economic status has been defined to include the levels of educational, occupational and income status of parents. For this study Father's and Mother's Education, Occupation and Income are treated as separate variables. So for this study six variables are included separately to measure the socio economic status of the individual child.

3.1.6 Operational definition of `Tutor'

For this study `Tutor' means the person `who teaches the child

at home, and help the child in doing the homework assignment given by the school and prepare the child for tests and examination of the school. Tutor may be parent, private tutor or relative.

3.1.7 Operational definition of the 'School Variables'

For this study the school variables taken to predict academic achievement are: (i) Physical Facilities of the school (ii) Staff Composition (iii) Teachers' Qualification (iv) Teachers' Experience (v) Teaching Method (vi) Evaluation Procedure (vii) Instructional Materials (viii) Library Facilities (ix) Co-curricular activities (x) Equipment for Cultural Programme (xi) Characteristics and services delivered by the head of the school (xii) Systems and management of the school (xiii) Teaching learning process.

3.1.8 Definition of 'Physical Facilities'

The operational definition of 'Physical Facilities' includes location of the school, transport facilities available, condition of the school building and facilities available.

3.1.9 Operational Definition of 'Staff-Composition'

In this study 'Staff-composition' is operationally defined as to include the 'qualifications' and 'experience' of the teachers of that school who are involved in the primary level teaching (i.e grade one to five).

3.1.10 Definition of 'Teachers Qualification'

Here teacher's qualification denotes both academic and professional qualifications.

3.1.11 Definition of Library Facilities

A library is a building or a room equipped for housing books and other materials of communication and used for reading or

listening purposes (Mehdi 1978, Page 96). For this study library is defined to include 'Librarian', 'reading room' and 'number of books per student'.

3.1.12 Definition of 'Teaching Method'

The methods used by the teachers while teaching the students are termed as 'teaching method'. For this study teaching method is operationally defined as frequencies of the use of lecture, Question-answer, Group-technique, Audio-visual aid, Field Trip, Role play, Dramatization, Story Telling, Demonstration, Problem Solving, Translation Grammar, Direct method, Structural Approach, during teaching in the classroom.

3.1.13 Definition of 'Evaluation Procedure'

For this study the 'Evaluation Procedure' is defined in terms of 'Examination held' 'Type of questions asked in the examination', 'Information detail of the progressive report.'

3.1.14 Definition of Instructional Material'

The text books, black boards, charts, model equipments etc. used in teaching are defined as the instructional materials.

3.1.15 Definition of 'Co-curricular Activities'

For this study 'Co-curricular activities' are defined in terms of provision for games and sports, cultural programmes, painting, gardening, literacy activities, scouting etc.

3.1.16 Definition of 'Equipment for Cultural Programme'

The equipment which are usually used for cultural programme of that school.

3.1.17 Definition of teaching and learning process'

For this study the 'Teaching-learning process' is defined in terms of classroom observation. The analysis of the observation was made in terms of (i) classroom condition (ii) behaviour of the teachers and the students in the classroom situation (iii)

methods of teaching followed by the teachers in the classroom (iv) system of giving and checking assignments.

3:2.0 OBJECTIVES OF THE PRESENT STUDY

The purpose of the present investigation is to find the answer to the four research questions mentioned in the first chapter in section 1.7.0 . The main objectives of the investigation may be phrased as follows:

(a) To identify the correlates of academic achievement of primary school students;

(b) To understand the contribution of the primary schools in the academic achievement of the students.

The above broad objectives may be reformulated, in the light of the research questions, into the following five specific objectives.

1. To find out the relationship of the three groups of factors to the academic achievement of the primary school children of each grade (I to V) and each type of schools (government and non-government).
2. To study the contribution of all the selected variables to academic achievement singly and jointly.
3. To identify the variables (out of the selected 21 variables) which contribute most to the academic achievement.
4. To study the difference between the high achievers and low achievers in terms of Individual and Home factors in the same school situation.
5. To study the contribution of the schools (school variable) to the academic achievement of the pupils.

3.3.0 VARIABLES OF THE STUDY

Two sets of variables were taken for this study. The variables of this study are presented in table 3.1. and 3.2.

Table 3.1 Selected Variables for the Quantitative Analysis

INDEPENDENT VARIABLES (PREDICTOR VARIABLES)	DEPENDENT VARIABLES (CRITERION VARIABLES)
i. Under Individual Factors of academic achievement three variables are selected. These are: 1. Creativity 2. Motivation 3. Nutritional Level. ii. Under Home Factors of academic achievement eight variables are selected. These are: 4. Home environment 5. Father's Education 6. Father's Occupation 7. Father's Income 8. Mother's Education 9. Mother's Occupation 10. Mother's Income 11. Tutor (who teaches the child at home) iii. Under School Factors of academic achievement ten variables are selected. These are: 12. Physical Facilities 13. Staff composition 14. Teacher's Qualification 15. Teacher's Experience 16. Teaching Method 17. Evaluation Procedure 18. Instructional Materials 19. Library Facilities 20. Equipment for Cultural programme 21. Co-curricular Activities	1. Achievement of the selected government primary school students in four academic subjects (Bengali, English, Mathematics, Environmental Science) together. 2. Achievement of selected non-government primary school students in four academic subjects (Bengali, English, Mathematics, Environmental Science) together. 3. Achievement of selected Grade one students of government & non-government. schools in four subjects together. 4. Achievement of selected Grade Two students of government & non-government schools in four academic subjects together. 5. Achievement of selected Grade three students of government & non-government schools in four academic subjects. 6. Achievement of selected Grade four students of government & non-government schools in four academic subjects together. 7. Achievement of selected Grade five students of government & non-government schools in four academic subjects together.

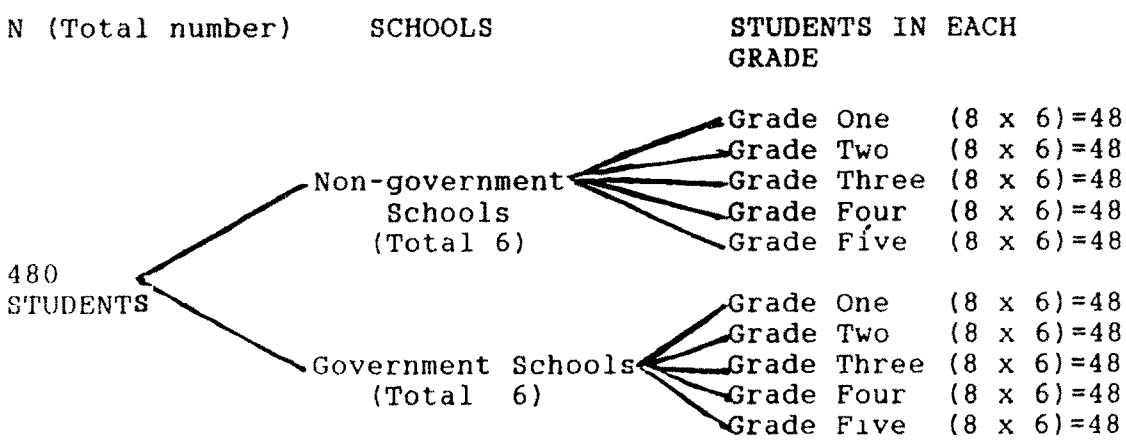
Table 3.2 Selected Variables for Qualitative Analysis

INDEPENDENT VARIABLES (PREDICTOR VARIABLES)	DEPENDENT VARIABLES (CRITERION VARIABLES)
i. Under Individual and Home factors of academic achievement the following variables are selected 1. Father's Education, Occupation and Income. 2. Mother's Education, Occupation and Income. 3. Number of sibs 4. Tutor (Who teaches the child at home) 5. Type of family (Nuclear or joint) 6. Health and Nutritional level of the students. 7. Regularity in attending school ii. Under school factor of academic achievement the following variables are selected: 1. Physical condition of the school 2. Selection of the students for admission 3. Syllabus followed 4. School hour 5. Evaluation procedure 6. Characteristics and services delivered by the head of the school 7. Qualities and composition of teaching staff. 8. The classroom environment and the behaviour of the students and the teachers in the classroom situation 9. Methods of teaching followed by the teachers in the classroom 10. System of giving assignment and correction of homework and classwork.	1. Achievement of the students of five grades (1 to 5) of the selected four schools in four academic subjects (Bengali, English, Mathematics, Environmental Science)

3.4.0 THE SAMPLE

The study was conducted in Dhaka city which is the capital and the largest city of Bangladesh. All the schools having a primary section constituted the population for this study. The sampling approach taken for this study can be described as purposive and stratified. A total of 12 schools were selected as the sample for this study.

The sample included equal numbers of government and non-government schools. Each of the schools has five grades in the primary section. Eight students were selected from each grade. Therefore the total number of sampled students was 480. The sampling procedure is explained in the sections 3.4.1 to 3.4.3 The investigation also included the responses of 120 teachers of the sampled schools, 480 parents of the sampled children of the schools and 12 principals of the schools. The number of responding teachers was not equal in each school, it varied from school to school, depending on the number and availability of the teachers in the school during data collection. The scheme of sampling is as follow:



The selection procedure for the schools, students, teachers, principals & parents are as follow.

3.4.1 Selection of the schools

In Bangladesh the schools can be categorized into three groups: (i) Bengali medium government Schools, (ii) Bengali medium non-government Schools (iii) English medium non-government Schools. Two types of Bengali medium schools, namely, Government schools and Non-Government schools were selected for the study. As the standardized achievement tests were in Bengali language, so the english medium non-government schools were not included in the sample. The following sampling policies were applied to select schools from the two broad categories.

1. Two schools were selected from each of the four parts of Dhaka City: East, West, North, South. As good schools are concentrated in the central part of Dhaka City, four schools were selected from Central Dhaka City. Thus all together 12 schools were selected for this purpose (The locations are shown in the map of Dhaka City ,Appendix-14)
2. The schools were selected by pairing one government school with one non-government school located in a similar environment.
3. Special attention was given to select representative school of the city. 5 government schools and 5 non-government schools were selected on this basis. Two other schools, one government and one non-government school, was selected from among the recognized good schools. The reason for including these two schools purposefully was to identify the factors which made a good school.

3.4.2 Selection of the students

(i) The subjects (i.e students) were selected from grade one to grade five of each sampled schools. The justification of taking the five grades was to make the study in-depth and comprehensive. The intensive nature of the study is expected to give answer on the contributions of the schools.

(ii) Eight students were selected from each grade by stratified sampling. The sample was stratified by taking top three students, bottom three students and two from middle of each grade (based on their results in final examination of the school in the year 1991). Thus 96 students (8 from each of twelve sampled schools) were selected from each grade, out of which 48 students were from government schools and 48 students were from non-government schools. The total number of students from all grades were 480.

3.4.3 Selection of Teachers, Principals and Parents.

(1) The teachers who were involved in teaching at primary level (grade one to five) of the sampled schools were included in the study.

(2) All of the principals of the sampled schools were included in the study.

(3) All of the parents of the sampled children were included in the study.

3.5.0 TOOLS USED

For collection of data for the study the following tools were used.

1. Torrance Test of Creative Thinking Non-verbal Form B (1979).
2. Achievement Motivation Inventory. (Mehta 1969)
3. Scale to measure Home Environment (Reddy 1973)
4. Socio-economic status (SES) scale (Singh & Saxena 1984)
5. Scale of Evaluation Criteria for Teachers & Principals. (Mehdi 1978).
6. Pupil Achievement CR Test Batteries for UPE project Bangladesh (1985).

Achievement Motivation Inventory (Mehta 1969), Scale to measure Home Environment (Reddy 1973), Socio-economic status scale (Singh & Saxena 1984), Scale of Evaluation Criteria for Teachers & Principals (Mehdi 1978), has been adopted, translated into Bengali language and are presented in the Appendices with English version. New Achievement tests (Bengali and Mathematics) for grade one were made by the researcher. The tools are described below with essential details such as: adaptation, modification (wherever applicable), total items of the tools, components, administration & scoring procedure in detail.

3.5.1 TORRANCE TEST OF CREATIVE THINKING (TTCT)

For this study Torrance Tests of Creative Thinking (TTCT, figural form B) was used. Five norm-referenced measures: (i) Fluency, (ii) Originality, (ii) Abstractness of titles, (iv) Elaboration, (v) Resistance to premature closure were taken to measure creativity. The definitions of the terms as given by Torrance are presented in chapter 1 under section 1.9.1.

a. Description of the Tool

Torrance Tests of Creative Thinking figural form B consists of three activities:

A. Activity 1, Picture construction

B. Activity 2, Picture completion. 10 incomplete pictures were provided to complete.

C. Activity 3, Circles. With the circles the subjects are asked to make as many different pictures or objects as they can do.

b. Administering the Test and Scoring Procedure

The figural forms of the Torrance Tests of Creative Thinking (TTCT) require responses that are mainly in the form of drawing. A small amount of writing is required to name some of the pictures. The actual working time in the figural tests is 30 minutes. Instructions for administering test activities for this study were given as stated in the TTCT test manual.

i. Scoring for Fluency: (Source: TTCT manual page 16-22) The fluency score is the number of interpretable relevant responses. For activity 1 (picture construction) there is no point for fluency.

For activity 2, fluency score is obtained by counting the number of figures acceptably completed. The maximum number is 10. If two or more figures are combined into a single picture, credit is still given for the number of figures used.

For activity 3, Fluency score is obtained by counting the number

of relevant responses. Here relevant response is defined as one which makes use in some way of the stimulus e.g. a circle. Any repetitions or irrelevant responses are eliminated for scoring.

ii. Scoring for Originality

The scoring of originality is based on the statistical frequency and unusualness of the response. One point is given if the response is original. For this study the scoring originality was based on a tabulation of a sample of 480 subjects of Bangladesh, ranging from grade one to grade five.

The researcher during scoring eliminated the responses which were common for Bangladeshi sample. The list of the common responses in Bangladesh is given in Appendix – 1a

Bonus point for originality for activity 2: If two incomplete figures are combined 1 bonus point is given, if three incomplete figures are combined 2 bonus point is given and so on.

Bonus point for originality for activity 3:

2	circles or sets of lines combined	1 point
3-5	circles or sets of lines combined	2 point
6-10	circles or sets of lines combined	3 point
11-15	circles or sets of lines combined	4 point
16 or more	circles or sets of lines combined	5 point

iii. Scoring for Abstractness of Titles:

The ability to produce good titles involves synthesizing and organizing the process of thinking. Points are given as follows

0 for obvious class or generic title

1 for simple descriptive title at a concrete level involving a modifier plus a class.

2 for Imaginative, goes beyond concrete.

3 for abstract but appropriate title, capturing the essence of the picture.

iv. Scoring as Elaboration:

Elaboration is the imagination and exposition of detail, which is a function of creative ability. Therefore in scoring elaboration, credit is given for each pertinent detail added to the original stimulus figure, its boundaries or its surrounding space. The points are given as follow.

0 to 5 details would be scored 1

6 to 12 details would be scored 2

13 to 19 details would be scored 3 and so on.

The elaboration score is the sum of the scores for the three activities.

v. Scoring for Resistance to Premature Closure:

The creative person is able to keep open and delay closure long enough to make the mental leap that makes possible original ideas. Less creative persons close the incomplete figures immediately. The points are given as follow:

0 is given if the figure is closed by quickest, easiest, most direct way.

1 point can be given if the closure of the picture goes beyond the simple closing of the incomplete figures.

2 point can be given if the closure is never completed or is completed with irregular lines which form part of the

picture rather than with straight lines or simple curved lines.

The scores on fluency, originality, abstractness of titles, elaboration and resistance to premature closure are entered on to the streamlined scoring sheet (The sample of the scoring sheet and the TTCT figural form B is given in appendix 1a)

3.5.2 ACHIEVEMENT MOTIVATION INVENTORY:

To measure Achievement Motivation of the students, Achievement Motivation Inventory of Mehta (1969) was used, after adaptation and motivation.

a. Adaptation and Modification of the Tool

The tool was translated into Bengali language and it was administered on Bangladeshi Children during pilot study. From the experience of the pilot study the researcher felt that for the primary school children (1 to v) it was too difficult to answer items with 6 alternatives. So the investigator modified the Inventory to make it usable for the primary school children.

b. Description of the Tool and Scoring Procedure:

Mehta's Achievement Motivation Inventory consists of 22 items with 6 alternatives of which two are achievement related (AR), two are task related (TR) and the two are unrelated to achievement (UR). To make the Inventory simple for the children the researcher took one achievement related (AR), one task-related (TR) and one unrelated to achievement (UR) from each item. So the modified test consisted of 22 items with three alternatives. The response to any one item could be either AR or

TR or UR. One point was given for each response. The points on the Achievement Related (AR) response was taken as Achievement Motivation score of the individual. The time required for the test was 30 minutes. The modified test with English and Bengali version are in the appendices 2a and 2b.

3.5.3 MEASURING NUTRITIONAL LEVEL

a. Description of the Tools

For this study nutritional status of the children was assessed on the basis of weight, height and mid arm circumference. The evaluation of nutritional status was done on the basis of:

a. Weight for age measure

b. Height for age measure

c. Mid arm circumference for age measure

using the US National Center for Health Statistics (NCHS) reference data, Waterlow Criterion and Gomeg criterion (Jelliffee 1989). Weights were taken using Detector scale. The weight of the children were taken without shoes, but with school dresses in the month of May-June. Height of the sample group was measured by using standard measuring tapes made of steel. Heights of the children were measured without shoes. Measurement of mid arm circumference was done by using a measuring tape on the left arm of the child.

b. Scoring Procedure

(i). Weight for age measure

According to the weight for age measure children weighing 80% or more of the NCHS reference median weight for age, were classified as nutritionally normal. Children weighing 70-79.9%

of the reference weight were classified as moderately malnourished and children weighing below 70% of the reference median weight for age were classified as significantly malnourished. The NCHS reference median weight for age is given in Appendices-3a and 3b. To measure the percentage of reference weight for age the following formula was used.

$$\frac{\text{Mean Weight (kg.)}}{\text{Reference median weight for age (kg.)}} \times 100$$

Mean weight of the Bangladeshi primary school children by age and their comparison with the reference NCHS data is given in the Appendix 3f. To measure the nutritional level of the individual child by weight for age the same reference table was used.

To quantify the nutritional level of the children 2 points were given to the normal child, 1 point for moderately malnourished and 0 for malnourished.

(ii) Height for age measure

The same formula was used to measure the percentage of reference height for age. The NCHS reference median height for age is given in Appendix 3c and 3d. According to the height for age measure children measuring less than 90% of the NCHS reference median height were classified as stunted. So for this study the children with 90% or above of the NCHS reference median weight for age were classified as normal. Children with 80% to 89.9% of

the reference median height were classified as moderately malnourished and those below 80% of the reference median height for age were classified as malnourished. In the quantitative scale, 2 points were given for normal, 1 point for moderate and 0 for those who were below 80% of the reference median height for age.

(iii) Mid arm circumference for age measure:

According to the mid arm circumference for age measure the children with 85% or more of the NCHS reference median were classified as normal, 75% to 84.9% as moderately malnourished and below 75% classified as malnourished. 2 points were given to those whose mid arm circumference was 85% or above the NCHS reference median, 1 point for moderately malnourished and 0 for malnourished.

Since nutritional level has been taken as one variable in the study, it is necessary to define a composite measure, incorporating the values of height, weight and mid arm circumference measures. So to get a valid and reliable measure of the nutritional level of the children, the investigator decided to take the three measures of the nutritional level. The points obtained by the child in three measures were added together and that was the `Score for nutritional level' of the child.'

3.5.4. SCALE TO MEASURE HOME ENVIRONMENT

a. Adaptation and Modification

The tool to measure `Home Environment' is based on Reddy's (1973) `Home Environment Questionnaire cum Rating Scale.' Reddy

constructed the Home Environment Questionnaire for college students, but the sample for this study was primary school children. So an adapted and modified version of Reddy's tool had to be used. Reddy's Home Environment Scale consists of 100 items with 5 options. For this study, the number of options and items was reduced to make it easier for the primary school children. The scale was translated into Bengali (Appendices 4a and 4b).

b. Description of the Tool

The total number of items in the modified scale is 40 with two alternatives: yes or no. The scale covered four aspects of home environment in terms of educational environment provided for the child at home. The four components measured by the tool are: (i) Parental value on education, (ii) Educational facilities provided at home, (iii) Parental Encouragement to the children in the process of education and (iv) Emotional climate in the home. 10 items are taken from each area. The specific aspect measured by each item in each area is shown below with only the number of the items. The scale with English and Bengali version are in the Appendix - 4a and 4b.

1. **Parental value on education.**

   Item Nos: 1, 5, 9, 13, 17, 21, 25, 29, 33, 37

2. **Educational facilities at home.**

   Item Nos: 2, 6, 10, 14, 18, 22, 26, 30, 34, 38

3. **Parental encouragement for education.**

   Item No: 3, 7, 11, 15, 19, 23, 27, 31, 35, 39

4. **Emotional Climate in the home.**

Item No: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40

Instead of putting all the items measuring a particular area in one place, the items were distributed in a systematic pattern. The first item belongs to first area (i.e parental value), the second item belongs to second area (i.e education facilities at home), the third item belongs to third area (i.e parental encouragement), the fourth item belongs to fourth area (i.e emotional climate).

c. Scoring of the Items

1 point was given for 'Yes' answer and 0 for 'No' answer. In the case of negatively worded items, the scoring was reversed. The total score of the individual child for this 'home variable' was obtained by adding the points on the four areas together.

3.5.5 SOCIO-ECONOMIC SCALE

a. Adaptation and Modification

For this study Singh & Saxena's (1984) Socio-Economic Status SES urban was used with some modification. The scale was translated into Bengali and was given to the parents of the sampled children. The Urban scale consists of 18 items. The first three items are on Education, Occupation and Income respectively. For this study the first three items were taken. The scale with English and Bengali version are in the Appendices- 5a and 5b.

b. Scoring Procedure

The final weightage given to education is represented by a '9 point' scale, starting with 'Illiterate' and ending up in

`University highest degree'. For `Illiterate' the point is 0 and `University highest degree' it is 8.

The weightage given to occupation is represented by a 8 point scale, starting with `Without Work' (0 point) and ending up in `High Administrative Work (7 point).

The weightage given to Income is represented by a 6 point scale, starting with `Below 900' (1 point) and ending up in `Above 10,000 (6 point).

3.5.6 MEASUREMENT OF `TUTOR'

a. Description of the Tool and Scoring Procedure

The information on `who teaches the child at home' was collected through the Home Environment questionnaire and interview by the investigator. The scoring procedure is as follow:

3 points were given to the child during the scoring of `tutor' if he/she was taught regularly by any of the parents or by both of the parents.

2 points were given to the child if she/he was taught regularly by private tutor' either from school or outside.

1 point was given to the child if she/he was taught regularly by some one else, such as a relative, a neighbour or friends, who did not take any salary for teaching.

0 point was given to the child if he/she had no helping hand for study at home. He/she studied by himself/herself.

3.6.7 SCALE TO MEASURE 'SCHOOL VARIABLES'

a. Description of the Tools with Components

For this study the 'School Variables' taken to predict academic achievement are: Physical Facilities, Staff Composition, Teachers' Qualification, Teachers' Experience, Teaching method, Evaluation Procedure, Instructional Materials, Library Facilities, Equipment for Cultural programmes, Co-curricular activities. The tools used to measure these variables were:

(1) **Evaluative Criteria Used By Teachers to measure the five school variables:**

i. Teaching methods

ii. Instructional Materials

iii. Co-curricular activities

iv. Assessment Procedure

v. Equipment for cultural programmes

(2) **Evaluation Criteria Used By Principals to measure the five other school variables:**

i. Physical facilities

ii. Staff-Composition

iii. Teachers' Qualification

iv. Teachers' Experience

v. Library Facilities

Both of these tools were prepared by Mehdi (1978). The tools were translated into Bengali with some modifications in scoring (according to the necessity of the study). The tools are

presented in the Appendix-7a and 7b with English and Bengali version.

b. Scoring Procedure:

(i) Scoring Procedure for Physical Facilities

Items	Scores	Maximum possible score
1. Location		2
a. Natural	2	
b. Congested	1	
2. Transportation if 'Yes'	1	1
3. A. Building Condition		3
i) Well maintained	3	
ii) Moderately	2	
iii) Poorly	1	
B. Building Compound		3
i) Good Compound	3	
ii) Bad Compound	2	
iii) No Compound	0	
C. Play ground, if Yes	1	1
D. Ventilation		3
i) Good Ventilation	3	
ii) Moderate	2	
iii) Poor	1	
E. Separate Room for		11
i) Head Master	1	

ii) Staff room	1	
iii) Office room	1	
iv) Store room	1	
v) Audio Visual room	1	
vi) Museum	1	
vii) Indoor Games room	1	
viii) Library	1	
ix) Auditorium	1	
x) Canteen	1	
xi) Laboratory	1	
F. Class room		
I. Size of class room		3
1. More than 8' per student	3	
2. 6'-7' per student	2	
3. Less than 5' per student	1	
II. Sitting Arrangement		3
1. Chairs	3	
2. Benches	2	
3. Madur	1	
III. Furniture		1
1. Sufficient if yes	1	
IV. Students per class		3
1. Less than 35	3	

2. 36 to 40	2	
3. 41 to more	1	

Evaluation of physical Facilities (Maximum Score 33)

Score	Evaluation
Less than 9	Very poor
10 to 14	Poor
15 to 20	Fair
21 to 26	Good
27 to 33	Very good

(ii) Scoring Procedure of Staff-Composition

Items	Score	Maximum possible scores
A. Scoring		
1. Qualification of the staff		4
i. S.S.C	0	
ii. H.S.C	1	
iii. H.S.C, C.Ed	2	
iv. B.A	2	
v. B.A, B.Ed/M.Ed	3	
vi. M.A, B.Ed/M.Ed	4	
2. Experience of the staff		3
i. Upto 5 years	1	

ii. 6 to 10 years	2	
iii. More than 10 years	3	

Evaluation of Staff-Composition (Maximum Score 7)

Score	Evaluation
Upto 2.99	Very poor
3 to 3.99	Poor
4 to 4.99	Fair
5 to 5.99	Good
6 to 7.00	Very good

(iii) Scoring Procedure for Teachers' Qualification and Experience

For Scoring of Teachers' Qualifications and Experience the scoring procedure of staff-composition was followed. But separate scoring was done for Teachers' Qualification and Teachers' Experience.

(iv) Scoring Procedure for Library Facilities

Items	Score	Maximum possible scores
A. Scoring		
1. Qualification of the staff		
1. Library	1	1
2. Librarian		2
i. Full time librarian	2	
ii. Teacher as Librarian	1	
3. Timings		2
i. Morning or Evening	2	

ii. Recess	2	
iii. No fixed time	1	
4. Reading room	1	1
5. Number of Books		4
Less than 200	1	
201 to 500	2	
501 to 1000	3	
1001 and above	4	
6. Books per students		5
Less than 1	1	
1 to 2	2	
3 to 4	3	
5 to 6	4	
7 & above	5	

Evaluation of Library Facilities (Maximum Score 15)

Score	Evaluation
0 ----------	Very poor
1 to 4 ----------	Poor
5 to 8 ----------	Fair
9 to 12 ----------	Good
13 and above ----------	Very good

(v) Scoring Procedure of Teaching Method

Items	Score	Maximum possible scores
A. Scoring		
1. Method used		39
i. Generally	3	
ii. Frequently	2	

iii. Less frequently	1	
iv. Not at all	0	
(Total 13 methods)		

Evaluation of Teaching Method

Score	Evaluation
Upto 6.4	Not at all
6.5 to 19.4	Less frequently
19.5 to 32.4	Frequently
32.5 to 39	Generally

(vi) Scoring Procedure for Instructional Material

Items	Score	Maximum possible score 14
i. Charts	1	
ii. Pictures	1	
iii. Models	1	
iv. Projector	1	
v. Radio	1	
vi. Tape Recorder	1	
vii. Television	1	
viii.VCR/VCP	1	
ix. Cards	1	
x. Map	1	
xi. Globe	1	

xii. Instrument box	1	
xiii.UNICEF kit box	1	
xiv. Others	1	

Evaluation for Instructional Material (Maximum Possible Score 14)

Score	Evaluation
Less than 3	Very poor
3 to 5	Poor
6 to 8	Fair
9 to 11	Good
12 to 14	Very Good

(vii) Scoring Procedure for Evaluation Scheme

Items	Score	Maximum possible score
A. Scoring		
1. Examination held		2
a. Weekly, fortnightly monthly	1	
b. Quarterly, half yearly, yearly (only one score to be considered	1	
2. Types of questions		3
a. Essay type	1	
b. Objective type	1	
c. Multiple type	1	
3. Progress Report		3
a. Reporting		
i. Monthly	3	
ii. Half yearly or Quarterly	2	

iii. Yearly	1	
b. Personal data		3
i. Intensive	3	
ii. Detailed	2	
iii. Short	1	

Evaluation of Evaluation Scheme (Maximum Score 11)

Score	Evaluation
Less than 4.5	Very poor
4.5 - 6	Poor
6.5 - 8	Fair
8.5 - 10	Good
10.5 - 12	Very Good

(Viii) Scoring Procedure of Co-curricular Activities

Items	Score	Maximum possible score
Debate	1	
Drama	1	
Song	1	
Dance	1	
Recitation of poetry	1	
Story telling	1	
Drawing	1	
Sports	1	
Gardening	1	

Scouting	1	
Education Tour	1	
Wall Magazine	1	
Literature Form	1	
Others	1	

Evaluation of Co-curricular Activities (Maximum Score 14)

Score	Evaluation
Less than three	Very poor
3 to 5	Poor
6 to 8	Fair
9 to 11	Good
12 to 14	Very Good

(ix) Scoring of Equipment for Cultural Programme

Items	Score	Maximum possible score 10
i. Harmonium	1	
ii. Table	1	
iii. Dandia	1	
iv. Manjura	1	
v. Khanjri	1	
vi. Loud Speaker	1	
vii. Piano	1	
viii. Gitter	1	
ix. Tanpura	1	
x. Others	1	

Evaluation of Equipment for Cultural Programme (Maximum Score 10)

Score	Evaluation
Less than two	Very poor
2 to 3	Poor
4 to 5	Fair
6 to 7	Good
8 to 10	Very Good

3.5.8. Pupil Achievement CR Test Batteries

A set of standardized tests were administered to the students for measuring their academic performance. These standardized tests were developed by Institute of Education and Research, Dhaka University for UPE (IDA) project in Bangladesh; and were named Pupil Achievement CR Test Batteries for UPE (IDA) project Bangladesh'. The test batteries were sample-tested on children of all five grades. For grade one and two only Bengali and mathematics tests were taken. Other four grades were given tests on four subjects: Bengali, English, Mathematics and Environmental Studies (science). As new text books were introduced for grade one in 1990 making the old test invalid, the researcher constructed new tests for grade one students. In the case of tests for grades III to V, it was found that out of 50-60 items, seven items, were not in the present syllabus. The tests were based on the whole syllabus of the respective grade.

a. Description of the Tests

All of the tests consisted of multiple choice items with four alternatives. 1 mark was allotted for each item.

For grade one

1. Bengali: There are 30 multiple choice items with four alternatives. Total marks is 30, 1 mark is allotted for each item.
2. Mathematics: 25 multiple choice items.

For grade Two

1. Bengali: 40 multiple choice items.
2. Mathematics: 30 multiple choice items.

For grade Three

1. Bengali: 50 multiple choice items.
2. Mathematics: 50 multiple choice items.
3. English: 50 multiple choice items.
4. Environment Studies (Science): 50 multiple choice items.

For grade Four

1. Bengali: 60 multiple choice items.
2. Mathematics: 60 multiple choice items.
3. English: 60 multiple choice items.
4. Environmental Studies (Science): 60 multiple choice items.

For grade Five

1. Bengali: 60 multiple choice items.
2. Mathematics: 60 multiple choice items.
3. English: 60 multiple choice items.
4. Environmental Studies (Science): 60 multiple choice items.

3.6.0 PROCEDURAL DETAILS AND TECHNIQUES OF DATA COLLECTION

The study was conducted in three stages,

1) Adaptation and Translation of the tools for data collection.

2) Pilot study for the finalization of the tools.

3) Full scale study.

3.6.1 Adaption and Translation of the Tools

For the collection of data for the **quantitative part** of this study the following tools were used

1. Test of creativity (Torrance 1979, non-verbal form B).
2. Achievement Motivation Inventory (Mehta 1969).
3. Scale to measure Home Environment (Reddy 1973).
4. Scale to measure Socio-economic status (Singh 1984).
5. Scale of Evaluation Criteria for teachers and principals (Mehdi; 1978).
6. Pupil Achievement CR Test Batteries for UPE project Bangladesh (1985)

In the first stage, the tools were adapted, modified (according to the necessity) and translated into Bengali language.

Collection of data for the **qualitative part** of the study was done by observing the schools and their facilities, reviewing the systems of admission and evaluation, appraising the role of head teachers and the qualifications of the teachers, and most importantly, observing the teaching-learning process in the classrooms. Structured and non-structured interviews were conducted for case studies of high achievers and low achievers.

3.6.2 Pilot Study

The pilot study was conducted in the month of April 1992 in a Government school. The tests were administered on a small group of students from each grade (grade One to grade Five). The pilot study showed that the grade one and grade two students were

unable to fill up the 'Home Environment Questionnaire' and 'Motivation Inventory'. So it was decided to fill up these two questionnaires for grade one and grade two by directly interviewing the respondents.

3.6.3 Full Scale Survey (Collection of Data)

Collection of data was done in three phases:

In the first phase of data collection, the questionnaires on Creativity, Achievement Motivation and Home Environment were administered on the students. Interview technique was used for the grade one and grade two students. It took 5 consecutive days to collect the data in the first phase. The procedural details of the first phase is presented below.

Five Research Assistants (All of them graduates) were appointed to assist during data collection. They were given proper instructions and training before data collection. A separate room was arranged in every school to administer the tests. Grade one and grade two students were studied on the first day of data collection. First, 8 sampled students (detail of sampling is in section 3.4.2) were taken from grade One. They were seated on four benches in the study room. Two students sat on each bench, with one Research Assistant sitting in between them. The two students sitting on any bench were given two different tests. For example, while one of them took the test of Creativity, the other answered Home Environment and Motivation Questionnaire. When they finished, the student who took the Creativity test was given the Motivation test and the other student was given the Creativity test. After completing the test, students were interviewed one by one by the researcher. The interview of each student began with ice-breaking questions, like 'What is your name' or 'How many brothers and sisters you have'. The purpose of the interview was:

a) To validate the information which they provided in the questionnaire.

b) To form some ideas about the teacher and their teaching method.

The interview was a structured interview. The questionnaire used in the interview is shown in the Appendix 11. After the interview, the scripts of both homework and classwork were checked to see whether the teachers were giving written class work and home work and whether they were able to correct the scripts or not. During the interview, the smartness and cleanliness of the students as well as the neatness of their hand writing were also observed. The investigator recorded the information as soon as the student left the interview table.

The fifth Research Assistant who did not take part in the interview took measurements of weight, height and mid-arm circumference and examined the eye sight of the student (i.e. whether he could read the blackboard from the last bench of the classroom). The Socio-Economic Status (SES) scale questionnaire was given to the students with the advice to give it to their parents and return it on the next day.

On the second day of the data collection, the sampled students from Grade III to Grade V (8 students from each grade) were taken for the study. They were first given instruction to answer the 'Home Environment Questionnaire'. After that, the Motivation Inventory Questionnaire was administered to the students. The Research Assistants helped the students to understand the questionnaire.

On the third day, 'Test of Creativity' was administered to the

same students. After the completion of the test, the students were interviewed in the same manner as it was done for the Grade one and two students. Each and every script of the students were checked by the investigator.

On the fourth and the fifth days, the investigator came alone to the school, sat in the staff-room with the permission of the teachers, checked the remark book of the school inspectors (in the case of government primary school), recorded the attendance of the sampled students etc. The main purpose of visiting staff room, however, was to observe the teachers in their normal school environment and also to make rapport with the teachers. Rapport was developed by discussing the common problems of primary school teachers, such as teaching load, over crowed classrooms, inadequate salary, etc. After such discussions, the teachers were given the questionnaire on 'Evaluation Criteria for the Teachers' and were requested to give the real picture. 'Evaluation Criteria for the Principal' were given to the Principals. The first phase of data collection was done during the months of April to June 1992.

In the second phase of data collection, a standardized achievement test (Pupil Achievements CR test batteries for UPE project Bangladesh) of Bengali, English, Mathematics, Environmental studies (science) were administered on the students in two sessions. Bengali and Mathematics tests were taken on the first day and English and Environmental Studies (Science) test were taken on the next day. Seven days before

taking the tests, the students were informed about the examination. The tests were different for different grades. The standardized tests are based on the whole syllabus of the respective grades. The tests were administered in the months of October and November 1992 because in Bangladesh the final examinations are held in November and December.

In the third phase of data collection, classrooms in four schools were observed by the researcher. The four selected schools included the top two schools and bottom two schools determined by the results of the aforementioned standardized tests. The researcher used to go to a classroom fifteen minutes before the class started, take a seat on a back bench and remain in the same classroom from the first period through the last period. In this way she observed all the five grades of a school in five consecutive days. A total of 20 days were taken to complete this phase. The classroom observations were done in the month of May 1993. The information schedule which was used during classroom observations in presented in Appendix 10.

3.7.0 HYPOTHESES

1. There is a significant relationship between the predicting variables (Home & Individual) and the academic achievement of the students of different grades of non-government schools.
2. There is a significant relationship between the predicting variables (Home and Individual variables) and the achievement of the students of different grades of government schools.
3. There is a significant correlation between the school

variables and the academic achievement.

4. There is a significant contribution of the predicting variables (Home and Individual variables) singly and jointly to the academic achievement of the students in each grade of non-government school.

5 There is a significant contribution of the predicting variables (Home and Individual variable) singly and jointly to the academic achievement of the students in each grade of government school.

6. There is a significant contribution of the school variables singly and jointly to the academic achievement of the students.

7. Among the Home and Individual variables, some are more significant in terms of contribution to academic achievement of the primary school children of non-government schools.

8. Among the Home and Individual variables, some are more significant in terms of contribution to academic achievement of the primary school children of government schools.

9. Among the school variables some are more significant in terms of contribution to academic achievement of the primary school children.

10. In any school situation, there is a significant difference between the high achievers and low achievers of each grade in terms of differences in Home and Individual variables.

11. There is a significant difference between the schools with good result and poor result due to the difference of the school variables.

3.8.0 THE RESEARCH DESIGN

To get the answer to the research questions (objectives of this study), two types of empirical information are needed. Answer to the first three questions requires examination of relationships between the Predictor (IVs) Variables and Criterion Variables (DVs). The fourth and fifth objectives on the other hand, raise issues which cannot be explained only by quantitative analysis. Many important issues cannot be addressed by quantitative analysis. So the researcher felt strongly that research objectives called for a composite approach, constitute of both qualitative analysis and quantitative analysis. It is thought that such an approach can provide deeper understanding of educational phenomenon.

3.8.1 Establishing relationship with Predictor Variables (Ivs) and Criterion Variables (Dvs).

The first objective of this research is to measure the degree of relationship between predictor variables (IVs) and Criterion Variables (DVs). So in this phase of the study attempts have been made to establish mathematical relationship between each Dependent Variables (academic achievement, i.e aggregate marks of the standardized achievement tests in Bengali, English, Mathematics, Environment Science) of each grade (I to V), each school (Govt. & Non-Govt.) and three broad independent factors with 21 variables (Individual, Home, School). This is done by calculating Coefficients of Correlation. The significance of the degree of relationship also determined by t-test, using the

following formula

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

Where, R = coefficient of correlation.

N = number of cases.

This analysis provides an approach to test the 1st, 2nd and 3rd hypotheses. The second objective of the present study is to test the joint and relative contributions of each independent variable to the prediction of the dependent variable, this is done by calculating multiple regression coefficients. Beta Co-efficient for the regression equations has been estimated, with the addition of one more independent variable at the end of each equation. R^2 indicates the strength of relationship between one variable and the other variables taken together. R^2 may be expressed in terms of Beta Co-efficient. It will test the 4th, 5th and 6th hypothesis. Computation of correlations and multiple regression was done with the help of computer programme.

3.8.2 Establishing Specific Relationship of Predictor Variables (Ivs) and Criterion Variables (Dvs)

The third objective of this study is to measure the specific relationship between predictor variables (IVs) and Criterion Variables (DVs). Multiple regression analysis gives the joint and relative contributions of each independent variable to the prediction of the dependent variables. Klees et al (1982) in a critique of multiple regression analysis argued that these models are inevitably incomplete and are therefore subject

to specification error. Models in which important variables have been omitted, or that contain variables that overlap significantly may give rise to misleading result and interpretation.

So the next best statistical technique is the application of the method of 'Step-Wise Regression'. This method add or subtract one predictor at a time to the regression equation, seeking the 'best' set of predictors. Step-wise regression was done for each grade and each type of schools separately. Computation of step wise regression was done with the help of a computer programme. It will test the 7th, 8th and 9th hypotheses.

3.8.3 Testing Significance of the Difference Between the Means ($\bar{X}$) of High Achievers and Low Achievers in the Same School Situation.

Significance test of the difference between means ($\bar{x}$) of high achievers (i.e who scored high in standardized achievement test.) and low achievers (i.e who scored low in the standardized test) of each grade (I to V) and each school provides the answer in respect of the fourth objective of this study. The means ($\bar{x}$) of the Independent Variables of top three students and 'bottom three' students of each grade and each school are calculated. t-values are also calculated to test the significance of difference of the means ($\bar{x}$) between the 'top three' and bottom three students on each Independent Variables. Qualitative analysis is also done on this issue. Top and bottom students from each grade of the top two schools and bottom two schools of

the sampled schools are selected for case studies.

3.8.4 Testing Significance of the Difference Between the Means ($\bar{x}$) of the School with Good Result and Poor Result

To test the fifth objectives & 11th hypothesis significance test of means (of the predictor variables) between the good schools and poor schools is done by t-test. Means ($\bar{x}$) of each predictor variables are calculated and t-tests are done. Two top schools (i.e best & the second best) and two schools with poor result (bottom and second from the bottom) are taken for this purpose. To get the answer, the contribution of the schools in academic achievement of the students, a qualitative analysis is needed with this quantitative analysis. So a qualitative analysis is also done after the quantitative analysis. Qualitative analysis is done by comparing these top two & bottom two schools.

3.9.0 LIMITATIONS OF THE STUDY

The limitations of the present study are as follows:

i) The present study is confined to a sample of the pupils studying in grade one to grade five in different schools of Dhaka City of Bangladesh.

ii) Only two types of schools; (i) Bengali medium government schools and (ii) Bengali medium non-government schools were taken for the study. It means the other type of schools, the English medium non-government schools were not included in the study.

iii) Only Bengali medium schools & those schools who follow the national based curriculum were taken for this study.

iv) Standardized tests on Bengali, English, Mathematics and Environmental Studies (Science) were considered as a measure of academic achievement.

3.10.0 CONCLUSION

The detailed plans and procedure followed for this investigation are discussed in this chapter. The objectives are set and hypotheses are made for this study will be verified in the next chapter.

For quantitative analysis a detail of techniques of analysis is presented in chapter 4.

For qualitative analysis a detail of techniques of analysis is presented in chapter 5.