CHAPTER IV
ANALYSIS AND INTERPRETATION OF DATA

4.1 INTRODUCTION

"Statistical methods render two invaluable services. The first is that of enabling us to organise, classify and summarise data so that they can be more rapidly comprehended and interpreted. The second service is that of enabling us to draw conclusions, to a stable degree of exactness about the probable nature of objects and events upon less complicated evidence".1

The aim of this chapter is to present the results of the study. This chapter presents the results of the different measures obtained from data collection. In order to systematize the presentation, the results are presented in three sections.

Section - I describes the measures connected with Teachers' classroom Behaviour.

Section - II describes the measures connected with Pupil variables, viz., personality factors, intelligence, academic achievement and creativity. Differential and correlational studies were also attempted with respect to these variables.

Section-III describes the relationship of Teacher behaviour with pupil creativity. Here again, correlational studies were attempted with respect to teacher and pupil variables. Multiple Regression Analyses were also carried out.

4.2 SECTION I

This section includes the results of the statistical analysis of the measurements on Teachers' Behaviour.

ANALYSIS AND INTERPRETATION OF TEACHERS' CLASSROOM BEHAVIOUR

While it is perfectly possible as well as desirable to attempt a detailed interpretation from individual matrices which will throw light on the classroom behaviour of different teachers who were observed, the investigator confines the discussions and interpretations to the 'Master Matrices', computed from the individual matrices separately for Aided, Government, Corporation and special school teachers.

4.2.1. TABULATION AND METHOD OF ANALYSIS OF THE MASTER MATRIX

From the observation records, sixty 17x17 individual matrices were prepared. Twentytwo matrices of those teachers working in Aided schools were combined into one what is known as 'Master Matrix'. In the sameway, Master Matrices were prepared by combining sixteen matrices of teachers working in Government Schools, fourteen matrices of teachers working in Municipal Corporation Schools and eight matrices of teachers working in special schools, viz., Kendriya Vidyalaya, Anglo-
Indian and Matriculation Schools. Thus master matrices for Aided, Government, Corporation and Special school teachers were prepared. The investigator studied each Master Matrix in four phases as follows:

i) Area Analysis

ii) Cell Analysis

iii) Graphical Analysis

iv) Flow of Communications.

4.2.1.1 AREA ANALYSIS

The interaction can be described more specifically in terms of certain areas of the matrix. The important areas are as follows:

(i) "Content Cross" is the area enclosed by the rows and columns 4 and 5. The tallies of this area represent teacher statements consisting of primarily lecture, teacher statements of opinion and teacher question about information, etc.,

(ii) The diagonal area of the matrix is known as 'steady state cells'. Only when the teacher behaviour remains in a single category longer than three seconds, will there be tallies in these cells. The other cells are called 'Transitional cells'.

(iii) They are enclosed by the nine cells of the columns and rows of categories 2 and 3 and is known as Area 'E'. It indicates the continued use of acceptance and praise and transitions among these categories while the teacher is talking. The 3-3 cell in this block indicates extended teacher acceptance and clarification of student ideas.
(iv) Area 'F' is a block of four cells that indicates the continued use of directions and criticism and transitions between these two categories. The two transition cells are particularly reliable indicators of discipline problems. Shifting from directions to criticism is tabled in the 6-7 cell and indicates that expected compliance is judged unsatisfactorily by the teacher. Shifting from criticism back to directions, the 7-6 cell indicates a return to more directions after criticism.

(v) The area enclosed by the rows and columns 8,9 and 16 is known as 'Pupil Talk'.

(vi) Column 17 represents silence or confusion.

4.2.1.2. CELL ANALYSIS

A careful examination of certain important cells enable us to identify the behaviour pattern of the teacher. The following cells are of particular interest.

(i) (4-8) Question - Answer
(ii) (5-5) Extended Teacher Talk
(iii) (5-4) Teacher Talk followed by Questioning
(iv) (5-12) Talk followed by Blackboard work
(v) (8-8) Extended student's response
(vi) (8-5) and (8-14) student's response followed by teacher talk and help
(vii) (12-12) Extended Blackboard work
(viii) (15-15) Extended Class Work
(ix) (5-15) Teacher Talk followed by student work
(x) (10-5) Reading the text followed by lecturing
4.2.1.3 GRAPHICAL ANALYSIS

The following skills of teaching are represented in the form of 'Bar Diagrams'. They are as follows:

i) Skill of Questioning: This constitutes the percentage of tallies in the row and column 4.

ii) Skill of Lecturing: This accounts for the percentage of tallies in the row and column 5.

iii) Skill of reinforcement: This accounts for the total percentage of tallies in the rows and columns 1 to 3.

iv) Skill of Increasing pupil participation: The total percentage of tallies in the rows and columns of 8, 9, 15 and 16 are taken into consideration.

v) Skill of using blackboard: The total percentage of tallies in rows and columns 12 and 13 are taken into consideration.

4.2.1.4. Flow of Communication (CLOCKWISE FLOW DIAGRAM)

The flow of communication will help to see the critical teaching behaviour. Care was taken to study the relative loads in different cells.

The highest frequency cell is the starting point of the flow diagram, since it is the sequence pair which occurs most often. The cell is circled around so that the cell has double lines around it. This
marked cell will be the starting point for constructing the flow of events.

Most often the cell with the highest frequency will be the (5.5) cell. However it is possible for another cell to have the highest frequency and become the starting point.

Once the starting point is located, the next step is to locate the event which is most likely to follow. This is done by inspecting the row which is designated by location number in the address of the starting cell. The unmarked cell with the highest frequency in this row is located. This cell is circled and a little looping arrow is drawn from that cell.

The next step is to find out the event which is most likely to follow that transition. To do this, we have to look in the row designated by the second number in the address of the cell just marked. The highest frequency cell in that row will be chosen and circled or squared. An arrow is drawn from the previous cell to connect the cell recently selected. This procedure is continued until all possible routes have been traced and the corresponding arrows have been drawn. The routes are combined by using a single arrow wherever possible.

There are two ground rules about this procedure. First, some minimum number which is the lowest cell frequency that will be marked should be chosen. Second all cells with this frequency or higher must have entry and exit arrows. Sometimes, the loop we are working on, becomes completed without including all the above minimum cells. Should this happen, simply we have to look for the highest unmarked cell and
use it to start a new loop using the procedure. We have to keep tracing loops until all cells to be marked have one entry and one exit.

The arrows help to clarify sequence and make the matrix display more understandable. Thus, most of the interaction is illustrated by the arrows.

Each of the four master matrices of Aided, Government, Corporation and special school teachers were interpreted, in the light of the method of analysis cited above, in the following pages.

4.2.2 Analysis of the Master Matrix of Aided School Teachers

The master matrix combining the observations made in twenty-two classes of teachers working in Aided Schools is presented in the Table 4.1. The following findings are brought out from this master matrix.

4.2.2.1 Area Analysis

i) 35.85 percent of the total tallies occur in the content cross area. This shows that the teacher talk or lecturing is more concerned with content.

ii) 59.72 percent of the total tallies occur in the diagonal or steady state cells. This indicates poor flexibility in interaction.

iii) Extended indirect influence is 9 percent. This shows that at least some importance is given to the skills of
reinforcement in the class.

iv) 3.15 percent of the total tallies occur in Area 'F', which indicates the continued use of directions and criticisms and transitions between the two categories of 6 and 7.

v) Pupil talk covers 26.61 percent of the total tallies. This shows that teachers allow their pupils to respond and initiate adequately.

vi) Silence of confusion accounts for 0.25 percent of the total tallies. From this, it is clear that there is active interaction between the teacher and the taught and pupils remain silent only for short periods of time in the classroom.

4.2.2.2 Cell Analysis

i) (4-8) cell representing the pupil's response to the teacher's questions accounts for 4.24 percent of the total tallies. This indicates the scanty occurrence of this particular behaviour.

ii) (5-5) Extended Teacher Talk is 18.69 percent of the total time. This states that the teachers do not spend more time in lecturing.

iii) (5-4) Talk followed by question is 1.95 percent of the total time. This must be higher in a democratic classroom.

iv) (5-12) Talk followed by blackboard work, occurs 2.85 percent of the total time. This shows that the Aided school teachers' using the blackboard is not adequate.
v) (8-8) Extended students' response is 10.02 percent of the total tallies. This makes it clear that there is flexible interaction in the classroom.

vi) (8-5) (8-14) student's response followed by teacher talk and help from the teacher is 0.17 percent of the total time. This must be higher, for it enables more pupil participation in the interaction.

vii) (12-12) Extended blackboard work is 2.78 percent of the total time. This shows that teachers should give more importance to the blackboard work.

viii) (15-15) Extended class work accounts for 1.22 percent of the total time. This clearly shows that the pupils remain passive in the class, as though the classroom is the monopoly of the teacher concerned.

ix) (5-15) Teacher talk followed by Pupil's work is found to be 0.29 percent of the total time. This shows that the amount of notes taken by pupils is not sufficient.

x) (10-5) Reading the text followed by lecturing accounts for 0.07 percent of the total time. The low percentage implies that there is no consistency in the matter of reading the text followed by lecturing.

4.2.2.3 Graphical Analysis

The following skills of teaching are represented in the form of bar-chart diagrams which are given in Graph 1.
The following findings emerge from the bar-chart diagram:

i) Skill of questioning accounts for 9.96 percent of the total time. If this is still higher, more number of pupils will partake actively in the classroom discussions.

ii) Skill of lecturing accounts for 25.89 percent of the total time. This must be brought down for the benefit of pupils.

iii) Skill of reinforcement accounts for 13.56 percent of the total time. This shows that teachers accept, praise and encourage the feelings and activities of pupils.

iv) Skill of using pupils' participation comes to 28.76 percent of the total time. This indicates active pupil participation in the classroom interaction.

v) Skill of using the black board is 7 percent of the total time. The skill appears to be better in the Aided Schools than in the other types of schools.

4.2.2.4 Flow of Communication (Clockwise flow Diagram)

The flow chart diagram is given in the opposite page (Figure No.2).

The flow diagram helps to see the critical teaching behaviour. The flow diagram was drawn with reference to the tabulated master matrix (in percentage). Care was taken to study the relative loads in different cells. In this diagram (5-5) cell is the highest frequency cell and so becomes the starting point. An attempt was made to reconstruct the
interaction in the form of flow. This flow diagram illustrates the critical teaching behaviour of teachers of Aided Schools.

4.2.3. Analysis and Interpretations of the Master Matrix of Government School Teachers

The master matrix, combining the observations made in the sixteen classes of teachers working in Government Schools, is presented in Table 4:2. The following findings emerge from this master matrix.

4.2.3.1 Area Analysis

i) 72.96 percent of the total time is spent on the content area. This reflects that the teacher talk or lecturing is more concerned with the content.

ii) 85.38 percent of the total tallies occur in the diagonal or steady state cells. This indicates the poor flexibility in interaction.

iii) Extended indirect influence is 0.80 percent. This shows that there is practically no importance given to the skill of reinforcement in the class.

iv) 1.45 percent of the total time is spent on area 'F', which indicates the continued use of directions and criticisms and transition between the two categories 6 and 7.

v) Pupil talk covers only 3.53 percent of the total tallies. This shows the inadequacy of pupil response.

vi) Silence or confusion accounts for 1.1 percent of the total
It is evident that pupils of Government schools remain silent for longer durations.

### 4.2.3.2 Cell Analysis

i) (4-8) Cell representing the pupils' response to the teachers' questions accounts for 0.7 percent of the total time. This must be made higher so that there will be more interaction between the teachers and pupils.

ii) (5-5) Extended Teacher Talk is 63.22 percent of the total time. This indicates that lecturing occurs most of the time during teaching.

iii) (5-4) Teacher Talk followed by question is 0.39 percent of the total time. This must be higher in a dynamic classroom.

iv) (5-12) Teacher Talk followed by blackboard work occurs 0.44 percent of the total time. This shows that Government School teachers poorly use the blackboard.

v) (8-8) Extended Student's Response is 1.14 percent of the total time. This must be higher for flexible interaction in the classroom.

vi) (8-5) and (8-14) Student's response followed by teacher talk and help from the teacher is 0.21 percent of the total time. This should be made higher since it facilitates more pupil participation in the interaction.

vii) (12-12) Extended blackboard work is 2.95 percent of the total time. This clearly shows that the teachers of Government
Schools do not give much importance to the blackboard work.

vii) (15-15) Extended classwork accounts for 0.05 percent of the total time. This reveals that the pupils remain passive in the classroom. The teachers of Government schools monopolize the classrooms.

ix) (5-15) Teacher Talk followed by pupils' work accounts for 0.44 percent of the total time. This indicates that the occurrence of this particular behaviour is not sufficient.

x) (10-5) Reading the text followed by lecturing accounts for 3.03 percent of the total time. This reveals that the Government School teachers either read the text continuously or lecture the content matter continuously.

4.2.3.3 Graphical Analysis

The following skills of teaching are represented in the form of bar-chart diagrams which are given in Graph 2.

The following findings emerge from bar-chart diagrams:

i) Skill of questioning accounts for 4.38 percent of the total time. This must be increased to enable more pupil participation in the classroom discussions.

ii) Skill of lecturing accounts for 68.48 percent of the total time. This must be brought down since it will result in more indirect behaviour of teachers.

iii) Skill of reinforcement accounts for 1.87 percent of the total
time. This is very low and hence should be increased. This entails in free self-expression by pupils.

iv) Skill of using pupils' participation comes to 4.04 percent of the total time. This skill is meagre while compared to the other types of schools.

v) Skill of using blackboard is found to be only 3.67 percent of the total time. This must be higher for promoting more of non-verbal behaviour.

4.2.3.4 Flow of Communication (Clockwise Flow Diagram)

The flow diagram (figure No.3) is given in the opposite page. The flow of communication helps to see the critical teaching behaviour. The flow diagram was drawn with reference to the tabulated master matrix (in percentage), care was taken to study the relative loads in different cells. In this diagram (5-5) cell is the highest frequency cell and so becomes the starting point. An attempt was made to reconstruct the interaction in the form of a flow. This flow diagram illustrates the critical teaching behaviour of the Government School teachers.

4.2.4 Analysis and Interpretations of the Master Matrix of Corporation School Teachers

The master matrix, combining the observations made in fourteen classes of teachers working in Corporation Schools, is presented in the Table 4.3. The following findings emerge from this master matrix.

4.2.4.1 Area Analysis

i) 68.94 percent of the totals occur in the content cross
of the matrix. This shows that the teacher talk or lecturing is more concerned with content.

ii) 80.35 percent of the total tallies occur in the diagonal or steady state cells. This indicates poor flexibility in interaction.

iii) 2.55 percent of the total tallies occur in Area 'E'. This points to the very little importance given to the skill of reinforcement in the class.

iv) 1.31 percent of the total tallies occur in area 'F' of the matrix. This shows the continued use of directions and criticisms and transition between the two categories.

v) Pupil talk covers 5.88 percent of the total time. This shows that pupil talk in the classrooms of Corporation School teachers is better than that found in the classes of Government school teachers.

vi) Silence or confusion accounts for 1.26 percent of the total time. It is found that pupils of corporation schools spend their time either in silence or confusion for longer durations.

4.2.4.2 Cell Analysis

i) (4-8) Cell representing pupil's response preceded by teacher's question accounts for 1.41 percent of the total time. The occurrence of this behaviour is very meagre.

ii) (5-5) Extended Teacher Talk accounts for 57.83 percent of the total time. This proves that lecturing is the only event which occurs most often in the classes of teachers of Corpora-
iii) (5-4) Teacher talk followed by questioning accounts for 1.30 percent of the total time. This must be higher for free interaction.

iv) (5-12) Teacher Talk followed by blackboard work occurs 0.78 percent of the total time. To promote non-verbal behaviour, this should be increased.

v) (8-8) Extended student's response is 1.21 percent of the total time. This must be higher for flexible interaction in the classroom.

vi) (8-5) and (8-14) student's response followed by teacher talk and teacher help is 0.62 percent of the total time. This must be increased for free self expression of pupils.

vii) (12-12) Extended blackboard work is 1.21 percent of the total time. This shows that the Corporation School Teachers are unaware of the importance of blackboard work.

viii) (15-15) Extended class work by the pupils accounts for 0.34 percent of the total time. This seems to be very low and it must be made higher for more pupil participation during the classroom interaction.

ix) (5-15) teacher talk followed by pupil's work accounts for 0.34 percent of the total time. This indicates the slackness of pupils to work in the classrooms of corporation schools.

x) (10-5) Reading the text followed by lecturing accounts for
2.48 percent of the total time. This shows the teachers of Corporation schools either read or lecture continuously.

4.2.4.3 Graphical Analysis

From the bar-chart diagram given in the Graph 3, the following findings are brought forth:

i) Skill of questioning accounts for 4.91 percent of the total time. This shows that the skill of questioning is very low in Corporation Schools.

ii) Skill of lecturing accounts for 64.03 percent of the total time. This is very high and must be brought down.

iii) Skill of reinforcement accounts for 4.11 percent of the total time. This must be higher to facilitate active participation in the classroom interaction.

iv) Skill of using pupil's participation comes to 6.80 percent of the total time. This indicates the inadequacy of pupil participation during the interaction.

v) Skill of using blackboard is 2.04 percent of the total time. This should be made higher.

4.2.4. Flow of Communication (Evinced from Clockwise Flow Diagram)

The flow diagram (figure No.4) is given in the opposite page. It helps to see the critical teaching behaviour. The flow diagram was drawn with reference to the tabulated master matrix (in percentage). Care was taken to study the relative loads in different cells. In this
diagram, (5-5) cell is the highest frequency cell and so becomes the starting point. An attempt was made to reconstruct the interaction in the form of a flow. This flow diagram illustrates the critical teaching behaviour of the corporation school teachers.

4.2.5. Analysis and Interpretation of the Master Matrix of Special School Teachers

The master matrix, combining the observations made in eight classes of Teachers of special schools, is presented in Table 4.4. The following findings emerge from the master matrix.

4.2.5.1 Area Analysis

i) 23.95 percent of the total tallies occur in the content cross area. This reveals that the teachers give more importance to the content area.

ii) 65.85 percent of the total tallies occur in the steady state cells. This shows poor flexibility in interaction.

iii) Extended indirect influence Area 'E' covers 10.25 percent of the total tallies. This clearly shows that much importance is given to the skill of reinforcement in the classroom of special schools.

iv) 1.6 percent of the total tallies occur in Area 'F' which indicates the continued use of directions and criticisms and transitions between the two categories of 6 and 7.

v) Pupils' talk covers 38.7 percent of the total time. This shows that pupil talk in the special schools is very high when
compared to the pupils of other schools (Aided, Government and Corporation)

vi) Silence or confusion accounts for 0.55 percent of the total time. This indicates that the time spent by pupils of special schools in silence or confusion is very low.

4.2.5.2 Cell Analysis

i) (4-8) cell representing pupils' response to the teachers' question accounts for 1.35 percent of the total time. To attract active pupil participation in the interaction, this must be made higher.

ii) (5-5) Extended Teacher Talk is 12.4 percent of the total time. This proves that teachers of special schools do not lecture for long durations.

iii) (5-4) Teacher Talk followed by questioning is 0.07 percent of the total time. This must be increased to stimulate pupils to partake actively in the classroom discussions.

iv) (5-12) Teacher Talk followed by blackboard work is found to be 1.5 percent of the total time. This shows that the special schools teachers' using the blackboard is not adequate.

v) (8-8) Extended students' Response occurs 12.45 percent of the total time. This is much better than the pupil response found in other types of schools.

vi) (8-5) and (8-14) Students' Response followed by the teacher talk and teacher help accounts for 0.45 percent of the total time. This must be made higher for enabling pupils to be open-minded
in their classroom discussions.

vii) (12-12) Extended blackboard work is 1.7 percent of the total time. This shows that teachers must attach more importance to the blackboard work.

viii) (15-15) Extended class work by the pupils is Zero percent. This shows that these pupils practically do no serious work in the classrooms while compared to their counterparts studying in other types of schools.

ix) (5-15) teacher Talk followed by pupils' work is also found to be zero. It is clear that the pupils of special schools respond more orally during the interaction, than sticking on to writing work.

x) (10-15) Reading the text followed by lecturing is 0.15 percent of the total time. This shows that teachers of special schools very often shift from reading the text and lecturing, to concentrate more on pupil talk and pupil initiation.

4.2.5.3 Graphical Analysis

From the bar-chart diagram given in the Graph 4, the following findings emerge.

i) Skill of questioning accounts for 6.55 percent of the total time. This must be increased as it helps to measure the comprehensive ability of pupils.

ii) Skill of lecturing accounts for 17.4 percent of the total time. It is found that teachers of special schools do not tend to lecture
continuously.

iii) Skill of reinforcement accounts for 17.3% of the total time. This shows that the encouragement given to the pupils of special schools is satisfactory.

iv) Skill of using pupils' participation accounts for 39.1 percent of the total time. This indicates the adequacy of pupil participation during the interaction.

v) Skill of using the backboard accounts for 3.1 percent of the total time. This should be made higher.

4.2.5.4 Flow of Communication (Clock-wise Flow Diagram)

The flow diagram (figure No.5) is given in the opposite page. It helps to see the critical teaching behaviour. The flow diagram was drawn with reference to the tabulated master matrix (in percentage). Care was taken to study the relative loads in different cells. In this diagram, (9-9) cell is the highest frequency cell and so becomes the starting point. An attempt was made to reconstruct the interaction in the form of a flow. This flow diagram illustrates the critical teaching behaviour of the special school teachers.

4.2.6. Definition and method of calculations of different ratios representing different communication patterns of teachers:

Knowledge of how much the teacher or the pupils talked becomes much more useful when it is combined with some index or quality. Simple ratios can be calculated which provide such informations in terms of teacher initiative, teacher response and pupil initiation.
We normally expect reciprocal relationships between teacher statements and pupil statements. That is, the more the teacher takes the initiative, the more likely the pupils are to respond. The more the teacher responds, the more likely it is that pupils will make statements which show initiative.

It is being proposed that a more ceremonious way to conceptualise the aspect of classroom interaction is to use the same concepts - initiation and response to describe both teacher and pupil talk.

The ratios are proposed for making quick comparisons of the balance between initiative and response.

i) **Content Cross Ratio (CCR)**:

This represents the percentage of teacher statements consisting primarily of lecture, statements of opinion and teacher question about information, etc. This can be calculated by the percentage of all tallies that lie within the column and rows of categories 4 and 5.

\[
CCR = \frac{4 + 5}{\text{Total tallies}} \times 100
\]

ii) **Steady State Ratio (SSR)**:

The diagonal area of the matrix is known as 'Steady State Cells'. Only when the behaviour remains in a single category longer than three seconds, there will be tallies in these cells. The percentage of those tallies to the total tallies in the matrix is known as steady state Ratio.
This can be calculated by the following formula:

\[
SSR = \frac{\text{Total Number of tallies that lie within the Steady State Cells}}{\text{Total number of tallies in the Matrix}} \times 100
\]

The Steady State Ratio reflects the tendency of teacher and pupil talk to remain in the same category for periods longer than three seconds. The higher this ratio, the less rapid is the interchange between the teacher and the pupils on the average.

**iii) Pupil Steady State Ratio (PSSR):**

It is an even more sensitive index to the rapidity of the teacher-pupil interchange when pupil talk is average or above average. This can be calculated by the following formula:

\[
PSSR = \frac{\text{All the tallies that lie in the cells (8-8) + (9-9) + (11-11) + (13-13) + (15 - 15) + (16-16)}}{\text{All tallies that lie in the columns 8, 9, 11, 13, 15 & 16}} \times 100
\]

**iv) Extended Indirect Influence Ratio:**

It is defined as actions taken by the teacher which encourage and support student participation. Accepting, clarifying, praising and developing the ideas and feelings expressed by the pupils will support student participation. It is calculated by the percentage of all the tallies that lie within the columns and rows of categories 1, 2 and 3.
Extended Indirect Influence Ratio = \( \frac{\text{Total tallies that lie in the columns of 1, 2 & 3}}{\text{Total tallies in the Matrix}} \times 100 \)

v) Extended Direct Influence Ratio :

It refers to actions taken by the teacher which restrict students' participation. Giving directions and criticizing with expectation of compliance tend to restrict pupil participation. This can be calculated by the following formula.

Extended Direct Influence Ratio = \( \frac{\text{All the tallies that lie in cells (6-6), (6-7), (7-6) & (7-7)}}{\text{Total tallies in the Matrix}} \times 100 \)

vi) Teacher Pupil Ratio (T/P) :

It indicates the amount of teacher participation as compared with the amount of pupil participation. If the ratio is greater than one, it shows that the teacher is dominating over the class. It can be calculated by the following formula :-

\[
T/P = \frac{\text{All the tallies in the rows and columns of the categories of 1,2,3,4,5,6,7,10,12}}{\text{& 14}}
\]

\[
\text{All the tallies in the rows and columns of the categories of 8,9,11,13,15 & 16}
\]

vii) Indirect Influence to Direct Influence Ratio (I/D) :

Indirect influence is defined as actions taken by the teacher which encourage and support pupil participation. Accepting, clarifying, praising and developing the ideas and feelings expressed by the pupils
will support pupil participation. Indirect behaviour can operationally be defined by noting the percent of teacher statements falling into categories 1, 2, 3 & 4.

Direct Influence refers to the actions taken by the teacher which restrict students' participation. Expressing one's own views through lecture, giving directions and criticising with the expectation of compliance tend to restrict pupil participation.

Direct Influence can be operationally defined by noting the percent of teacher statement, falling in categories 5, 6 and 7. This ratio can be calculated from the following formula:

\[
\text{I/D} = \frac{\text{The sum of tallies in the rows and columns of categories 1, 2, 3 and 4}}{\text{The sum of tallies in the rows and columns of categories 5, 6, 7, 12, and 14}}
\]

viii) Indirect Influence to Direct Influence Ratio (Non-verbal) (i/d):

It is the ratio of Indirect to Direct Teacher Influence (Non-verbal). This can be calculated from the following formula:

\[
i/d = \frac{\text{All the tallies in the columns and rows of categories 1, 2 and 3}}{\text{All the tallies in the columns and rows of categories 6 and 7}}
\]

ix) Teacher Talk Ratio (TTR):

It is defined as an index representing the tendency of the teacher to talk in the class. It can be calculated from the following formula:
x) Teacher Question Ratio (TQR):

It is defined as an index representing the tendency of the teacher to ask questions when guiding the more content part of the classroom discussion. The TQR is the percent of the sum of tallies that lie in the column and row of category 4 to the total tallies that lie in columns and rows of categories 4 and 5. This can be calculated from the following formula:

\[ TQR = \frac{\text{The sum of tallies that lie in the column and row of category 4}}{\text{The sum of tallies that lie in the columns and rows of categories 4 and 5}} \times 100 \]

xii) Teacher Response Ratio (TRR):

It is defined as an index which corresponds to the teacher's tendency to react to the ideas and feelings of the pupils. The formula is so designed that the index will be a percent figure never higher than hundred and never less than zero. It can be calculated from the following formula:

\[ TRR = \frac{\text{All tallies that lie in rows and columns of categories 1,2 and 3}}{\text{All tallies that lie in rows and columns of categories 1,2,3,6 and 7}} \times 100 \]
xii) Instantaneous Teacher Question Ratio (TQR 89):

It is defined as the tendency of the teacher to respond to pupil talk with questions based on his own ideas, compared to his tendency to lecture. This can be calculated from the following formula:

\[
TQR_{89} = \frac{\text{All tallies in cells (8-4), (9-4)}}{\text{Total tallies in cells (8-4), (8-5), (9-4) and (9-5)}} \times 100
\]

xiii) Instantaneous Teacher Response Ratio (TRR 89):

It is defined as the tendency of the teacher to praise, or integrate pupils' ideas and feelings into the class discussion at the moment the pupils stop talking. The TRR 89 can be calculated from the following formula:

\[
TRR_{89} = \frac{\text{Cell frequencies in rows 8 and 9, columns 1, 2 and 3}}{\text{Total tallies in the cells of rows 8 and 9}} \times 100
\]

xiv) Pupil Talk Ratio (PTR):

It is defined as an index representing the tendency of the pupils to talk either by responding to the teacher's question or by initiating the talk by himself. Mass answering by the pupils is also taken as pupil talk. It can be calculated from the following formula:

\[
PTR = \frac{\text{All the tallies in the rows and columns of categories 8, 9 & 16}}{\text{Total tallies in the Matrix}} \times 100
\]
xv) Pupil initiation Ratio (PIR) :

It is proposed to indicate what portion of pupil talk is judged by the observer to be an act of initiation. It can be calculated from the following formula:

\[
\text{PIR} = \frac{\text{All the tallies that lie in the row and column of category 9}}{\text{All the tallies that lie in the rows and columns of categories 8, 9 & 16.}} \times 100
\]

xvi) Silence Ratio :

It is defined as an index representing the amount of silence or confusion prevailing in the classroom during discussion. Very rarely there are moments of confusion in our classes. So, this index may exclusively be taken as the amount of silence prevailing in the class. The moments of silence in the classroom may be due to the inability of the pupil to respond to the teacher or lack of initiation on the part of pupils or hardships in following the content area of the discussion.

It is the percent of tallies that lie within the column and row of category 17. This can be calculated from the following formula:

\[
\text{Silence Ratio} = \frac{\text{All the tallies that lie within the row and column of category 17}}{\text{Total number of tallies in the matrix.}} \times 100
\]
xvii) Classroom Control Index:

It is defined as an index representing the tendency of the pupils either to respond to the teacher by mass answering or to create moments of confusion during classroom discussion so that no communication can be recognised. Normally in our classrooms the moments of confusions are very rare. The moments of silence are also very meagre in our class rooms. So, this index may wholly represent the tendency of the pupils to respond to the teacher by mass answering. This index can be calculated from the following formula:

\[
\text{Classroom control Index} = \frac{\text{All tallies that lie in the rows and columns of categories 16 & 17}}{\text{Total number of tallies in the Matrix}} \times 100
\]

The researcher calculated the scores of all above said ratios for each of the sixty teachers who comprise the sample, using their individual matrices. The scores of these ratios of the respective teachers are given in the Appendix 9. Most of these ratios were taken into account for further analyses which are given in the succeeding sections.

4.2.7 Analysis and Interpretations of the Ratios Representing Different Communication Patterns

The following findings emerge from the values found in Appendix 9.

i) The mean score of CCR was found to be 50.99 with the standard deviation of 18.29. The scores found to be ranging
from 20.90 to 76.31. It is found that most of the teachers are more concerned with the content-oriented part of the classroom discussion.

ii) The mean score of SSR is found to be 72.05 with the standard deviation of 30.64. Most of the teachers score above 70 with regard to SSR and hence it is concluded that the interaction patterns are not flexible.

iii) The mean of PSSR is found to be 57.11 with the standard deviation of 14.2. Here again it is concluded that the interaction patterns are not flexible.

iv) The mean score of Extended Indirect Influence Ratio is 8.53 with the standard deviation of 7.62. This shows that teachers generally are not supportive of encouraging pupils' participation in the classroom discussions.

v) The mean score of the Extended Direct Influence ratio is found to be 2.16, with the standard deviation of 1.32. Hence, it is concluded that the teachers are not more inclined in their tendency to direct or criticize the pupils.

vi) The mean score of the T/P ratio is found to be 8.95 with the standard deviation of 10.14. Most of the teachers are found to be scoring more than one in this ratio. It is obvious that most of the teachers are dominating over their pupils in their classrooms.

vii) The mean score of I/D is found to be 0.53 with the standard deviation of 0.67. Almost all the teachers score less than
one in this ratio. Hence, it is concluded that almost all the teachers are direct in their influence patterns.

vii) The mean score of i/d is found to be 3.03 with the standard deviation of 4.65, from which it is clear that teachers are more indirect in their non-verbal interaction with pupils.

ix) The mean score of TTR is found to be 68.38 with the standard deviation of 11.21. It is also seen that most of the teachers score more than 60 with respect to this ratio, which is proof of the fact that almost all the teachers are talking more than 60 percent of the time during the classroom discussions.

x) The mean score of TQR is found to be 19.80 with the standard deviation of 14.26, from which it is understood that teachers engage themselves in questioning their pupils for longer durations.

xi) The mean score of TRR is found to be 57.70 with the standard deviation of 24.12. It is concluded that the teachers are more eager to receive responses from their pupils.

xii) The mean scores of TQR 89 and TRR 89 found to be 45.80 and 175.66 with the standard deviations of 26.82 and 45.70 respectively. These scores are found to be adequate.

xiii) The mean scores of PTR and PIR are found to be 16.62 and 13.15, with the standard deviations of 12.36 and 16.76 respectively. It is evident that the encouragement, shown to pupils to partake more in the classroom discussions, is not satisfactory.
xiv) The mean score of SR is found to be 0.95 with the standard deviation of 3.51 from which it is inferred that pupils do not remain silent for longer durations.

xv) The mean score of classroom control Index is found to be 4.72 with the standard deviation of 3.58. Hence it is concluded that mass answering by the pupils is not more in many of the classes.

4.2.8 Differential studies between different grouping of teachers with regard to different communication patterns:

One of the main objectives of the study is to find whether the communication patterns of the teachers differ among factors related to the teachers’ sex, nature of management and location of schools. To find the significance of difference between the mean scores of the most important ratios representing different communication patterns of these grouping of teachers, the investigator applied 'F' tests and 't' tests. The results are given in the succeeding sections.

4.2.8.1 Comparison between teachers of different groups with regard to different communication patterns:

The teacher sample comprises sixty post-graduate English teachers working under different managements. Of them eight teachers belonged to Aided Girls' Schools, six teachers to Aided Boys' Schools, eight teachers to Aided co-education Schools, six teachers to Municipal Corporation Girls' Schools, eight teachers to corporation Boys' Schools, four teachers to Government Girls' Schools, two teachers to Government Boys' Schools, ten teachers to Government co-education schools, four
teachers to Central Board of Secondary Education schools (CBSE), two teachers to Matriculation Schools and two other to Anglo-Indian Schools. To find the significance of difference between the means of those ratios with regard to different groups of teachers, the investigator applied 'F' tests. The results are given in the following tables.

**TABLE 4:5** Analysis of Variance between different groups of teachers with regard to T/P

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>sums of Squares</th>
<th>Mean square variance</th>
<th>F&lt;sub&gt;o&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among the Means of Groups</td>
<td>10</td>
<td>3714.95</td>
<td>371.49</td>
<td>7.39</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Significant at 0.01 level</td>
</tr>
<tr>
<td>Within the Groups</td>
<td>49</td>
<td>2461.53</td>
<td>50.24</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>6176.48</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the preceding table, it is clear that T/P differs significantly between teachers of different groups. Hence it is concluded that the tendency of the teachers to dominate in the classrooms do differ between different groups of teachers.
Table 4.6 Analysis of variance between different groups of teachers with regard to I/D

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Sums of squares</th>
<th>Mean square variance</th>
<th>Fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among the means of</td>
<td>10</td>
<td>10.21</td>
<td>1.021</td>
<td>2.49</td>
</tr>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
<td>Not</td>
</tr>
<tr>
<td>Within the Groups</td>
<td>49</td>
<td>19.984</td>
<td>0.41</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Significant</td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>30.194</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the preceding table it is clear that the I/D ratio does not differ between different groups of teachers.

Hence, it is concluded that teachers' tendency to encourage and support pupils' participation in the teaching learning process, does not differ according to the nature of management of schools, but remains alike.

Table 4.7 Analysis of variance between different groups of teachers with regard to I/D

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Sums of Squares</th>
<th>Mean square Variance</th>
<th>Fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among the means of</td>
<td>10</td>
<td>298.52</td>
<td>29.85</td>
<td>1.48</td>
</tr>
<tr>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
<td>Not</td>
</tr>
<tr>
<td>Within the groups</td>
<td>49</td>
<td>986.54</td>
<td>20.13</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Significant</td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>1285.06</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
From the above table, it is found that there is no significant difference between the means of different groups of teachers belonging to different managements, with regard to i/d.

Hence it is concluded that all teachers are alike in exercising indirect influence (non-verbal) in their classrooms, unmindful of their management.

Table 4.8 Analysis of variance between different groups of teachers with regard to TTR.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Sums of Squares</th>
<th>Mean square</th>
<th>Variance</th>
<th>$F_0$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among the means of Groups</td>
<td>10</td>
<td>6934.58</td>
<td>693.45</td>
<td></td>
<td>47.92</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Significant at 0.01 level</td>
</tr>
<tr>
<td>Within the Groups</td>
<td>49</td>
<td>709.14</td>
<td>14.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>7643.72</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the above table, it is clear that TTR differs significantly between teachers of different groups.

Hence it is inferred that the groups of teachers of various managements are not alike in their tendency to prolong their talk in the classroom (without considering the Pupils' participation in the classroom discussions)
Table 4.9 Analysis of variance between different groups of teachers with regard to TQR

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Sums of Squares</th>
<th>Mean square Variance</th>
<th>F₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among the means of Groups</td>
<td>10</td>
<td>8611.29</td>
<td>861.12</td>
<td>10.88</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Significant at 0.01 level</td>
</tr>
<tr>
<td>Within the groups</td>
<td>49</td>
<td>3877.68</td>
<td>79.13</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>12488.97</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The above table clearly shows that there is significant difference between the means of different groups of teachers with regard to TQR.

Hence, it is concluded that these groups of teachers differ in their tendency to ask questions while guiding the content part of the discussions.

Table 4.10 Analysis of variance between different groups of teachers with regard to PTR.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Sums of squares</th>
<th>Mean square Variance</th>
<th>F₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among the means of Groups</td>
<td>10</td>
<td>7825.48</td>
<td>782.54</td>
<td>13.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Significant at 0.01 level</td>
</tr>
<tr>
<td>Within the Groups</td>
<td>49</td>
<td>2818.86</td>
<td>57.52</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>10644.32</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
From the above table, it is found that PTR differs significantly between different groups of teachers falling under different categories of management.

Hence, it is concluded that different groups of teachers belonging to different managements differ in their tendency to allow for pupils' participation in the teaching-learning process by encouraging them to respond to teachers' questions, initiate the discussions and even give mass answers.

Table 4.11 Analysis of Variance between different groups of teachers with regard to PIR

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Sums of Squares</th>
<th>Mean square variance</th>
<th>Fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among the means of Groups</td>
<td>10</td>
<td>13390.88</td>
<td>1339.08</td>
<td>21.42</td>
</tr>
<tr>
<td>Within the Groups</td>
<td>49</td>
<td>3063.60</td>
<td>62.52</td>
<td></td>
</tr>
</tbody>
</table>

Significant at 0.01 level

Total                      | 59  | 16454.48        |                      |      |

From the above table, it is found that the PIR ratio differs between teachers working in schools, managed by different bodies. Hence it is concluded that these groups of teachers are not alike in their
tendency to allow and encourage the pupils to initiate their ideas in the classroom interaction.

Table 4.12 Analysis of Variance between the means of Teachers working in schools managed by different bodies with regard to TRR.

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Sums of Squares</th>
<th>Mean square Variance</th>
<th>F₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among the means of Groups</td>
<td>10</td>
<td>14280.41</td>
<td>1428.04</td>
<td>3.66</td>
</tr>
<tr>
<td>Within the Groups</td>
<td>49</td>
<td>19118.82</td>
<td>390.18</td>
<td>Significant at 0.01 level</td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>33399.23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The above table indicates the existence of significance of difference between means of different groups of teachers working in schools managed by different bodies with regard to TRR.

Hence, it is inferred that these groups of teachers are not alike in their tendency to respond to the ideas and feelings expressed by the pupils.

4.2.8.2 Comparison between teachers working in schools managed by Government, Corporation, Private bodies and special schools (i.e. Schools under the CBSE, Anglo-Indian and Matriculation Syllabus)

In the sample selected for the study, there are 60 teachers in 30 Higher Secondary Schools in Coimbatore Educational District. Of
them, Sixteen are working in Government Schools, fourteen are working in Municipal Corporation Schools, twenty-two are working in Private Management (Aided) Schools and eight are working in Special Schools. The distribution of the teacher sample according to the management of the schools is shown in Graph 5. The means and standard deviations for different ratios of these four groups of teachers were calculated. To find out the significance of difference between the means of different groups of teachers, the investigator applied 't' tests. The results are given in the succeeding tables.

4.2.8.2.1 Significance of difference between the means of teachers working in Aided and Corporation Schools with regard to different communication patterns

Table 4.13

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Ratios</th>
<th>Aided School Teachers</th>
<th>Corpn.School teachers</th>
<th>'t'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M&lt;sub&gt;1&lt;/sub&gt;</td>
<td>σ&lt;sup&gt;1&lt;/sup&gt;</td>
<td>M&lt;sub&gt;2&lt;/sub&gt;</td>
</tr>
<tr>
<td>1.</td>
<td>I/D</td>
<td>0.86</td>
<td>0.91</td>
<td>0.26</td>
</tr>
<tr>
<td>2.</td>
<td>TQR89</td>
<td>64.41</td>
<td>23.16</td>
<td>33.51</td>
</tr>
<tr>
<td>3.</td>
<td>TQR</td>
<td>31.41</td>
<td>11.86</td>
<td>8.62</td>
</tr>
<tr>
<td>4.</td>
<td>TRR</td>
<td>66.69</td>
<td>16.65</td>
<td>52.11</td>
</tr>
<tr>
<td>5.</td>
<td>T/P</td>
<td>2.43</td>
<td>0.70</td>
<td>15.89</td>
</tr>
<tr>
<td>6.</td>
<td>TTR</td>
<td>57.01</td>
<td>4.65</td>
<td>73.04</td>
</tr>
<tr>
<td>7.</td>
<td>PTR</td>
<td>23.46</td>
<td>6.86</td>
<td>7.54</td>
</tr>
<tr>
<td>8.</td>
<td>PIR</td>
<td>10.94</td>
<td>8.68</td>
<td>4.00</td>
</tr>
<tr>
<td>9.</td>
<td>CCR</td>
<td>39.01</td>
<td>6.01</td>
<td>66.56</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level N<sub>1</sub> = 22 N<sub>2</sub> = 14
From the above table, it is found that there is no significant difference between the means of the teachers working in Aided and corporation schools with regard to the teacher behaviour ratios—TQR, TRR, T/P, TTR, PTR, PIR and CCR. But there is significant difference (at 0.01 level) between the means of these teachers with regard to I/D only. Teachers of Aided Schools scored more on I/D than the teachers of Corporation schools. The means of the scores of certain teacher behaviour ratios of these two groups of teachers are shown in Graph 6.

Hence it is concluded that the Aided school teachers are more indirect in their classroom behaviour, by way of accepting, encouraging and praising the ideas of pupils, than the Corporation School teachers.

But both the categories of teachers are alike in their tendency to respond to pupils with questions based on their own ideas, praise or integrate pupils' ideas and feelings into the class discussion, ask question when guiding the more content part of the classroom discussion, react to the ideas and feelings of the pupils, talk more in the class, dominate over the pupils, allow the pupils to respond and initiate in the class and concentrate more on content part.

4.2.8.2.2 Significance of difference between the means of teachers working in Aided and Government Schools with regard to different communication patterns.
The preceding table shows that there is significant difference (at 0.01 level) between the means of teachers working in Aided and Government Schools with regard to certain Teacher Behaviour ratios, Viz., I/D, TQR 89, TTR and CCR. But there is no significant difference between the means of these teachers with regard to TQR, TRR, T/P, PTR and PIR. The means of the scores of certain teacher behaviour ratios of these two groups of teachers are shown in Graph 7.

Hence it is found that the teachers working in Aided Schools are more indirect in the classroom interaction, soliciting more pupil
participation through constant acceptance, encouraging and praising of the ideas of pupils, than their counterparts of Government Schools. The Aided school teachers are also more keen, in their tendency to respond to pupils with questions based on their own ideas, than Government School teachers.

The Government School teachers talk more in the classroom and also concentrate more on content part than the Aided School teachers. But both the groups of teachers are alike in their attitude to praise pupils' ideas and feelings during classroom discussion, to ask questions when guiding the more content part of the syllabus react to the ideas and feelings of the pupils, dominate over the pupils, and permit the pupils to respond and initiate in the class.

4.2.8.2.3 Significance of difference between the means of teachers working in special and Aided Schools with regard to different communication patterns.

Table 4.15

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Ratios</th>
<th>Special School Teachers</th>
<th>Aided School Teachers</th>
<th>'t'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M₁</td>
<td>σ₁</td>
<td>M₂</td>
</tr>
<tr>
<td>1.</td>
<td>I/D</td>
<td>1.01</td>
<td>0.26</td>
<td>0.86</td>
</tr>
<tr>
<td>2.</td>
<td>TQR89</td>
<td>51.80</td>
<td>9.19</td>
<td>64.41</td>
</tr>
<tr>
<td>3.</td>
<td>TQR</td>
<td>31.58</td>
<td>6.83</td>
<td>31.41</td>
</tr>
<tr>
<td>4.</td>
<td>TRR</td>
<td>80.46</td>
<td>6.55</td>
<td>66.69</td>
</tr>
<tr>
<td>5.</td>
<td>T/P</td>
<td>1.20</td>
<td>0.29</td>
<td>2.43</td>
</tr>
<tr>
<td>6.</td>
<td>TTR</td>
<td>44.44</td>
<td>2.98</td>
<td>57.01</td>
</tr>
<tr>
<td>7.</td>
<td>PTR</td>
<td>36.68</td>
<td>6.89</td>
<td>23.46</td>
</tr>
<tr>
<td>8.</td>
<td>PIR</td>
<td>49.98</td>
<td>11.45</td>
<td>10.90</td>
</tr>
<tr>
<td>9.</td>
<td>CCR</td>
<td>22.03</td>
<td>2.75</td>
<td>39.01</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level
N₁ = 8
N₂ = 22
From the above table, it is found that there is no significant difference between the means of teachers working in special schools and Aided Schools with regard to I/D, TQR 89, TQR, TRR, TTR, PTR, PIR and CCR, while there is a significant difference (at 0.01 level) between the means of these teachers with regard to T/P only. The means of the scores of certain teacher behaviour ratios of these two groups of teachers are shown in Graph 8.

Hence it is concluded that the Aided School Teachers dominate more over the pupils than their counterparts in special schools, as the former has scored more on T/P than the latter.

But both the categories of teachers are similar in their tendency to encourage and praise the feelings and ideas of pupils, respond to pupils with questions based on their own ideas, ask questions when guiding the more content part of the classroom discussion, react to the ideas and feelings of the pupils, talk more in the class, allow the pupils to respond and initiate in the class and concentrate more on content part.

4.2.8.2.4 Significance of difference between the means of teachers working in special and Corporation Schools with regard to different communication patterns:
Table 4.16

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Ratios</th>
<th>Special School Teachers</th>
<th>Corporation School Teachers</th>
<th>t'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M1 σ-1</td>
<td>M2 σ-2</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>I/D</td>
<td>1.01 0.26</td>
<td>0.26 0.34</td>
<td>5.81 **</td>
</tr>
<tr>
<td>2</td>
<td>TQR 89</td>
<td>51.80 9.19</td>
<td>33.51 29.22</td>
<td>2.70 *</td>
</tr>
<tr>
<td>3</td>
<td>TQR</td>
<td>31.58 6.83</td>
<td>8.62 7.11</td>
<td>7.47 **</td>
</tr>
<tr>
<td>4</td>
<td>TRR</td>
<td>80.46 6.55</td>
<td>52.11 30.11</td>
<td>3.38 **</td>
</tr>
<tr>
<td>5</td>
<td>T/P</td>
<td>1.20 0.29</td>
<td>15.89 13.47</td>
<td>4.08 **</td>
</tr>
<tr>
<td>6</td>
<td>TTR</td>
<td>44.44 2.98</td>
<td>73.04 3.75</td>
<td>19.66 **</td>
</tr>
<tr>
<td>7</td>
<td>PTR</td>
<td>36.68 6.89</td>
<td>7.54 4.77</td>
<td>10.63 **</td>
</tr>
<tr>
<td>8</td>
<td>PIR</td>
<td>49.98 11.45</td>
<td>4.00 5.61</td>
<td>10.65 **</td>
</tr>
<tr>
<td>9</td>
<td>CCR</td>
<td>22.03 2.75</td>
<td>66.56 8.57</td>
<td>1.99</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level  \( N_1 = 8 \)  \( N_2 = 14 \)
* Significant at 0.05 level

From the preceding table, it is found that there is a significant difference between the means of teachers working in special and corporation schools with regard to all ratios, except TRR 89 and CCR which are not significant. All other ratios, viz., I/D, TQR, TRR, T/P, TTR, PTR & PIR are significant at 0.01 level, and TQR 89 is significant at 0.05 level. The means of the scores of certain teacher behaviour ratios of these two groups of teachers are shown in Graph 9.

The special school teachers have scored more on I/D,
TQR 89, TQR, TRR, PTR and PIR. The corporation school teachers have gained more scores on T/P and TTR.

Hence, it is concluded that special school teachers possess a tendency to accept, encourage and praise the ideas of pupils unlike their counterparts working in corporation schools. They are more ready to respond to pupils with questions based on their own ideas, ask questions when guiding the more content part of the classroom discussion, react to the ideas and feelings of pupils and allow pupils more freedom to respond and initiate in the classroom discussions, than the teachers of corporation schools.

Teachers working in corporation schools dominate more over their pupils within the classroom and also talk more, thereby curbing the flow of pupil talk.

Both the groups of teachers are alike in integrating pupils' ideas into the class discussion and in concentrating more on the content part.

4.2.8.2.5 Significance of difference between the means of teachers working in special and Government schools with regard to different communication patterns.
Table 4.17

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Ratios</th>
<th>Special School Teachers</th>
<th>Government School Teachers</th>
<th>t'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M₁</td>
<td>σ⁻¹</td>
<td>M₂</td>
</tr>
<tr>
<td>1.</td>
<td>I/D</td>
<td>1.01</td>
<td>0.26</td>
<td>0.09</td>
</tr>
<tr>
<td>2.</td>
<td>TQR89</td>
<td>51.80</td>
<td>9.19</td>
<td>28.17</td>
</tr>
<tr>
<td>3.</td>
<td>TQR</td>
<td>31.58</td>
<td>6.83</td>
<td>7.74</td>
</tr>
<tr>
<td>4.</td>
<td>TRR</td>
<td>80.46</td>
<td>6.55</td>
<td>38.93</td>
</tr>
<tr>
<td>5.</td>
<td>T/P</td>
<td>1.20</td>
<td>0.29</td>
<td>15.73</td>
</tr>
<tr>
<td>6.</td>
<td>TTR</td>
<td>44.44</td>
<td>2.98</td>
<td>73.16</td>
</tr>
<tr>
<td>7.</td>
<td>PTR</td>
<td>36.68</td>
<td>6.89</td>
<td>5.15</td>
</tr>
<tr>
<td>8.</td>
<td>PIR</td>
<td>49.98</td>
<td>11.45</td>
<td>6.94</td>
</tr>
<tr>
<td>9.</td>
<td>CCR</td>
<td>22.03</td>
<td>2.75</td>
<td>68.33</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level  N₁ = 8  N₂ = 16

The table found above points to the fact that there is significant difference (at 0.01 level) between the means of teachers working in Special and Government Schools, with regard to all ratios, viz., I/D, TQR 89, TQR, TRR, T/P, TTR, PTR, PIR and CCR. The means of the scores of certain teacher behaviour ratios of these two groups of teachers are shown in Graph 10.

The special school teachers have scored more on I/D, TQR89, TQR, TTR, PTR and PIR. The teachers of Government schools have scored higher on T/P, TTR and CCR.
Hence it is established that teachers of special schools are having a tendency to accept and encourage pupils' ideas, respond to pupils with questions based on their own ideas, ask questions when guiding the more content part of the classroom discussion, react to the ideas and feelings of pupils and allow the pupils to respond and initiate in the class. And the teachers of Government schools have a tendency to talk more in the class, dominate more over the pupils and concentrate more only on the content part, limiting the freedom of expression of the pupils.

4.2.8.2.6 Comparison between teachers working in rural areas and those working in urban areas with regard to different communication patterns:

In the sample chosen for the present study there are 60 teachers working in 30 Higher Secondary School situated in Rural and urban areas. Of them sixteen teachers are working in the schools situated in rural area and the remaining 44 are working in the schools situated in urban area. Mean and standard deviation for certain ratios of these two groups of teachers were calculated and 't' tests were applied. The results are given in the Table 4.18.

Significance of difference between the means of Teachers working in rural and urban areas with regard to different communication patterns:
Table 4.18

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Ratios</th>
<th>Rural School Teachers</th>
<th>Urban School Teachers</th>
<th>'t'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M₁</td>
<td>σ⁻¹</td>
<td>M₂</td>
</tr>
<tr>
<td>1.</td>
<td>T/D</td>
<td>0.39</td>
<td>0.79</td>
<td>0.58</td>
</tr>
<tr>
<td>2.</td>
<td>TQR 89</td>
<td>37.21</td>
<td>22.58</td>
<td>45.21</td>
</tr>
<tr>
<td>3.</td>
<td>TQR</td>
<td>12.96</td>
<td>17.86</td>
<td>20.92</td>
</tr>
<tr>
<td>4.</td>
<td>TRR</td>
<td>44.67</td>
<td>23.20</td>
<td>62.44</td>
</tr>
<tr>
<td>5.</td>
<td>T/P</td>
<td>13.25</td>
<td>8.25</td>
<td>6.62</td>
</tr>
<tr>
<td>6.</td>
<td>TTR</td>
<td>71.92</td>
<td>6.48</td>
<td>60.53</td>
</tr>
<tr>
<td>7.</td>
<td>PTR</td>
<td>9.01</td>
<td>12.44</td>
<td>19.25</td>
</tr>
<tr>
<td>8.</td>
<td>PIR</td>
<td>4.82</td>
<td>5.60</td>
<td>15.33</td>
</tr>
<tr>
<td>9.</td>
<td>CCR</td>
<td>63.84</td>
<td>14.16</td>
<td>46.32</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level  \( N₁ = 16 \)  \( N₂ = 44 \)

* Significant at 0.05 level

The preceding table states that there is significant difference between the means of teachers working in rural and urban schools, with regard to TRR, T/P, TTR, PTR, PIR and CCR. The means of the scores of certain teacher behaviour ratios of these two groups of teachers are shown in Graph 11.

The urban school teachers have scored more on TRR, PTR, and PIR. The teachers of rural schools have scored higher on T/P, TTR and CCR.
Hence it is clear that teachers of urban schools are having a tendency to respond and react to pupils' ideas and also allow the pupils to respond to the classroom situation and initiate their ideas during the interaction. But the teachers of rural schools have a tendency to dominate more over the pupils through their lengthy talks and concentrate only on the content part, never allowing the pupils to express their ideas freely.

4.2.8.2.7 Comparison between Male and Female Teachers with regard to different communication patterns:

In the sample chosen for the study, there are 34 male teachers and 26 female teachers. Mean and standard deviation for different ratios of these teachers were calculated. To find the significance of difference between the means of male and female teachers with regard to different ratios, the investigator applied 't' tests and the results are given in the Table 4.19.

Significance of Difference between the means of Male and Female teachers with regard to Different Communication Patterns:
Table 4.19

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Ratios</th>
<th>Male Teachers</th>
<th>Female Teachers</th>
<th>'t'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$M_1$</td>
<td>$\sigma_1$</td>
<td>$M_2$</td>
</tr>
<tr>
<td>1.</td>
<td>I/D</td>
<td>0.436</td>
<td>0.516</td>
<td>0.66</td>
</tr>
<tr>
<td>2.</td>
<td>TQR</td>
<td>44.60</td>
<td>24.61</td>
<td>47.50</td>
</tr>
<tr>
<td>3.</td>
<td>TQR</td>
<td>17.66</td>
<td>14.89</td>
<td>22.64</td>
</tr>
<tr>
<td>4.</td>
<td>TRR</td>
<td>57.60</td>
<td>25.90</td>
<td>57.41</td>
</tr>
<tr>
<td>5.</td>
<td>T/P</td>
<td>11.57</td>
<td>12.19</td>
<td>5.53</td>
</tr>
<tr>
<td>6.</td>
<td>TTR</td>
<td>65.29</td>
<td>12.18</td>
<td>60.86</td>
</tr>
<tr>
<td>7.</td>
<td>PIR</td>
<td>11.87</td>
<td>14.88</td>
<td>15.54</td>
</tr>
<tr>
<td>8.</td>
<td>CCR</td>
<td>54.28</td>
<td>19.44</td>
<td>46.62</td>
</tr>
</tbody>
</table>

NS : Not Significant  
$N_1 = 34$  
$N_2 = 26$

From the above table, it is found that there is no significant difference between the means of the male and female teachers with regard to all the ratios mentioned above.

Hence it is concluded that there is no significant difference between male and female teachers with regard to certain communication patterns such as influencing the pupils with questions, integrating the pupil's ideas and feelings into the class discussion, asking questions while guiding the content part, reacting to the ideas of pupils dominating over the pupils in the classroom, talking more in the class, permitting the pupils
to respond and initiate and concentrating more on the content-oriented talk in the classroom.

4.2.9 Correlational Studies between some of the important ratios representing different communication patterns of Teachers

Correlation Analysis:

In practice, we come across a large number of problems involving the use of two or more than two variables. If two quantities vary in such a way that movements in one are accompanied by movements in the other, these quantities are correlated. The degree of relationship between the variables under consideration is measured through the correlation analysis. The measure of correlation is called the correlation coefficient or correlation index, summarizing in one figure the direction and degree of correlation. A.M. Tuttle defines correlation as: "An analysis of the covariation of two or more variables is usually called correlation".

To find the nature of relationship that exists between some of the important ratios representing different communication patterns of teachers, the investigator attempted to work out the intercorrelations between these ratios using Pearson's Product Moment method. The coefficient of correlations were calculated from the obtained scores using

the following formula:

\[ r = \frac{\sum XY - N \bar{X} \bar{Y}}{\sqrt{\left( \sum X^2 - N \bar{X}^2 \right) \left( \sum Y^2 - N \bar{Y}^2 \right)}} \]

Table 4.20 Correlation Matrix between certain ratios representing different communication patterns.

<table>
<thead>
<tr>
<th>Ratios</th>
<th>I/D</th>
<th>TQR</th>
<th>CCR</th>
<th>T/P</th>
<th>TTR</th>
<th>PTR</th>
<th>PIR</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/D</td>
<td>-</td>
<td>0.713</td>
<td>-0.623</td>
<td>-0.365</td>
<td>-0.515</td>
<td>0.633</td>
<td>0.346</td>
</tr>
<tr>
<td>TQR</td>
<td>-</td>
<td>-0.850</td>
<td>-0.672</td>
<td>-0.704</td>
<td>0.805</td>
<td>0.397</td>
<td></td>
</tr>
<tr>
<td>CCR</td>
<td>-</td>
<td>-0.29</td>
<td>-0.745</td>
<td>0.952</td>
<td>-0.937</td>
<td>-0.683</td>
<td></td>
</tr>
<tr>
<td>T/P</td>
<td>-</td>
<td>-0.710</td>
<td>-0.693</td>
<td>-0.441</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TTR</td>
<td>-</td>
<td>-0.895</td>
<td>-0.706</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PTR</td>
<td>-</td>
<td>0.688</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level

Degrees of freedom = 58

N = 60

From the preceding table, it is found that all the ratios mentioned in the table, of teachers, Correlate Significantly (at 0.01 level) with each other. A detailed study of the table shows that the ratios I/D, TQR, PTR and PIR correlate with each other positively while CCR, TTR and T/P correlate negatively with these ratios. Hence it is concluded that a rise in the I/D, TQR, PTR and PIR ratios is
followed by a fall in the CCR, TTR and T/P ratios and vice-versa.

The tendency of teachers to accept, praise and respond to the ideas and feelings of pupils plays a vital role in initiating more pupil talk in the classroom. On the other hand, the teachers' tendency to criticise the pupils' ideas and talk more in the classroom curbs pupil talk and pupil initiation.

I/D, TQR, PTR and PIR are classified as "Indirect Influence Communication Patterns", while CCR, T/P and TTR are classified as "Direct Influence Communication Patterns" of teachers. Indirect Influence Communication Patterns of teachers allow for the pupils' participation in the teaching-learning process, while "Direct Influence Communication Patterns" of teachers restrict pupils' participation in the classroom discussions. Indirect Influence Patterns are characterised by teachers' tendency to accept, clarify, praise and develop the ideas and feelings expressed by the pupils, ask questions when guiding the content part, respond to pupils' ideas and feelings and to allow pupils either to respond to questions or initiate the classroom discussions. Direct Influence Patterns are characterised by teachers' tendency to dominate over the pupils in the class, express views through lecture, give directions and criticise the pupils with the expectation of compliance.

SECTION - II

4.3 Analyses and Interpretations of the scores related to pupil variables: Personality variables, I.Q., Academic Achievement and Total creativity scores.

Of the total pupil sample of 1500, 775 are girls and the
remaining 725 are boys studying in the first year of the Higher Secondary Course. The 16 personality Factor Questionnaire, Intelligence Tests and creativity Tests were administered to all the 1500 pupils studying in 60 classes of 30 Higher Secondary Schools in Coimbatore Educational District. The distribution of the pupil sample according to the management of schools, is shown in Graph 12. The English teachers of these pupils had already been observed of their teaching, for one period each.

The answer papers of the 16 personality Factor and intelligence Tests were scored out by the investigator herself, with the help of stencilled scoring cards. The 16 personality factor raw scores of the pupils from the 16 personality factor questionnaire by Cattell were converted into standard scores using the appropriate norm table. With regard to the Intelligence Test, the raw scores were converted into standard I.Q., scores using the appropriate norm table. Both the verbal and non-verbal Tests of Creativity by Baquer Mehdi were also scored out and the raw scores were taken for analysis. Mean and standard deviation for all the 3 aforementioned scores and also for the academic achievement scores (obtained from school records) for all the 60 classes were calculated, and the distribution of these scores are given in the appendices 10 and 11.

4.3.1 The combined Mean and standard deviation of Personality factors, I.Q., Academic Achievement and creativity Scores:

The combined mean and standard deviation of all the four scores of personality factors, I.Q., Academic Achievement and creativity
Tests for the whole sample were calculated using the following formula.

\[
M_{comb} = \frac{N_1 \cdot M_1 + N_2 \cdot M_2 + \cdots + N_n \cdot M_n}{N_1 + N_2 + \cdots + N_n}
\]

\[
\sigma_{comb} = \sqrt{\frac{N_1 \left[ \sigma_1^2 + d_1^2 \right] + N_2 \left[ \sigma_2^2 + d_2^2 \right] + \cdots}{N_1 + N_2 + \cdots}}
\]

Where,

\[
\sigma_1 = \text{Standard deviation of the distribution 1}
\]

\[
\sigma_2 = \text{Standard deviation of the distribution 2}
\]

\[
d_1 = (M_1 - M_{comb})
\]

\[
d_2 = (M_2 - M_{comb})
\]

<p>| Table 4.21 Combined Mean and Standard deviation of the four Scores for the whole sample |
|-----------------|-----------------|-----------------|-----------------|</p>
<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Factors</th>
<th>Combined Mean</th>
<th>Combined Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Personality Factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>Extraversion</td>
<td>6.2</td>
<td>1.2</td>
</tr>
<tr>
<td>b.</td>
<td>Anxiety</td>
<td>5.3</td>
<td>1.3</td>
</tr>
<tr>
<td>c.</td>
<td>Tough Poise</td>
<td>6.0</td>
<td>1.5</td>
</tr>
<tr>
<td>d.</td>
<td>Independence</td>
<td>6.0</td>
<td>1.4</td>
</tr>
<tr>
<td>2.</td>
<td>Intelligence Quotient</td>
<td>115.59</td>
<td>18.75</td>
</tr>
<tr>
<td>3.</td>
<td>Academic Achievement</td>
<td>43.03</td>
<td>13.94</td>
</tr>
<tr>
<td>4.</td>
<td>Creativity :</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>Verbal creativity</td>
<td>90.88</td>
<td>32.11</td>
</tr>
<tr>
<td>b.</td>
<td>Non-verbal Creativity</td>
<td>70.27</td>
<td>40.11</td>
</tr>
<tr>
<td>c.</td>
<td>Total creativity</td>
<td>161.15</td>
<td>62.48</td>
</tr>
</tbody>
</table>
Using the aforesaid formula, the investigator calculated the combined mean and standard deviation of all the four scores for the various groups of pupils and 't' tests were carried out between these groups of pupils. The results are given in the succeeding tables.

4.3.2 Analysis and Interpretation of pupils' personality factor scores:

The sixteen personality factor raw scores of the pupils obtained from the 16 personality factor Questionnaire by Cattell were converted into sten scores using the appropriate norm table.

Sixteen personality factors can be scored for broad secondary factors as well as for the sixteen primaries. Eight second order factors have been identified. The first four, which will generally be of most interest to practitioners, are,

Q1 Introversion Vs. Extraversion, Q11 Low Anxiety Vs. High Anxiety, Q III Tenderminded Emotionality Vs. Tough Poise, Q IV Subdueness Vs. Independence.

Second Order scores are more easily derived from the sten scores on the primaries than from raw scores. If the primary sten scores are combined in the manner shown in the procedure, the resulting second order scores will also be in sten form. The second order scores were derived for all the 1500 students. Class averages were calculated for the scores of all the 4 second order factors, I.Q., Academic Achievement and creativity and standard deviations were also found and the distribution of the same is given in the Appendices 10 & 11.
4.3.2.1 Description of the 16 personality factor - Second order factors:

i) Factor Q I :

**Introversion**: The person who scores low on Q I tends to be shy, self-sufficient and inhibited in interpersonal contacts. This can be either a favourable or unfavourable finding, depending upon the particular situation in which the person is expected to function.

**Extraversion**: The person who scores high on this factor is a socially outgoing, uninhibited person, good at making and maintaining interpersonal contacts. This can be very favourable in situations that call for this type of temperament. But it should not be considered necessarily favourable as a general predictor.

ii) Factor Q II :

**Low Anxiety**: The person who scores low on this factor tends to be one whose life is generally satisfying and one who is able to achieve more things that seem to him to be important. However, an extremely low score can mean lack of motivation for difficult tasks as is generally shown in studies relating anxiety to achievement.

**High Anxiety**: The person who scores high on this factor is high on anxiety as it is commonly understood. He need not be neurotic since anxiety could be situational, but is probable that he has some maladjustment, i.e., he is dissatisfied with the degree to which he is able to meet the demands of life and to achieve what he desires. Very high anxiety is generally disruptive of performance and productive of physical disturbances.
iii) Factor Q III:

**Tendermined Emotionality**: The person who scores low on factor Q III is likely to be troubled by pervasive emotionality and may be of a discouraged, frustrated type. He is, however, sensitive to the subtleties of life, likely to be artistic and rather gentle. If he has problems, they often involve too much thought and consideration before action is taken.

**Tough Poise**: The person who scores high on this factor is likely to be an enterprising, and resilient personality. However, he is likely to miss the subtle relationships of life and to orient his behaviour too much towards obvious. If he has difficulties, he is likely to involve rapid action with insufficient consideration and thought.

IV) Factor Q IV:

**Subdueness**: The person who scores low on Factor Q IV is a group-dependent chastened, passive personality. He is likely to desire and need support from other persons and likely to orient his behaviour toward persons who give such support.

**Independence**: The person who scores high on this factor tends to be an aggressive, independent, daring, incisive person. He will seek more situations where such behaviour is at least tolerated and possibly rewarded and is likely to exhibit considerable initiative.

(Note: High score or low score on the personality factor second-order is determined by the average score fixed at 5.5)
Correlational study between 16 personality factor-second order factor scores:

To find out the nature of relationship that exists between the 16 personality factor-second order factor scores, the investigator attempted to work out the intercorrelations between these second order factor scores using Pearson's Product Moment method. The Co-efficient of correlations were calculated from the obtained scores using the following formula:

$$r = \frac{\sum_{xy} - N \times \bar{X} \times \bar{Y}}{\sqrt{\left[\sum x^2 - N \times \bar{X}^2\right] \times \left[\sum y^2 - N \times \bar{Y}^2\right]}}$$

The obtained intercorrelations for different groups of pupils are given in the following correlation matrices.

**Table 4.22** Correlation Matrix between 16 personality factor-second order factor scores - (All pupils)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Extraversion</th>
<th>Anxiety</th>
<th>Tough Poise</th>
<th>Independence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraversion</td>
<td>--</td>
<td>0.169</td>
<td>0.079</td>
<td>0.180</td>
</tr>
<tr>
<td>Anxiety</td>
<td>--</td>
<td>--</td>
<td>0.20</td>
<td>0.361 **</td>
</tr>
<tr>
<td>Tough Poise</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.337 **</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level  
N = 60

From the above table, it is found that Tough Poise correlates significantly with Independence positively at 0.01 level. Anxiety has
a significant (0.01 level) negative correlation with Independence. Extraversion also correlates negatively with Tough Poise and Independence, but the correlation is very low.

Hence, it is concluded that, while the values of Tough Poise and Independence are directly proportional, that of Anxiety and Independence are inversely proportional.

4.3.3 Comparison between Different groups of pupils with regard to I.Q., Academic Achievement, Personality Factors and creativity

4.3.3.1 Comparison between Boys and Girls with regard to I.Q., Academic Achievement, personality factors and Creativity:

Of the whole sample of 1500 pupils, there are 725 boys and the remaining 775 are girls. The mean and standard deviation of the scores of I.Q., Academic Achievement, Personality factors and creativity for the groups of boys and girls were calculated. To find the significance of difference between the means of these groups the investigator applied 't' tests and the results are given in the Table - 4.23.

Significance of difference between the Means of Boys and Girls with regard to I.Q., Academic Achievement, personality factors and creativity.
Table 4.23

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Item</th>
<th>Boys</th>
<th></th>
<th>Girls</th>
<th></th>
<th>'t'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M1</td>
<td>$\sigma^1$</td>
<td>M2</td>
<td>$\sigma^2$</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>I.Q.</td>
<td>118.12</td>
<td>19.21</td>
<td>118.91</td>
<td>17.80</td>
<td>0.82</td>
</tr>
<tr>
<td>2.</td>
<td>Academic</td>
<td>45.36</td>
<td>14.32</td>
<td>42.15</td>
<td>13.42</td>
<td>4.47**</td>
</tr>
<tr>
<td></td>
<td>Achievement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Extraversion</td>
<td>6.1</td>
<td>1.19</td>
<td>6.2</td>
<td>1.32</td>
<td>1.18</td>
</tr>
<tr>
<td>4.</td>
<td>Anxiety</td>
<td>5.1</td>
<td>1.2</td>
<td>5.4</td>
<td>1.37</td>
<td>3.71**</td>
</tr>
<tr>
<td>5.</td>
<td>Tough poise</td>
<td>6.1</td>
<td>1.66</td>
<td>5.9</td>
<td>1.37</td>
<td>3.85**</td>
</tr>
<tr>
<td>6.</td>
<td>Independence</td>
<td>6.7</td>
<td>1.36</td>
<td>5.4</td>
<td>1.15</td>
<td>19.70**</td>
</tr>
<tr>
<td>7.</td>
<td>Creativity</td>
<td>161.43</td>
<td>63.14</td>
<td>160.90</td>
<td>61.94</td>
<td>0.16**</td>
</tr>
</tbody>
</table>

* Significant at 0.01 level  \( N_1 = 725 \)  \( N_2 = 775 \)

From the above table, it is found that there is significant difference (at 0.01 level) between the means of boys and girls with regard to their Academic Achievement, Anxiety, Tough Poise and Independence Scores. But there is no significant difference between the means of boys and girls with regard to their I.Q., Extraversion and creativity scores.

Hence it is concluded that boys and girls differ from each other with regard to their Academic Achievement, Anxiety, Tough Poise and Independence. Boys are better than girls in Academic Achievement and appear to be more socially outgoing, enterprising, decisive and independent persons than girls.
4.3.3.2 Comparison between pupils studying in Rural Schools and urban schools with regard to I.Q., Academic Achievement, personality factors and creativity scores:

Of the entire sample, there are 400 pupils studying in schools situated in rural areas and the remaining 1100 pupils are studying in the urban areas. Mean and standard deviation of the scores of I.Q., Academic Achievement, Personality factors and creativity, for the pupils of these two groups were calculated and 't' tests were applied. The results are given in the Table - 4.24.

Significance of Difference Between the Means of pupils studying in Rural and urban schools with regard to I.Q., Academic Achievement, Personality Factors and creativity scores.

Table 4.24

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Item</th>
<th>RSP</th>
<th>USP</th>
<th>( t )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>( M_1 )</td>
<td>( \sigma_1 )</td>
<td>( M_2 )</td>
</tr>
<tr>
<td>1</td>
<td>I.Q.</td>
<td>111.93</td>
<td>16.69</td>
<td>120.94</td>
</tr>
<tr>
<td>2</td>
<td>Academic Achievement</td>
<td>38.97</td>
<td>11.43</td>
<td>45.38</td>
</tr>
<tr>
<td>3</td>
<td>Extraversion</td>
<td>6.1</td>
<td>1.13</td>
<td>6.2</td>
</tr>
<tr>
<td>4</td>
<td>Anxiety</td>
<td>5.3</td>
<td>1.15</td>
<td>5.2</td>
</tr>
<tr>
<td>5</td>
<td>Tough Poise</td>
<td>5.7</td>
<td>1.47</td>
<td>6.1</td>
</tr>
<tr>
<td>6</td>
<td>Independence</td>
<td>6.1</td>
<td>1.34</td>
<td>6.0</td>
</tr>
<tr>
<td>7</td>
<td>Creativity</td>
<td>140.74</td>
<td>30.24</td>
<td>168.58</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level \( N_1 = 400 \) \( N_2 = 1100 \)
From the above table, it is found that there is significant difference (at 0.01 level) between the means of pupils studying in rural and urban areas with regard to their scores of I.Q., Academic Achievement, Tough Poise and Creativity. Hence it is concluded that these two groups of pupils differ from each other in their intelligence, Academic Achievement, Tough Poise and creativity. Urban pupils fared better than rural pupils in the aforesaid four scores. Having higher I.Q., Academic Achievement and being more decisive and enterprising, urban pupils could score more on the creativity Tests than the rural pupils.

Comparison between pupils studying in Aided and Government Schools with regard to I.Q., Academic Achievement, Personality factors and creativity scores.

Of the total pupil sample, there are 550 pupils studying in Aided schools and 400 pupils are in Government Schools. The mean and standard deviation of the seven scores for the pupils belonging to these groups were calculated and 't' tests were applied. The results are given in the table 4.25.

Significance of difference between the mean of pupils studying in Aided and Government schools with regard to I.Q., Academic Achievement, Personality factors and creativity scores.

Table 4.25

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Item</th>
<th>ASP</th>
<th>GSP</th>
<th>'t'</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I.Q.</td>
<td>123.11</td>
<td>111.74</td>
<td>10.51**</td>
</tr>
<tr>
<td>2.</td>
<td>Academic Achievement</td>
<td>47.19</td>
<td>37.52</td>
<td>12.08**</td>
</tr>
<tr>
<td>3.</td>
<td>Extraversion</td>
<td>6.1</td>
<td>6.2</td>
<td>0.773</td>
</tr>
<tr>
<td>4.</td>
<td>Anxiety</td>
<td>5.2</td>
<td>5.4</td>
<td>1.99*</td>
</tr>
<tr>
<td>5.</td>
<td>Tough Poise</td>
<td>6.0</td>
<td>5.8</td>
<td>3.54**</td>
</tr>
<tr>
<td>6.</td>
<td>Independence</td>
<td>6.0</td>
<td>5.8</td>
<td>1.58</td>
</tr>
<tr>
<td>7.</td>
<td>Creativity</td>
<td>148.42</td>
<td>137.33</td>
<td>5.77**</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level, * Significant at 0.05 level, N₁ = 550, N₂ = 400
From the preceding Table it is found that there is significant difference between the means of Aided and Government School pupils with regard to their scores on I.Q., Academic Achievement, Anxiety, Tough Poise and creativity. Hence it is inferred that these two groups of pupils differ from each other in their I.Q., Academic Achievement, Anxiety, Tough Poise and Creativity. Since the pupils belonging to Aided schools possess higher I.Q., better academic records and being of a more enterprising personality than pupils of Government Schools, they could also score more on their creative aspect. Acquiring low scores on creativity by Government School pupils may be ascribed to possessing low I.Q., and lack of motivation in doing difficult tasks.

4.3.3.4 Comparison between pupils studying in Aided and Corporation Schools with regard to I.Q., Academic Achievement, Personality Factors and creativity scores:

Of the total pupil sample chosen for the present study, 550 pupils are from the Aided schools and 350 are from Corporation Schools. The mean and standard deviation of the seven scores for the pupils of these two groups were calculated and 't' tests were applied. The results are given in the Table - 4.26

Significance of difference between the means of pupils studying in Aided and Corporation schools with regard to I.Q., Academic Achievement, Personality Factors and creativity Scores.
From the above table, it is found that there is significant difference between the means of pupils studying in Aided and Corporation Schools, with regard to their scores on I.Q., Academic Achievement, Tough Poise and creativity. Hence it is inferred that Aided School pupils are better in their I.Q., Academic Achievement and creativity than their counterparts studying in corporation schools.

4.3.3.5 Comparison between pupils studying in Special and Government Schools with regard to I.Q., Academic Achievement, Personality Factors and Creativity Scores:

Of the entire pupil sample, 200 pupils study in special schools
like Kendriya Vidyalaya (CBSE), Anglo-Indian and Matriculation schools, and 400 pupils study in Government Schools. The mean and standard deviation of the seven scores for these two groups of pupils were calculated and 't' tests were applied. The results are given in the Table 4.27.

Significance of difference between the means of Special and Government school pupils with regard to I.Q., Academic Achievement, personality factors and creativity scores

Table 4.27

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Item</th>
<th>Special School pupils</th>
<th>Government School pupils</th>
<th>'t'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M₁</td>
<td>σ₁</td>
<td>M₂</td>
</tr>
<tr>
<td>1</td>
<td>I.Q.</td>
<td>129.28</td>
<td>18.73</td>
<td>111.74</td>
</tr>
<tr>
<td>2</td>
<td>Academic Achievement</td>
<td>53.04</td>
<td>16.61</td>
<td>37.52</td>
</tr>
<tr>
<td>3</td>
<td>Extraversion</td>
<td>6.2</td>
<td>1.40</td>
<td>6.2</td>
</tr>
<tr>
<td>4</td>
<td>Anxiety</td>
<td>5.2</td>
<td>1.37</td>
<td>5.4</td>
</tr>
<tr>
<td>5</td>
<td>Tough Poise</td>
<td>6.1</td>
<td>1.49</td>
<td>5.7</td>
</tr>
<tr>
<td>6</td>
<td>Independence</td>
<td>6.4</td>
<td>1.35</td>
<td>5.8</td>
</tr>
<tr>
<td>7</td>
<td>Creativity</td>
<td>280.57</td>
<td>75.04</td>
<td>137.33</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level M₁ = 200 M₂ = 400
The preceding table makes it clear that there is significance of difference (at 0.01 level) between the means of pupils studying in Special Schools and Government Schools, with regard to their scores on I.Q., Academic Achievement, Tough Poise, Independence and creativity. Hence it is concluded that pupils of Special Schools have shown better performance in their I.Q., Academic Achievement, Tough Poise, Independence and creativity. Due to the possession of higher I.Q., and better academic records, the pupils of special schools are able to acquire higher scores in creativity than their counterparts studying in Government Schools. Moreover, the special school students are more enterprising, daring and independent than those of Government Schools. Hence it is seen that their personality factors have also induced them to fare well in creativity.

4.3.3.6 Comparison between pupils studying in special and Corporation Schools with regard to I.Q., Academic Achievement, Personality Factors and Creativity Scores:

Of the whole sample of 1500 pupils, 200 pupils are studying in special schools and 350 are in corporation schools. The mean and standard deviation of the seven scores for these groups of pupils were calculated and 't' tests were applied. The results are given in the Table 4.28.

Significance of difference between the means of Special and Corporation School pupils with regard to I.Q., Academic Achievement, Personality Factors and creativity scores.
Table 4.28

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Item</th>
<th>Special School pupils</th>
<th>Corporation School pupils</th>
<th>t'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M₁</td>
<td>M₂</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>I.Q.</td>
<td>129.29</td>
<td>112.98</td>
<td>9.86 **</td>
</tr>
<tr>
<td>2.</td>
<td>Academic Achievement</td>
<td>53.03</td>
<td>39.80</td>
<td>10.37 **</td>
</tr>
<tr>
<td>3.</td>
<td>Extraversion</td>
<td>6.2</td>
<td>6.3</td>
<td>0.53</td>
</tr>
<tr>
<td>4.</td>
<td>Anxiety</td>
<td>5.2</td>
<td>5.3</td>
<td>0.67</td>
</tr>
<tr>
<td>5.</td>
<td>Tough Poise</td>
<td>6.2</td>
<td>6.3</td>
<td>0.859</td>
</tr>
<tr>
<td>6.</td>
<td>Independence</td>
<td>6.4</td>
<td>5.9</td>
<td>3.56 **</td>
</tr>
<tr>
<td>7.</td>
<td>Creativity</td>
<td>280.56</td>
<td>140.36</td>
<td>24.54 **</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level  \( N₁ = 200 \)  \( N₂ = 350 \)

From the above table it is found that there is significance of difference between the means of pupils studying in special and Corporation Schools with regard to their I.Q., Academic Achievement, Independence and creativity. Hence it is inferred that pupils studying in special schools are better than their counterparts studying in Corporation Schools, in their I.Q., Academic Achievement, Independent attitude and creativity. Because of having higher I.Q., better academic performance and more daring and independent personality the special school pupils are able to score more on creativity than the corporation school pupils.
4.3.3.7 Comparison between pupils studying in special and Aided Schools with regard to I.Q., Academic Achievements, Personality Factors and Creativity Scores:

Of the pupil sample of 1500, there are 200 pupils studying in Special Schools and 550 pupils in Aided Schools. The mean and standard deviation of the seven scores for the pupils belonging to these groups were calculated and 't' tests were applied. The results are given in the Table 4.29.

Significance of difference between the means of pupils studying in Special and Aided Schools with regard to I.Q., Academic Achievement, Personality Factors and Creativity scores.

Table 4.29

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Item</th>
<th>Special School pupils</th>
<th>Aided School pupils</th>
<th>'t'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$M_1$</td>
<td>$\sigma^{-1}$</td>
<td>$M_2$</td>
</tr>
<tr>
<td>1.</td>
<td>I.Q.</td>
<td>129.29</td>
<td>18.73</td>
<td>123.11</td>
</tr>
<tr>
<td>2.</td>
<td>Academic Achievement</td>
<td>53.04</td>
<td>16.61</td>
<td>47.19</td>
</tr>
<tr>
<td>3.</td>
<td>extraversion</td>
<td>6.2</td>
<td>1.48</td>
<td>6.1</td>
</tr>
<tr>
<td>4.</td>
<td>Anxiety</td>
<td>5.2</td>
<td>1.37</td>
<td>5.2</td>
</tr>
<tr>
<td>5.</td>
<td>Tough Poise</td>
<td>6.1</td>
<td>1.49</td>
<td>6.0</td>
</tr>
<tr>
<td>6.</td>
<td>Independence</td>
<td>6.4</td>
<td>1.35</td>
<td>6.0</td>
</tr>
<tr>
<td>7.</td>
<td>Creativity</td>
<td>280.57</td>
<td>75.04</td>
<td>148.42</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level
$N_1 = 200$ $N_2 = 550$
The preceding table indicates the fact that there exists a significant difference (at 0.01 level) between the means of pupils of Special and Aided Schools with regard to their I.Q., Academic Achievement, Independence and creativity scores. The pupils of special schools appear to have acquired more in their I.Q., Academic Achievement, Independence and creativity, when compared to their counterparts of Aided schools. Hence it is inferred that the higher creative potentialities of special school pupils may be attributed to their having higher I.Q., achieving higher academically and possessing a more aggressive and independent personality than those of the Aided schools.

4.3.4 Correlational studies between pupil variables I.Q., Academic Achievement, Personality Factors and creativity.

In order to find out the relationship that exists between the pupil variables, viz., I.Q., Academic Achievement, Personality Factors and creativity, the investigator attempted to work out the inter-correlations between these variables, using Pearson's Product Moment method. The co-efficient of correlations were calculated from the mean scores calculated for each class using the following formula:

\[ r = \frac{\sum XY - N \times \bar{X} \times \bar{Y}}{\sqrt{[\sum X^2 - N \times \bar{X}^2] \times [\sum Y^2 - N \times \bar{Y}^2]}} \]

The obtained correlations are given in the following correlation matrices.
### 4.3.4.1 Correlation between pupil variables - I.Q., Academic Achievement, Personality Factors and creativity (General)

Table 4.30

<table>
<thead>
<tr>
<th>Item</th>
<th>I.Q.</th>
<th>Academic Achievement</th>
<th>Extraversion</th>
<th>Anxiety</th>
<th>Tough Poise</th>
<th>Independence</th>
<th>Creativity</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.Q.</td>
<td>-</td>
<td>0.720**</td>
<td>-0.203</td>
<td>-0.029</td>
<td>0.245*</td>
<td>0.204</td>
<td>0.496**</td>
</tr>
<tr>
<td>Academic</td>
<td>-</td>
<td>-</td>
<td>-0.203</td>
<td>-0.116</td>
<td>0.103</td>
<td>0.357**</td>
<td>0.456**</td>
</tr>
<tr>
<td>Achievement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.169</td>
<td>-0.079</td>
<td>-0.180</td>
<td>-0.011</td>
</tr>
<tr>
<td>Anxiety</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.020</td>
<td>-0.361*</td>
<td>-0.130</td>
</tr>
<tr>
<td>Tough Poise</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.337*</td>
<td>0.147</td>
<td></td>
</tr>
<tr>
<td>Independence</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.295**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level
* Significant at 0.05 level

N = 60

From the above table, it is found that I.Q., Academic Achievement, Tough Poise and Independence correlate positively with creativity. Except the correlation of Tough Poise with creativity, the other three correlations are significant at 0.01 level. While Extraversion and Anxiety correlate negatively with I.Q., and Academic Achievement (not significant) Tough Poise and Independence correlate positively with I.Q., and Academic Achievement. The correlations of Tough Poise with I.Q., (significant 0.01 level) and Independence with Academic Achievement (significant at 0.01 level) are positive.
Extraversion and Anxiety correlate negatively with Tough Poise and Independence.

Hence it is concluded that, the higher the values of I.Q., Academic Achievement and Independence, the higher also will be the value of creativity. High scores of I.Q., and Independence promote Academic Achievement. While the scores of Extraversion and Anxiety are inversely proportional to I.Q., Academic Achievement, and creativity scores, that of Tough Poise and Independence are directly proportional to I.Q., Academic Achievement and creativity.

While calculating the intercorrelations among all the four personality Factors selected for the study, the investigator found that except Independence, the other three (Extraversion, Anxiety and Tough Poise) have acquired very negligible values of intercorrelations. And hence the investigator decided to take only the factor of Independence for further analyses.

4.3.4.2 Correlation between pupil variables - I.Q., Academic Achievement, Independence and Creativity (Pupils of Aided Schools)

Table 4.31

<table>
<thead>
<tr>
<th>Items</th>
<th>I.Q.</th>
<th>I.Q.</th>
<th>Academic Achievement</th>
<th>Independence</th>
<th>Creativity</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.Q.</td>
<td>-</td>
<td>0.809**</td>
<td>0.452*</td>
<td>0.544**</td>
<td></td>
</tr>
<tr>
<td>Academic Achievement</td>
<td>-</td>
<td></td>
<td>0.624**</td>
<td>0.618**</td>
<td></td>
</tr>
<tr>
<td>Independence</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td>0.587**</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level
* Significant at 0.05 level
N = 22
Degrees of freedom = 20.
From the preceding table it is found that there is a significant (at 0.01 level) and positive correlation between I.Q., & creativity, Academic Achievement & Creativity and Independence & Creativity. It is also found that I.Q., Academic Achievement and Independence correlate positively and significantly with each other.

Hence it is inferred that in the case of Aided School Pupils, the high scores of I.Q., Academic Achievement and Independence influence high scores in creativity also. Those who are possessing high I.Q., and are highly independent, are also good academically.

4.3.4.3. Correlation between pupil variables - I.Q., Academic Achievement Independence and creativity (pupils of Corporation Schools)

Table 4.32

<table>
<thead>
<tr>
<th>Items</th>
<th>I.Q.</th>
<th>Academic Achievement</th>
<th>Independence</th>
<th>Creativity</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.Q.,</td>
<td>-</td>
<td>0.452</td>
<td>-0.157</td>
<td>0.792**</td>
</tr>
<tr>
<td>Academic Achievement</td>
<td>-</td>
<td>-</td>
<td>0.010</td>
<td>0.054</td>
</tr>
<tr>
<td>Independence</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.126</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level

N = 14

Degrees of freedom = 12

From the above table, it is found that I.Q., Academic Achievement and Independence Correlate positively with creativity. The correlation between I.Q., and creativity is significant at 0.01 level, but that of the other two with creativity is low. I.Q., correlates positively
with Academic Achievement but negatively with Independence. The correlation between Academic Achievement and Independence also, though positive, is very insignificant.

Hence it is concluded that, in the case of the pupils of Corporation Schools, the higher their scores on I.Q., Academic Achievement and Independence, the higher also will be the scores on creativity and vice versa. High scores on I.Q., result in inducing a corresponding rise in the scores of Academic Achievement. But when the I.Q., increases, Independence decreases and vice versa.

4.3.4.4 Correlation between pupil variables - I.Q., Academic Achievement, Independence and creativity (Rural).

Table 4.33

<table>
<thead>
<tr>
<th>Items</th>
<th>I.Q.</th>
<th>Academic Achievement</th>
<th>Independence</th>
<th>Creativity</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.Q.</td>
<td>-</td>
<td>0.483</td>
<td>0.066</td>
<td>0.623**</td>
</tr>
<tr>
<td>Academic Achievement</td>
<td>-</td>
<td>-</td>
<td>-0.010</td>
<td>0.345</td>
</tr>
<tr>
<td>Independence</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.228</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level
N = 16
Degrees of freedom = 14.

From the above table, it is found that I.Q. correlates positively and significantly (0.01 level) with creativity. Academic Achievement and Independence also correlate positively with creativity even though the correlation is not significant. The correlation between I.Q., and
Academic Achievement is also positive but not significant. I.Q., and Independence also correlate positively.

Hence it is concluded that in the case of rural School pupils also, there is a positive relationship with their I.Q., and creativity. The more the scores on Academic Achievement and Independence, the more also will be the scores on creativity. Pupils possessing high I.Q., are more independent and also academically sound.

4.3.4.5 Correlation between pupil variables - I.Q., Academic Achievement, Independence and creativity (Urban)

Table 4.34

<table>
<thead>
<tr>
<th>Items</th>
<th>I.Q.</th>
<th>Academic Achievement</th>
<th>Independence</th>
<th>Creativity</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.Q.</td>
<td>-</td>
<td>0.717**</td>
<td>0.270</td>
<td>0.446**</td>
</tr>
<tr>
<td>Academic Achievement</td>
<td>-</td>
<td>-</td>
<td>0.478**</td>
<td>0.433**</td>
</tr>
<tr>
<td>Independence</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.339*</td>
</tr>
</tbody>
</table>

* * Significant at 0.01 level  N = 14
* Significant at 0.05 level

The table found above presents the fact that all the items correlate positively (at 0.01 level) with each other except the correlation between Independence and creativity which is significant at 0.05 level. I.Q., Academic Achievement and Independence Correlate positively with creativity. I.Q., Academic Achievement and Independence also correlate
with each other positively.

Hence it is concluded that in the case of pupils studying in urban schools, those with high I.Q., good academic records and independent nature, are highly creative. The higher the I.Q., the higher also will be the Academic Achievement and Independence of these pupils, and vice versa.

4.3.4.6 Regression Analysis

The statistical tool with the help of which we are in a position to estimate (or predict) the unknown values of one variable from known values of another variable is called regression. Regression reveals the average relationship between two variables and this makes possible estimation or prediction. If the tool of regression is applied to the problems of two variables only, it is called Simple Regression. But if it is extended to three or more variables, it is known as Multiple Regression.

In Regression Analysis, cause and effect relationship is very clearly indicated. One variable is taken as dependent and the other the independent. The variable whose value is influenced is called the "dependent variable" and is denoted by 'Y', the variable which exerts the influence is called the "independent variable" and is denoted by 'X'. The value of the independent variable 'explains' the value of dependent variable.

Simple regression analyses were attempted to find out the influence of I.Q., Academic Achievement and Independence on creativity,
separately. The influence of one variable on the other is tested with the help of the 'R' value (simple correlation coefficient).

(i) Simple Regression Analysis for I.Q., & Creativity:

Table 4.35

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>118.538</td>
<td>18.477</td>
</tr>
<tr>
<td>Y</td>
<td>161.156</td>
<td>62.503</td>
</tr>
</tbody>
</table>

Table 4.36

<table>
<thead>
<tr>
<th>Source</th>
<th>S.S</th>
<th>DOF</th>
<th>M.S.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>400546.7</td>
<td>1</td>
<td>400546.7</td>
<td>109.984</td>
</tr>
<tr>
<td>Residual</td>
<td>5455493</td>
<td>1498</td>
<td>3641.851</td>
<td>Significant at 0.01 level</td>
</tr>
<tr>
<td>Total</td>
<td>5856040</td>
<td>1499</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Simple Regression Equation:

\[ \hat{Y} \text{ est} = 56.2873 + 0.885 \times X \]

Simple correlation Coefficient \( R = 0.2615 \)

\( X = \text{I.Q.} \)

\( Y = \text{Creativity} \)
When the I.Q. Score increases by unity (unit 1), creativity score increases by 0.89.

It is predicted from the 'R' value that the I.Q., of pupils influences their creativity to the tune of 26%.

ii) Simple Regression Analysis for Academic Achievement and Creativity:

Table 4.37

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>43.668</td>
<td>13.937</td>
</tr>
<tr>
<td>Y</td>
<td>161.156</td>
<td>62.503</td>
</tr>
</tbody>
</table>

Table 4.38

<table>
<thead>
<tr>
<th>Source</th>
<th>S.S</th>
<th>DOF</th>
<th>M.S</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>471788.7</td>
<td>1</td>
<td>471788.7, 131.26</td>
<td></td>
</tr>
<tr>
<td>Residual</td>
<td>5384251</td>
<td>1498</td>
<td>3594.293</td>
<td>Significant</td>
</tr>
<tr>
<td>Total</td>
<td>5856040</td>
<td>1499</td>
<td></td>
<td>at 0.01 level</td>
</tr>
</tbody>
</table>

Simple Regression Equation:

\[ \hat{Y}_{\text{est}} = 105.568 + 1.273 X \]

Simple Correlation Coefficient 'R' = 0.2838

X = Academic Achievement

Y = Creativity
When the Academic Achievement score rises by Unity (unit 1), Creativity score rises by 1.27.

It is also predicted from the 'R' value, the Academic Achievement of pupils influences their creativity to the tune of 28%.

iii) Simple Regression Analysis for Independence and Creativity:

Table 4.39

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>60.385</td>
<td>14.068</td>
</tr>
<tr>
<td>Y</td>
<td>161.157</td>
<td>62.503</td>
</tr>
</tbody>
</table>

Table 4.40

<table>
<thead>
<tr>
<th>Source</th>
<th>S.S</th>
<th>DOF</th>
<th>M.S</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>143190</td>
<td>1</td>
<td>143190</td>
<td>37.547</td>
</tr>
<tr>
<td>Residual</td>
<td>5712850</td>
<td>1498</td>
<td>3813.65</td>
<td>Significant at 0.01 level</td>
</tr>
<tr>
<td>Total</td>
<td>5856040</td>
<td>1499</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Simple Regression Equation:

\[ \hat{Y} \text{ est} = 119.204 + 0.695 X \]

Simple Correlation coefficient 'R' = 0.156

\[ X = \text{Independence} \]

\[ Y = \text{Creativity} \]
If the score on Independence goes up by one unit, the score on creativity increases by 0.695.

It is predicted from the 'R' value that pupils' creativity is influenced by their independent attitude, to the tune of 15.6%.

4.3.4.7 Multiple Regression Analysis

A multiple regression analysis was attempted to find out the cumulative influence of I.Q., Academic Achievement and 4 personality factors (Extraversion, Anxiety, Tough Poise and Independence) on the creativity of pupils selected. The combined influence of these variables on creativity scores is tested with the help of $R^2$ Value (Multiple Correlation Co-efficient or Multiple determination co-efficient).

Table 4.41

<table>
<thead>
<tr>
<th>Sources</th>
<th>S.S</th>
<th>DOF</th>
<th>M.S</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>50802.48</td>
<td>6</td>
<td>8467.079</td>
<td>4.0192</td>
</tr>
<tr>
<td>Error</td>
<td>111651.5</td>
<td>53</td>
<td>2106.632</td>
<td>Significant at 0.01 level</td>
</tr>
<tr>
<td>Total</td>
<td>162451.6</td>
<td>59</td>
<td>2753.416</td>
<td></td>
</tr>
</tbody>
</table>

Multiple regression Equation:

Total creativity scores of pupils as influenced by their I.Q., Academic Achievement and four Personality Factors (Extraversion, Anxiety, Tough Poise and Independence): -
To estimate the value of 'Y', the multiple regression equation,

\[ Y_{\text{est}} = -256.19 + 2.04X_1 + 0.69X_2 - 2.16X_3 - 0.90X_4 + 0.41X_5 + 1.39X_6 \]

Can be used -

\[ Y = \text{Creativity} \]
\[ X_1 = \text{I.Q.} \]
\[ X_2 = \text{Academic Achievement} \]
\[ X_3 = \text{Extraversion} \]
\[ X_4 = \text{Anxiety} \]
\[ X_5 = \text{Tough Poise} \]
\[ X_6 = \text{Independence} \]
\[ R^2 = 0.3127 \]

If the I.Q., score increases by one Unit, the creativity score of pupils increases by 2.04. With the increase in Academic Achievement score by one Unit, the creativity Score rises by 0.69. For the increase of one unit each in Extraversion and Anxiety scores, that of creativity decreases by 2.16 and 0.90 respectively. When the Tough Poise and Independence score rises up by one unit each, that of creativity also goes up by 0.41 and 1.36 respectively.

It is also predicted from the 'R^2' value, that pupils' I.Q., Academic Achievement, Extraversion, Anxiety, Tough Poise and Independence, influence their creativity to the tune of 31.3%.
4.4 Analyses and interpretations of the Scores related to both Teacher and Pupil Variables

An attempt was made by the investigator to find out the existence of any relationship between Pupils' creativity and some of the teacher variables, by working out the co-efficient of Correlation between them using Pearson's Product Moment Method. The Co-efficient of correlations were calculated from the mean creativity scores calculated for each class and the raw scores of the teachers of the respective classes.

The obtained correlations are given in the following correlation tables.

4.4.1 Correlations between Pupils' Mean creativity Scores and the scores of certain Teacher Variables.

Table 4.42

<table>
<thead>
<tr>
<th>Teacher Variables</th>
<th>I/D</th>
<th>TQR</th>
<th>CCR</th>
<th>T/P</th>
<th>TTR</th>
<th>PTR</th>
<th>PIR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pupils' mean Creativity Scores</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>0.356</td>
<td>0.432</td>
<td>-0.669</td>
<td>-0.442</td>
<td>-0.663</td>
<td>0.728</td>
<td>0.881</td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level  N = 60
Graph 13

Relationship between Pupils' Mean Creativity Scores and the scores of Certain Teacher Variables.

Y-axis: 1 cm = 0.1 unit
From the preceding table, it is found that pupils' creativity scores correlate positively (significant at 0.01 level) with I/D, TQR, PTR and PIR, but negatively with CCR, T/P and TTR (significant at 0.01 level) These correlations are represented in Graph 13.

Hence it is concluded that the higher values of I/D, TQR, PTR and PIR influence better pupil creativity while the higher values of CCR, T/P and TTR cause low level of pupil creativity. It is obvious that 'Indirect Influences Patterns' of the teachers' classroom behaviour influences better pupil creativity while 'Direct Influence Patterns' of the teachers' classroom behaviour causes low level of pupil creativity.

An attempt was made to find out the existence of any relationship between a few components of creativity (fluency, flexibility, originality and elaboration) of pupils and some of the teacher variables by working out the coefficient of correlations between them using Pearson's Product Moment Method. The co-efficients were calculated from the mean scores of different components of creativity, calculated for each class and the raw scores of the teachers of the respective classes. The obtained correlations are given in Table 4.43.

4.4.2 Correlations between the scores of a few components of pupils' creativity and the scores of certain Teacher variables
GRAPH-14

Relationship between the scores of a few components of Pupils' Creativity and the scores of certain Teacher Variables.

Y-AXIS: 1 cm = 0.1 unit
Table 4.43

<table>
<thead>
<tr>
<th>Pupils' creativity</th>
<th>Teacher variables</th>
<th>I/D</th>
<th>TQR</th>
<th>PTR</th>
<th>PIR</th>
<th>CCR</th>
<th>TTR</th>
<th>T/P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluency</td>
<td>0.272</td>
<td>0.277</td>
<td>0.585</td>
<td>0.794</td>
<td>-0.487</td>
<td>-0.478</td>
<td>-0.261</td>
<td></td>
</tr>
<tr>
<td>Flexibility</td>
<td>0.348</td>
<td>0.459</td>
<td>0.663</td>
<td>0.765</td>
<td>-0.636</td>
<td>-0.642</td>
<td>-0.415</td>
<td></td>
</tr>
<tr>
<td>Originality</td>
<td>0.260</td>
<td>0.388</td>
<td>0.583</td>
<td>0.689</td>
<td>-0.564</td>
<td>-0.582</td>
<td>-0.342</td>
<td></td>
</tr>
<tr>
<td>Elaboration</td>
<td>0.366</td>
<td>0.478</td>
<td>0.732</td>
<td>0.834</td>
<td>-0.685</td>
<td>-0.644</td>
<td>-0.531</td>
<td></td>
</tr>
</tbody>
</table>

** Significant at 0.01 level
* Significant at 0.05 level
N = 60

The above table shows that all the four components of creativity, viz. fluency, flexibility, originality and elaboration correlate positively and significantly with the Teacher Behaviour ratios, viz. I/D, TQR, PTR and PIR. At the same time the aforesaid components of creativity correlate negatively and significantly with some other ratios of Teacher Behaviour viz. CCR, TTR, and T/P. These correlations are represented in Graph 14. A rise in the scores of I/D, TQR, PTR and PIR, helps to increase the scores on fluency, flexibility, originality and elaboration. But a rise in the scores of CCR, TTR and T/P leads to a decrease in the scores of fluency, flexibility, originality and elaboration.

Hence it is inferred that teachers' tendency to encourage, praise and guide pupils and allow them more freedom of expression enables pupils to think creatively and produce many diversified ideas which are clever or uncommon, and can also be elaborated. The teachers' tendency
Relationship between the scores of I.Q., Academic Achievement, Independence and the scores of the Teacher Variables.

Y-AXIS: 1cm = 0.1 unit
to talk more and their authoritarianism curtail the spontaneous creative thought that arises in the minds of pupils. This results in creating a vacuum in the formation of ideational fluency, adaptive flexibility, originality and elaboration.

The researcher is interested in finding out the relationship between the scores of I.Q., Academic Achievement, Independence and the scores of some of the teacher variables. Hence an attempt was made to work out the co-efficient of correlations between them using Pearson's Product Moment Method. The co-efficient of Correlations were calculated and given in the succeeding tables.

4.4.3 Correlations between the scores of I.Q., Academic Achievement, Independence and the scores of some of the Teacher Variables.

Table 4.44

<table>
<thead>
<tr>
<th>Teacher Variables</th>
<th>I/D</th>
<th>TQR</th>
<th>CCR</th>
<th>T/P</th>
<th>TTR</th>
<th>PTR</th>
<th>PIR</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.Q.</td>
<td>0.367**</td>
<td>0.600**</td>
<td>-0.652**</td>
<td>-0.597**</td>
<td>-0.545**</td>
<td>0.622**</td>
<td>0.412**</td>
</tr>
<tr>
<td>Academic</td>
<td>0.515**</td>
<td>0.509**</td>
<td>-0.580**</td>
<td>-0.340**</td>
<td>-0.495**</td>
<td>0.621**</td>
<td>0.366**</td>
</tr>
<tr>
<td>Achievement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independence</td>
<td>0.162</td>
<td>0.178</td>
<td>-0.180</td>
<td>-0.007</td>
<td>-0.136</td>
<td>0.243*</td>
<td>0.196</td>
</tr>
</tbody>
</table>

** Significant at 0.01 level  
* Significant at 0.05 level  
N = 60

The above table states that I.Q., and Academic Achievement correlate positively (at 0.01 level) with I/D, TQR, PTR and PIR. But
I.Q., and Academic Achievement correlate negatively with CCR, T/P and TTR (at 0.01 level). There is a positive correlation between Independence and I/D, TQR, PTR and PIR. But Independence correlates negatively with CCR, T/P and TTR. These correlations are represented in Graph 15.

Hence it is concluded that the higher the level of pupils' intelligence the higher also will be the teachers' tendency to behave indirectly in the classroom. The higher the tendency of the teachers to behave indirectly in the classroom and encourage pupils' participation in the teaching-learning process, the higher also will be pupils' academic achievement and Independence. If the pupils are more intelligent, responsive, initiative and independent, the teachers will feel free to elicit more responses from the pupils by putting more questions. Pupils with high intelligence level, good academic records and more independent attitude, will be more responsive and initiative in their learning behaviour. Better the learning behaviour of the pupils, better also will be the teachers' classroom behaviour. Hence it is evident that higher level of intelligence, academic achievement and Independence of pupils will influence "Indirect Influence Patterns" of teachers' classroom behaviour.

4.4.4 Multiple Regression Analysis

A multiple regression analysis was attempted to find out the cumulative influence of I/D, TQR, PTR and PIR on the creativity of pupils selected and also the cumulative influence of CCR, T/P and TTR on pupil creativity. The combined influence of these variables
on creativity scores is tested with the help of $R^2$ value (Multiple correlation co-efficient or Multiple determination co-efficient)

i) Influence of I/D, TQR, PTR and PIR on creativity:

Table 4.45

<table>
<thead>
<tr>
<th>Sources</th>
<th>S.S</th>
<th>DOF</th>
<th>M.S</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>131724.10</td>
<td>4</td>
<td>32931.02</td>
<td>58.95</td>
</tr>
<tr>
<td>Error</td>
<td>30727.23</td>
<td>55</td>
<td>558.68</td>
<td>Significant at 0.01 level</td>
</tr>
<tr>
<td>Total</td>
<td>162451.60</td>
<td>59</td>
<td>2753.42</td>
<td></td>
</tr>
</tbody>
</table>

Multiple Regression Equation:

Total creativity scores of pupils as influenced by their teachers' I/D, TQR, PTR and PIR ratios:

To estimate the value of 'Y', the multiple regression equation,

\[
Y_{\text{est}} = 115.81 + 2.64X_1 + 0.41X_2 + 1.56X_3 + 2.15X_4
\]

\[Y = \text{creativity} \]
\[X_1 = \text{I/D} \]
\[X_2 = \text{TQR} \]
\[X_3 = \text{PTR} \]
\[X_4 = \text{PIR} \]
\[R^2 = 0.8108 \]
If the I/D score increases by one Unit, the creativity score of pupils increases by 2.64, with the increase in TQR score by one Unit, the creativity score rises by 0.41. For the increase of one unit in PTR Score that of creativity increases by 1.56. Creativity score goes up by 2.15, if PIR score rises up by one unit. This regression equation is shown in Graph 16.

It is predicted from the \( R^2 \) Value, that Teachers' Indirect behaviour (I/D), questioning ratio (TQR), allowing more pupil talk (PTR) and more pupil initiation (PIR) during classroom interaction, influence the creativity of their pupils, to go up to the tune of 81%.

\[ \text{i) Influence of CCR, T/P and TTR on creativity :} \]

\[ \text{Table 4.46} \]

<table>
<thead>
<tr>
<th>Sources</th>
<th>S.S.</th>
<th>DOF</th>
<th>M.S.</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>75001.25</td>
<td>3</td>
<td>25000.42</td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>87449.69</td>
<td>56</td>
<td>1561.60</td>
<td>16.01</td>
</tr>
<tr>
<td>Total</td>
<td>162451.60</td>
<td>59</td>
<td>2753.42</td>
<td></td>
</tr>
</tbody>
</table>

\[ \text{Multiple Regression Equation :} \]

Total creativity of pupils as influenced by their teachers' CCR, T/P and TTR ratios :

To estimate the value of \( Y \), the multiple regression equation,
\[ Y \text{ est} = 309.98 - 1.41 X_1 - 0.65 X_2 - 1.31 X_3 \]

can be used,

\[
\begin{align*}
Y &= \text{Creativity} \\
X_1 &= \text{CCR} \\
X_2 &= \text{T/P} \\
X_3 &= \text{TTR} \\
R^2 &= 0.4616
\end{align*}
\]

If the CCR score rises by one Unit, creativity score goes down by 1.41 With the increase of T/P score by one Unit, the creativity score decreases by 0.65. Creativity score is reduced by 1.31 units for every unit of increase in the TTR score. This regression equation is represented in Graph 17.

It is predicted from the \( R^2 \) value, that teachers' stereotyped way of teaching, purely sticking on to the content oriented part of the syllabus (CCR), dominating tendency (T/P) and talking more by themselves in the class without allowing enough opportunities for pupil talk (TTR) hinder the flow of creative ideas of pupils to the level of 46%.

**SECTION IV**

4.5. **Testing of Hypotheses :-**

In order to test the hypotheses, the investigator attempted to find out the 'r' value for different factors and applied 't' and 'F' tests and the results are discussed as follows:
Hypothesis No.: 1

Teachers' "Indirect Influence Patterns" of classroom behaviour are not positively correlated to pupils' creativity.

The correlations ('r' Values) between I/D and pupils mean creativity scores were found to be 0.356, TQR and creativity 0.432, PTR and creativity 0.728 and PIR and creativity 0.881. Since all these values are significant at 0.01 level, the hypothesis is rejected. Hence it is concluded that "Indirect Influence Patterns" of teachers' classroom behaviour are positively correlated to creativity of pupils.

Hypothesis No.: 2

Teachers' "Direct Influence Patterns" of classroom behaviour encourage pupils' creativity.

The correlations ('r' values) between CCR and pupils' mean creativity scores, T/P and Creativity and TTR and Creativity, were found to be - 0.669, - 0.442 and - 0.663 respectively, which are significant at 0.01 level. Hence the hypothesis is rejected and it is concluded that teachers' "Direct Influence Patterns" of classroom behaviour does not encourage pupil creativity.

Hypothesis No.: 3

Classroom behaviour of teachers and their pupils' academic achievement are independent.

The correlations ('r' values) of I/D with Academic Achievement, TQR with Academic Achievement, PTR with Academic Achievement
and PIR with Academic Achievement were found to be 0.515, 0.509, 0.621 and 0.386, which are significant at 0.01 level.

The correlations ('r' values) of CCR, T/P and TTR with Academic Achievement of pupils were found to be -0.580, -0.340 and -0.495, which are significant at 0.01 level.

Hence the hypothesis is rejected and it is inferred that classroom behaviour of teachers and their pupils' creativity, depend upon each other.

Hypothesis No.: 4

Intelligence and creativity of pupils are negativity correlated.

The correlation showing the relationship between I.Q., and creativity was found to be 0.496 which is significant at 1 % level. Hence the hypothesis is rejected and it is assessed that both the factors influence each other positively.

Hypothesis No.: 5

Intelligence of pupils does not enhance their academic achievement.

While comparing the I.Q., and Academic Achievement of pupils, the 'r' was found to be 0.720 which is highly significant at 0.01 level. Hence the hypothesis is rejected and it is inferred that intelligence and academic achievement are positively correlated.

Hypothesis No.: 6

Pupils' academic achievement and creativity have no mutual influence.
The correlation showing the relationship between academic achievement and creativity of pupils was found to be 0.456, which is significant at 1% level. Hence the hypothesis is rejected and it is established that pupils' academic achievement and creativity are positively correlated.

Hypothesis No.: 7

Personality factors of pupils have no impact on their creativity and academic achievement.

The 'r' values showing the relationship of Extraversion and Anxiety with creativity and Academic Achievement are positive but insignificant. Hence it is inferred that Extraversion and Anxiety of pupils do not affect the creative level and Academic Achievement of pupils.

The significant correlation (0.295) between Independence and creativity of pupils proves that both are positively intercorrelated. The Independence scores and Academic Achievement scores were compared and from the 'r' (0.357) which is significant at 0.01 level, it is evident that both are positively correlated. Hence the hypothesis is rejected, and it is concluded that creativity and academic achievement of pupils are influenced by their personality factors.

Hypothesis No.: 8

There does not exist any relationship between pupils' I.Q., and Personality factors.

The I.Q. of pupils correlates negatively (not significant) with
their Extraversion and Anxiety scores. This implies that Extraversion and Anxiety of pupils do not affect their I.Q. The correlation of Tough Poise with I.Q., (0.245) which is significant at 0.05 level, indicates the dependence of one factor on the other. The correlation between Independence and I.Q., is not significant but positive and hence it is found that both are dependent factors. So the hypothesis is rejected.

Hypothesis No.: 9

The scores of creativity, I.Q., Academic Achievement and personality factors do not differ according to the sex of pupils and locality and type of management of schools.

i) Differential Studies with regard to the Sex of pupils:

It is found that there is significant difference between the means of boys and girls with regard to their Academic Achievement Scores (\(t' = 4.47\)), Anxiety Scores (\(t' = 3.71\)), Tough Poise scores (\(t' = 3.85\)) and Independence Scores (\(t' = 19.17\)) at 0.01 level. But there is no significant difference between the means of boys and girls with regard to their I.Q., creativity and Extraversion scores. Boys fared better than girls in Academic Achievement, Tough Poise and Independence scores and girls fared better than boys in Anxiety scores. Hence the hypothesis is rejected.

ii) Differential studies pertaining to the locality of schools:

Significant difference (at 0.01 level) between the means of rural School pupils and urban school pupils with regard to their I.Q.,
(′t′ = 9.02) Academic Achievement (′t′ = 8.92), Creativity (′t′ = 10.79) and Tough Poise (′t′ = 4.38) Scores, was found. Hence it is inferred that urban school pupils fared better than rural School Pupils in I.Q., Academic Achievement, Creativity and Tough Poise and so the hypothesis is rejected.

iii) Differential studies pertaining to the type of Management of schools:

It is also found that there is significant difference between the means of Aided School pupils and Government School Pupils with regard to their I.Q., (′t′ = 10.51), Academic Achievement (′t′ = 12.08), Creativity (′t′ = 5.77) and Tough Poise (′t′ = 3.54) scores at 0.01 level. It is inferred that Aided School pupils are better than Government School pupils in their I.Q., Academic Achievement, Creativity and Tough Poise, Here too, the hypothesis is rejected.

Significant difference is found (at 0.01 level) between the means of special and Government school Pupils, with regard to their I.Q., (′t′ = 11.28). Academic Achievement (′t′ = 12.16), Creativity (′t′ = 26.18) Tough Poise (′t′ = 3.49) and Independence (′t′ = 4.84) scores. It is concluded that special school pupils are better than Government School pupils in their I.Q., Academic Achievement, Creativity, Tough Poise and Independence and hence the hypothesis is rejected.

Hypothesis No.: 10

i) Differential Studies pertaining to the Sex of teachers:

Teachers of different categories are alike in their
communication patterns.

It is also found that there is no significant difference between the means of male and female teachers with regard to I/D, TQR, CCR, T/P, TTR, PTR and PIR. Hence it is concluded that the sex of the teachers does not influence their classroom behaviour and so the hypothesis is accepted.

ii) Differential studies pertaining to the locality of schools:

Significant difference (at 0.01 and 0.05 levels) was found between the means of the Rural and Urban school teachers, with regard to CCR, TRR, T/P, PTR & PIR. Urban School Teachers are better than rural school teachers in their application of Indirect Influence patterns. Hence it is concluded that urban school teachers are more indirect in their classroom behaviour, and so the hypothesis is rejected.

iii) Differential studies pertaining to the type of management of schools:

There is significance of difference (at 0.01 level) between the means of special and Government School Teachers with regard to their I/D ('t' = 10.0), TQR ('t' = 9.46), CCR ('t' = 7.74), TRR ('t' = 8.17), T/P ('t' = 7.16), TTR ('t' = 19.67), PTR ('t' = 12.74) and PIR ('t' = 9.93). It is found that special school teachers are better than Government School teachers in their Indirect Influence Patterns and hence the hypothesis is rejected.

There is no significant difference between the means of special and Aided School Teachers with regard to their I/D, TQR, CCR, T/P,
TTR, PTR and PIR. Hence it is concluded that both special and Government School teachers are alike in their classroom behaviour and so the hypothesis is accepted.