CHAPTER-5

SUMMARY AND GENERALIZATIONS:

In the preceding chapters, introduction of the problem, development of the tools, method of the study and interpretation of the results have been discussed. The present chapter has been devoted to the summary and generalisations of the results. For providing the background to the findings, a brief description of purpose, design of the study and procedure along with the suggestions for further research have also been presented.

5.1 INTRODUCTION:

Education at all stages needs an overhauling to be an effective instrument of national reconstruction. The progress, welfare and security of the nation depend upon the planned and sustained growth in the quality of education. No system of education can rise above the level of its teachers. The strength of an educational system largely depend upon the quality of its teachers. It is towards the teachers that a society has to look up for moral upliftment and fineness in all their manifestations. However enlightened the aims, however efficient the administrator; the actual task of education of children is conducted by the teachers. With the rapid expansion of schooling all over the world these problems have acquired a new dimension. Therefore, "it is imperative for those in
education to analyse the present teaching status and pinpoint the weaknesses: Mathur (1960).

To understand and describe the classroom interactions, there is a need to study it, in the context of relevant variables, which can be easily operationalised. The present study is an attempt in this direction.

The observation of what goes on in the classrooms would contribute in a sense to the nature of teaching and learning and may also give an insight into the special kind of world, that one finds in the classroom. Hence, the present problem has been taken up in order to gain the first hand experience of classroom interactions, determine different patterns of interactions and investigate their learning outcomes in terms of the students' behavioural changes in cognitive and non-cognitive areas. Thus, the problem has been worded as follows:

"Classroom Interaction Patterns in relation to some Teacher Characteristics and their effect on Learning Outcomes of science students at High School level"

5.2 OBJECTIVES

The present study is designed to attain the following objectives.

Process Variables:

1) To determine the common teaching-pattern of high and low-effective teachers.
To determine the common teaching pattern of extrovert introvert, unstable and stable teachers.

3) To determine the common teaching pattern of teachers with different levels of teaching experience.

**Product Variables:**

4) To investigate the effects of the different patterns of interaction on the students' academic achievement.

5) To investigate the effects of different patterns of interaction on the attitude of students towards science subject (biology).

6) To investigate the effects of different patterns of interaction on the initiative level among the students.

All these aspects have been studied for the presage variable like:

i) Teacher-effectiveness

ii) Teacher-personality and

iii) Teaching experience.

5.3 HYPOTHESES

The present study was designed to test the following hypothesis:-
1. There will be no difference in the academic achievement of students of high effective and low effective teachers.

2. There will be no difference in the attitude towards biology of students belonging to high effective and low effective teachers.

3. There will be no difference in the initiative level of students of high/effective and low/effective teachers.

4. There will be no difference in the academic achievement of Students belonging extrovert, introvert, unstable as stable teachers.

5. There will be no difference in students attitude towards Biology belonging to extrovert, introvert, unstable and stable groups of teachers.

6. There will be no difference in the initiative level of students of extrovert, introvert, unstable and stable teachers.

7. There will be no difference in the academic achievement of students of teachers with different level of teaching experience.

8. There will be no difference in the students attitude towards Biology, belonging to teachers with different teaching-experience.

9. There will be no difference in the initiative level
of students belonging to teachers with different teaching experience.

5.4 SAMPLE OF THE STUDY

The present research investigation was carried out on the teachers and students from bio-sciences, of class IX taken from some Govt. and Public schools of Chandigarh, representing both Hindi and English medium of instruction.

TEACHERS

The teacher sample for the investigation comprised of thirty Biology teachers. The selection of teachers was made on the basis of their effectiveness score; their personality-type and on the basis of their teaching experience.

STUDENTS:

For the present investigation those class IX students who took biology as major were selected. It consists of boys and girls offering Hindi or/and English medium. The final sample comprised of 600 students, (20 for each teacher).

5.5 DESIGN OF THE STUDY:

(1) The present investigation employed an Ex-post-facto design. the study begins with selection of teacher' sample. The teachers' sample was separately classified on the basis of the three independent variables:

i) Teacher effectiveness

ii) Personality type
i) Teacher effectiveness
ii) Personality type
iii) Teaching experience

(2) Each teacher's class was observed and encoded three times with the help of RCS and three times with the help of ETC observation system.

(3) Teachers were studied for their instructional patterns. The instructional patterns were further studied for their impact on the three aspects of students' behaviour as their dependent variables:
   i) Academic performance of students,
   ii) Student's attitude towards Biology
   iii) Student's initiative-level.

5.6 **TOOLS:**

The following tools were used for the purpose of data collection:

i) Scale of Initiative
ii) Eysenck Personality Inventory
iii) Scale of Teacher-Effectiveness (Teacher Form)
iv) Observation Systems of ETC and RCS (for observing classroom interactions).
   v) Scale of attitude towards biology.
   vi) Criterion-reference test for biology

5.7 **PROCEDURE:**

Procedure of the investigation was comprised of two main stages. They are:
2) Conducting the study

5.7.1 SELECTING THE SAMPLE:

This stage involves firstly the identification of schools for investigation; and secondly the selection of IX class biology-teachers the basis of the self-reporting scales one for Teacher Effectiveness and another for Eysenck's Personality types. Out of 62 selected teachers, the selection of 30 were based on top and bottom 27 percent teacher-effectiveness scores. Similarly high extrovert, low extrovert, low stable and high stable teachers were selected. The twenty students corresponding to each teacher were randomly selected for the data.

5.7.2 CONDUCTING THE STUDY:

The study was conducted in two phases namely:

a) Observation of classroom interactions.

b) Administration of tests.

a) Observation of classroom Interactions:

The teaching of selected teachers were observed three times with help of RCS, while encoding the verbal interactions. The lessons were simultaneously recorded on the audio cassette and later encoded with the help of ETC system of observation.

b) Administration of tests:

Along with the observation of classroom interactions the tests were distributed to the students in each
selected class. Students were asked to report their attitude towards biology. To test their academic performance in biology, a criterion reference test was administered. A scale for rating initiative was given to the respective teachers of the students, so as to test their initiative level.

After administering the tests, scoring was done, and the data was processed statistically.

5.8 **Statistical Techniques Used:**

The following statistical techniques were employed to analyse the data obtained from the study:

1) Aggregates of rows and columns of millage-matrix were converted into percentages for further computation of the data.

2) Ratios of different comparative categories were computed.

3) Descriptive statistics like means and SD’s of achievement scores, attitude scores and initiative scores were computed and later initiated.

4) The t-test for difference in between the two percentages was applied.

5) Test of significance (Chi-square test) for the comparative category ratios was applied to test the equality between the two ratios.

6) Analysis of variance was applied and F-ratio was
calculated.

5.9 CONCLUSIONS:

The conclusions of the present study are reported as follows:

PROCESS VARIABLE:

1. Low and High effective teachers:

1. Low effective teachers spend more instructional time in the delivery of content as compared to high effective teachers.

2. Student response, in the classes of high effective teachers, was found more than the same in the classes of low effective teachers.

3. On the social aspect of the class climate, high effective teachers initiate on their own lesser and leave more room for the students to initiate than their low-effective counterparts.

4. The comparative category ratios of Teacher talk/student talk, Teacher elicitation/Teacher initiation, Student direct response/Student divergent response, Teacher elicitation/Student response, and Content cross were found more for low/effective teachers than their high effective counterparts.

5. High effective teachers surpassed their low-effective counterparts on comparative category ratios of Warming/Cooling, and Student initiation/Student talk.
6. The Comparative category ratios of Teacher acceptance/Teacher correction, Student acceptance/Student correction, Teacher direct response/Teacher divergent response, Teacher direction/Teacher talk, and the Steady state ratio were not found different for high and low effective teachers.

7. The comparative category ratios of Teacher talk, Student talk, Lower order teacher questions/Higher order teacher questions, Lower order student response/Higher order student response, Lower order teacher questions/ Lower order student response, Higher order teacher questions/ Higher order student response, and the content cross, were found high for low effective teacher than their high effective counter parts.

8. The comparative category ratios of Teacher extending reaction/Teacher reacting behaviour, and Lower order student questions/Lower order teacher response, were found more for high effective teachers than for low effective ones.

9. The comparative category ratios such as Teacher continuation reaction/Teacher reacting behaviour, Teacher initiation/Structuring learning activities, Student initiation/Student questions, Higher order
student questions/Higher order teacher response and the Steady state ratio for high effective teachers were not found different from the same for low effective teachers.

10. The teaching pattern of high effective teachers was characterised by following instructional sequence; Presentation of information ---> Presentation of formal Questions ---> Response of students ---> Formulation of Higher issues and questions ---> Prevalence of silence ---> Presentation of information.

11. The social climate of the classes of high effective teachers was not open. Students were not free with their teachers and by and large remain passive recipients in classes.

12. The teaching pattern of low effective teachers was characterised by following instructional sequence; Presentation of information --> Presentation of formal questions --> Response of students --> Presentation of questions --> Prevalance of silence --> Response of Teacher --> Presentation of Teacher questions.

13. The social climate in the classes of low-effective teachers was poor. Low student -involvement was
observed throughout the classroom activities. Classes were dominated by the teachers.

**Extrovert and Introvert teachers**

14. Extrovert teachers spend more time on presentation of information and initiation, whereas introvert teachers encourage students to initiate in the class. They, themselves speak less and to-the-point.

15. In introvert teachers’ classes, teacher questioning and student response found more room than the same in the classes of extrovert teachers.

16. The comparative category ratios of Teacher Talk/Student talk, Teacher acceptance/Teacher correction, Student acceptance/Student correction, Student elicitation/Student initiation, Teacher elicitation/Student response, Student initiation/Teacher response, Teacher clarification/Teacher initiation, Steady state and Content cross ratio were found more for extrovert teachers than for introvert ones.

17. The comparative category ratios of Teacher elicitation/Teacher initiation, Teacher direct response/Teacher divergent response, Student direct response/Student divergent response, Teacher direction/Teacher initiation, and Student initiation/Student talk, were found more for introvert teachers
than their extrovert counterparts.

18. The comparative category ratio of Warming/Cooling was not found existing either in the classes of extrovert teachers or in the classes of introvert teachers.

19. The comparative category ratios such as Teacher talk/Student talk, Lower order teacher questions/Higher order teacher questions, Lower order student response/Higher order student response, Higher order teacher questions/Higher order student response, Teacher initiation/Structuring learning activities and the content cross ratios were found more in extrovert teachers classes than in introvert teachers classes.

20. The comparative category ratios of Teacher initiation/Teacher questions and Student initiation/Student questions were found higher for introvert teachers than their extrovert counterparts.

21. The comparative category ratios of Lower order teacher questions/Lower order student response, Higher order student questions/Higher order teacher responses, Teacher extending reaction/Teacher reacting behaviour and Teacher terminating reaction/Teacher reacting behaviour ratio, extrovert teachers were not found different from introvert
The teaching pattern of extrovert teachers was characterised by the following instructional sequence:
Presentation of information —> Prevalance of silence —> Presentation of formal questions —> Response of student —> Presentation of Questions.

The social climate in the classes of extrovert teachers remained poor, as there was no social interaction among teacher and students. Poor student involvement indicated the dominance of teachers in the classes.

The teaching pattern of introvert teachers was characterised by the following instructional sequence; Presentation of information —> Presentation of formal questions —> Response of students —> Prevalance of —> silence —> Presentation of teacher questions.

The social climate of the classes of introvert teachers was not very poor. Healthy student involvement was noticed in the form of responses only. No special effort, however, was made by the teachers to establish a sound social and emotional climate in the classes.

Unstable and stable teachers:
Unstable teachers initiate and respond more than
their counterparts, whereas stable teachers use more questioning and get more student response in the classes as compared to the same in unstable teachers' classes.

27. Comparative category ratios such as Teacher talk/Student talk, Teacher acceptance/Teacher correction, Teacher elicitation/Student response and Content cross were found more in the classes of unstable teachers than of stable teachers.

28. The comparative category ratios of Teacher elicitation/Teacher initiation, Student direct response/Student divergent response, Teacher clarification/Teacher initiation and Student initiation/Student talk, were found higher for stable teachers than their unstable counterparts.

29. The comparative category ratios of Student acceptance/Student correction and Warming/Cooling for unstable teachers were not found different from that of stable teachers.

30. The comparative category ratios as Teacher talk/Student talk, Lower order teacher questions/Lower order student response, Lower order student questions/Lower order teacher response, Teacher terminating reaction/Teacher reacting behaviour, Teacher initiation/Structuring learning
activities, Teacher initiation/Teacher questions and Content cross were found higher for unstable teachers than the same for stable teachers.

31. The comparative category ratios such as Lower order teacher questions/Higher order teacher questions, Lower order student response/Higher order student response, Higher order teacher questions/Higher order student response, and Student initiation/Student questions, were found higher for stable teachers than for unstable teachers.

32. Comparative category ratios of Higher order student questions/ Higher order teacher response and Teacher continuation reaction/ Teacher reacting behaviour, the unstable teachers were not found different from the stable teachers.

33. The teaching pattern of unstable teachers was characterised by the following instructional sequence; Presentation of information --> Presentation of formal Questions --> Response of students --> Structuring of learning activities --> Prevalance of silence.

34. The social climate of the classes of unstable teachers was not open. Students were not much involved in classroom activities. Teachers did not care to establish emotional rapport with the
35. The teaching pattern of stable teachers was characterised by the following instructional sequence: Presentation of information --> Presentation of formal questions --> Response of Students --> Formulation of higher level questions --> Prevalance of Silence --> Presentation of questions, in simplified terms Expanded response of students --> Prevalance of Silence --> Presentation of information.

36. The social climate of the classes of stable teachers was not very conservative. Student involvement was quite healthy. Teachers were conscious of creating an emotional rapport with the students. The class remained active, alert and the democratic atmosphere prevailed throughout in the teaching Time.

**Low and Moderate experience teachers**

37. Teacher initiation was observed male in the classes of teacher with moderate the experience, whereas teacher questioning, teachers response and student response were observed more in the classes of teacher with low experience.

38. The comparative category ratios of Teacher talk/Student talk, Student elicitation/Student initiation, Student direct response/Student divergent
response, Steady state and Content cross were found more in case of moderate experience teachers, as compared to low experience teachers.

39. The comparative category ratios of Teacher elicitation/Teacher initiation, Teacher direct response/Teacher divergent response, Teacher elicitation/Student response, Teacher clarification/Teacher initiation and Student initiation/Student talk, were found more for low experience teachers than their moderate experience counterparts.

40. The comparative category ratios of Teacher acceptance/Teacher correction, Student acceptance/Student correction, and Teacher direction/Teacher talk, the low experience teachers were not found different from the moderate experience teachers.

41. The comparative category ratios of Lower order teacher questions/Higher order teacher questions, Lower order student response/Higher order student response, Higher order teacher questions/Higher order student response, Teacher extending reaction/Teacher reacting behaviour, and Student initiation/Student questions, were found more for low experience teachers when compared to the same in case of
moderate experience teachers.

42. The comparative category ratios of Teacher talk/Student talk, Higher order student questions/Higher order teacher response, Teacher terminating reaction/Teacher reacting behaviour, Teacher initiation/Structuring learning activity, Teacher initiation/Teacher questions, Steady state and the Content cross, were exceeding in case of moderate experience teachers than the same in case of low experience teachers.

43. The comparative category ratios of Lower order student questions/Lower order teacher response, and Teacher continuation reaction/Teacher reacting behaviour, the low experience teachers were not found different from the moderate experience teachers.

44. The teaching pattern of low experience teachers was characterised by the following instructional sequence; Presentation of information --> Presentation of formal questions --> Response of students --> Prevalance of silence --> Presentation of questions. Structuring of learning activities --> Presentation of information.

45. The social climate of the classes of has experience teachers was not relaxed. The emotional climate also appeared to be flat and business like and interaction
was not spontaneous.

46. The teaching pattern of moderate experience teachers was characterised by the following instructional sequence; Presentation of information --> Prevalence of Silence --> Presentation of formal question --> Response of students --> Presentation of information. Structuring of learning activities --> Structuring of learning activities, continue.

47. The social climate of the classes of moderate-experience teachers was warm. Student-teacher interaction was observed. No special efforts, however, were made by the teacher to create an emotionally sound atmosphere.

**Moderate and High experience teachers:**

48. Teacher questioning, student initiation and continuation of classroom activities have been reported high in case of high experience teachers, when compared the same with moderate experience teachers.

49. Student response, however, has been reported more in moderate experience teachers than the high/experience teachers.

50. The comparative category ratios of Student elicitation/Student initiation, Student direct response/Student divergent response, and Teacher
questions/Student response, were found more in case of teachers with moderate experience than the same for teacher with high experience.

51. The comparative category ratios of Teacher talk/Student talk, Teacher elicitation/Teacher initiation, and Student initiation/Student talk, were found more for high experience teachers than the same for moderate experience teachers.

52. The comparative category ratios of Teacher acceptance/Teacher correction, Student acceptance/Student correction, Teacher direct response/Teacher divergent response, Warming/Cooling, Teacher direction/Teacher talk and Content cross for the moderate experience teachers were not found different from the high experience teachers.

53. The comparative category ratios of Lower order student response/Higher order student response, Higher order teacher questions/Higher order student response, Higher order student questions/Higher order teacher response, Teacher extending reaction/Teaching reacting behaviour, Teacher terminating reaction/Teacher reacting behaviour and Teacher initiation/Teacher questions were found more in case of teachers with moderate experience than the same in case of high experience teachers.
54. The comparative/category ratios of Lower order teacher questions/Higher order teacher questions, Lower order teacher questions/Lower order student response and Student initiation/Student questions, were found more for high experience teachers as compared to the same in case of moderate experience teachers.

55. The comparative category ratios of Teacher talk/Student talk, Lower order student questions/Lower order teacher response, Teacher continuation reaction/Teacher reacting behaviour, Teacher initiation/Structuring learning activities, Steady state and Content cross ratio for high experience teachers were not found different from the same for moderate experience teachers.

**Low and High experience teachers:**

56. Teacher initiation and student initiation were more in high experience teachers classes whereas teacher response and student response were observed more in low-experience teachers' classes.

57. The comparative category ratios of Student elicitation/Student initiation, Teacher direct response/Teacher divergent response, Student direct response/Student divergent response, and Content cross were reported high in the classes of low
experience teachers than the same in the classes of high experience teachers.

58. The comparative category ratios of Teacher talk/Student talk, Teacher elicitation/Student response and Student initiation/Student talk were found more for high experience teachers than the same for low experience teachers.

59. The comparative category ratios of Teacher acceptance/Teacher correction, Teacher elicitation/Teacher initiation, Student elicitation/Teacher response, Teacher direction/Teacher talk and that of steady state in classes of high experience teachers were not found different from the same in the classes of low experience teachers.

60. The comparative category ratios of Lower order teacher questions/Higher order teacher questions, Lower order student response/Higher order student response, Higher order teacher questions/Higher order student response, Higher order teacher questions/Higher order student response and Teacher terminating reaction/Teaching reacting behaviour were found more in the classes of low experience teachers than the same in classes of experience teachers.

61. The comparative category ratios of Teacher talk/Student talk, Lower order teacher
questions/Lower order student response, Teacher continuation reaction/Teacher reacting behaviour, Teacher initiation/Structuring learning activities, Teacher initiation/Teacher questions, Student initiation/Student questions, and that of Content cross were found more in the classes of high experience teachers, when compared the same to the classes of low experience teachers.

62. The comparative category ratios of Lower order student questions/Lower order teacher response, Teacher terminating reaction/Teacher reacting behaviour, in the classes of low experience teachers were not found different in the classes of the high experience teachers.

63. The teaching/pattern of high/experience teachers was characterised by the following instructional sequence; Presentation of information --> Presentation of formal questions --> Response of students --> Prevalance of silence --> Presentation of Questions. Structuring of the learning activities --> Presentation of information.

64. The social climate of the classes of high experience teachers was poor. Students remained passive most of the time. Social interaction was low and on the whole the classroom activities were dominated by the
Product variable:

65. High effective teachers did not differ from low effective ones with respect to the academic achievement of their students.

66. High effective teachers did not differ from Low effective teachers with respect to their students' attitude towards biology.

67. The High effective teachers did not differ from Low effective teachers with respect to their students initiative level.

68. The teaching pattern of Extrovert, Introvert, unstable and Stable teachers did not differ from each other with respect to the students' academic performance.

69. The teaching pattern of Extrovert, introvert, unstable and Stable teachers did not differ from each other, with respect to the students' attitude towards biology.

70. The teaching pattern of Extrovert, Introvert, Vanstable and Stable teachers did not differ from each other, with respect to the initiative level of students.

71. The academic achievement of students of High experience teachers was higher than the academic
achievement of students of Moderate experience teachers.
72. The teaching pattern of teachers with Low, Moderate and High experience, did not differ from each other, with regard to the students' attitude towards biology, yielded by the corresponding patterns.
73. The teaching pattern of teachers with Moderate experience marginally differ from High experience teachers, with respect to the student's initiative level yielded by the corresponding patterns.
74. High experience teachers developed more initiative than low and moderate experience teachers, among their students.

5.10 Educational Implications of the Study:
The present investigation may provide a deep insight into the presage-process-product relationship in a teaching learning situation. It develop awareness about the classroom interactions, flow of teaching learning activities and spontaneous teaching behaviour of different types of teachers and also about the impact of the teaching behaviour on their students' cognitive and affective behaviour. The study depicts, that students of high-experience teachers perform better in their academic field and have more initiative than the students of low
and moderate experience teachers. Such findings may provide an impetus to presage-process-product research investigations.

A thorough study of cognitive and social aspects of classroom interactions have been made in the course of the present investigation. The study of Patterns of teaching depicts a direct relationship of teacher variables with their classroom behaviour and it consequently affects the learners.

Process study in the present research has revealed that the teachers usually are not much bothered about the emotional rapport, approval of student behaviour and social interactions in their classes. They behave in a business like way and the entire classroom process is reduced to a routine of lower cognitive functioning. The finding throws light on the process of in-service teachers where much importance is given to socio-emotional rapport for the development of students' affective aspects of personality.

The findings of the study on pupils academic achievement, pupils attitudes and pupils initiative in relation to teacher pupil interactions, provides a feedback about the teaching behaviour of a teacher with which he can try to bridge the gap between his instructional intentions and overt actions and the inturns
that stimulates better learning among students.

5.11 **SUGGESTIONS FOR FURTHER STUDY**

A single study, as the present one, however controlled it may be, may not provide sufficient evidence for its utility in actual institutional settings. So the findings of the study may be confirmed or contradicted—

i) with different samples from rural or urban backgrounds

ii) with trained and untrained teachers

iii) at different levels of schooling viz primary, middle and/or higher level.

iv) with other presage variables such as sex, intelligence, anxiety, cognitive style, etc.

v) with different subjects like languages, social studies, science and maths separately.

vi) with the help of an experiment with one group receiving the feedback of classroom observation and the other not receiving it.