SUMMARY AND CONCLUSION

6.1) Need for the Present Study
6.2) Research Questions
6.3) Statement of the Problem
6.4) General Objectives of the Study
6.5) Variables involved in the study
6.6) Tools used for the Study.
6.7) Sample and Sampling Procedure
6.8) Procedure of Data Collection
6.9) Statistical Techniques Used
6.10) Conclusions
6.11) Educational Implications
6.12) Suggestions for Further Research
CHAPTER - VI

SUMMARY AND CONCLUSION

Education is never ending process, which is intricately interwoven with life, enriching the individual with a variety of experience, kindling the flames of knowledge with constant probing into the mysteries of life, within and without. Each educational institution should produce educated, intelligent individual who can think independently not a mass which can be manipulated. For this, the emphases in education should shift from cramming information to stimulating analytical thinking. Charles E. Silverman in his Crises in Class-room rightly mentioned “What tomorrow needs is not mass of intellectual, but mass of educated men to feel and to act as well as to think. Herbert Spencer said “Education is the training of completeness of life, it will bring out the perfection which is latent in every man”.

Education does not mean pouring of lot of ideas or information into the brain of the individual. It is a more process of drawing from within than putting from without. It means the gradually mental growth and enrichment of man from infancy to maturity.
6.1) Need for the Present Study

Whether teaching is an Art or a Science, to be an effective teacher one must develop certain attitudes and qualities, which make teaching effective.

The role of teachers, particularly those of secondary schools in shaping the personality of younger generation, is becoming increasingly important. Whether teacher is viewed as a model, director, supervisor, guide, co-worker or leader, the teacher has a crucial role in moulding the behaviour of pupils. The secondary school teacher may be regarded as the builder of the nation. The task of a teacher today, is far more difficult than it was a few decades ago. The tremendous explosion of knowledge, development of teaching technology and availability of different channels of education, like TV, video and audio lessons have on the one hand provided opportunities which were not available for effective teaching, and on the other hand, increased the challenges and responsibilities of the teacher. In the past, when the teacher was the main source of knowledge he / she could not afford to be static and lethargic. Studies have been conducted to analyze and determine the special qualities of successful teachers. Although the studies have revealed different findings, there are certain basic qualities, which are common to most of the successful or effective teachers. These qualities are to be imbibed by all the teachers, if they are being effective teachers. The dimension of effective teaching normally includes: human relations dimension,
instruction dimension and evaluation dimension. Those teachers who are good on these dimensions can become good professionals in their fields. Teachers with commitment, interest and love for teaching can be more effective in their profession.

Teaching process is an interaction between the personalities of the teacher and the pupils. The teachers' personality, his values, attitudes, outlook, behaviour and overall performance exert illustration on his pupils. A competent teacher is considered to be one who is not only intelligent, personally desirable and socially adequate and also professionally able individual with optimum motivation for self-actualization. Researches conducted so far have revealed that teachers' personality as well as students' personality have significant effect on students' academic achievement. Many studies have related the two important dimensions of personality, extroversion and neuroticism, to school achievement. The former characterizes the person who is outgoing, social, and interested in others rather than himself. The latter is developed from chronic anxiety, caused by multiple and obscure sources, that makes the person ineffective in carrying out the ordinary affairs of living. He feels exhausted, helpless, and excited. The findings though not completely consistent, have tended to indicate that these two personality variables of students are important in predicting school achievement. Attitudes of students towards science and teaching profession have been shown to be a significant predictors of school
achievement. Studies have revealed that students who achieved the highest grade in each subject had students with highly favourable attitudes towards science and teaching profession. Attitude is a comparatively stable, emotional and learned pattern of behaviour, which predisposes the individual to act in some consistent way towards his/her profession.

Chandra, D. (1976) studied the perception of work values in teaching. The study, among other things, revealed that students with favourable attitude towards teaching perceived their achievement effectively on work values like social service, chances of progress, intellectual challenge, prestige and power, etc. Further, effective teachers differed significantly from ineffective teachers on work values like economic returns, chances of progress, prestige and power, etc. Sukhwal, K.D. (1977) studied the attitudes of students towards the teaching profession. The study revealed, among other things, that a high percentage of those who were identified as having a favourable attitude towards the teaching profession gained more than with unfavourable attitude.

Thus, it is revealed that a liking for the profession is an essential pre-requisite for its success in the teaching profession, success is measured in terms of the academic achievement of students. Hence, the teachers should develop right type of attitude amongst the students and also towards his profession in order to achieve the goal in the
educational field. The goal is to transform the personalities of the students into beings useful to the society.

The review of studies conducted so far clearly shows that although, teaching effectiveness, personality and attitudes of the students are thoroughly investigated and these studies examined their effect on dependent variable separately. There is a need to study the interactive effect of these variables on the dependent variable. Therefore, the pre-sort study is an effort to investigate the interactive effect of students' personality, attitude towards science and teachers teaching effectiveness on the academic achievement of students in science.

6.2) Research Questions

Specifically, the current study attempted to answer the following questions:

1. Whether students personality type like extroversion introversion and neuroticism influence upon academic achievement of students in independently in case of male teachers, female teachers, teachers with minimum qualifications, teachers with higher qualifications, teachers with higher teaching experience and teachers with lower teaching experience?

2. Whether students attitude towards science influence upon academic achievement in science independently in case of male teachers, female teachers, teachers with higher qualifications, teachers with minimum qualifications, teachers with higher teaching experience and teachers with lower teaching experience?
3. Whether teachers' teaching effectiveness influence upon academic achievement of students in science independently in case of male teachers, female teachers, teachers with higher qualifications, teaches with minimum qualifications, teaches with higher teaching experience and teachers with lower teaching experience?

Whether the interactive effect of students personality types, attitude towards science and teachers' teaching effectiveness taken 2 variables and 3 variables at a time, significantly effect upon the academic achievement of students in science when the data were classified into male teaches, female teachers, teachers with higher qualifications, teachers with minimum qualifications, teachers with higher teaching experience and teachers with lower teaching experience?

6.3) Statement of the Problem

"Interactive Effect of Teacher Effectiveness, Secondary School Students Personality and Attitude Towards Science on their Academic Achievement".

The present study is intending to know the factors affecting on academic achievement like teacher effectiveness, students personality and attitude towards science.

6.4) General Objectives of the Study

The present study was designed with the following general objectives.

1. To study the effect of students personality factors, attitude
towards science and teachers' effectiveness on academic achievement in Science.

2. To study the effect of male teachers' effectiveness, students personality and attitude towards science on academic achievement.

3. To study the effect of female teachers' effectiveness, students personality and attitude towards science on academic achievement.

4. To study the effect of higher qualification of teacher effectiveness, students attitude towards science and personality on achievement of students in science.

5. To study the effect of minimum qualification of teacher effectiveness, students attitude towards science and personality on achievement of students in science.

6. To study the effect of higher experienced teachers' effectiveness, students' personality, attitude towards science on achievement in science.

7. To study the effect of lower experienced teachers' effectiveness, students' personality, attitude towards science on achievement in science.
Specific Objectives

1. To study the effect of students' personality factors like extroversion and high neuroticism and introversion and low neuroticism on achievement in Science.

2. To study the effect of students' desirable and undesirable attitude towards science on academic achievement in Science.

3. To study the effect of teachers' effective and ineffective teaching effectiveness on academic achievement of students in Science.

4. To study the interactive effect of students' personality factors and attitude towards science on academic achievement of students in science.

5. To study the interactive effect of students' personality factors and teachers' teaching effectiveness on academic achievement of students in Science.

6. To study the interactive effect of students' attitude towards science and teachers' teaching effectiveness on academic achievement of students in Science.

7. To study the interactive effect of students' personality factors, attitude towards science and teacher teaching effectiveness on academic achievement of students in science.
6.5) Variables involved in the study

1) Independent variables (Predictors)

   i) The independent variables considered in the present study were;

   ii) Students' Personality (Introversion and Extroversion)

   iii) Students' Attitude towards Science

   iii) Teachers' Teaching Effectiveness (Effective-Ineffective)

2) Dependent Variable (Criterion)

   Academic-achievement of Students in Science

6.6) Tools used for the Study.

   The review of related literature revealed that, the present study requires students' personality inventory (Introversion, Extroversion and Neuroticism), Students Attitude towards Science scale, Teacher effectiveness tool and a criterion test that is Achievement Test in Science. Hence, the investigator contacted experts and professors of Psychology and Education and explored for the appropriate tool. He finally, decided to use following tools for the study

   i) Junior Personality Inventory (JPI) Kanada version.

   ii) Achievement Test in Science.

   iii) Student Rating of Teaching Effectiveness Scale (SROTES).

   iv) High School Students' Attitude Scale towards Science.
6.7) Sample and Sampling Procedure

The sample for the study is usually drawn from the population related to the problem of the study. In the present case the high school students and teachers are to be involved. Hence, the sample is drawn from the High Schools.

There are three types of secondary schools established in Karnataka State. They are;

i) Government Secondary Schools (Rural and Urban).
ii) Aided Secondary Schools (Rural and Urban).
iii) Un-aided Secondary Schools (Rural and Urban).

The investigator chosen randomly the above three types of schools in the Dharwad and Belgaum Districts.

Sample of Teacher and Students

<table>
<thead>
<tr>
<th>Types</th>
<th>No. of Sc.Area</th>
<th>Teachers</th>
<th>Students IXA,IXB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>Female Total</td>
</tr>
<tr>
<td>Government</td>
<td>10 Urban</td>
<td>20</td>
<td>20 40</td>
</tr>
<tr>
<td>Schools</td>
<td>10 Rural</td>
<td>20</td>
<td>20 40</td>
</tr>
<tr>
<td>Aided</td>
<td>10 Urban</td>
<td>20</td>
<td>20 40</td>
</tr>
<tr>
<td>Schools</td>
<td>10 Rural</td>
<td>20</td>
<td>20 40</td>
</tr>
<tr>
<td>Un-Aided</td>
<td>10 Urban</td>
<td>20</td>
<td>20 40</td>
</tr>
<tr>
<td>Schools</td>
<td>10 Rural</td>
<td>20</td>
<td>20 40</td>
</tr>
</tbody>
</table>
The above schools are randomly chosen. Hence, there are 60 schools (30 Urban and 30 Rural). 240 teachers and 1200 students studying in IX standard taught by the respective selected teachers who are involved in the present study. From each class three students (above average, average and below average) were also selected to rate each teacher. Thus stratified random sampling technique was used to select the teachers and random sampling technique was used to select the students.

6.8) Procedure of Data Collection

The data collection for the present study was done in four stages. The first stage of data collection was done with the help of student rating of teacher effectiveness. For this purpose three students from each class of each school (above average, average, below average) were trained to observe the teachers. Then the teacher effectiveness rating scale developed by Dr. Shashikala Deshpande (SORTES) was given to the selected students for rating. Each teacher teaching Science subject was rated by the selected three students in each of the class belongs to selected schools. The average score of three students is the perceived effectiveness of the teacher who taught the subject.

The Junior Eysenck Personality Inventory which is known as JPI was administered to the students with proper instructions. The responses of the students were noted separately as high and low extraverts and high and low neurotics.
The selected students were also given the attitude towards science or Students Attitude towards Science Questionnaire (SAS) for knowing the attitudes of the students towards various aspects of science subject. The attitudes were rated as high, moderate and low.

Finally the students were given the achievement test in Science constructed by the investigator.

6.9) Statistical Techniques Used

The purpose of the study was to investigate the main effects and the Interactive effects of three independent variables viz., students personality, students attitude towards science, teachers teaching effectiveness on the independent variables that is academic achievement of the students in science. As there were three independent variables it was decided to use 3-way analysis of variance (ANOVA). In order to find out the main and Interactive effects.

Secondly if the treatment group differ significantly, it will not be clear from the findings that which of the comparison of the treatment group differ significantly in terms of their effect on academic achievement variable. Hence, to know these, multiple comparisons of means of all the treatment groups was carried out using Scheffe's test (1959).

These statistical techniques were also used in order to study the Interactive effect in case of sub samples like, male teachers, female teachers with higher qualification and minimum qualification, teachers
with higher teaching experience and lower teaching experience. The analyses of the data were carried out in pursuance of the objectives of the study as well as the research hypothesis.

6.10) Conclusions

Based on the discussion of the results of the study the following conclusion could be drawn;

- The 'Introversion and low Neurotic personality' type of secondary school students has influenced more on academic achievement in science than the students with extroversion high neurotic personality type in the entire sample, male teachers with higher qualifications and teachers higher teaching experience and lower teaching experience.

- The 'Favourable attitude of secondary school students towards science has greater influence on academic achievement in science than the students with unfavourable attitude towards science in the entire sample, female teachers, teachers with minimum qualification and teachers with lower teaching experience.

- The 'Teaching effectiveness of secondary school teachers has more influence on academic achievement of students in science than the teachers' with ineffective teaching in the entire sample, male and female teachers, teachers with higher qualifications and with higher teaching experience.
• The 'Introversion and low Neurotic Personality' type with 'Favourable attitude' of school students towards will jointly influence more on academic achievement of students in science than the students with 'Extroversion high Neurotic Personality' type and the students with 'Unfavourable attitude' towards science in the entire sample, teachers with minimum qualifications and with higher and lower teaching experience.

• The 'Extroversion and high Neurotic Personality' type with 'Favourable attitude towards science will jointly influence more on academic achievement of students in science than the students with ' Extroversion and high Neurotic Personality' type and students with unfavourable attitude towards science in the entire sample, teachers with minimum qualification and with lower teaching experience.

• The 'Introversion and low Neurotic Personality' type with 'Effective teaching of teachers will jointly influence more on academic achievement of students in science than the students with 'Extroversion and high Neurotic Personality' type and ineffective teaching by teachers in the entire sample, male and female teachers and teachers with higher qualifications.

• The 'Extroversion and high Neurotic Personality' type of students with 'Effective teaching' of teachers will jointly influence more on
academic achievement of students in science than the students with 'Extroversion and high Neurotic Personality' type and teachers with 'ineffective teaching in the entire sample and male teachers.

- The 'Favourable attitude of Students towards Science with 'Effective Teaching' of teachers will jointly influence more on academic achievement of students in science than the students with favourable/unfavourable attitude and effective/ineffective teaching in the female teachers, teachers with higher qualifications and teachers with higher teaching experience.

- The 'Introversion and low Neurotic Personality' type with 'Effective Teaching' of teachers will jointly influence more on academic achievement of students in science than the students with introvert/extrovert with favourable /unfavourable attitude and teachers with effective/ineffective in the entire sample, male and female teachers and teachers with higher teaching experience.

- The 'Introversion and low Neurotic Personality' type with favourable attitude towards science and ineffective teaching of teachers will jointly influence more on academic achievement of students in science than the students with introvert/extrovert with Unfavourable attitude and teachers with effective/ineffective in the entire sample female teachers.
• The 'Extroversion and high Neurotic Personality' type with favourable attitude and 'Effective teaching' of teachers will jointly influence more on academic achievement of students in science than Introvert/Extrovert students with favourable/unfavourable attitude and effective/ineffective teaching in the entire sample, male teacher and teachers with higher teaching experience.

• The 'Introversion and low Neurotic Personality' type with unfavourable attitude and effective teaching of teachers will jointly influence more on academic achievement of students in science than the extrovert and high neurotic students with unfavourable attitude towards science and ineffective teaching in the male teachers alone.

• The 'Introversion and low Neurotic Personality' type with unfavourable attitude and ineffective teaching of teachers will jointly influence more on academic achievement of students in science than the extrovert and high neurotic students with unfavourable attitude towards science and ineffective teaching in the male teachers.

**6.11) Educational Implications**

1) **Students personality and Students achievement.**

Although the outcome of the learning is currently classified into three dominos-Cognitive, affective and psychomotor (Bloom, et.al., 1971),
The primary goal of the school is acquisition of people of cognitive outcome, namely, academic skills. The extent to which this goal is attained reflects the effectiveness of the schools' endeavour. Therefore, it is not surprising that great attention has been paid to the school achievement of students.

School achievement is referred as academic achievement which is an outcome of instruction. It can be assessed by using an achievement test, either may be teacher-made test or a standardized test. Such tests typically focus upon such topics as the understanding and application of specific and scientific principals, the interpretation of literature, or the appreciation of art school achievement may be expressed as an overall grade based upon combination of all the subjects taken or as a grade in a specific subject or course such as science, reading comprehension or mathematics. An achievement tests is usually constructed to measure knowledge in a specific subjects and the pupils' total grade can be obtained by combining the results of all the tests taken. The purpose of a study indicates what kind of achievement test is to be used.

Research studies concerning school achievement have employed both kinds of achievement scores. However, educational researchers have recently become more interested in looking at scores for specific subjects separately. Most of the researches on school achievement have sought to identify the factors responsible for different levels and types of accomplishment among individuals. The method generally use to solve
this problem is to relate achievement scores to some selected variables such as intelligence or aspects of personality.

In the present study the investigator hypothesized that, extrovert and high neurotic, introvert and low neurotic students differ significantly in terms of their effects on academic achievement in science. Findings of the study clearly reveal that, introvert and low neurotic personality type of students has more affinity on the academic achievement in science than the students with extrovert and high neurotic personality type. This may be described as follows:

Introvert and low neurotic students are individuals with predominantly subjective outlook but objective implementation and have higher degree of cerebral activity than the extrovert high neurotic students. They generally appear cold, aloof, silent and hard to understand. They tend to be socially inept. It is assumed that, this kind of introvert and low neurotic tendency may lead to positive and significant influence on academic achievement in science and other subjects. The findings of the previous study or related studies though not completely consisting, have tended to indicate that this two personality variables are important in predicting academic achievement.

Personality factor is not a collection of intrapsychic structures and events. It is rather a pattern of behaviour in relation to other people. This means that, a person cannot find his personality by sitting in meditation.
Personality emerges only when a person is actually doing something — with, against, away from, for, to inspite, or in some other relationship with other people. Personality is developed out of Interactive with others. Jung (1964) regards the introvert as someone whose energies and interest or directed towards his own inner mental stage. Ensick (1965) explains the neurotic as mental stage of behaviour and reflects the consistence to the situation both introvert and neuroticism acts simultaneously in an individual. Usually, the introvert individuals are having stable neurotic nature. This means introverts are having low neurotic character. Whereas the extrovert tendency, which leads to ineffective influence on achievement in science in the present study may be termed as the nature of individual talking much about the factors rather unnecessarily, uncalled for, unnoticed, creating confusion amongst others, always the tendency to expose enthusiastically. While doing such things the individual becomes highly nervous and tensioned. Hence, the extrovert individual is having high exposing nature with high tension. Hence, the extrovert individual is having high neurotic nature. In the present study it is found that, the extrovert and high neurotic personality students did not achieve much because of the above reasons. Hence, this nature can be modified through appropriate teaching techniques and modification behaviour techniques like, individual guidance and counseling, therapeutic continuum may be more suitable.
Many studies have related the two important dimensions of the personality considered in the study like extroversion and high neuroticism, introversion and low neuroticism to school achievement. The former characterizes the persons as outgoing, and interested in others than him. The latter although signifies a hesitant, reflective, retiring nature they may have progressive effects, when a person create unique and useful product, such as first-rate novel. For instance at the elementary school level the extroverted boys and girls have been shown to be scholastically superior to introverted once (Eysenck and Cookeson 1971: Rushton, 1972 and Entwistle and Cunmit Ham, 1972). However, at the higher level of education, the relationship between academic achievement and the two personality variables considered in the study change inversely that is high achievers tended to be introverted and low neurotic (Lyn 1972; Savage, 1972 and Banks and Finlayson 1973).

(Banks and Finlancon 1973). Found that for secondary school boys the relationship between the school achievement and the neuroticism varied according to parental pressure and expectation for achievement when the pressure were low pupils have low on neuroticism and attain higher academic achievement. However, when the pressures were greater the pupils get high neurotic in nature resulting to be disadvantage to the total attainment. In the present study the investigator identified personality factors of the male and female students by administering the junior personality inventory (originally prepared by Ensyck and Cookson,
It was found that, the students with extroversion are having high neurotic in nature. Hence, they are categorized as extroversion and high neurotic personality type. Similarly, students with introversion are having low neurotic in nature. Hence, they are categorized introversion and low neurotic personality type. Another interesting factor emerged in the study more number of boys are mostly having extravert and high neurotic personality type and some of them are having introvert and low neurotic personality type. Whereas the girls are mostly having introvert and low neurotic type but some of them are having extrovert and high neurotic personality type. The studies carried out by Vidhumohan (1978) and Jantli and Deshpande revealed that, the secondary school students with extroversion and low neurotic have achieved more than the students with extroversion and high neuroticism. The present study also supporting the same results.

2) Students' Attitude towards Science and Academic Achievement.

Attitudes are enduring dispositions to react in certain ways towards different objects. They are relatively stable. In other words, they represent the extent of positive or negative affect (feelings) associated with such object including person, places, institutions, systems, practices and ideas. As the feelings towards any of these may be Positive or Negative, the overall attitude may be said to be Favourable or
Unfavourable. Attitudes are essentially affective but they have cognitive and effective domains as well. They have cognitive contain in terms of the knowledge and beliefs about the objects concerned. This may emerge from one's sustained experienced with the object over a period of time, or from an intense experience in a limited time. In fact, this is the base of the attitude, as the feeling emerges from this cognitive structure with internalized with the accompanying feelings. Attitudes also have a affective domains in the sense that, they urge one to behave or respond in certain particular way in the respect of subjects. In other words, they make for certain behavioral tendencies. A positive attitude or favourable entertains approach behaviour in some form or degree (receive, respond, seek, participate, contribute, love, etc.,), and a negative or unfavourable attitude makes for avoidance behaviour (avoid, move away from, dislike, oppose, hate etc.,).

In the present study, students' attitude towards teaching learning process in science subjects or perseverance of science activities in the schools is conceived. It is a comparatively stable, emotional and learned pattern of behaviour which predisposes the individuals to act in some consistency towards his or her opinion. It may range between positive or favourable attitude to negative or unfavourable attitude. The findings of the present study revealed that, the favourable attitude of the students towards science has more influence on the academic achievement than the unfavourable attitude towards science. This may be due to that a
favourable attitude makes the students to know better, to take more interest, to get involved in, to experience effectively, to comprehended more, to thing creatively, to explore more, to look the happenings carefully, to analyze and interpret properly to develop systematic approach and thinking, to adopt scientific steps etc. Whereas the unfavourable develops less thinking, no interest, no creative thinking, no proper experimentation, no enquires, no discussions, no opportunities to express the feelings. Hence, low attitude towards the subjects and teachers etc. The unfavourable attitude towards science of students makes the teaching learning tasks harder more tedious and unpleasant.

Attitudes tend to develop incipiently, gradually and generally unconsciously. They arise as by-products of one's day-to-day experiences. If the teacher is pleasant, enthusiastic about his subject and sensitive to the needs of his students the students may develop favourable attitude towards the teachers and the subject matter. If the teacher is punitive, on the other hand, the student will tend to develop negative attitudes towards the teacher as the subject matter. Thus, the attitudes of the teachers or the determinants of the students' attitude. This will prevent him from doing well. As a result, the school experience, rather than serving as the bases for self-realization, may well have highly determinately repercussions on his whole life. Thus, he may not care particularly about the date of historically events or theories of sciences.
Attitude formation may be a matter of imitation; many of our attitudes are simply borrowed. The child accepts the views of his parents and other significant persons in his environments. Attitudes also develop as a result of deliberate cultivation, especially parents and teachers. What the teachers is as a person and the way he act is generally more important in fostering describable attitudes on the part of the children then what he perches. Hence, it is very essential that the teacher possess favourable attitude towards ones professions to develop proper attitude amongst the students. To the extent that teachers often use models by children in the formation of their attitudes, it is imperative that they meet definite standarise of suitability. It is essential that they have a positive outlook on teaching profession and whose integrity, sincerity and loyalty are unquestioned, who can embody such beliefs into living lessons, and who can use their prestige to inspire in the development of wholesome attitudes which will serve as a foundation of wholesome behaviour. It is essential teachers expires the basic values of our culture. On the other hand teachers can not give the child attitudes; they can only arrange for him to have satisfying experiences that will lead to the formation of positive attitude on the basis of which desirable behaviour can become integrated into a pattern of life.

In the present study favourable attitudes of the students towards science influenced more on the academic achievement in science and the
other subject. Hence, it is essential to influence upon the attitudes of the teachers for manifestation in a right direction.

If we have to deliberately influence attitude change, one way is to provide appropriate experience in an intense and systematic way with the psychological objects concerned. Personal experience with the objective concern can influence the attitude significantly. Encouraging the approach behavior or avoidance behaviour as appropriate through repeated reinforcement is another. But the most convenient and adequately effective means is perhaps concentrated and systemic communication, to build up a suitable cognitive structure or change in the existence system of knowledge and beliefs about the object, presage, status, reputation, etc., of the communicator would count in this printed materials especially those published by reputed firms, and mass media presentations have prestige value and influence. The logical strength of the communication is important for the relatively more intelligent ones and emotional appeal for the others. The messages must carry conviction, verbal exposition, especially inspiring talks, discussions and debates, facilitating logical analysis, convincing arguments and conclusions, audio-visual support or communication (sound, drawings, pictures, cartoons, slides, mock-ups, etc) dramatized presentations like (skits, plays, socio-drama, T.V. or video presentation, documentary, feature films, etc.) have all been found to be effective. Judiciously mixing up some of these is also quite effective in making persuasive communication.


**Teachers' Teaching Effectiveness**

In the present study, the investigator hypothesized that effective and ineffective teachers differ significantly in terms of their effect on academic achievement in science. The study clearly revealed that teachers with effective teaching influence more on academic achievement in science than the teachers with ineffective teaching. The term 'teaching effectiveness', in the present study is used to refer to the results a teacher gets or to the amount of progress the pupils make towards attainment of instructional objectives. The role of the classroom teacher in education is central. The teacher is, after all, the point of contact between the educational system and the pupil. The impact of any educational programme or innovation on the pupil operates through the pupil's teachers. It is, therefore, quite accurate to say that a school's effectiveness depends directly on the effectiveness of its teachers. Maximizing teacher effectiveness is a major goal of education.

The studies conducted in the areas of teaching effectiveness showed that effective teaching is correlated with many variables like intelligence, personality of the teacher, classroom situation and the studies also revealed that pupils co-operation, readiness of teacher, motive to achieve better qualifications, age, sex, rewards, fulfillment of needs would influence on teacher effectiveness.
Teacher effectiveness was first perceived by researchers as a consequence of characteristics or personality. The teaching learning process is essentially a live process in the sense that, it is a warm interaction between two living organisms and hence, while exploring the effectiveness of teaching, one should take into account the non-cognitive dimensions such as warmth, understanding, empathy, concern, sharing, sympathy, deep understanding, mutual psychological explorations which are all rooted in the philosophical view of life one holds. Therefore, the effectiveness of teaching apart from the classroom interaction should add certain aspects of value orientation of the individual teacher. Attempts were thus made to identify these characteristics of effective teacher is best characterised by Commonwealth Teacher Training Study (Charters and Waples, 1929), which used exhaustive and meticulous procedures to produce a number of list of varying lengths. Typical of the characteristics listed were the following, which were the top six on a list of twenty-five: (1) adaptability, (2) considerateness, (3) enthusiasm, (4) good judgement, (5) honesty, and (6) magnetism.

As already mentioned that there are several factors that would affect teacher effectiveness such as; teaching experience, type of school, and competency in teaching. It is also true that the intelligence and creativeness, the innovative endeavour on the part of the teacher are the factors affecting the teacher effectiveness. Borich (1977) observes that, "teaching involves the dynamic interplay of human personalities the
central one being those of the teacher and the pupils". Effective teaching will depend upon the attitude of the teacher the way he sees his own role and the way he relates it to his students. Chartes and Waples (1929) identified the competency of teachers in the classroom teaching as follows: he has to understand the child and his difficulties select and organise material to suit his capacities and interests, choose appropriate time for his work and present the subject matter in an effective manner.

Any effective teaching in the classroom depends upon these competencies. Travers (1980) observes that, effective teaching is not a set of distinct acts, each isolated from the other, as proponents of the theory of distinct competencies would have believe specific behaviours identified as related to effective teaching are merely symptomatic of the underlying characteristics of effective teachers and it is these characteristics that teacher preparation should attempt to develop. Teaching as performing art requires that the teacher training give emphasis to training the prospective teachers' personality. His school of thought emphasizes the development of an effective classroom personality as a precondition to effective teaching.

It is instructive to examine a study in which secondary school students were asked to list characteristics of the teachers they had liked best (Hart, 1936). The six most frequently mentioned characteristics were:
i) Has teaching skills;

ii) Is cheerful, good-natured, patient, not irritable;

iii) Is friendly, companionable, not aloof;

iv) Is interested in pupils, understands them;

v) Is impartial does not have teacher's pets; and,

vi) Is fair in grading and marking.

The same students were asked to consider whether the teacher from whom they learned most was the same as the one they liked best; and asked to show how the most effective teacher differed from the one best liked. The four characteristics mentioned most often were:

(i) Makes greater demands of students,

(ii) Has more teaching skills,

(iii) Has more knowledge of subject matter, and

(iv) Has better discipline.

Hence, there is a need to develop remedial major keeping in view the qualities identified in the latter part of the above study to overcome the qualities of ineffectiveness among secondary school teachers.

The findings of the present study revealed that ineffective teaching has less influence on academic achievement in science when compared to effective teaching. The available research studies indicate
that many factors have been examined in relation to teaching effectiveness among school teachers. As it has already been indicated, teacher effectiveness is a psychological condition, where in an individual may happy when he deals effectively in the classroom, when compared to ineffective teacher. Though some research has been done on teacher effectiveness in abroad not many studies have been undertaken in India.

Growing consciousness about the limitation of research on teacher effectiveness and the compelling need to achieve the much needed break through to meet the emerging challenge of teacher effectiveness stimulated many researchers to make concerted attempts to salvage the complicated situation. Thus, there is a need to explore the possible causes for ineffective teaching among teachers, so that proper programme may be developed for ineffective teachers, viz., need based short-term orientation courses, long term subject orientation courses, workshops, seminars, symposium, conferences, summer courses, panel discussion, film-shows on important educational themes, arrangement for mobile library, provision of internet facilities to schools, telecasting theme oriented programmes during the specific hours, liaison with the nearby college of education and a degree college, to act as nodal agencies in sharing resources, supply of C.D's to schools, supply of A.V. materials, recognition and rewards for best teachers, promotional facilities, etc., are to be created for upliftment of professional skills among ineffective teachers.
Over and above, developing a liking for the profession is an essential prerequisite for its success. Under the present stress of unemployment, an individual perhaps has little freedom to take up a job of his choice, but has to accept whatever comes in his way. Under these circumstances, a person should develop an attitude to like the work that is given. It is only by identifying oneself with one's profession that it is possible for an individual to perform his/her work to the satisfaction of everyone. This statement particularly applies to the teaching profession.

6.12 Suggestions for Further Research

While conducting the study, a need for undertaking a few specific research studies relating to the field was felt. The suggestions for such studies are enumerated below, under two categories: one, studies that arise out of the limitations of the present investigation, and the other, studies that are related to the field.

(a) Studies Arising out of the Limitations of the Present Investigation

Development of valid and reliable rating scale to measure the professional attitudes of secondary school teachers towards the teaching profession.

- Development of valid and reliable personality inventory to measure the personality of secondary school teachers.
- Development of valid and reliable student rating scales and inventory for objective measurement of secondary school teacher's personality and attitude towards profession
• A critical study of influence of selected teacher variables on academic achievement of students in all the classes of secondary schools.

• An Interactive effect of influence of selected teacher variables on academic achievement of students in all the school subjects of secondary schools

• The findings of the present study may be cross validated involving the secondary school teachers from both rural and urban areas.

• The study may be repeated involving larger sample of teachers as well as students at the secondary level.

• The study with the same design may be conducted to investigate the relationship of teachers' personality, teachers' attitude and teachers' teaching effectiveness with academic achievement of students in all the school subjects

Study may be undertaken to investigate the relative contributions of the variables - teachers' personality, teachers' attitude and teachers' teaching effectiveness on academic achievement in all the school subjects.

Interaction study could be undertaken involving Cattell's 16 Personality factors in relation to academic achievement.

In the present study teachers teaching effectiveness is rated by 3 students (above average, average and below average) in order to arrive at
efficiency index a study may be undertaken involving large number of students to assess teacher teaching effectiveness.

The present investigation is confined to Interactive effect of personality, attitude and teaching effectiveness of teachers on academic achievement of students. However, further analysis may be carried out to study the direct and indirect effect of these variables on dependent variable using path analysis technique.

b) Studies Related to the Problem

- Similar study may be undertaken to investigate the Interactive effect of teachers' personality, teachers' attitude and teachers teaching effectiveness at the primary level, +2 level, and at the university level.

- Study may be undertaken to investigate the Interactive effect of students' personality, attitude and study habits on their academic achievement in all the school subjects.

- The study with the same design may be undertaken involving teacher educators personality, attitude and teaching effectiveness on the academic performance of teacher trainees at the Colleges of Education and as well as Teacher Training Institutions.

- Study may be undertaken to investigate the Interactive effect of teacher educators' personality, attitude and teaching effectiveness on the academic performance of teacher-trainees/in-service teachers undergoing pre-service and in-service training programmes organized in DIETs.
• A comparative study of Interactive effects of the selected variables among teachers serving in Government, Private Aided and Private Unaided secondary schools may be undertaken.

• A study of Interactive effect of teachers' variables, viz., personality, attitude and teaching effectiveness may be undertaken keeping in view the residential schools like Morarji Desai Residential School, Jawahar Navodaya Vidyalayas, Sainik Schools, etc.

• A study may be undertaken involving the teachers' job satisfaction, job involvement and job expectations on teaching performance.

Contradictory to the findings of certain studies the present investigation has revealed insignificant Interactive effect of the teachers variables like introversion personality type, favourable attitude and effective teaching in the teachers with minimum and higher qualifications and teachers with lower teaching experience. An in-depth study may be undertaken in order to tackle this contradictory result.

• A comparative study of teachers serving at primary, secondary, pre-university level may be undertaken with the same research design.

• A study could be undertaken with the same teachers variables with a view to compare Interactive effect of students in rural and urban areas; and students belonging to advantaged and disadvantaged groups.
• A comparative study may be undertaken to investigate the Interactive effect of personality, attitude and teaching effectiveness of teachers coming from urban and rural areas.

• A comparative study may be undertaken to investigate the Interactive effect of personality, attitude and teaching effectiveness of teachers serving in residential and non-residential schools.

• An Interactive effect of personality, attitude and teaching effectiveness of teachers on academic achievement motivation of students may be undertaken.

• An impact study may be undertaken to investigate the effect of school climate on personality, attitude and teaching effectiveness of teachers at primary secondary, pre-university and university levels.