# CHAPTER II

## REVIEW OF RESEARCH

The review of literature is an important part of the scientific approach. It is generally carried out in all areas of scientific research whether they are physical sciences, natural sciences or social sciences. In the field of educational research the literature familiarize one with the frontiers reached in a particular field. It is not possible to develop a research project successfully untill one does not know what others have done and what more remains to be done in one's particular area of interest or investigation. In short a review of literature enables one to lay the foundation upon which all future work will be carried out. It has been rightly said that the research worker is tempted to let a sketchy review of the related research suffice so that he can get started sooner on his own research project. But the fact remains that the investigator should make every effort to complete a thorough review before starting his research so that he might get proper insights and knowledge. Therefore, "often the insights gained," writes Borg, "through the review will save the research worker as much time in conducting his project as the review itself required."

The following are the relevant brief summaries of the researches done on the various dimensions of this study :

A. Review of Personality Studies

Lamke (1951) in his study compared the personality characteristics of a small group of 'good' and 'poor' teachers. The sample consisted of 18 teachers - 10 'good' teachers and 8 'poor' teachers. The teachers were assigned to groups on the basis of a composite rating by their principal and two observers.

It was found that the two groups differed on three of the factor scores involved. The good teachers were above average on Cattell's source traits F (Surgency - Desurgency) and H (Parmia Vs. Threctia). It indicated that good teachers are more than usually talkative, cheerful, placid, frank, and quick; whereas the poor teachers are below average in these respects. Similarly the good teachers are above average in their tendencies to be gregarious, adventurous, frivolous, to have strong artistic or sentimental interests and to be interested in opposite sex. The poor teachers are below average in these respects.

Again the good teachers were average or slightly below average on source trait N (Shrewdness Vs. Naivete), while the poor teachers were far below on this trait. It indicates that good teachers are approximately average in their tendencies to be polished, fastidious and cool, while poor teachers are definitely below average in these respects.

Erickson (1954) in his study administered the Cattell's 16 P.F. test on 60 teachers. The 16 P.F. test scores were correlated with nine different measures of teaching effectiveness. Among the 144 correlation coefficients, however, only 14 reached the .05 level of significance. Four of the factor scores yielded significant correlations (.05 level) with at least two of the nine effectiveness criteria. These factors were : Factor G (Positive Character Vs. Immature Dependent Character); Factor M (Practical Vs. Imaginative), Factor O (Placid Versus Apprehensive) and Factor $Q_3$ (Undisciplined Self Conflict Vs. Controlled).

Hadley (1954) administered the 16 P.F. test to entire graduating class (number and sex not reported) at a state teachers college in Pennsylvania. He then compared students who received a practice teaching grade of "A" with those whose grade was "C". Three of the sixteen factor scores discriminated between the two groups at .05 level or better. Students who received an "A" Grade, as compared with those who received a "C", were more likely to be low on Factor F - Surgency Vs. Desurgency and high on Factor G - Positive Character Vs. Immature Dependent Character.

Montross (1954), conducted a study on a group of 35 teachers consisting of 16 males and 19 females. The scores of these teachers on Cattell's 16 P.F. Test were correlated with two composite ratings of success in teaching. The first was a summation of four ratings given by the principal and two outside raters during the subject's first year of teaching.

The second comprised all the ratings included in the first plus an additional one made by the principal during the subject's second year of teaching. None of the correlation coefficients between scores on the 16 P.F. test and the first composite reached the .05 level of significance. Only one of the 16 factor scores - Factor A (Cyclothymia Vs. Schizothymia) - correlated significantly ($r = .40$) with the second composite rating.

Cattell and Drevdhal (1958) administered the 16 P.F. Test to 294 eminent scientists. The subjects represented three fields - biology, physics, and psychology - and within each were further divided into three groups - administrators, teachers and researchers.

As compared with researchers, the teaching scientists were significantly higher on Factor A - Cyclothymia Vs. Schizothymia - and lower on Factor $Q_2$ - Self Sufficiency. The teaching scientists in this study were compared with administrators, and they showed a greater number of differences than when they were compared with researchers. The teachers were significantly higher (.05 level or better) than the administrators on five factors - Factor L (Paranoia); Factor M (Bohemian unconcern); Factor O (Free anxiety); Factor Q (Redication); and Factor $Q_4$ (Psychosomatic anxiety). They were significantly lower than the administrators on Factor H (Adventurous Cyclothymia) indicating greater conscientiousness, application to school work and regard for the authority.

Bhagoliwal (1960) reported a study in which he studied the personality profile of Indian M.Sc. students. More

specifically the present study was conducted with the objective of comparing the personality pattern of Indian post-graduate (M.Sc.) students in Science with those of American college students and of eminent scientists in America.

The sample of the study consisted of students of University of Allahabad belonging to four different courses of study at post-graduation level. (Physics, Inorganic Chemistry, Organic Chemistry and Mathematics). The total number of students who took part in the present study numbered 50. The students were administered Cattell's 16 P.F. Questionnaire after making suitable item changes to make it appropriate On Indian conditions and consistent with the factors.

The investigator reported the factors where the four groups of students differed were those of Factor B (Intelligence) and Factor H (Self-contained, aloof). Their scores on Factor B (Intelligence) indicated that the students of Physics are more intelligent and those of Mathematics the least. Similarly, with regard to their difference on Factor H (Aloofness and being Self-contained), our subjective impression is that the students of Physics and Mathematics are more aloof than those of Chemistry. The author remarks "But, on the whole, we can say that the four groups can be safely regarded as samples of common population, and they can be treated as a composite group by themselves for comparison with other groups."

The comparison of personality structure of Indian post-graduate students with those of American college students revealed that the Indian students were intellectually at a

lower level (B-); emotionally unstable (C-), glum and silent (F-), less conscientious (G-), timid and shy (H-), sensitive and effiminate (I+), suspecting and cautious (L+), Bohemian and unconcerned (M+), timid and insecure (O+), imitative ($Q_2$+) and also excitable ($Q_4$+). But, on the other hand, comparing the group of American Scientists, with the American students and with the Indian students, it was found that the American Scientists and Indian advanced science students have similar trends on factors, A, C, E, F, G, I, L, M, N, Q, and $Q_2$.

Barr and others (1961) in their investigation have shown relationship between personality and teaching success. They have made use of Cattell's 16 P.F. Questionnaire. They have reported that Factor G+ (Conscientiousness), $Q_3$ (Control) and M (Practicality) were positively related to teaching success.

Warburton and others (1963) in their study on Student Performance in a University Department of Education in England using Cattell's 16 P.F. test found it to be a fair predictor of teaching mark in that conscientiousness (G+), tenderminded-ness (I+) and Control ($Q_3$+) exhibited relationship significant at the .05 level with teaching ability. This they regarded as of sufficient promise to suggest their use as a part of selection procedures.

Tarpey (1965) reported a study in which he used besides Intelligence, Teacher Attitude and Interest measure, 16 P.F. Questionnaire of Cattell on a sample of 120 students in four different colleges, three colleges from Ireland and fourth

college from England, which served for the comparison.

The results were varying and rather contradictory.

| | | |
|---|---|---|
| Factor M | : | Positive for all Irish Colleges, significant for colleges 2 and 3. |
| Factor $Q_2$ | : | Positive but insignificant for all Irish Colleges. |
| Factor $Q_4$ | : | Positive but insignificant for all Irish Colleges. |
| Factor N | : | Positive but insignificant for three colleges. |
| Factor I | : | Positive but insignificant for three colleges. |
| Factor L | : | Positive but insignificant for all women's colleges. |
| Factor $Q_1$ | : | Negative but insignificant for all Irish Colleges. |
| Factor O | : | Negative but insignificant for the women's colleges. |
| Factor G | : | Negative but insignificant for three colleges, but positive and insignificant for college 1. |

Start (1966) conducted a study on thirty five members of the staff of a mixed secondary modern school in England. The staff members were administered Cattell's 16 P.F. with the objective of seeing relationship between the teaching ability and the measures of personality. The measure of teaching ability was the rating of the head teacher of the school.

He found that the best teachers differed from the rest on factors A-, B+, E+, L-, M+, $Q_1$- and $Q_3$-. As teaching ability was linked with sex, correlations partialling out sex indicated that factors L- and M+ were significantly (.05) correlated with rated teaching ability and that H+ marginally failed to reach this level of significance.

Cross, Cattell, and Butcher (1967) in their comparative study of personality characteristics of creative Artists used

Cattell's 16 P.F. Questionnaire. In this study Sixtythree visual artists and twentyeight craft students were compared with a matched control group. Significant differences in the mean scores between artists and controls were found on twelve factors of the 16 P.F. test. On eleven of these twelve factors, the scores of the craft students were intermediate between those of the artists and the controls. Especially salient features of the artists' personality pattern were A- (reserved, schizothyme tendency), E+ (assertiveness, dominance), $Q_2$+ (self-sufficiency), C- (low emotional stability), $Q_3$- (low self-integration, casualness), M+ (autistic or bohemian tendency) and G- (low superego strength). They also differed from the control group in being more suspicious (L+), more apprehensive or guilt prone (O+), and more tense or overwrought ($Q_4$+). In terms of the second order factors, the artists are assessed as being slightly introverted though there is evidence of some contradiction, strongly anxious, experimenting, non-moralistic, and slightly sensitive.

Henjum (1967) in his study reported personality characteristics of secondary student teachers. The purpose of the study was to see the relationship between certain personality characteristics of the secondary academic student teachers and their success during their student teaching experience.

The sample of this study consisted of 78 student teachers of University of Minnesota registered in different teaching subjects. They were administered Cattell's 16 P.F.

Questionnaire. At the close of the student-teaching units, the supervising teachers administered the Hoyt-Grin Pupil Reaction Inventory to the student teachers pupils. Each University supervisor assigned letter grades and ranked the student teachers for whom he was responsible according to his judgement of their relative teaching effectiveness.

The results of this study indicated that different personality characteristics were important for student teaching success at Junior and at Secondary School level. In the present study two personality factors B+ (More Intelligent) and F+ (Surgency) were related to teaching success at the secondary level. But in case of junior level teachers it was found that teaching success was related to C+ (Emotional stability), $Q_1$+ (Experimenting), A+ (Outgoing), $Q_3$+ (Self controlled), I+ (Sensitive), F+ (Surgency).

The investigator of the present study concluded that "it is also indicated that Cattell's Sixteen Personality Factor Questionnaire is a useful objective means for quantifying and profiling personality characteristics of prospective teachers."

Cortis (1968) tested 259 students in three constituent colleges of Education of the University of Manchester school of education with cognitive, creativity and personality measures. Among the relevant results for this study were the correlation of 16 P.F. Questionnaires scores with the criteria of Educational Theory, Practical Teaching and main and subsidiary subjects were relatively few, totalling only eight

percent of significant correlations compared with the University sample of eighteen percent. However, the 16 P.F. has failed to reveal any significant relationship to practical teaching such as Warburton, Butcher and Forrest (1963) found in case of G+ (Conscientiousness), sensitivity and self discipline.

Mclain conducted a study (1968) on 196 Secondary School student-teachers (74 male + 122 females). The tool was 16 P.F. and the objectives of the study were (1) identification of those scales of 16 P.F. that differentiate superior male and female student-teachers from the inferior ones, and (2) Development of a specification equation separately for men and women for the same purposes (differentiation of superior and inferior student-teachers). Point-Biserial Correlation and Mann-Whitney U-Test were used as statistical techniques. He found that superior male student teachers differed significantly from the inferior ones on nine scales of the 16 P.F. (Factors G, H. L, $Q_4$, A, B, C and N). The Mann-Whitney U-Test produced a Z of 3.52 which is significant at 0.0023 level. Superior female student teachers differed significantly from the not superiors on seven scales of the 16 P.F. (Factors A, B, E, F, H, M and $Q_3$). The Mann-Whitney test produced a Z of 10.71, significant beyond 0.0003 level of confidence.

Mclain recommended a follow-up study for other student teachers, experienced teachers and teachers teaching in different fields. He concluded : "It may well be concluded that successful teaching in different teaching fields calls

for personality configurations unique to each field."

Davis and Satterly (1969) in their study of personality profile of student teachers administered Cattell's 16 P.F. Questionnaire to the 149 female students of Homerton College at the time of their entry to the college. The same Questionnaire was again administered after a period of twenty six months prior to final teaching practice. Small groups of 'high' and 'low' teaching ability were identified and their personality profiles compared. Four factors, conscientiousness (G), toughmindedness (I), confidence (O) and relaxed behaviour ($Q_4$) significantly differentiated between the groups on both test occasions, and practicality (M) on the first occasion. Two way analysis of variance on all possible pairs of factors revealed 15 interactions significant at .01 level. The findings suggest that particularly poor performances were encountered where tendermindedness (I+), high insecurity (O+) and tenseness ($Q_4$+), respectively, are associated with a lack of conscientiousness (G-). Coefficients of test-retest stability over the period were calculated.

Cattell, Eber and Tatsuoka (1970) in their Handbook For the 16 P.F. Questionnaire have reported following studies on teachers.

(i) Bromley at Taylor University arranged for 64 student teachers (elementary school) to be rated on five aspects of a teaching effectiveness criterion (class management, preparation, personal qualities in a teacher, professional zeal, and teaching procedures) and obtained the following :

Teaching Effectiveness = .34A + .34B + .34C + .68M
+ .34N + .17$Q_3$ - .17$Q_4$
- 5.72 (12%). (Multiple R=.4)

(ii) Mattsson (1968) found G positively related to rated teacher success at the junior high level (.35), but negatively so among senior high teachers (-.40). In general, his results suggest that the personality correlates of teaching ability must be examined in relation to teaching level.

(iii) Meosky's (1967) study suggests that A-, B+, N+, and O- are associated with success for a sample of industrial arts teachers.

(iv) Mitchell (1963b), at the University of Rochester, for example, found significant personality factors associations with different motivations for entering teaching. Source traits A, E, F, G, $Q_3$ and $Q_4$ were involved, in patterns.

DeBlassie (1971) reported a study in which he compared the personality structure of the persistant and prospective teachers. The purpose of this study was to determine whether personality differences exist between persistant teachers with undergraduate training in teacher education and prospective teachers with an undergraduate background in the liberal arts.

The sample of this study consisted of 32 teachers (16 males and 16 females) and 32 persons with undergraduate liberal arts training (16 males and 16 females) who were undergoing teacher training at the post-baccalaureate level were administered the Cattell's Sixteen Personality Factor Questionnaire. In this study analysis of variance was used to compare the personality structures of the four subgroups.

It was found that the four subgroups were significantly different on four of the sixteen personality factors viz E+ (Humble), I+ (Toughminded), N+ (Forthwright), O+ (Placid). The results suggest that only slight personality differences exist between teachers with undergraduate teacher training background and prospective teachers with an undergraduate liberal arts background.

Mehta (1972) in his study on 489 student teachers in the various colleges of Maharashtra concluded his results on Cattell's 16 P.F. test as follows :

(i) It was found that men were more outgoing, assertive, venturesome, shrewd and radical than the women pupil teachers.

(ii) Women on the other hand were more tender.

(iii) High and low achievers in B.Ed. theory differed significantly on six personality variables. The high achievers were found to be more conscientious, venturesome, tenderminded and experimenting.

(iv) The low achievers were outgoing and imaginative.

Gupta (1972) conducted a study on 260 student-teachers (Science and Non-science) preparing for the teaching profession at Regional College of Education, Ajmer. The sample consisted of Science student teachers 109, Non-science student teachers 110, and Four year science student teachers 41. In this study Gupta made use of Cattell's 16 P.F. Questionnaire with the objective of comparing personality characteristics of Science and Non-science student teachers.

In this study Science student teachers were found to be reserved-tend to be stiff, cool, aloof (A-) whereas Non-science student teachers were outgoing, ready to cooperate, emotionally expressive, soft hearted and adaptable (A+). Science student

teachers were found to be more intelligent (B+) than their comparative group of Non-science student teachers (B-). The Science student teachers were found to be shy (H-) which indicates that they tended to be slow and impeded in speech and expression, prefer one or two close friends to a large group, whereas the Non-science student teachers were venturesome (H+), indicating spontaneity, abundant emotional responses, careless of details and consume much time in talking.

Another factor which differentiated Science student teacher from their Non-science counterpart was that Science student teachers were toughminded (I-) that is they are practical, realistic, masculine, independent, hard and cynical whereas Non-science student teachers were found to be tenderminded (I+) indicating artistic, day-dreaming, fastidious and faminine behaviour. Lastly it was found that Science student teachers were self-sufficient ($Q_2$+) that is they are independent, accoustomed to going their own way whereas the Non-science student-teachers were found to be group-dependent ($Q_2$-) indicating the preference to work and make decisions with other people, like and depend on social approval and admiration.

Gupta (1974) reported a study of student teachers who were administered Cattell's 16 P.F. (Hindi form). The sample of 260 male student-teachers consisted of 169 Science, 46 Agriculture and 45 Commerce student teachers. The findings showed that when the factors were listed in rank order the

first five important factors were (G+), (H+), I+), ($Q_3$+) and ($Q_2$+). The least important from the point of rank order were (F-), ($Q_4$-), (E-), (C-).

In conclusion the investigator reported that student teachers exhibit, in general, personality traits at an average level, avoiding extremes. The only exception is Factor F on which they take a lower position and hence are sober, restrained and dependable.

Kaul (1974) undertook a study with a view to identify the personality characteristics that differentiated between teachers who were popular with their students and to find out the common factors in the differentiating characteristics with the help of Factor Analysis. A popular teacher was one who was liked by at least 80% of the group. The teachers at the other extreme i.e. those liked by only 20% or less to be not popular with the group of students. The study was conducted in the state of Haryana on VIII, IX and X class students. The students were asked to write the names of five teachers whom they liked the most on a performa supplied to them by the investigator. The total number of 'popular' teachers was 124 and 'not popular' were 100 only. The investigator however randomly weeded out 24 teachers out of the popular group in order to make the two groups of a comparable strength.

Cattell's 16 P.F. Questionnaire was used to identify the differentiating personality traits of 'popular' teachers. The results indicated that the 'popular' teachers scored significantly higher on Factors A, B, C, G, H, N, and $Q_3$ while

the 'not popular' teachers scored higher on Factors F, I, O and $Q_4$.

The investigator has extracted four personality factors that characterise the 'popular' teachers. The first one has been characterised as the factor of 'Striving' which according to investigator means "makes a man capable of seeking new avenues for fulfilment inspite of the risks involved. It appears to make an individual pushing to seek success." Such a teacher will be ready to try new experiments with his pupils in matters of maintenance of discipline, assessment, teaching techniques etc. He would also be emotionally responsive to the pupils in a placid manner without being exuberant and will be able to give proper leadership to the social group of the class. All these attributes seem to constitute popularity.

The next factor has been characterized as factor of "Self-Confidence". It represents a well knit personality. It appears to make an individual self-reliant and realistic. Such a teacher will be practical and confident and firm in his dealings, but his firmness will be tempered with placidity and calmness.

The third factor has been termed as the factor of "Ability and Perseverance". Perseverance makes ability functional; it is like, its lubricant. A teacher who has a good deal of this common factor in his personality is likely to be intelligent, conscientious and objective.

The last and the fourth factor has been called as the factor of 'Calmness'. This is a factor of serenity alone. In

the context of the personality of a teacher it may be said that serenity and calmness seem to be conducive to congenial relationship between the teacher and the taught.

Savage (1974) in his comparative study of Medical, Teaching and Planning students administered the Cattell's 16 P.F. with the objective of comparing study habits and personality characteristics among these three groups.

In this study three hundred and seventy four students volunteered to complete assessments of their intellectual functioning, study habits and a number of a personality characteristics. They included 113 medical undergraduates, 194 students at a college of Education and 67 candidates for a degree in Town and Country Planning. Study habits were seen to be significantly different between the groups. The medical students appeared to have the best study habits, followed by Planners, both with significantly higher scores than the teachers.

These professional groups differed significantly on a number of personality characteristics measured by Cattell's Sixteen Personality Questionnaire. Probably of most practical significance in this regard were the scores on $Q_3$ factor which measures disciplined self-conflict versus controlled socially precise behaviour and attitudes. Potential Teachers and Planners showed significantly more undisciplined self-conflict than Medical students. A similar position emerged on factor $Q_2$. Medical students were significantly more self-sufficient and resourceful than both Teachers and Planners. Planners and

Teachers were both less relaxed in their attitude than Medical students. It was also found that Medical and Planning students were, in general, placid and confident compared to Teachers who tended to be somewhat more apprehensive and worrying. Teachers were generally more conservative in their opinions than both Medical students and Planners, Planners in particular, being the most experimenting and radical in their views ($Q_1$). Teachers also tended to be more restrained and shy in their behaviour (H) compared with the Medical and Planning students who tended, by comparison, to be progressively and significantly more venturesome and socially bold. The potential Planners were also on average more expedient and rule evading, that is to say less conscientious (G) than both Medical and Teacher groups. They were, at the same time, more shrewd and calculating in their behaviour than both Teachers and Doctors (N). The student Teachers were seen as significantly more tenderminded and sensitive than both Doctors and Planners (I).

Gopal (1975), proposed to test the following hypotheses that : (i) Creative Science students are significantly more reserved, emotionally stable, assertive, sober, self-opinionated, imaginative, shrewd, experimenting, self-sufficient and relaxed than non-creative Science students; (ii) Creative Engineering students are significantly more reserved, emotionally stable, assertive, sober, self opinionated, imaginative, shrewd, experimenting, self-sufficient and relaxed than non-creative Engineering students; (iii) Creative Engineering students are significantly more outgoing, happy-go-lucky and tenderminded

than creative Science students; and (iv) Non-creative Engineering students are significantly more outgoing, happy-go-lucky and tenderminded than non-creative Science students. The sample of this study was drawn from Kurukshetra University and one University from each of Punjab and Uttar-Pradesh.

The findings of this study were (i) Creative Science students were more reserved, emotionally stable, assertive, sober, expedient, venturesome, suspicious, imaginative, shrewd, experimenting, self-sufficient and relaxed than the counter-group. The non-creative Science students were found to be more outgoing, affected by feelings, humble, happy-go-lucky, conscientious, shy, trusting, practical, forthright, conservative, group-dependent and tense; (ii) Creative Engineering students in comparison to their less creative peers were found to be more reserved, emotionally stable, assertive, sober, expedient, venturesome, toughminded, suspicious, imaginative, shrewd, experimenting, and self-sufficient. The non-creative Engineering students were found to be more outgoing, affected by feelings, humble, happy-go-lucky, conscientious, shy, tenderminded, trusting, practical, forthright, conservative, and group dependent; (iii) on comparison, creative Science students were found to be more reserved, assertive, expedient, conservative, group dependent, and undisciplined, while creative Engineering students were found to be more outgoing, humble, conscientious, experimenting, self-sufficient and controlled; (iv) On comparison, the non-creative Science

students were found to be more reserved, assertive, expedient, toughminded, imaginative, shrewd, conservative and undisciplined, whereas the non-creative Engineering students were found to be more out-going, humble, conscientious, tenderminded, practical, forthright, experimenting, and controlled.

Gupta (1976) in his study conducted on 300 teachers tried to test following hypothesis : (i) teachers in the 'high', 'average', and 'low' categories, put according to their scores on the teacher effectiveness measures, could also be differentiated on the basis of their 16PF scores profiles; and (ii) some of the sixteen personality factors would be significantly correlated with the composite teacher effectiveness used and on the basis of these relationships, it was possible to develop a 16PF specification equation and linear qualification grid for predicting teacher effectiveness.

The major findings of the study were as follows : (i) The high effective teachers differed significantly from the general population with respect to nine personality factors out of sixteen. They were more affecto-thymic (A+), more intelligent (B+), having more ego-strength (C+), more surgent (F+), more self-sentiment ($Q_3$+), less suspicious (L-), less guilt prone (O-), and less radical ($Q_1$-); (ii) The low effective teachers were less intelligent (B-) and were having lower self-concept control ($Q_3$-) compared to general adult population; (iii) In comparison to average effective teachers, high effective teachers were significantly more intelligent (B+),

emotionally stable (C+), assertive (E+), conscientious (G+), adventurous (H+), tenderminded (I+) and had higher self-control ($Q_3$+), and they were also less suspicious (L-), less experimenting and radical (Q-), less self-sufficient ($Q_2$-) and less tense and frustrated ($Q_4$-); (iv) In comparison to low effective teachers, the high effective teachers were more warm hearted (A+), intelligent (B+), emotionally stable (C+), assertive (E+), surgent (F+), adventurous (H+), and self-controlled ($Q_3$+); and they were less suspicious (L-), imaginative (M-), apprehensive and guilt prone (O-), experimenting and radical ($Q_1$-), and self-sufficient ($Q_2$-); (v) the average affective teachers, in comparison to low effective teachers, were more outgoing (A+), surgent and happy-go-lucky (F+), controlled and socially precise ($Q_3$+), and less imaginative and more practical (M-).

Gupta (1977) conducted a study on 400 teachers (200 male and 200 female) with the purpose of testing the following hypothesis: (i) to locate successful and less successful teachers; (ii) to find out the personality traits (Cattell's factors) of successful teachers and differentiating them from less successful teachers; (iii) to compare the academic achievement of successful and less successful teachers; (iv) to compare the attitude of successful and less successful teachers towards teaching; and (v) to find out the home, health, social, emotional, professional and total adjustment differences, between the successful and less successful teachers.

It was found that success in teaching was significantly related to (i) personality factors A, B, C, F, G, H, I, L, N, O, $Q_3$ and $Q_4$; (ii) adjustment in various fields of life like home, health, social, emotional and total adjustment; and (iii) professional attitude. But it had no significant relationship with academic achievement. It was also found that there were differences in personality characteristics, adjustment and attitude towards teaching of successful and less successful teachers. The personality characteristics, adjustment - home, health, social, emotional professional and total adjustment, attitude towards teaching, and sex were concluded to be determinants of teaching success. Also, it was concluded that the factors as a group were better indicators of teaching success than individual factors.

Raina (1978) conducted a study on 110 B.Ed. science students of Regional College of Education, Ajmer. The tool used in the study was Cattell's 16P.F. Questionnaire. The main objective of the study was to compare the personality characteristics of two parallel groups of student teachers of high and low teaching ability as represented by the final teaching marks at the University of Rajasthan.

In the present study the high and low ability student teachers differed on Factors E and $Q_1$. The high ability group scored lower on Factor E which means that the high ability teachers are humble, accomodating and conforming rather than assertive, independent and stubborn as is the case with the low ability ones. Again, the high ability student teachers have

$Q_1$-, which signifies conservatism, respecting established ideas, tolerant of traditional difficulties; on the other hand low ability teachers are experimenting, critical and free-thinking, infact characterized by Radicalism ($Q_1$+).

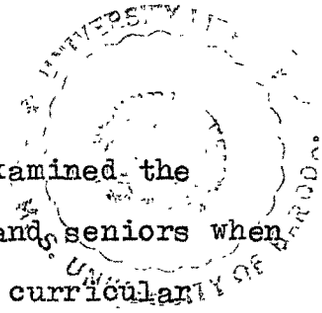
The high ability student teachers, (rated by supervisors of different orientations and back-grounds), in this study were humble, conforming (E-); Conservative traditionalists ($Q_1$-); Shrewd, calculating (N+), Restless tense ($Q_4$+); and emotionally stable, Unruffled (C+); practical, and Conventional (M-).

Review of Attitude Studies

Callis (1950) investigated the changes that occur during teacher training and early teaching experience, using "a slight extension" of the Leeds Inventory that correlated .95 with the original. This study was designed to determine in a general way the stability of the attitudes being measured by comparing the test-retest scores of four groups of subjects: (1) Controls -- 57 first-quarter juniors in the College of Education tested and retested at one-week or ten-day intervals; (2) Juniors -- 175 first quarter juniors in the College of Education tested at the beginning of the school year and again after six months later; (3) Seniors -- 147 first quarter seniors in the College of Education tested at the beginning of the school year and so again six months later; (4) Beginning teachers -- 137 teachers from the College of Education tested just before graduation and again after they had been teaching for the six months.

The investigator reported that the results were quite straightforward. All the groups, including the controls, showed a significant change in mean Inventory scores between the first and second testing. For the controls, Juniors, and Seniors this change was an increase from first to second testing; for the Beginning Teachers, it was a decrease. When the change in score of the Experimental groups was compared with the change of control group, it was found (a) For the juniors, the increase was significant at the .01 level; (b) For the Beginning Teachers, the decrease was significant at the .01 level; (c) For the Seniors, the increase was not significantly different from the increase for the controls.

The correlation coefficient between the first and second testings for the three Experimental groups was .71 for the Juniors, .74 for the Seniors, and .66 for the Beginning Teachers. Analysis of the effect of training and early teaching experience on each of the 239 items of the Inventory revealed that the first six months of professional training produced significant changes in the desired direction in 20 per cent of the attitudes (items), while the first six months of experience produced significant changes in the undesirable direction in 11 per cent of the attitudes (items). The investigator concluded: "the attitudes measured by the Teacher Attitude Inventory are of sufficient stability to warrant further investigation as to their efficiency in predicting teacher-pupil relations and in pre-training selection of teachers."



Callis (1950) in his another study examined the teacher attitude scores of education juniors and seniors when the students were classified into three major curricular groups : (1) Early childhood education majors - nursery to elementary; (2) Academic field majors; (3) special field majors - art, home economics, industrial, music, physical education. He found significant differences among the three groups, with the early childhood education majors scoring highest and the special field majors scoring lowest in about the same magnitude both at the junior and senior levels, i.e., at the beginning and at the end of the professional training.

Kearney and Rocchio (1955) studied the differences in MTAI scores between 587 elementary school teachers who taught all subjects to the same pupils (self-contained classrooms) and 52 teachers who taught different pupils in art, home economics, industrial, arts, music, and physical education (specialist classrooms). The respective MTAI scores for the two groups were 41 and 28, differing significantly at the .01 level. The investigators explained the findings as follows :

> Teachers who have pupils for longer periods during the day are interested not only in the pupil's acquisition of subject matter, but also are concerned with the pupil's whole personality which demands knowledge of the pupil's home background, his physical and mental health, and his outside activities. On the other hand, teachers of "special" subjects think in terms of the subject matter to be

covered rather than the development of a self-directing personality in their pupils.

Cook, Kearney, Rocchio, and Thompson (1956) described a study investigating the relationship between MTAI scores and the "amount of education" of teachers. They reported that elementary school teachers with two years of college education (N = 238) obtained a mean MTAI score of 21, those with four years (N = 291) obtained a mean of 51, those with five or more years (N = 73) obtained a mean of 66; secondary school teachers with four years (N = 287) obtained a mean of 52. Several interpretations of the results were offered, among which are : (1) The teachers with only two years of college may have realized they did not have teaching aptitude and discontinued their preparation; or (2) They may have been subjected to less comprehensive training in such things as child growth and development; or (3) Teachers who acquire more college education may be a superior group to begin with, or (4) The superiority of the MTAI scores was directly affected by the increased richness of a full college education.

Cook, Kearney, Rocchio and Thompson (1956) reported the results of a study in which pupils in the tenth and twelfth grades of four high schools were asked to name the subjects taken during the year with the two teachers they liked best and with the two teachers they liked least. There was no difference in the sex or age of the teachers most often liked and disliked but the differences in the MTAI scores was

pronounced, the mean of the liked group (N = 50) being 39 and the mean of the disliked group (N = 50) 18.

Kearney and Rocchio (1956) in their study reported the relationship of MTAI scores to the type of teacher training institution attended by elementary school teachers. The sample of this study was 291 teachers in a large Midwestern city who had earned a bachelor's degree from one of the following types of institutions : (a) liberal arts college (N = 51); (2) teachers' college (N = 88); (3) University (N = 152). Significant differences were found for the three groups, the respective means were 34, 51, and 56. The investigators concluded :

> ....it seems reasonable to expect that a teacher who is educated in an institution endorsing the viewpoint that thorough background in liberal arts is essential for effective teaching will differ from one educated in an institution which emphasizes that knowledge alone does not guarantee that the teacher will manifest a desirable pattern of behaviour in the classroom... The MTAI is the only instrument that discriminates between teachers educated in various types of institutions - liberal arts colleges, teachers colleges, and universities. It will be to the advantage of both prospective teachers and their pupils if these institutions find it possible to build curriculum in reference to improvement on MTAI scores.

Sandgreen and Schmidt (1956) investigated the problem: Do the attitudes of teachers change as a result of practice teaching and do these attitudes correlate with ratings of teaching proficiency? The subjects were 393 seniors in

elementary, secondary academic, and secondary non-academic education, and other types of seniors at a Midwestern teachers college who took practice teaching during one or more of the three 12-week terms of the school year. The MTAI was administered at the beginning and again at the end of this practice-teaching experience, and critic teacher's ratings on the Student Teacher Report for each student teacher were obtained. Comparisons were made between the two MTAI scores, and between the second MTAI score and the critic teacher's ratings. The findings were quite straight forward. The mean for the entire group of 393 student teachers was 43 before practice teaching and 54 at the end of practice teaching, a statistically significant increase. On a sub-group basis the changes upward were noticeable in every group in which there was no relationship for any of the groups between the MTAI score and the critic teacher's rating on teaching proficiency.

Sandgreen and Schmidt (1956) in their study divided a sample of 393 student teachers into an upper, middle, and lower groups on the basis of their Minnesota Teacher Attitude Inventory score. This was done with the objective of seeing relationship between MTAI scores and the critic teacher's rating of teaching effectiveness.

It was found that there was no significant relationship between the MTAI scores and the critic teacher's ratings of teaching effectiveness, even though the student-teachers were further subdivided into male versus females, elementary versus secondary or according to the curriculum followed. The

investigator concluded, "... because there was no apparent relation between MTAI scores and critic teacher's ratings the MTAI cannot be used to predict probable success in teaching if the ratings made by public school critic teachers on the Student Teaching Report are used as a criterion of success."

Stein and Hardy (1957) made use of Minnesota Teacher Attitude Inventory on student teachers. In this study three samples of student teachers from the University and the Normal School in Manitoba were utilized. Two samples of 50 subjects each were in the elementary schools and the third, of 26 subjects, in the secondary schools.

MTAI scores were correlated with four types of classroom measures : (1) ratings by pupils on an adaptation of the Leeds scale called "Our student-teacher", (2) ratings by pupils of the student-teacher's lessons apart from his personality, (3) adviser ratings, (4) a combination of the three ratings - Of eight correlations reported, six were significant at or beyond the .05 level. One provocative finding reported by the investigators is the difference between the MTAI and pupil ratings of the student-teacher personality on the "Our student-teacher" scale and the pupil ratings of the student teachers' lessons themselves. The former gave a significant correlation of .507, the latter a nonsignificant correlation of .282. The combined ratings gave a correlation of .39 for the elementary student teachers and .56 for the secondary student teachers. The investigators concluded from these findings that student

teacher attitudes are measured by the MTAI with a "fair degree of both validity and reliability."

Verma (1964) reported a study in which he administered different psychological measures besides Minnessota Teacher Attitude Inventory on 546 randomly selected student teachers of the B.Ed. course in Rajasthan. Student teachers were tested at the time of joining the course and again the same tests were administered at the time of completing the course. The main objective of this study was to study whether teacher-training made a favourable impact on different psychological measures including the attitude towards teaching.

Among other findings this investigation revealed that the impact of teacher training on the attitudes of student teachers towards children and school work had been consistently favourable, there being a significant gain in scores at almost all points of the scale.

Joshi and Srivastava (1964) reported a study with the purpose of seeing relationship between intelligence and teacher attitude and practice-teaching and Theory of Education. The investigators were motivated to conduct the study on the assumption that Intelligence is not the sole factor required in order to be a good teacher.

The Minnesota Teacher Attitude Inventory (MTAI) and Humanities Group Test of General Ability (HGT-GMA) were administered on 95 pupil teachers in a Madhya Pradesh Training College. It was found by the investigators that there was a high degree of positive correlation between Intelligence and

teaching attitude. Similarly, it was found that Intelligence was highly correlated with the teaching of "theory of education." The investigators conclude "the results of this study show that intelligence tests may be used with a high degree of success for the selection of pupil teachers possessing the right teaching attitudes."

Evans (1969) reported a study in which he compared Teachers, Anglican theology students, Baptist theology students and Engineering students on values and Attitude towards teaching.

In the present study two tests, the Study of Values and the Minnesota Teacher Attitude Inventory, were administered to a group of above mentioned students in October, 1965 and again in May, 1966, and their scores on the two dates were compared. In this study apart from the teacher training students, the other three student groups were all pursuing courses with a strong vocational bias, but their members were unlikely to become teachers. These three groups of students formed the experimental groups. Besides these a group of experienced teachers also participated in the inquiry.

Analysis of variance was used to compare the values and attitude towards teaching for different groups. It was found that at the beginning of their course, student teachers did not differ from student theologians and engineers in their attitude towards pupils. Significant differences were found between the MTAI scores of the teacher-training students at the October, 1965 and May, 1966 testings, and it was the May, 1966 scores which resembled those of experienced teachers.

The author of the present study concludes "The outcome seems to be that, at the beginning of the course, the basic values of the teacher-training students were similar to those of the experienced teachers, and that during their training course they acquired attitude to pupils which resembled those held by experienced teachers... In short, the teacher-training department turns students into teachers.

Raina and Raina (1968) reported a study on the "Attitude change of student Teachers." The objectives of their study were to see (a) if teacher education programme brings about a change in graduate student teachers towards children favourably and secondly (b) what is the relationship between attitude scores and theoretical and practical dimensions of teaching.

A Hindi version of the Minnesota Teacher Attitude Inventory was administered to 140 student/teachers of a Teacher's College in Rajasthan. The same test was readministered before the commencement of the University examination. The percentage marks secured by the sample in the University examination served as the criterion of the overall teacher effectiveness with which the past test MTAI scores were correlated.

The results of this study did not provide any evidence that teachers' college programme lead to any significant shift of attitudes in a favourable direction. Secondly a significantly high correlation was found between the MTAI (I) pre-test and MTAI (II) post-test scores for the whole

group and the two sections separately. Similarly MTAI (II) post-test scores have a positive but insignificant correlation with the University examination marks in both the theoretical and practical dimensions of teaching.

Funti (1969) conducted a study with an objective (i) to see if there was a relationship between student's attitude towards teaching and his performance in the theory examination and practical teaching at the end of their year of training, (ii) if intelligence was related to performance at Theory and Practice Teaching examination.

In the present study Minnesota Teacher Attitude Inventory was administered to 97 students enrolled in the Department of Education in the University of Hong Kong in two successive years, 1961 and 1962. The sample included 48 women and 49 men. Besides MTAI, the Raven Progressive Matrices and $AH_5$ tests were also administered. The Progressive Matrices is a non-verbal test of intelligence and $AH_5$ is a group test of general intelligence, designed for the use of highly intelligent subjects.

The results of the present study showed that a significant relationship existed between students attitudes towards teaching and their performance at Theory and Practice Teaching examination results. Significant correlations were obtained between MTAI scores and end-of-year Theory examination marks. Similarly those awarded a credit in Practical Teaching had significantly higher MTAI scores than those given a pass. The intelligence tests scores were not found to relate to performance

in the Diploma in Education course.

The studies of non-cognitive factors of Teacher Behaviour still have not yielded consistent results. This may be due both to between - and within - subject variation and to the variety of measurement techniques employed. With this idea Lindon and Lindon (1969) conducted a longitudinal study on 152 teacher education graduates of Purdue University who completed the Guilford - Zimmerman Temperament Survey (GZTS) and the Minnessota Teacher Attitude Inventory (MTAI) three times; (i) upon entry into teacher education, (ii) during student teaching and (iii) on one year following graduation. This sample represented slightly more than 48% of the total initial pool of subjects.

The results of the study indicated that four of the eleven varieties did not demonstrate significant differences either between criterion groups identified one year following graduation or among subjects according to sex, measure curricular area / or level. However the results of the analysis of variance of the MTAI and the GZTS indicated that only the MTAI distinguished between teacher education graduates who entered teaching after graduation and those who did not. However, the MTAI did not differentiate between these groups when data were collected at two points in time prior to graduation. It thus appeared to identify a teaching - non-teaching criterion only when it was administered after graduation. This finding suggests, according to the

investigator that the MTAI has little value for teacher education selection committees whose aim is to identify early those individuals who might be expecting to enter the teaching profession. Again the MTAI did distinguish between sexes and among subjects in given curricular areas and / or levels on all test administrations. The MTAI results obtained over three levels of undergraduate and graduate experience tended both to support and contradict findings reported by Cook (1962) and Leeds (1956).

In short only MTAI data obtained after graduation distinguished between teacher and non-teacher criterion groups. The author concludes that "MTAI and some scales of GZTS scales especially appear to warrant longitudinal cross-validation.

Kakkar (1970) in his study made use of Minnesota Teacher Attitude Inventory (MTAI) to determine the influence of teacher training upon the attitudes of undergraduate students towards children.

The MTAI was administered to 160 elementary teacher trainees (J.B.T. Students) undergoing teacher training programme in the State College of Education, Patiala. The inventory was first administered in the initial days of their training programme and again during the closing period of the first phase of training.

The investigator of this study reported that the attitudes of teacher trainees underwent a change while in the training programme. This change was in terms of a more liberal attitude toward children. The trainees showed a much higher

mean MTAI score on completion of the training programme than they did on entering the programme. Similarly, the trainees showed a higher mean score on entering the final phase of training than they did on entering the first phase.

Raina (1971) in his study administered Minnesota Teacher Attitude Inventory with the purpose to see the efficacy of two different teaching programmes on the direction and extent of changes in attitudes towards children and school work. The Minnesota Teacher Attitude Inventory (MTAI) was administered on a sample of 110 student teachers; 50 from the Regional College of Education, Ajmer and 60 from the Teachers' Training College, Sardarshahr. The teaching programme followed at R.C.E., Ajmer 'Internship in Teaching' was different from the traditional 'Practice Teaching' in the respect that the student teachers were exposed to intensive Pre-Internship programme and secondly in 'Internship' students were required to be in practicing schools for the whole day.

The pre-test and post-test difference for the two samples indicated that the internship programme had an edge over the practice teaching programme. The relationship between the pre-test and post-test MTAI scores for the samples separately and in combination was significant. It testified that the measurement of attitudes of student teachers was somewhat reliable and stable in that the sample student teachers retained their positions on the MTAI over a period of time.

A study was undertaken (Mehrotra, 1973) with the objective to see the impact of the Bachelor of Education Course

on the attitudes of those who had gone through it. The sample of the study consisted of regular B.Ed. students and Correspondence Course students for 1968-69 session of the Central Institute of Education, Delhi. A scale prepared by the method of summated ratings on the lines suggested by Likert was used to measure the attitudes of trainees towards the teaching profession.

The finding of the study were (i) the attitude of male students of Correspondance Course was more favourable than that of the full time course men, both at the beginning and at the end of the course; (ii) the attitude of full time Science students was more favourable than that of the Humanities students while in the Correspondence Course group, the attitude of Humanities students was more favourable than that of Science students; (iii) the attitude was more favourable with higher age group and it increased as the age increased except a decrease in between the age group thirty-two to thirty six.

Kumar (1974) in his comparative study of science and non-science teachers signified that the science student-teachers have more favourable attitude towards teaching as compared to arts student-teachers.

Singh (1974) in his study aimed at developing a category system for systematic observation of teachers and determining relationship between observed behaviours and measures of teacher attitudes. The sample of the study consisted of 500 B.Ed. students (250 male and 250 female). The tools used were the Minnesota Teacher Attitude Inventory and Flanders

Interaction Analysis Category System (FIACS). The findings of the study revealed that (i) there was a significant relationship between attitude towards teaching and classroom verbal interaction of student teachers at secondary level; (ii) lecturing, criticising and justifying authority, direct influence and restrictiveness were found to be negatively correlated with attitude towards teaching amongst language, social studies, and science-mathematics groups; (iii) teacher response ratio, teacher question ratio, instantaneous teacher response and question ratios were found to be related to attitude towards teaching.

Verma (1976) in her study compared the attitude of inservice Physical Science teachers with those of Biological Science Teachers. The main objectives of the study were to see (i) if Biological Science Teachers differed from Physical Science Teachers in their attitude towards teaching, (ii) if their was differences in attitude on the basis of academic qualification of teacher--graduate and post-graduate, teaching experience and on the basis of sex differences.

The sample of the study was drawn from science teachers serving in the Secondary and Higher Secondary Schools of Ajmer city. The number of the sample is not reported in the study. In the present study Minnessota Teacher Attitude Inventory (MTAI) was used. The investigator reports that the Biological and Physical Science Teachers did not differ significantly in attitude towards teaching. Similarly academic qualification did not make any differences in both the groups

in their attitude towards teaching. It was found that their were no sex differences regarding the attitude towards teaching.

Review of Creativity Studies

Knoell (1953) in his study administered six tests of verbal fluency to 112 under-graduate students and followed up 38 of them later in the secondary schools. Word Fluency, Verbal Versatality and Ideational Fluency were included in the creativity tests. Ratings were independently collected from observers, superintendents and principals. The 'r' between ideational fluency and observer ratings varied between .30 to .40. The conclusion is : "Ideational fluency is significantly correlated with teaching success."

McElvin, Fretwell and Lewis (1963) in their study demonstrated the fact that school administrators gave lower ratings to the highly creative teachers. In this study letters were sent to the teacher's principals asking them to rate on a five point scale the overall effectiveness of the teacher in the classroom. An 'r' of -.22 ($p < .01$) was found between teacher's creativity score and the Principal's ratings.

Yamamoto (1963) reported a study in which he administered tests of creative thinking, a personality inventory, an information form, a comment form (on the creativity tests), and a nomination form (of the creative pupils) to 19 teachers and 461 pupils of fifth grade classes in a suburban school. The objective of the study was to see the relationship between teacher creativity and pupil achievement.

The 19 teachers were dichotomized into the High creative Group (10) and the Low Creative Group (9) and comparisons were made between them. The results reported were as follows :

(i) There is no significant difference between these two groups in background factors such as sex, martial status, age, educational attainment, and teaching experience.

(ii) The High creative teachers show a significantly stronger theoretical orientation than that shown by the Low creative teachers. There was a fairly strong indication that the former show a tendency to perceive and react to the more complex aspects of their environment when compared with the latter group. These two groups do not differ in their aesthetic orientation.

(iii) The two groups do not show any significant difference in their classroom behaviour.
The pupils were divided into three groups according to their scores on the creativity tests and further dichotomized according to their sex. It was found that : (i) On reading comprehension, arithmetic skill there is a significant interaction between teacher creativity and pupil creativity, (ii) On personal and social adjustment, there is a significant teacher creativity main effect.

Doshanj (1965) reported a study in which he studied the relationship between imagination and skill in teaching. With this purpose 133 B.Ed. students, Government Teachers Training College, Jullunder, Punjab were administered Horn-Hellersberg test of Imagination. A coefficient of correlation to the tune of .71 was reported between imagination and skill

in teaching.

Yamamoto and Davis (1966) reported a study in which they studied the motivation, ideational fluency and inter-professional attitudes of students under teacher training. A total of 102 female students in their junior year at Kent State University participated in the study. Among these College of Education students 27 were in the secondary education programme, 42 in the elementary education, and 33 in early childhood education. The students were administered Personal-Social Motivation Inventory, Minnessota Test of Creative Thinking and Interprofessional Attitude Inventory (IPAI).

The results of the study were reported as follows :

(i) There is a negligible correlation between creative motivation and power motivation.

(ii) There is a significant correlation between creative motivation and Fluency.

(iii) The two scales, critical motivation and power motivation differentiated between three groups of secondary, elementary and early childhood students.

(iv) On both critical motivation and power motivation the secondary students scored highest followed by the elementary education and early childhood education students.

(v) On critical motivation, the mean of the secondary-elementary education students was significantly higher than the early childhood education students.

The results indicate that so far as creative motivation is concerned the F ratio does not reach the .05 level of significance between the three groups of the teachers.

Walberg and Welch (1967) studied the personality characteristics of innovation Physics teachers. A group of 36 male physics teachers were selected for the purpose of this study. They were termed innovative for the reason that they "volunteered to teach using new materials and travelled across the country to attend a summer briefing season." These were compared with the other group of unselected teachers numbering 126. The subjects were administered Edwards Personal Preference Schedule (EPPS), Allport-Vernon-Lindzey Study of Values (AVL) and Minnessota Teacher Attitude Inventory (MTAI) and Test of Selected Topics in Physics (TSTP, unpublished).

The results of the study showed that the innovative physics teachers scored higher on theoretical and aesthetic values than other male high school teachers, but lower on economic, religious, and political values. The Innovative teachers scored much higher on a physics achievement test than physics teachers in three summer institutes. While they are close to the norm for male secondary school teachers on teaching attitudes, they had a lower need for affiliation than this group. Compared with other male high-school science teachers, they are less abasing and affiliative, but more autonomous and heterosexual. Because of their relatively high intellectual and artistic values, and needs for autonomy and social independence, their profiles resemble those of creative scientists. Two personality variables suggesting a "warm, outgoing teaching attitude factor" are significantly correlated with teacher's knowledge of physics. The teachers who have a firm grasp of

their subject not only have more positive attitude toward teaching, but appear to be less interceptive.

Inspite of the fact that many variables have been studied in relation to teaching and academic success; intelligence and verbal abilities (Vernon, 1939; Shea, 1955; Warburton, 1955; Tarpey, 1965), creativity (Yamamoto, 1963), educational attitudes (Evans, 1953; Oliver and Butcher, 1962), personality factors (Warburton and Hadely, 1960; Soloman, 1965) interview type selections methods (Burrows, 1958; Dreven, 1963) none of these studies has given a firm answer to prediction problems regarding teaching success. Perhaps this uncertainity arises from the complex nature of the criterion and the nature of different samples and the various types of measures used.

With this purpose in mind Cortis (1968) conducted a study in three Colleges of Education in the University of Manchester, School of Education. Initially 300 students were tested but finally the sample was reduced to 259 students (152 women, 107 men). There were considerable differences in age, social background and attainment among the sample. The tests used were like Hiem's $AH_5$, Cattell's 16 PF Questionnaire, Oliver's A Survey of Opinions about Education and all these are well standardized tests. One of the important tests was that of Creativity. Three tests of the Getzels and Jackson's (1962) were used; Word Association, Uses for Objects, and Fables. The criteria were Teacher's Certificate Examination final results. The results of this study show that among the three Creativity tests only the Word Association test correlated

significantly with Educational Theory and Main subject.

Crocker (1968) reported a study in which he administered a Flexibility scale to 69 third-year education students at University of North Carolina, U.S.A. The objective of the study was to see if among other psychological measures Flexibility was a measure of predicting teaching success. The criteria of teaching success was the teaching practice marks for the three teaching practices. The results of the study indicated that the relationship between total teaching practice and flexibility was highly satisfying. The weakest teachers were the lowest scorers on the test.

Raina (1968) conducted a study in which he studied the motivations, preferences and ideational fluency of teachers under training. More especially, the study compared certain motivational dimensions and ideational fluency of male and female teachers. A total number of 50 students participated in this study. They included 25 male and 25 female teachers. These subjects were administered Personal-Social Motivation Inventory and Minnessota Tests of Creative Thinking.

The results of the study show that ideational fluency is positively and significantly related to the creative motivation and secondly critical motivation and power motivation is significantly related. The relationship between fluency and other two scales were found to be low and positive but not significant. The correlations between the three scales was low and nonsignificant, though they were positive. Secondly the findings show that the male teachers have

significantly higher creative motivations than the female teachers and there are no significant differences between the two groups on rest of the three measures.

Raina (1970) conducted a study on 55 teachers undergoing B.Ed. degree in Summer School-cum-correspondance course in the Regional College of Education, Ajmer. The study was conducted with the objective to find out the sex differences among the teachers in creative thinking ability and to determine whether such variables as age and experience was related to creative ability. The teachers were administered non-verbal form of the Torrance Test of Creative Thinking. The mean differences between male and female teachers on the various dimensions of and total creativity were found. It was found that though females scored higher than the males except on the originality factor, the difference between the means except in originality was not significant. The correlation between fluency and age was negative and insignificant and between flexibility and age it was positive but not significant. At the same time it was found that correlation between elaboration and age was positive, and significant at 5 per cent. Similarly the correlation between total creativity and age was significant at 5 per cent level. The coefficient of correlation between years of experience and fluency and flexibility was found to be negative but not significant. The correlation between two remaining factors and total creativity was positive but not significant.

Raina (1970) reported a study in which he administered

Torrance Test of Creative Thinking to 55 students of the Department of Summer School cum-correspondence Course at the Regional College of Education, Ajmer with the objective of seeing relationship between Creativity and Teaching success. The marks obtained by the students in the teaching practice examination (internal plus external) conducted by the university, were taken as a measure of teaching success.

The investigator reported that there was no significant correlation between fluency, flexibility and total creativity with the teaching practice marks. It was also found that there existed a modest positive and significant relationship between elaboration and teaching practice marks. Coefficients between fluency, flexibility and total creativity and teaching practice marks were positive but not significant. Similarly the correlation between originality and teaching practice marks was negative and small.

Raina (1970) in his study studied the creative, critical and power motivations of high and low creative teachers. With this objective Personal-Social Motivation Inventory was administered to 55 students of Department of Summer School cum-Correspondence Course in the Regional College of Education, Ajmer. They were also administered non-verbal form of Torrance Tests of Creative Thinking. On the basis of this test 11 high creative and 11 low creative subjects were identified.

The results of the present study were reported as follows :

(i) The high creative subjects scored significantly higher than the low creative on creative motivation scale.

(ii) The low creative subjects were significantly high on critical motivation scale than the high creative subjects.

(iii) There was no significant difference between the two groups on power motivation scale, though low creative showed a slight edge over high creative.

Storm and Larimore (1970) reported in their study on teachers that elaboration as measured by Torrance Test of Creative Thinking was significantly related (r = .49) to teaching success. Verbal fluency correlated with the teaching success to the tune of .60.

Torrance, Tan and Allman (1970) studied 325 elementary education majors (306 women and 19 men) enrolled in the University of Minnessota in the fall quarter, 1958. Form A and B of the "How Good is Your Imagination" was administered to the subjects. One of the most pervasive insights that emerged is the lack of compulsivity of the high originals. The high originals also indicated that they occassionally used role playing, problem-solving, panels, experiments, research and like. The low originals, on the other hand, tended not to use these methods at all or used them regularly and continuously.

Goyal (1973) administered the verbal and non-verbal form of the Torrance Tests of Creative Thinking on 484 B.Ed. students. He concluded that the verbal creativity measures (fluency, flexibility and originality) and theory and practical skill in teaching marks correlated statistically significantly

at better than .01 level of significance (r .150 to .254). The non-figural elaboration was significantly related to theory marks (r = .168) and Fluency, Originality and Elaboration correlated to the tune of r = .112 to .203 with skill in teaching. In short, Flexibility followed by originality, in verbal creativity and elaboration in figural creativity were found to be the best predictors for both the indicies of teaching success, that is, for performance in skill in teaching and the theory courses.

Khatena (1974) conducted a study on the developmental patterns of creative self-perception and the six orientations (which characterized the instrument used in this study) on 912 West-Virginia adolescents and college adults as subjects. He found that the creative self-perception of adolescent boys and girls as measured by the total scale were lower than those of college men and women, with boys and men showing somewhat better on the scale than girls and women whereas in terms of six orientations, both adolescent boys and girls and college men and women were found to perceive themselves as having creative orientations in the priority of Environmental Sensitivity, Intellectuality, Individuality, Self-strength, Artistry and Initiative.

A second similar study (Khatena, Zetenyi, Browning, 1975) with 1093 adolescents and college adults Budapest, Hungarian subjects found hardly any differences within mean scores on the total scale for male and female adolescents and college adults, that relate to six orientations, Initiative

was found to be significantly lower for all the groups, that self-strength was another orientation found to be lower than the other four orientations for adolescents and college adult males and when male and female groups were combined Initiative was found to be lowest of the six orientation at all educational levels with Self-strength being below average for college adults.

Samar (1974) in his study compared the creative talent of Science and Non-science Student Teachers. More specifically it was attempted to find out if there existed sex differences, age differences and if academic qualifications had relationship with creative talent. The sample of the study consisted of 211 student teachers (79 science, 50 Arts, 42 Agriculture and 40 Commerce) of Regional College of Education, Ajmer.

The results of the study were reported as follow :

1. Science student-teachers had a significantly higher creative potential than Agriculture and Commerce student-teachers only on Non-verbal Fluency.
2. Science student-teachers had a significantly higher edge on Agriculture students on the combined scores of Fluency, Flexibility and Originality as measured by Non-verbal Test of Figure Completion.
3. Science student-teachers had significantly higher scores of Fluency as compared to Arts student-teachers.
4. Science student-teachers had a significantly higher creative potential than Agriculture student-teachers only on the dimensions of Non-verbal Flexibility and Originality.
5. Science student-teachers had a significantly higher edge on Agriculture and Arts student teachers on the

total scores of Fluency, Flexibility and Originality on the Non-verbal test.

6. On the combined scores of Non-verbal Tasks the Science graduate student-teachers showed significantly higher creative potential than the Non-science student teachers. There was no difference between Post-graduate student-teachers of Science and Non-science streams.

Raina (1975) reported a study in which an attempt was made to see relationship between Creativity and Teaching Success. In the present study 105 students of B.Ed. science of Regional College of Education, Ajmer were administered, Some Thing About Myself (SAM) a creativity checklist developed by Joe Khatena. The criteria of teaching success was taken as the marks secured by the students in six theory papers in the Mid-terms test and the marks secured by the students in Internship of teaching.

The findings of the result were as follows :

(i) The coefficient of correlation between creativity scores and Philosophical and Sociological Foundation, Educational Psychology, School Organization, Guidance, Health, Content-cum-Methodology papers was respectively 0.095, 0.00, 0.12, -.038, .024 which are either positively insignificant or negatively insignificant.

(ii) The coefficient of correlation between creativity scores and Lesson planning, Teaching, and Personality were 0.00, 0.140 and -0.059 respectively, which are either positively insignificant or negatively insignificant.

In conclusion the results demonstrated an absence of relationship between creativity and teaching success.

Khatena, Raina and Browning (1976) conducted a study on Indian College adults to investigate their creative orientations as elicited by the use of Something About Myself (SAM). The subjects were 50 men and 37 women, 87 in all attending Meerut University, Meerut, India.

The results indicate that the greatest strengths of Indian college-subjects tend to be Self-strength and Intellectuality and whereas both West Virginia and Hungarian subjects show least strength on Initiative, Indian college subjects show themselves no weaker on Initiative than on Environmental Sensitivity, Individuality and Artistry. It is however important to note that interpretation of the evidence is to be taken as tentative because of sampling bias.

Khatena and Raina (1977) conducted a study on the creative perceptions of Indian and American College adults. The sample included was 912 American adults and 87 (50 men, 37 women) students at Meerut University of India. The instrument used was Something About Myself (SAM). The results indicate that Indians obtained significantly higher means on Initiative, Individuality and Artistry, and Americans as having higher means on Environmental Sensitivity, Self-strength, Intellectuality, and the total scale. The authors suggest that the tentative findings need replication but suggest clues for further investigation.