

## Teaching and Teacher Behaviour

### A Trend Report

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#### INTRODUCTION

The Education Commission (1964-66) has emphasised that education is the one and the only instrument that can be used to bring about a change towards the social and economic betterment of India. Such a process of education focuses around teaching-learning in the classrooms. Reiterating the same, Mitra (1972) has rightly said, "The aims, processes and evaluation of education are primarily associated with teaching and reasonably, therefore, the vital problems in education cannot be solved unless we look into the problems and processes of teaching."

Related to the problems and processes of teaching, research studies at the doctoral and institutional levels have been conducted to investigate into the causes and consequences of teacher behaviour. Below is given an overview of such studies.

#### OVERVIEW

Trend of research in India in the area, 'teaching and teacher behaviour', was traced by Jangira and Sharma (1974). It was based on twenty-one studies. The present report is based on thirty-eight studies. These include work done at the doctoral level and projects undertaken at the institutional level. The work done at the master's level or in individual capacity are not included. With this as the preamble, the following presentation provides a trend of the research in the area of teaching and teacher behaviour.

The first study in this area has been traced back to 1952, whereas, the first doctoral study in education in India was completed in 1943. This points out that this area drew the attention of researchers quite late. Moreover, till 1961, the progress of research in this area was rather slow. It has gained momentum since 1962, attaining a sharp increase after 1972. About fortyfive percent of studies in this area has been cov-

ered since 1972. Table 1 presents a picture of the number of studies conducted in five-year span from 1952.

TABLE 1  
Yearwise Distribution of Studies

Years	Numer of studies
1952 - 1956	2
1957 - 1961	1
1962 - 1966	5 + 3*
1967 - 1971	8 + 2*
1972 onwards	15 + 2*
<b>Total</b>	<b>31 + 7*</b>

\*These studies are of Bhattacharya and Shah (1966), Kaul (1972), Pandey (1968), Pandya (1972), Shah (1962), Sharma (1969), and Sherry (1964). Refer the chapter on Teacher Education in Buch (1974) for the abstracts of these studies.

The heavy concentration of studies in this area from 1972 onwards can be attributed to the work done at the Centre of Advanced Study in Education (CASE), M.S. University of Baroda. Three national seminars on teaching were conducted by CASE. The First National Seminar on Teaching was organised in 1970 with intentions of exploring the research possibilities in this area and to initiate interested researchers in the country to undertake studies. As an outcome of it a countrywide study, Cooperative Project on Productive Teaching (COPPT), was undertaken aiming at finding out the classroom behaviour norms of Indian teachers. The Second National Seminar on Teaching held in 1971 oriented itself to synthesise the research results and to generate future studies. In 1972, the Third National Seminar 'Towards a Theory of Teaching' was organised, which stimulated the

thinking of educators for evolving a model for teacher effectiveness. All these efforts led to the completion of thirteen studies (about thirtyfour percent of the total work done in India in this area) at the M.S. University of Baroda.

Apart from the CASE, research work in this area is also carried out at different places in the country. Though Allahabad University produced the first study (Adaval, 1952), no further study has been taken up there. The work done at National Institute of Basic Education (1960), the S.I.T.U. Council of Educational Research (Manuel, 1964), Agra University (Sherry, 1964), Delhi University (Roy Bina, 1965), Aligarh Muslim University (Deva, 1966), R. K. Mission Vidyalyaya (Kulandaivel and Rao, 1968), Jiwaji University (Pandey, 1968), Patna University (Sharma, 1969), Saugar University (Prasad, 1970), NCERT (Roy, 1970), Viswa Bharati University (Debnath, 1971), Government College of Education, Jabalpur (1971), Sambalpur University (Samantaroy, 1971), Kurukshetra University (Kaul, 1972), Nagpur University (Mehta, 1972) and Government Training College, Trichur (Nair, 1974) occupy the status of stray research done in this area. Meerut University (Sharma, 1971; Singh, S. K., 1974; Vasishta, 1976) and Panjab University (Dosajh, 1956; Suraj Balram, 1965; Singh, 1970; Gurbaksh Lal, 1974) seem to have taken up the area of teaching with a little more seriousness as one could see studies in this area getting repeated once in a few years. The above facts present a national picture of the centres where research on teaching and teacher behaviour has been carried out.

#### *Methodology*

Looking into the research studies in the area of teaching and teacher behaviour from the point of view of the methodology employed, it was found that a large majority of them were descriptive. The 1970's have seen a shift in the trend when experimental studies have started figuring. The studies of Roy (1970), Jangira (1972), Pangotra (1972), Sharma (1972), Lulla (1974), Singh L. P. (1974), Padma (1976), Roka (1976) and Vasishta (1976) have employed experimental designs. More and more, well designed experimental studies are expected to break the nebulous surrounding teaching. A bunch of such studies will be helpful in formulating much wanted theoretical framework for teaching.

#### *Classification of Studies*

The studies have been broadly classified into

three groups according to the nature of the work done. They are : (i) Teacher Behaviour studies (26 studies), (ii) Tool Construction studies (8 studies), and (iii) Other studies (4 studies). These three groups of studies are discussed below :

#### (i) *Teacher Behaviour Studies*

These studies include the input-process-output ideas. The input or presage variables relate to the teacher or pupil characteristics which are supposed to play a role in the teaching-learning process. The variables that pertain to the interaction between the teacher and the taught in the classroom are referred to as process variables. The output or the product variables deal with the extent of achievement of pupils on various dimensions like achievement in knowledge, gain in skills, change in attitude, etc., which occur as a result of the process in the classroom. The studies under this classification have been subdivided and presented in order to provide greater clarity.

(a) *Presage Studies* : These studies have mainly dealt with the presage variables. The studies by Adaval (1952) and Kaul (1972) fall under this category. Adaval (1952) aimed at finding out the specific qualities needed to make the teacher successful in the profession and the motives of persons to take up teaching as their profession. The study revealed that intelligence was an important factor in determining one's aptitude for teaching. The chief motives for undertaking the profession were revealed to be love for public service and love for children. Kaul (1972) studied the differentiating personality traits and values of 124 'popular' teachers and 100 'not popular' teachers. The popular teachers distinguished themselves as more outgoing, intelligent, emotionally more stable, sober, conscientious, venturesome, toughminded, shrewd, placid, controlled, and relaxed. They were significantly high on theoretical, social, political, and religious values and were significantly low on economic and aesthetic values.

(b) *Process Studies* : The studies of Roy (1970), Mehta (1972), Pangotra (1972), Singh L. P. (1974), and Vasishta (1976) which fall under this cluster, have concentrated on process variables. All other studies except that of Mehta (1972) attempted to modify the teacher behaviour in the predetermined direction. In this attempt, Roy (1970), Pangotra (1972), and Vasishta (1976) have used the Flanders Interaction Analysis Category System (FIACS) as the research tool. The results of these three studies indicated that it was possible to change the teacher behaviour

by using the FIACS. Singh, L. P. (1974) has gone a step further by not only using FIACS but also trying to compare its efficacy with the microteaching technique. He found that the microteaching technique was more effective in changing the teacher behaviour than FIACS, when the criterion was indirect teacher behaviour.

Mehta (1972) factor-analysed the teaching ability of 489 pupil teachers of Maharashtra. The investigator established that there was a general ability called 'Teaching Ability' found as a factor highly loaded with achievement variables of training.

(c) **Presage-Process Studies** : The studies which have attempted to establish a link between the presage variables and the process variables have been clustered under this. As many as eleven studies fall under this category. Dosajh (1956) attempted to show that imagination and maturity were indicative of success in the teaching profession. The investigator found that the contingency coefficients of correlation between levels of imagination and maturity on the Horn-Hellersberg Test and levels of skill in teaching were found to be 0.71 and 0.80. Suraj Balram (1965) studied 400 graduate level teacher training students of Punjab with a purpose to find out the relationship existing among teacher trainees' intellectual efficiency (IE), self-acceptance (SA), and teaching skill (TS). The study showed that the coefficient of correlation was significant between IE and TS with respect to predictive value. Deva (1966) tried to find out the status of intelligence, social adjustment, personality adjustment, socio-economic status, and academic achievement as the predictors of teaching ability, which were measured on a rating scale developed for the purpose. The beta coefficients for the different predictors were found to be 0.0855 (intelligence, not significant), 0.3627 (social adjustment) and 0.1506 (academic achievement). Singh (1970) aimed at locating certain intellectual and non-intellectual variables related to the teaching skill of the postgraduate teacher trainees of the Punjab. The predictors of performance in teaching skill were found to be ascendance, extraversion, intelligence, and early academic achievement. Debnath (1971) in his study on 226 headmasters and staff members of 22 training colleges of West Bengal tried to find some determinants of teaching efficiency. The coefficients of correlation between the teaching efficiency and age, experience, academic achievement, and training were found to be 0.21, 0.24, 0.19, and 0.31, respectively.

Samantaroy (1971) while attempting to find the nature of relationship among teacher attitude, tea-

cher adjustment, and teaching efficiency on a sample of 320 graduate teachers of the secondary schools of Orissa found that (i) the Pearson's  $r$  of 0.49 between teacher attitude and teacher adjustment was significant, and (ii) teacher attitude and teacher adjustment were each related positively to teaching efficiency.

Quarishi (1972) studied the relationship between four dimensions of teacher behaviours, viz., proportion of indirect behaviour to direct behaviour — I/D ratio, proportion of motivating behaviour to controlling behaviour — i/d ratio, proportion of teacher behaviour to student behaviour — T/S ratio, and teacher behaviour of accepting students' ideas and student initiation, with certain personality traits and attitudes of teachers. The study was conducted on 200 secondary school teachers. He found that the personality of the teacher did not relate to his/her teacher behaviour in the class. Santhanam (1972) studied the relation between the teacher's age, recency of training, experience, sex, marital status and the subject taught by the teacher with the indirect behaviour of the teacher in the classroom. The study was conducted on 174 secondary school teachers of Gujarat and FIACS was used for measuring the indirectness. The investigator concluded that age, recency of training and experience did not relate to indirectness of the teacher in the class, whereas sex and marital status did affect some aspects of indirectness. Also subject taught affected indirectness of the teacher in the class.

Gurbaksh Lal (1974) studied the effects of creative thinking and vocational anxiety on the success in teaching of 300 teacher trainees from three colleges of Punjab. He found that (i) high vocational anxiety was inversely related to teaching success, but high general anxiety was not associated with teaching success, and (ii) interaction effect of vocational anxiety and creative thinking on teaching success was significant. Nair (1974) aimed at finding out the impact of certain sociological factors like family background, caste, religion, and sex on the teaching ability of teachers. The study which was conducted on 200 secondary school teachers from the educational district of Trichur (Kerala) revealed that age had a positive relationship with teaching ability, whereas teacher's parental socio-economic conditions had a negative influence on teaching ability. Sex, locality of the school, caste and religion were found to be not affecting the teaching ability. Singh, S. K. (1974) aiming at determining the relationship between observed behaviours and measures of teacher's attitude of 500 B.Ed. students of training colleges of Meerut

University found that there was a significant relationship between attitude towards teaching and the various components of classroom verbal interaction as measured through FIACS.

A look into the studies under this category indicates that more than one type of tools are used to measure the process variables. Suraj Balram (1965), Deva (1966), Debnath (1971), Samantaroy (1971) and Nair (1974) have used rating scales or other observation tools developed for each of the studies separately. Singh (1970), and Gurbaksh Lal (1974) have used the marks given by the observers on the teaching performance as a measure of the process of teaching. The studies of Quraishi (1972), Santhanam (1972) and Singh, S. K. (1974) have employed FIACS as the common tool to measure the different aspects of the classroom interaction. Nevertheless broad generalisations would be risky in the absence of replications.

(d) **Process-Product Studies**: Seven studies, namely, Government College of Education, Jabalpur (1971), Jangira (1972), Sharma (1972), Lulla (1974), Patel (1974), Padma (1976) and Roka (1976) have attempted to find out the effect of the process treatments on the product variables.

The study conducted by Government College of Education, Jabalpur (1971) aimed at finding out the developed attitude of the pupils towards teachers who used indirect influence in the class and those who used direct influence. It revealed that there was a trend, though not significant, among pupils to like teachers who used indirect influence and dislike those who used direct influence. Jangira (1972) studied the relationship between the 'Classroom Behaviour Training' imparted to the student teachers and the performance of pupils under their charge on adjustment to home, school, teacher, and peers, their dependency level, and classroom trust behaviour. It was found that pupils, taught by teachers who were trained to be indirect, scored higher on adjustment to school, adjustment to teacher, general adjustment, dependency, and classroom trust than pupils taught by teachers who were trained by conventional methods. Patel (1974) investigated into the effectiveness of the influence of teachers' classroom behaviour on pupils' personal anxiety, motivation and classroom organisation, attitude towards reward and punishment, attitude towards teacher, attitude towards school, and the classroom climate and the development of independent behaviour on the part of pupils. The study which was conducted on 100 teachers of primary schools run by the Ahmedabad Municipal Corporation revealed that in-

direct teacher influence had favourable effect on motivation and classroom organisation, and attitude towards teacher. The three studies discussed above have investigated into the affective domain of the product variables.

The other four studies which happen to be experimental ones, have investigated into the cognitive dimensions of product variables. Lulla (1974) involved the teachers and students of municipal corporation schools of Baroda city to find out the effects of teachers' classroom influence upon the pupils' achievement. The study revealed that the pupils taught by teachers trained to be indirect achieved higher than pupils taught by teachers trained otherwise. Roka (1976) experimented with nine inservice science teachers to find out the effect of certain verbal teaching behaviour patterns on the pupils' achievement at knowledge, understanding and application levels.

From the above studies an inference can be made that indirect teacher behaviour has a positive role in the development of certain affective, as well as cognitive abilities of the pupils.

The experimental studies by Sharma (1972) and Padma (1976) attempted to find out the effect of different teaching patterns on the cognitive attainment of pupils. Both these studies were conducted involving the pupils of grade VII of Baroda city. Sharma (1972) found that a teaching pattern which involved narrow questions was more effective than other teaching patterns in attaining the knowledge and comprehension objectives. It was not possible for both the investigators to identify a pattern of teaching which was superior to others in attaining the application objective. Such experimental studies are the crux of the research in teaching. But these are not very many in number. One of the reasons may be the difficulty in conducting them.

(e) **Presage-Process-Product Studies**: A lone study under this heading happens to be that of Sharma (1971). It aimed at studying the relationship between characteristics possessed by teachers, and teacher effectiveness with a view to predicting teacher success. The product criterion happened to be the pass percentage of the students taught by the teacher. The study, which was conducted on 700 teachers of normal government schools of Uttar Pradesh, used FIACS to observe the classroom interaction. It was found that the teacher talk seemed to have negative correlation with scores on the Pandey's Teaching Aptitude Test and academic grades. The combination of five predictors, namely, teaching aptitude, academic grades, socio-economic status, teaching experience, and age,

in order of their arrangement, appeared to be sound predictors of teacher effectiveness.

### (ii) *Tool Construction Studies*

Studies made by researchers to develop tools to measure teacher effectiveness are included under this category. These studies are of Jayamma (1962), Shah (1962), Sherry (1964), Bhattacharya and Shah (1966), Pandey (1968), Sharma (1969), Prasad (1970) and Pandya (1972). The inventory for predicting teacher efficiency for the primary school teachers of Mysore State was constructed by Jayamma (1962) on the basis of a questionnaire administered to 500 teachers drawn from sixty institutions. Shah (1962) constructed an aptitude test for secondary school teachers. The items were developed on the basis of personal experience, and discussions with training college teachers, education department personnel, secondary school principals, veteran teachers, and successful and unsuccessful teachers. The reliability coefficients of the tests varied from 0.802 to 0.878, the validity coefficients were around 0.502, the multiple R of the final test battery was 0.5333, and the predictive efficiency of the tests was sixteen percent. Sherry (1964) developed a battery of psychological tests for prediction of success in teaching by involving the pupil teachers of department of education and the training colleges affiliated to the Agra University in Agra region. The criteria for teaching efficiency were supervisor's ratings, final practice teaching examination marks, and final theory examination marks. The battery included an intelligence test, an interest inventory, a personality inventory, and an attitude scale, all of which were prepared by the investigator. It was found that supervisor's ratings could be predicted to a satisfactory extent by all the four tests. Bhattacharya and Shah (1966) developed a teacher efficiency inventory in Gujarati to be used as a satisfactory tool for prognosticating teachers' efficiency. The attitude and resourcefulness of the teachers were the aspects covered in the inventory. The final administration of the tool was done on 1000 primary and secondary school teacher trainees in Gujarat State. The predictive validity coefficient established by correlating internal practical examination marks and test scores was 0.72. Pandey (1968) developed a teaching aptitude test for use in the selection of trainees in the institutions of teacher education of Uttar Pradesh and other states having Hindi as the medium of instruction. The test which included eight subtests, viz., professional knowledge, vocabulary, inferential reasoning, number series, numerical reasoning, logical selection, general information, and

reading comprehension, had a validity coefficient of 0.49 against supervisors' ratings and 0.62 against final examination marks. Sharma (1969) developed a teaching aptitude test in Hindi for elementary school teachers. The five subtests finally included were mental ability, attitude towards children, adaptability, professional information, and interest in the profession. The predictive validity coefficients with internal assessment and with ratings by a board of instructors were 0.36 and 0.42, respectively. Prasad (1970) developed a teacher efficiency observation schedule. Pandya (1972) developed a professional test for teachers to measure the various traits needed to be present in an individual to become a good professional in teaching. The items to measure the different traits were developed on the basis of opinions of forty experts, experienced educationists, and educational administrators. In the construction of the different tools to measure 'teacher effectiveness', mostly the criteria used are the opinions of teachers, heads or experts in the field.

### (iii) *Other Studies*

Four studies are discussed under this heading. One of these studies related to the specific areas of difficulties of 409 basic school teachers of eleven erstwhile states (National Institute of Basic Education, 1960). A majority of the respondents felt the difficulty to be with regard to the provision of facilities. Manuel (1964) tried to focus upon the conditions required for quality teaching. The study which was conducted on boys and girls from seventeen institutions revealed the preferences of parents and pupils with regard to the different facets and activities of a school. Roy Bina (1965) attempted to follow up the teacher education programme by finding out the relationship between success of teachers when they were trainees in an institute of education in Delhi and when they were teachers in schools after training. One striking result of the study was that the training college staff and the school principals had more in common with each other in judging the teachers than either group had with the secondary school pupils. Kulandaivel and Rao (1968) attempted to analyse the qualities of a good teacher and a good student as rated by 2662 students. According to the findings of the study, the good teacher is one who teaches well, inspires good qualities in the students, reteaches a lesson when not understood by the students, does not have caste prejudices while treating students, and so on. A good student reads well, secures good marks, behaves properly, acts according to the wishes of the teachers, respects the teachers, and so on.

A brief discussion about different studies which fall in the area of teaching and teacher behaviour was provided in the above paragraphs.

#### RETROSPECT AND PROSPECT

The following paragraphs are devoted to a review of the research done in the area of teaching and teacher behaviour, pinpointing the gaps and needed research. It does not, however, mean that researches other than the ones suggested should not be undertaken. The ingenuity of the research workers and the needs of the consumers always hold a pivotal position. With this as the background, the following discussions are to be viewed.

In the studies reviewed above, there seems to be a heavy concentration (about one-third of the total number of studies) on presage-process studies. But, unless it is established as to what type of process results in what type of product, there is little advantage of such efforts. There is need for conducting more process-product studies undertaken simultaneously by many at different places in India. It is only to the CASE or the NCERT that one can look up for such a large scale research undertaking.

It is a welcome trend to note that the researchers have started taking note of the interaction in the classroom, which had eluded them since long. The FIACS is the mostly used tool to measure classroom interac-

tion. This tool is heavily saturated with the affective dimensions of the classroom atmosphere than the other domains. Efforts should be made to evolve a set of tools measuring variety of teacher behaviours. The use of such tools would facilitate to arrive at results having wider generalisability.

Research on teaching and teacher behaviour has a bearing on the teacher education programmes. Research evidences in this area will help the teacher educators to decide in what type of teacher behaviours the student teachers be trained in order that they be highly effective. There is thus a need to know the concomitant change in the cognitive, affective or psychomotor achievement of the students when a particular teacher behaviour is increased or decreased. This demands a series of experimental studies. These can be simple but well linked studies, or complex but scientifically designed studies. The trend towards experimental studies has already started and it is hoped that more number of future studies fall on this line.

It can be noticed that the studies reviewed above involve teachers and teaching at the school level. Irrespective of the reason behind that, it is essential to undertake studies at the college level also.

Whatever may be the inadequacies, the sustained research efforts in India and abroad leave a note of optimism for one to look forward to the evolution of science of teaching.

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**ABSTRACTS : 565-592**

\*565. *CHAKRABORTY, M., An Inquiry into the Strategies of Classroom Teaching, Ph.D. Edu., MSU, 1978.*

The broad objectives of the study were : (i) to find out the effectiveness of strategy  $S_1$  (lecturing and questioning-answering), strategy  $S_2$  (lecturing and questioning-answering by using behavioural objectives), and strategy  $S_3$  (discussion by using instructional materials) on the development of knowledge, comprehension, applicational ability and total achievement in geography of pupils of standard IX; and (ii) to find out the effectiveness of strategy  $S_1$ , strategy  $S_2$  and strategy  $S_3$  on the retention of knowledge, comprehension, applicational ability and total achievement in geography of pupils of standard IX.

The sample consisted of 150 students of two Bengali medium schools. The students of each school were divided into three groups and these groups were matched on the basis of their intelligence and pre-achievement in geography. The three groups of each school were taught through different strategies, viz., lecturing and questioning-answering, lecturing and questioning-answering by using behavioural objectives, and discussion by using instructional materials. Each group was taught fifteen lessons in a period of five weeks. Their achievement was measured on the criterion tests developed by the investigator. The collected data were analysed through the technique of analysis of covariance.

The following were the major findings of the study : (i) Lecturing and questioning-answering by using behavioural objectives was found to be more effective than lecturing and questioning-answering for knowledge, comprehension, application and total achievement at post test level and for knowledge, application and total achievement at retention level. (ii) Lecturing and questioning-answering with behavioural objectives was found to be more effective than discussion by using instructional materials for knowledge, comprehension, application and total achievement at post test level and for application at retention level. (iii) Discussion by using instructional materials was found to be more effective than lecturing and questioning-answering for application at post test level and for knowledge, comprehension, application and total achievement at retention level. (iv) Lecturing and questioning-answering with behavioural objectives and discussion by using instructional materials were more effective than lecturing and questioning-answering positively and conclusively.

\*566. *DESAI, H. B., Changing Teacher Behaviour in the Teaching of Mother Tongue and Studying Its Effects on Pupils, Ph.D. Edu., MSU, 1977.*

The main objectives of the study were to help the teachers to perceive their own classroom behaviour, modify it, sustain the modified behaviour and to study the effects of behaviour of such teachers on the pupils' academic achievement, adjustment, initiative and classroom trust.

Pretest—post test—control group design was employed for the study. From among the classes of primary schools of the Surat Municipal Corporation, five classes served as experimental group and two classes served as control group. Five teachers teaching Gujarati, and who formed the experimental group, were trained for seven days in Flanders Interaction Analysis Category System (FIACS) with a view to modifying their teaching behaviour. The verbal behaviour of both the groups — controlled and experimental — was observed at regular intervals; but the feedback was provided to the teachers of experimental group only. The effects of changed behaviour of the teachers on pupils were recorded with the help of teacher-made achievement tests and other tests to measure pupils' adjustment, classroom trust and initiative. Percentage and t test were used to analyse the data.

The major findings of the study were : (i) Training in FIACS modified teachers' indirect behaviour positively. (ii) The training and feedback given to the experimental group of teachers affected the academic achievement of the pupils in mother tongue positively. (iii) The training and feedback affected pupils' classroom trust, initiative and adjustment towards home, school, peers, and teachers also positively.

\*567. *GOEL, S., Behaviour Flow Patterns of Extrovert and Introvert Teachers in Classrooms at Secondary Level, Ph.D. Edu., Mee. U., 1978.*

The objective of the study was to obtain the behaviour flow patterns of extrovert and introvert teachers.

Stratified purposive sampling technique was employed to select 100 extrovert and 100 introvert teachers from a distribution of 400 teachers. The Maudsley Personality Inventory (Hindi version) adapted by Jalota and Kapoor was used to identify extrovert and introvert teachers. The Flanders Interaction Analysis

Category System (FIACS) was used to observe the classroom behaviour of the teachers. The intra-raters reliability was estimated by Scott's formula and was recorded to be 0.899.

The study revealed the following: Extrovert teachers seemed to have greater interchange of classroom events than introvert teachers. The extrovert teachers had larger transition from pupil response to the categories of 'teacher praise', 'encourage', 'acceptance', and 'questions' as compared to introvert teachers. Introvert teachers seemed to have greater content emphasis, whereas extrovert teachers seemed to provide more opportunity for pupil participation. Introvert teachers had more transitions from 'pupil response' to 'pupil direction'. The extrovert teachers' tendency was to break the silence or confusion by asking question more frequently whereas introvert teachers' tendency was to give direction in the same state of situation. It appeared that extrovert teachers had all the seven interaction models of critical teaching behaviours while introvert teachers had only first four models of teaching behaviour (with reference to FIACS).

568. *GOVERNMENT COLLEGE OF EDUCATION, JABALPUR. A Study of Students' Attitudes Towards Teachers with Direct or Indirect Influence, Jabalpur, 1971.*

The main aim of the present study was to find out: (i) whether the pupils like those teachers who use indirect influence; and (ii) whether the pupils dislike those teachers who use direct influence.

In all, seventyeight teachers trained and untrained, and teaching various subjects (science, languages and social studies) were observed. Their experience ranged from nil to more than three years. These teachers were representatives of seventeen boys', girls' and mixed recognised schools run by different agencies like government, semi-government and private education societies. The sample included teachers of both the sexes.

The tools used for the collection of data were: (i) a questionnaire to measure the attitudes of students; and (ii) the Flanders Interaction Analysis Category System to measure the direct and indirect influence of teachers. Separate 10 x 10 matrices, combined matrices and master matrices were prepared to study teacher influence.

The main findings revealed that (i) there was a slight tendency among pupils to like teachers who used indirect influence, though the relationship was not significant; (ii) there was a tendency among pupils to dislike teachers using direct influence, though the relationship was not significant; and (iii)

there was a positive and significant relationship between pupils' favourable attitudes towards a teacher and teacher talk with a high percentage of indirect talk and a low percentage of direct talk.

\*569. *GREWAL, S. S., Intellectual and Personality Correlates of Teacher Effectiveness at the Higher Secondary School Stage, Ph.D. Edu., Pan. U., 1976.*

The study had the following as the major hypotheses: (i) The measures of attitude, interests, pupils' ratings of teachers and colleagues' ratings of teachers are the interrelated criteria of teacher effectiveness. (ii) The measures of intelligence and personality traits cluster in specific constellation with the criterion measures of teacher effectiveness to explain common factor variance. (iii) The measures having communality appear on common factors, thereby justifying the factorial validity of different tools used in this study. (iv) The predictors correlate significantly with the criterion measures of teacher effectiveness in a bivariate analysis. (v) The conjoined effect of predictors on the four criterion measures taken one at a time, is higher than any of the individual correlations in a bivariate analysis and the predictors contribute differently to the criterion measures of teacher effectiveness.

The sample consisted of 520 trained graduate teachers. The Bell's Adjustment Inventory, the Bernreuter's Personality Inventory, the Raven's Standard Progressive Matrices and the Jalota and Tandon Group Test of Mental Ability were used. The attitude scale, interest inventory and rating scales were developed and used. Mean, median, mode, SD, skewness, product moment correlation, factor analysis and analysis of variance were used in the analysis of data.

The main findings of the study were as follows: (i) The four criterion measures of teacher effectiveness were not orthogonal to each other and the observed R was very high. (ii) The measures of intelligence and personality traits clustered in specific constellations with the criterion measures of teacher effectiveness. (iii) The hypothesis that similar type of measures fall on one common factor was confirmed. (iv) The hypothesis that the predictors correlate significantly with the criterion measures of teacher effectiveness was confirmed partly in a trivariate analysis. (v) Main predictors of teacher effectiveness were home, health, social, emotional, and total adjustments, dominance, submission, and verbal and nonverbal intelligence.



\*570. GUPTA, R. C., *Prediction of Teacher Effectiveness Through Personality Test*, Ph.D. Edu.. BHU, 1976.

The hypotheses of the present study were : (i) teachers in the 'high', 'average', and 'low' categories, put according to their scores on the teacher effectiveness measures, can also be differentiated on the basis of their 16 PF score profiles; and (ii) some of the sixteen personality factors will be significantly correlated with the composite teacher effectiveness used and on the basis of these relationships, it is possible to develop a 16 PF specification equation and linear qualification grid for predicting teacher effectiveness.

The sample constituted 300 male trained high school teachers having five to ten years of teaching experience, twentyfive principals and 350 students. Teacher effectiveness was measured by using a teacher's rating scale, a pupil's rating scale, a teacher attitude inventory and the Jai Prakash's Teaching Aptitude Test. The teacher's personality was measured by using the Hindi version (by Kapoor) of the Cattell's 16 PF Questionnaire.

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<sub>3</sub>+), less suspicious (L-), less guilt prone (O-), and less radical (Q-). (ii) The low effective teachers were less intelligent (B-) and were having lower self-concept control (Q<sub>3</sub>-) 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-concept control (Q<sub>3</sub>+), and they were also less suspicious (L-), less experimenting and radical (Q-), less self-sufficient (Q<sub>2</sub>-) and less tense and frustrated (Q<sub>4</sub>-). (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<sub>3</sub>+); and they were less suspicious (L-), imaginative (M-), apprehensive and guilt prone (O-), experimenting and radical (Q<sub>1</sub>-), and self-sufficient (Q<sub>2</sub>-). (v) The average effective teachers, in comparison to low effective teachers, were more outgoing (A+), surgent and happy-go-lucky (F+), controlled and socially precise (Q<sub>3</sub>+), and less imaginative and more practical (M-).

571. GURBAKSH LAL, *A Study of Relationship Between Creative Thinking and Vocational Anxiety and their Effect on Success in Teaching*, Ph.D. Edu., Pan. U., 1974.

The main objectives of this study were : (i) to determine the extent and nature of the relationship between vocational anxiety and general anxiety, between vocational anxiety and creative thinking, between vocational anxiety and teaching success, between general anxiety and teaching success, and between creative thinking and teaching success; (ii) to compare the male and the female teacher trainees in terms of vocational anxiety, general anxiety, creative thinking and teaching success; and (iii) to view teaching success as a function of vocational anxiety, general anxiety, and creative thinking ability.

The Vocational Anxiety Scale (VA Scale) having sixty items was constructed. Three tools, viz., the VA scale, the Dutt Personality Inventory and the Test of Creative Thinking were administered to 300 teacher trainees studying in three colleges of the Punjab. Their discussion lesson awards and university examination (skill in teaching) marks were collected from the principals of the colleges. The analysis of data was based on the scores obtained in respect of 220 (110 males and 110 females) subjects.

The findings of the present study were : (i) men and women teacher trainees did not differ significantly in vocational anxiety, whereas they differed significantly in general anxiety; (ii) high vocational anxiety was inversely related to teaching success, but high general anxiety was not associated with teaching success; (iii) the teacher trainees in high and low creative thinking groups did not differ significantly from each other in vocational anxiety, whereas they did differ significantly in general anxiety; (iv) the difference in percent number of men and women teacher trainees in high vocational anxiety group was not significant, whereas in the case of high general anxiety group, the difference in percent number of men and women teacher trainees was significant; (v) the difference in percent number of men and women teacher trainees in low vocational anxiety group was not significant, whereas in the case of low general anxiety group it was significant; (vi) interaction effect of vocational anxiety and creative thinking on teaching success was found to be significant, whereas interaction effect of general anxiety and creative thinking was found to be not significant; and (vii) it was concluded that vocational anxiety and general anxiety were two separate psychologically meaningful entities and were not reducible to one.

572. LULLA, T. P., *An Investigation into the Effects of Teacher's Classroom Behaviour on Pupil's Achievement*, Ph.D. Edu., MSU, 1974.

The study attempted to find out the effects of teacher's classroom influence upon the pupils' achievement.

It was a field experiment wherein teachers were trained to acquire indirect influence patterns of classroom behaviour. The achievement of pupils under their charge was measured. Forty-eight teachers teaching class VII were randomly selected from the municipal corporation schools of Baroda city. All the schools from which the teachers were drawn had almost similar conditions regarding class size, quality of teachers, facilities for teaching and management. The sample comprised 1,800 pupils of class VII. As all students were drawn from corporation schools, they usually came from middle and lower middle class homes with similar cultural background. The tools used in the present study were : (i) the Flanders Interaction Analysis Category System (FIACS); (ii) the Desai-Bhatt Group Test of Intelligence for age group 12-18; (iii) an achievement test in Geography for grade VII; and (iv) an achievement test on the unit 'The Arab Countries'. The analysis was carried out by employing analysis of covariance.

The study revealed that the pupils who were taught by the teachers trained in using indirect behaviour scored higher, as compared to their counterparts studying under the teachers who were not provided any training. It was also implied that the indirect teacher behaviour may raise the interaction potential of the classroom climate resulting in free communication and open interaction between the teacher and the group of pupils. It was found that such an atmosphere not only stimulated the learner in learning but also provided a congenial climate to the teacher for conducting his teaching.

\*573. MAHESHWARI, V., *A Study into the Classroom Verbal Interaction Pattern of Effective and Ineffective Teachers*, Ph.D. Edu., Mee. U., 1976.

The study was designed to explore the classroom verbal interaction patterns of effective and ineffective teachers.

A sample of 200 teachers consisting of 100 effective (50 males and 50 females) and 100 ineffective (50 males and 50 females) was selected. The effective and ineffective teachers were identified on the basis of pooled criteria of the Minnesota Teacher Attitude Inventory scores, academic qualifications,

ratings of the principals, students' ratings and students' results. Flanders Interaction Analysis technique was employed for encoding and decoding the classroom verbal behaviour. All subjects taught their lesson by question-answer method. The classroom observations were encoded by the two raters. The inter-rater reliability was obtained to be 0.84. The data were analysed by using t test.

The main findings of the study were as follows : (i) Effective teachers used the categories of "accepts feeling, praise, uses student ideas, questions, student response and initiation", whereas ineffective teachers employed "lecture, direction and authority" categories in the classroom behaviour. (ii) The effective teachers involved more indirect influence, student initiation, teacher response ratio and pupil steady state ratio, whereas ineffective teachers involved more direct teacher talk, silence or confusion, steady state ratio and non-stimulating situation in classroom behaviour. (iii) In the effective teachers' teaching, student response and initiations were followed by teacher's praise and accepting feelings, whereas in ineffective teachers' teaching, student response and initiation were followed by direction and authority. (iv) The effective teachers involved more creative teaching models.

\*574. MALHOTRA, S. P., *Teacher Classroom Behaviour in Relation to Presage Variables of Teacher Attitude and Adjustment, and Product Variables of Students Liking and Perceived Behaviour by Peers, Principals and Self*, Ph.D. Edu., MSU, 1976.

The study was undertaken with the following objectives : (i) to find out the relationship between demographic (age, sex, and qualifications) and professional (teaching experience, professional status, and the subject taught) variables, and the indirect-direct teacher classroom behaviour; (ii) to determine the relationship between teacher attitudes and adjustment, and indirect-direct teacher classroom behaviour; (iii) to find out the relationship between indirect-direct teacher behaviour and students' liking about their teachers; (iv) to find out the relationship between indirect-direct teacher behaviour and the perception of teacher behaviour by peers, principals, and self; and (v) to study the factorial structure of the test-space of presage-process-product variables through multivariate approach.

Multistage randomized cluster design was employed. The study was conducted on grade XI of the urban higher secondary schools of the Punjab. The sample consisted of 1724 students of age group

15 to 17+, and 250 teachers. The tools used were: (i) the Flanders Interaction Analysis Category System, (ii) the Minnesota Teacher Attitude Inventory, (iii) the Bell's Adjustment Inventory, (iv) a Students liking scale, (v) a teacher rating scale, and (vi) a personal information proforma. The data were analysed by using analysis of variance, t test, correlation by product-moment method, and factor analysis techniques.

The findings of the study were as follows: (i) There was negative relationship between the age of the teachers and indirect-direct teacher classroom behaviour. (ii) The male and female teachers did not differ in indirect-direct teacher classroom behaviour. (iii) The teachers with bachelor's degree were more indirect in their classroom behaviour than teachers with master's degree. (iv) Teachers with low teaching experience were more indirect in their classroom behaviour than teachers with high teaching experience. (v) Science teachers were more indirect in their classroom behaviour than arts teachers. (vi) Teachers with positive attitudes were more indirect in their classroom behaviour than teachers with negative attitudes. (vii) Poorly adjusted teachers were more direct in their classroom behaviour than teachers who were well adjusted. (viii) Teachers with indirect classroom behaviour were more liked by students than the teachers with direct classroom behaviour. (ix) The teachers with indirect classroom behaviour were rated higher by peers and principals for their behaviour in school. (x) The teachers with indirect classroom behaviour rated themselves higher for their own behaviour in the school. (xi) Factor analysis resulted into nine varimax factors, namely, Reinforcing Pupil Participation, Peers Disapproval of Stable Behaviour, Teachers Attitudes — Adaptability, Teacher Stimulated Pupil Initiation, Teacher Stimulated Pupil Participation, Students Liking for Indirectness, Principal Approved Subject Informative Behaviour, Perceived Teacher Behaviour, and Silence-Confusion.

\*575. *MASIH, S. B., A Study of Some Teacher Variables and Teaching Methods Associated with Learning Outcomes in Biology, Ph.D. Edu., Raj. U., 1976.*

The objectives of the study were: (i) to determine which of the selected teacher variables have a significant relationship with the attainment of specific learning outcomes of the students in Biology; and (ii) to determine which of the selected teaching methods or their combinations have a significant relationship with the attainment of specific learning outcomes of students in Biology.

Stratified random sampling technique was employed to select sixty schools from all over Rajasthan. The sample consisted of students studying in grades X and XI in 1972-73 and it was 1472 in number. The tools used in the study were: (i) a non-verbal test of intelligence, (ii) the Nelson Biology Test, (iii) a test on understanding science, (iv) a biology classroom checklist, (v) the Edwards' Personal Preference Schedule, (vi) a teacher inventory and (vii) a teaching attitude scale.

The study revealed the following: Objectives were most effectively attained when teaching was planned for a specific purpose. Relationship of planned teaching to the realisation of the objectives was evident in case of first two objectives. A comparison of teachers with classes achieving high gains to teachers with classes achieving low gains on each of the four selected outcomes indicated that successful methods and the patterns of student activity were related to student learning outcomes. Teachers with higher class means on several learning outcomes emphasised methods which were pupil centred, utilized the laboratory, used project and laboratory discussion combination methods for solving new problems, and also they planned to accomplish specific objectives.

\*576. *MATHEW GEORGE, Classroom Behaviour of Teachers and Its Relationship with their Creativity and Self Concept, Ph.D. Edu., MSU, 1976.*

The objectives of the study were: (i) to find out the nature and extent of relationship, if any, between creative teacher personality and teacher behaviour; (ii) to find out the nature and extent of relationship, if any, between creative teaching process and teacher behaviour; (iii) to find out the nature and extent of relationship, if any, between self-concept of teachers and teacher behaviour; (iv) to find out whether or not the demographic variables, namely, age, sex, marital status, residential location, and district, and qualifications of teachers influence their classroom behaviour; (v) to factor analyse the test-space due to the variables relating to creativity, self-concept and teacher behaviour of the total sample; and (vi) to suggest measures for incorporating the application of the findings of study in Indian educational system.

This presage-process investigation was a descriptive correlational study. The first set of presage variables included creative teacher personality, creative teaching process and self-concept; and the second set included demographic variables such as age, sex, marital status, residential location and district. The process variables were the dimensions of teacher be-

haviour. Out of the seventeen dimensions of teacher behaviour observed by the FIACS, indirect/direct ratio (i/d) was the main criterion variable. The population of the study consisted of classroom teaching situations in standard eight, nine and ten of secondary schools of Baroda and Muvattupazha, where the medium of instruction was English or Malayalam for the subjects mathematics, science and social studies. There were 1346 such teaching situations in 133 schools. Out of them 245 teaching situations from thirtyfive schools were selected employing stratified random cluster sampling technique. There were 245 teachers who were observed. Tools used were : (i) the Flanders Interaction Analysis Category System (Twentytwo Category System); (ii) the Deo's Personality Word List; (iii) the Creative Teacher Personality Scale; (iv) the Creative Teaching Process Scale; and (v) the personal information proforma. Of these tools, the first and the second were used in their original standardised forms and the remaining tools were adapted.

The findings revealed the following facts : (i) there was no significant relationship between creative teacher personality and indirect/direct behaviour of teachers; (ii) there was positive correlation between creative teacher personality and 'teacher talk' and negative correlation between creative teacher personality and 'vicious circle', whereas there was no relationship between creative teacher personality and other dimensions of teacher behaviour; (iii) there was no relationship between creative teaching process and indirect/direct behaviour of teachers; (iv) there was negative relationship between creative teaching process and divergent question ratio, whereas there was no relationship between creative teaching process and the remaining dimensions of teacher behaviour considered in the study; (v) there was no relationship between self-concept of teachers and their indirect/direct behaviour; (vi) there was negative relationship between self-concept of teachers and pupil initiation ratio, and self-concept of teachers and 'vicious circle'; (vii) there was negative relationship between chronological age of teachers and their indirect/direct behaviour; (viii) there was negative relationship between chronological age of teachers and teacher response ratio, constructive integration with reference to total interaction and constructive integration; (ix) there was no significant difference between male and female teachers in their indirect/direct behaviour; (x) trained graduate teachers were indirect in their classroom behaviour as compared with trained postgraduate teachers; and (xi) the results of factor analysis revealed eleven factors out of which nine factors were named

as : (i) Positive Self Concept, (ii) Teacher Verbal Flexibility in Classroom Communication, (iii) Negative Self Concept, (iv) Indirectness, (v) Constructive Integration-Divergent Questioning - Pupil Initiation, (vi) Positive Aesthetic Self Concept, (vii) Positive Intelligence Self Concept, (viii) Teacher Creativity, and (ix) Pupil Talk.

\*577. MEHTA, Y. M., *An Enquiry into the Relationship Between Teachers' Classroom Communication Pattern and Certain Perceptual Factors*, Ph.D. Edu., MSU, 1976.

The main objectives of the study were : (i) to enquire into the communication pattern of teachers teaching history in the classes VIII, IX and X of the secondary schools of Greater Bombay and to find out its relationship with the demographic factors; (ii) to study the relationship of the instructional roles as perceived by the teacher himself with his classroom behaviour; (iii) to study the relationship between teachers' instructional goals, perception and his classroom behaviour; (iv) to study the relationship between teachers' communication pattern in the classroom and his perception of the teaching profession, students, and self; and (v) to explore the possibility of developing a regression equation to predict teacher communication pattern based on perceptual and other factors.

The sample consisted of thirtysix males and 114 female teachers, chosen randomly, from Gujarati medium secondary schools of Greater Bombay. The Flanders Interaction Analysis Category System and the Patted Teachers' Perception Scale were used. Mean, SD, t test and multiple correlation were used for analysing the data.

The major findings of the study were as follows : (i) There was no relationship between the age of the teachers and their communication pattern in classroom, and similar result was found between the sex of the teachers and the measures of teacher communication pattern. (ii) Significant negative relationship was found between the sex of the teachers and TRR (Teacher Response Ratio). (iii) Significant relationship was observed between the qualifications of teachers and TQR (Teacher Question Ratio). (iv) No relationship was found between the recency of training and teaching experience with the teachers' classroom communication pattern. (v) The teachers' teaching in boys schools differed significantly from the teachers of the other two types of schools on TRR. (vi) The male teachers were not found to differ from the female teachers significantly regarding i/d, I/D and TQR. (vii) The male teachers differed significantly from

female teachers regarding TRR. (viii) As regards i/d, I/D and TRR, the post-graduate teachers did not differ significantly from graduate teachers while the post-graduate teachers differed significantly from the graduate teachers on TQR. (ix) Teachers having history at the graduate level as well as at professional level did not differ from those teachers who did not have history at both the levels in their communication pattern in actual classroom situations. (x) There was no relationship between the teachers' instructional goals perception and i/d, TRR and TQR. (xi) Negative relationship was found to exist between teachers' instructional goals perceptions and I/D. (xii) Teachers' perceptions of students were not found to have relationship with their communication patterns in the classroom. (xiii) The multiple correlation coefficient was found to be significant in the cases of I/D, T/S (Teacher/Student), TT (Teacher Talk), and ST (Student Talk).

578. NAIR, S.R., *Impact of certain Sociological Factors on Teaching Ability in the Classroom, Government Training College, Trichur, 1974. (NCERT financed)*

The study aimed at finding the impact of certain sociological factors like family background, caste, religion, and sex on the teaching ability of teachers. The following hypotheses were tested: (i) Teaching ability would not be positively related to socio-economic conditions. (ii) Teaching ability would not be affected by the sex, age and caste of the teacher, and the type of the management of the school.

A total of 200 secondary school teachers from the educational district of Trichur (Kerala) were selected giving equal representation to government and private schools, to rural and urban areas, and to men and women teachers. Particulars regarding their individual socio-economic status, age, sex, parental socio-economic status, etc., were collected in person. The teaching ability of these teachers was evaluated by their headmasters and pupils, using an evaluation sheet and a pupils' rating scale, respectively. The data were analysed using critical ratio and correlation.

The findings revealed that (i) teacher's parental socio-economic conditions had a negative influence on teaching ability; (ii) the private school teachers in general were found to have better teaching ability than government school teachers; (iii) sex was not found to be affecting teaching ability; (iv) the locality of the schools had no significant influence on teaching ability; (v) a positive relationship existed between age and teaching ability; and (vi) caste and religion

were not found to be affecting teaching ability.

\*579. NAYAR, P. R., *Cognitive Interactions in Classroom Instruction, Ph.D. Edu., MSU, 1976.*

The objectives of the study were: (i) to find out how much time was spent on different levels of cognitive interaction, viz., the exposition-reception level (E-R), the solicitation-reproduction level (S-R), the facilitation comprehension/discovery level (F-C/D), the facilitation/posing-application/evaluation level (FP-AE), and the facilitation/posing-synthesis level (FP-S); (ii) to find out how much time in a lesson was spent on different modes of presentation in each category of interaction at E-R level and on each irrespective of the mode of presentation; (iii) to find out the frequency of occurrence and time consumption in a lesson on each category or pair of interaction at S-R, F-C/D, FP-AE and FP-S levels; (iv) to find out the frequency of occurrence or time consumption in a lesson; (v) to find out the ranges of occurrence of different categories or pairs of cognitive interaction at different levels, and the proportion of lessons falling in different short ranges of time consumption measures of the major levels; (vi) to find out the ratios between measures of time consumption of different levels and the overall multiple ratio of different levels for the different subjects; (vii) to find out the differences in cognitive interaction in instruction between Kannada and English media in the teaching of non-language subjects; and (viii) to find out the relationship of cognitive interaction pattern as represented by component variables like time consumption for different major levels and inter-relationship variables like ratios between them to the selected teacher variables, viz., sex, achievement level, experience, and competence. Null hypotheses formulated were as follows: (i) There would be no significant differences between teachers of both the sexes, teachers at different achievement levels, different experience levels and levels of competence in respect of exposition-reception time (e), solicitation-reproduction time (r), facilitation/posing-comprehension/discovery/application/evaluation/synthesis time (d') and their different ratios. (ii) There would be no significant differences between (a) different school subjects, and (b) mother-tongue and English media of instruction in respect of different patterns of cognitive interaction.

This was a descriptive and correlational type of study. Cognitive interaction involved in the teaching of English, Kannada, mathematics, social studies, physical sciences and biological sciences were observed and analysed. Total number of lessons observed

were six hundred. Lessons were equally divided between classes VIII and IX. Sixty percent of the total lessons were observed in urban schools, twenty percent in sub-urban schools and twenty percent in rural schools. Fiftythree percent of lessons were given by male teachers and the rest by female teachers. The tools employed were : (i) A System of Analysing Interaction (SAI), and (ii) Teaching Competence Rating Scale.

The major findings were as follows : (i) Nearly one-third of the total time was spent in acquainting the information. (ii) Nine to thirteen percent of time was used in clarification. (iii) Eleven percent of time was used in explanation. (iv) Drawing was conspicuous in biological sciences than in physical sciences. (v) Display was most prominent in physical sciences. (vi) Oral presentation took more than half the time in social sciences and least in mathematics. (vii) There was wide variation in the occurrence of every exposition category and mode, among each lesson of a subject and among the different subjects. (viii) Student initiation occurred very rarely. (ix) Positive pronouncement occurred mostly followed by correction and negative pronouncement while resolving and neutral acceptance occurred rarely. (x) Sex differences were not significant in case of e, r, r/e and d'/r but significant at 0.05 level in respect of d' and d'/e. (xi) Competence differences were highly significant so far as e, d', d'/e and d'/r were concerned but not in case of r and r/e. The higher the competence the less seemed to be the quantum of expository teaching and more of higher level cognitive interaction and discovery learning. (xii) Differences by achievement level and by teaching experiences were highly significant in case of e, d', d'/e and d'/r only. Exposition was less and discovery learning was more with high achievement as well as longer experience. (xiii) Teachers did not exploit higher level of interaction in content matter though that was potent source of variation in cognitive interaction. (xiv) No significant difference was found between the two media of instruction in respect of any of the six cognitive interaction variables.

580. PADMA, M. S., *Teaching Patterns and Pupils' Attainment, Ph.D. Edu., MSU, 1976.*

The study aimed at fulfilling the following objectives : (i) to find out the effectiveness of pattern P<sub>1</sub> (lecturing-problem solving approach pattern), Pattern P<sub>2</sub> (questioning - answering - problem solving approach pattern), Pattern P<sub>3</sub> (questioning - answering - feedback - problem solving approach pattern),

and Pattern P<sub>4</sub> (lecturing - no problem solving approach pattern) on the development of applicational ability in science (physics) of standard VII pupils of Baroda City; and (ii) to find out the effectiveness of Pattern P<sub>1</sub>, Pattern P<sub>2</sub>, Pattern P<sub>3</sub>, and Pattern P<sub>4</sub> on the retention of the applicational ability in science (physics) of standard VII pupils of Baroda City.

The study comprised two experiments. The first experiment followed a Graeco-Latin Square Design (4 x 4) involving the four teaching patterns, four units of physics, four sections of standard VII and four weeks, with ten replicates in each cell. The second experiment followed a Completely Randomized Design. Intelligence as measured through the Shah's Nonverbal Group Test of Intelligence and pre-achievement in science as measured through a test developed for the purpose were used as the two covariates. Three types of criterion scores were obtained. These were (i) applicational ability scores under planned testing condition in the first and second experiments, (ii) applicational ability scores under surprise testing condition in the second experiment only, and (iii) applicational ability scores for retention in both the experiments. The first experiment involved forty pupils from four classes of standard VII, whereas the second experiment involved seventytwo pupils from four classes of standard VII from the city of Baroda. The investigator herself acted as the teacher in both the experiments. The teaching of the selected units according to the four teaching patterns chosen for the experiment formed the treatment. Uniformly structured lesson plans were developed for each lesson to facilitate the teacher to follow strictly the teaching patterns. Data were analysed using analysis of variance in the first experiment and analysis of covariance in the second experiment.

The following conclusions were drawn from the study. (i) The four teaching patterns (P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub> and P<sub>4</sub>) were having equal effects on the development of applicational ability when measured under surprise testing condition. (ii) the four teaching patterns (P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub> and P<sub>4</sub>) were having equal effects on the development of applicational ability when measured under planned testing condition. (iii) In the first experiment which involved the Graeco-Latin Square Design, it was found that the four teaching patterns had differential effects on the retention of applicational ability. On further analysis it was found that the mean for Pattern P<sub>3</sub> was significantly smaller than the means of Pattern P<sub>2</sub>, Pattern P<sub>4</sub>, and Pattern P<sub>1</sub>. There was no evidence of significant variability within the set patterns P<sub>2</sub>, P<sub>4</sub> and P<sub>1</sub>.

581. PATEL, P. F., *An Inquiry into the Relationship between Pupils' Attitudes and Teacher Influence in the Classroom*, Ph.D. Edu., MSU, 1974.

The purpose of the investigation was to study the effectiveness of the influence of teacher's classroom behaviour on (i) pupils' personal anxiety, (ii) pupils' motivation and classroom organisation, (iii) pupils' attitudes towards reward and punishment, (iv) the development of independent behaviour on the part of pupils, (v) pupils' attitudes towards teacher, (vi) the classroom climate, and (vii) pupils' attitudes towards school.

A stratified random sample of 100 teachers of primary schools run by the Ahmedabad Municipal Corporation who had at least sixty percent of teaching work in class VII was selected. The Flanders Interaction Analysis Category System was used to measure teacher influence in terms of indirect-direct behaviour. Attitude scales related to the different areas of pupils' attitudes considered in the study were used.

The study revealed: (i) indirect teacher influence had favourable effect on motivation and classroom organisation and also on the attitude towards teacher; (ii) when teacher influence without content emphasis was taken into consideration, indirect teachers had favourable influence on personal anxiety of their pupils, on the development of independent behaviour among pupils and on the classroom climate; (iii) teacher classroom behaviour did not influence pupils' attitude towards reward and punishment; and (iv) teacher classroom behaviour did not influence pupils' attitude towards school.

\*582. PAVANASAM, R., *Teacher Behaviour and Classroom Dynamics*, Ph.D. Edu., MSU, 1977.

The major objectives of the study were: (i) to change the teacher verbal behaviour through proper training programme; (ii) to study the effects of sustained changed behaviour and their effects on student performance; and (iii) to study the effects of changed teacher behaviour on variables such as achievement motivation, value orientation, dependency, classroom trust, initiative, adjustment and academic achievement as related to pupils.

Pretest-posttest-control group design was employed in the study. Eighteen secondary grade teachers were selected on the basis of teaching experience, sex, subjects, patterns of classroom verbal interaction and willingness to participate in the investigation. The selected teachers were randomly assigned

to two groups, twelve to experimental and six to control group. The experimental group teachers were given three days' classroom behaviour training in the Flanders Interaction Analysis Category System. This training consisted of the orientation in the theory of interaction analysis process and in the development of skills in observation, coding, matrix preparation and analysis. The selected teachers in this investigation taught three English lessons, six history lessons, and six science lessons with uniform speed, similar aids and lesson plans throughout the experimental period of eight weeks. The tools used in this study were: (i) the Pareek and Rao's Pre-Adolescent Adjustment Scale, (ii) the Pre-Adolescent Classroom Trust Schedule, (iii) the Pre-Adolescent Dependency Scale (Forms A and B), (iv) the Pre-Adolescent Initiative Questionnaire, (v) the Achievement Motivation Inventory, (vi) the Value Orientation Inventory, and (vii) achievement tests in English, science and social studies.

The study revealed the following: (i) The experimental group teachers talked less, were more responsive to pupils, encouraged more pupil participation and had more pupil initiative than the control group. (ii) The interaction patterns acquired during training were sustained for more than twenty weeks after the training was completed. (iii) The students who were taught by the teachers trained in using indirect behaviour scored high in all tests as compared with their counterparts working under teachers not given any training in this technique (using indirect behaviour).

\*583. PILLAY, G. S., *Effects of Patterns of Teaching upon Creative Thinking among Adolescents*, Ph.D. Edu., MSU, 1978.

The following were the objectives of the study: (i) to find out the effect of 'Creative Teaching Method' (combination of morphological analysis, brain storming, and traditional method) upon the general creative thinking of eighth graders; (ii) to find out the effect of Creative Teaching Method upon creative thinking in geography of eighth graders; and (iii) to find out the effect of the Creative Teaching Method upon the achievement in geography of the eighth graders.

The study employed multifactor covariance design having experimental and control groups. The treatment in the study was the teaching of geography through the Creative Teaching Method. The sample consisted of 71 eighth grade students (36 control group and 35 experimental group). The tools used in the study were the Kuppaswamy's SES Scale

Form A, the Madhookar Patel Intelligence Test and the Passi's Test of Creativity. The creative thinking in geography and achievement were tested by tools developed by the investigator. The data were analysed by using mean, SD, t ratio, biserial correlation, and analysis of covariance, etc.

The major findings of the study were as follows : (i) The treatment of Creative Teaching Method, when compared with the traditional method, did not produce differential effect upon general creative thinking and on its sub-parts such as, seeing problems, unusual uses and consequences of eighth graders, and upon creative thinking in geography too. (ii) Among the five operations of structure of intellect model, namely, cognition, memory, divergent production, convergent production, and evaluation, the convergent production ability in geography of eighth graders improved significantly by the Creative Teaching Method than by the traditional method. (iii) Out of thirty mental abilities, seven abilities were developed significantly higher by Creative Teaching Method, whereas the traditional method produced higher mean scores in case of memory for word meanings.

\*584. *RAJIWALA, B. C., Changing Teacher Behaviour in the Teaching of Science and Studying Its Effect on Pupils, Ph.D. Edu., MSU, 1976.*

The main objectives were : (i) to study the effects of change in the behaviour patterns of teachers on the development of the pupils; and (ii) to study the relationship between the teacher influence and pupils' academic achievement, classroom trust and initiative.

The study was conducted on seven VII grade classes of Surat Municipal schools of which five classes were experimental and two formed the control groups. Fifteen teachers were trained through Flanders' Interaction Analysis Category System (FIACS) to increase the indirect behaviour. FIACS was used to measure teacher behaviour. Pareek's Pre-Adolescent Adjustment Scale was used to measure pupil's adjustment with teacher, school, peer, father, and adjustment in general, and Pareek's Pre-Adolescent Initiative Scale was used to measure initiative. To test the significance of difference between the pretest and post test scores, t test was used.

The study revealed the following : (i) the training in FIACS modified the teachers' indirect behaviour positively; (ii) mean difference between pre and post observations on the i/d ratio was significant at 0.01 level in the case of experimental group; (iii) the training and feedback given to the teachers of the

experimental group affected pupils' adjustment, classroom trust, and initiative level positively; (v) the training and feedback given to the teachers of the experimental group affected the academic achievement of the pupils in science positively and significantly.

585. *ROKA, S. D., A Comparative Study of Verbal Teaching Behaviour Patterns and Student's Achievement in Terms of Instructional Objectives, Ph.D. Edu., MSU, 1976.*

The objective of the present study was to ascertain whether some selected verbal teaching behaviour patterns affected students' achievement. The study hypothesised no significant difference in mean achievement at knowledge, understanding and application levels when the pupils are taught by the teachers in the control group and two other experimental groups.

The study had adopted experimental approach. One experimental group (E<sub>1</sub>) of teachers had been given limited training in the theory and practice of interaction analysis. The second experimental group of teachers (E<sub>2</sub>) was given additional training in the use of the selected verbal teaching behaviour patterns. The control group of teachers was not given any training. The sample of the study consisted of nine teachers, randomly selected and assigned to three groups equally. These nine teachers belonged to five schools in Ajmer. The boy students of class VII, who were taught general science in their respective classes by these nine teachers, represented the sample of learners. In this study (i) providing confirmatory and corrective feedback, (ii) asking cognitive memory, convergent, divergent and evaluative questions, and (iii) general indirectness in teaching, were the three verbal teaching behaviour patterns considered as independent or treatment variables; level of pupil achievement in terms of knowledge, understanding and application was the dependent or criterion variable; and previous knowledge of the students and level of intelligence of the students were the two covariates. The tools used in the study were as follows : (i) Previous Knowledge Test, (ii) Achievement Test in General Science, (iii) Observational Category System (OCS), and (iv) A Group Intelligence Test in Hindi by Mehta. Among these tools the first two were developed by the author, and the third was developed by modifying and adapting FIACS. Median test and analysis of covariance were utilized in analysing the data.

The major findings of the study were as follows : (i) Limited training as was imparted to E<sub>1</sub> did not



result in significant difference when a number of verbal teaching behaviours were to be changed. (ii) Significant differences were not observed in favour of additional training as was given to  $E_2$ , with respect to asking cognitive memory and convergent questions, giving direction and command, and student initiation. (iii) However, comparison between  $E_1$  and  $E_2$  groups of teachers indicated significant difference at 0.05 level in favour of additional training in such interactive behaviours as asking divergent questioning, lecturing and student response. (iv) Occurrence of such teaching behaviours as accepting student's feelings, and criticising and justifying authority were generally rare in all the three groups of teachers. (v) The study gave an indication that asking significantly more of divergent and evaluative questions did not result in significant difference in mean achievement at knowledge level but resulted in significant difference at 0.05 level in mean achievement at understanding and application levels.

\*586. ROY, S., *Classroom Questioning and Pupil Achievement: An Inquiry into Teaching Style*, Ph.D. Edu., MSU, 1977.

The major objective of the study was to find out the relative effectiveness of the three styles of teaching upon pupil achievement for the instructional objectives of knowledge, comprehension, application and total achievement. The three styles of teaching were: (i) lecturing, (ii) questioning and response without feedback; and (iii) questioning-response-feedback sequence.

The sample consisted of 98 students of Baroda High School, studying in VIII standard. The number of students for the three styles of teaching were respectively 34, 33 and 31. The same lessons in geography were taught to all the three groups by the investigator himself. Bartlett's test was employed to ensure homogeneity of variance of the experimental data. Three-way analysis of variance was used to find out the significant treatment effects due to three styles of teaching. Analysis of covariance was used to control the influence of the intervening variables. The t test was used to find the significance of differences in the treatment means.

The study revealed that the three teaching styles had equal effects on the development of knowledge and application abilities and total achievement of pupils. However, with regard to comprehension ability, there were differential effects. Lecturing differed significantly from question-response-feedback sequence. Question-response without feedback and

question-response-feedback did not differ significantly.

\*587. SHAIDA, A. K., *Teaching Patterns — Questioning and Feedback — And Pupil Attainment*, Ph.D. Edu., MSU, 1976.

The main objectives of the investigation were: (i) to study the effects of four patterns of teaching, namely, narrow questions with feedback ( $P_1$ ), narrow question with no feedback ( $P_2$ ), broad questions with feedback ( $P_3$ ), and broad questions with no feedback ( $P_4$ ), upon the attainment of class VIII boys in social studies in terms of knowledge, comprehension, application, and total scores; and (ii) to study the effects of the four patterns upon retention in terms of knowledge, comprehension, application, and total scores.

In order to study the effect of different patterns of teaching, the 4 x 4 Graeco-Latin Square Design was used. All the class VIII pupils of the government higher secondary school at Kaithal were involved in the experiment. This class had four sections and these four sections were considered as four groups. The groups were matched on the basis of their IQ measured by the Jalota's Group General Mental Ability Test, socio-economic status measured by the Kuppaswamy's Socio-Economic Status Scale (Urban), and age. Each group was taught four units and through all the four patterns. The achievement of the subjects was measured through criterion tests prepared by the investigator. Using these tests data related to attainment and retention scores were collected and analysis of variance and t test were applied to the same.

The results revealed that the teaching pattern of narrow questions with feedback produced significantly higher mean for the development of knowledge and its retention than all other patterns. The teaching pattern of broad questions with feedback produced significantly higher mean than the remaining other two patterns. The teaching pattern of broad questions with feedback produced significantly higher mean for application and its retention than all other patterns. The teaching pattern of broad questions with feedback did not produce significantly higher mean for total attainment than other patterns.

\*588. SHASHIKALA, Y. S., *A Study of Interpersonal Relationship Between Teacher and Students with a View to Establishing Socio-Psychological Correlates of Teacher Behaviour*, Ph.D. Edu., Ban. U., 1978.

The objective of the study was to determine whether certain presage variables were related to teacher

behaviour indices. The presage variables were the needs, anxiety, modernity, attitude towards students, age, SES of the teacher and organisational climate of the school. The process variable was teacher verbal behaviour with its eight indices, viz., I/D, i/d, TRR, TRR89, TOR, TOR89, PIR and CCR, as could be measured through the Flanders Interaction Analysis Category System (FIACS).

The study was correlational in nature. The sample of the study consisted of 148 secondary school social studies teachers teaching IX standard. Two scales — a Likert-type attitude scale having 29 statements (split-half reliability coefficient was 0.83) to measure attitude of teachers towards students and a modernity scale of Guttman-type having 21 items (coefficient of reproducibility ranged from 0.83 to 0.90) — were constructed by the investigator. The other tools used were : the Sinha's Anxiety Scale, the Edwards Personal Preference Schedule, the Organizational Climate Description Questionnaire of Halpin and Croft, and Flanders Interaction Analysis Category System. Each teacher was observed twice on the FIACS. The statistical techniques used were the coefficient of correlation, t test, analysis of variance and multiple R.

The following were some of the main findings of the study : (i) Age was positively related to I/D and TOR and negatively to i/d and CCR (at 0.01 level). (ii) SES and modernity were not related significantly to any of the teacher behaviour indices. (iii) Anxiety was related negatively to TRR and TRR89 (at 0.05 level). (iv) There were no significant differences in teacher behaviour under the six different types of climates. (v) A multiple correlation coefficient of 0.3228 (corrected) was obtained between the criterion variable I/D and the predictor variables of age and production emphasis (significant at 0.05 level).

589. SINGH, L. P., *Interaction Analysis, Micro-teaching and Modification of Teacher Classroom Behaviour*, Ph.D. Edu., MSU, 1974.

The major objectives of the study were : (i) to study the effectiveness of microteaching vis-a-vis conventional method of training as a means of changing classroom behaviour of student teachers; (ii) to study the effectiveness of training in Flanders Interaction Analysis Category System (FIACS) vis-a-vis conventional programme as a means of changing classroom behaviour of student teachers; and (iii) to study the effectiveness of microteaching vis-a-vis training in Flanders Interaction Analysis Category System (FIACS) as a means of changing classroom behaviour of student teachers. In order to fulfil the objectives,

the following null hypotheses were framed : (i) student teachers trained by micro-teaching do not significantly differ in their verbal teaching behaviour in the classroom as compared to the student teachers trained by a conventional pattern; (ii) student teachers trained in FIACS do not significantly differ in their verbal teaching behaviour in the classroom as compared to the student teachers trained by traditional way only; (iii) student teachers trained by microteaching do not significantly differ in their verbal teaching behaviour in the classroom as compared to the student teachers trained in FIACS. Two sets of samples were used, one for the pilot study and the other for the final experiment. A sample of twenty student teachers for pilot study was drawn out of 160 student teachers admitted for B.Ed. training in the year 1970-71 in Tilakdhari College, Jaunpur, affiliated to the University of Gorakhpur, Uttar Pradesh. A sample of twenty student teachers for the final experiment was selected out of 157 student teachers admitted to the same college in the year 1971-72 for B.Ed. training. The experimental class, in both experiments was VIII grade. Pupils numbering ninety and 105 in the year 1970-71 and 1971-72 respectively, from the school attached to Tilakdhari Singh Inter College, Jaunpur, were used. For gathering information relating to the matching variable an information proforma was prepared and administered to the student teachers under training. For training the student teachers, the traditional method as practised today, micro-teaching and FIACS were used for different groups. Teacher behaviour was measured by observing and analysing the classroom verbal interaction of student teachers and pupils using FIACS.

The major findings of this study were : (i) student teachers trained through microteaching significantly changed their verbal teaching behaviour in the classroom compared to the student teachers trained in traditional way only; (ii) student teachers trained in FIACS changed their verbal teaching behaviour in the classroom significantly compared to the student teachers trained in traditional way only; (iii) student teachers trained through microteaching changed their verbal behaviour in the classroom significantly compared to the student teachers trained in FIACS.

\*590. SINGH, S. K., *A Study of Some Personality Variables Related to Teaching Effectiveness*, Ph.D. Edu., Pat. U., 1976.

The major objective of the study was to examine the relationship between some personality variables and teaching effectiveness.

The sample consisted of ten superior, ten aver-

age, and ten inferior student teachers out of 164 student teachers of 1972-73 batch at Tilakdhari Teachers' Training College, Jaunpur, U.P. In each group there were five male and five female teachers. The instruments used in the study were : (i) the Thematic Apperception Test; (ii) a rating scale to measure the teaching stimulus of the teacher by the observer which included fifty characteristics relevant to the teaching effectiveness in the areas, such as, (a) knowledge of the subject, (b) communicability, (c) sincerity, (d) ability to stimulate, (e) intelligence, (f) honesty, (g) emotional balance, (h) punctuality, (i) appearance, (j) responsibility, (k) resourcefulness, (l) judgment and reasoning, (m) sense of dedication, (n) helpfulness, (o) ability to organise; (iii) the Sinha's Anxiety Scale to measure anxiety; and (iv) the Sinha-Singh Adjustment Inventory to measure the adjustment of students. Analysis of variance was used in the analysis of the data.

The major findings of the study were as follows : (i) The needs of superior, average and inferior teachers were clearly distinct from each other and superior teachers were distinct from the other two in the needs, viz., cognition, dominance, autonomy, and construction. (ii) The inferior teachers were distinguishable from the other two by their need of acquisition. (iii) The inferior teachers were distinguishable in not possessing the need of exhibition, which was most prominent in the average teachers. Other most prominent needs of the average teachers were exposition and play. (iv) Prominent needs of inferior teachers were succourance, deference, and play. (v) The most prominent needs of superior teachers were nurturance, achievement counteraction and aggression. (vi) The organisation pattern of superior teachers was generally logical and that of inferior teachers was emotional. (vii) The interpersonal relation as regards social behaviour and adjustment were of very high degree in superior teachers but they were very low in inferior teachers. (viii) The inferior teachers lacked self-confidence in teaching and solving problems. The average teachers had self-confidence but had adjustment problems. (ix) The superior teachers had more strength of imagination while inferior teachers were weak in their imagination. (x) The average teachers were more entangled in family problems and were more sensitive to them, but the inferior teachers were less sensitive to such problems. The superior teachers were less entangled in family problems or were able to solve them quickly. (xi) The superior teachers used more literary language than average and inferior teachers.

591. SINGH, S. K., *A Study of the Relationship between Verbal Interaction of Teachers in Classroom and Attitude towards Teaching (with special reference to B.Ed. students), Ph.D. Edu., Mee. U., 1974.*

The study aimed at developing a category system for systematic observation of teachers and determining relationship between observed behaviours and measures of teacher's attitude. The specific objectives were : (i) to estimate the extent of relationship between verbal behaviour of teachers and their attitude towards teaching; (ii) to test the statistical significance of relationship between verbal behaviour of teachers and their attitude towards teaching, (iii) to find out the relationship between attitude towards teaching and verbal behaviour with reference to language, science, mathematics and social studies teachers; (iv) to ascertain the relationship between attitude towards teaching and pooled ten interaction variables; and (v) to identify the patterns of verbal behaviour in terms of flow of interaction models associated with favourable and unfavourable attitudes of teachers.

The sample consisted of five hundred B.Ed. students (250 male and 250 female) selected from the training colleges of Meerut University in 1972-73. All the pupil teachers taught their lessons through question-answer method. But variables such as academic qualifications, recency of training and knowledge of theory and practice were not controlled. The tools used were the Minnesota Teacher Attitude Inventory and the Flanders Interaction Analysis Category System (FIACS). Percentages, and correlations were used to analyse the data.

The findings revealed that i) indirect influence, pupil talk, indirect to direct ratio, pupil initiation ratio, teacher response and question ratios' instantaneous teacher response and question ratios appeared to be significantly related to attitude towards teaching in male and female groups, teaching subject groups, and teaching classes; (ii) there was a significant relationship between attitude towards teaching and classroom verbal interaction of student teachers of secondary level; (iii) lecturing, criticising and justifying authority, direct influence and restrictiveness were found to be negatively correlated with attitude towards teaching in male and female groups and language, social studies, and science-mathematics groups; (iv) pupil talk, and pupil initiation ratio were found to be associated with attitude towards teaching in male and female groups, teaching subject groups and teaching classes; (v) teacher response ratio, teacher

question ratio, instantaneous teacher response and question ratios were found to be related to attitude towards teaching; (vi) the restrictiveness, restrictive feedback and negative authority were found to be negatively associated with attitude towards teaching; and (vii) the teacher talk was found to be independent of or not related to attitude towards teaching at any level.

592. *VASISHTHA, K. K., An Experimental Study of the Change in Some Characteristics and Verbal Behaviour of Secondary Science and Training in Verbal Interaction Technique Mathematics Student-Teachers through the Ph.D. Edu., Mee. U., 1976.*

The objectives of the study were : (i) to explore the classroom behaviour of secondary science and mathematics student-teachers through the Flanders Interaction Analysis Category System (FIACS); (ii) to evaluate the effect of training in the verbal interaction analysis technique through the Minnesota Teacher Attitude Inventory, rating of self-perception and classroom rating; (iii) to examine the change of patterns of verbal behaviour of science and mathematics student teachers through the training of Flanders technique; (iv) to investigate into the specific nature of teachers' behaviour by the feedback of Flanders technique in terms of verbal interaction components; (v) to analyse the statistical significance of gains in the verbal interaction component as a result of training in Flanders interaction technique in science and mathematics; and (vi) to identify the distinctive points of contrast of verbal behaviours and positive or negative attitudes and self-perception of student-teachers trained in the Flanders verbal interaction technique.

The sample consisted of 120 student teachers studying in secondary teacher education institution of Meerut University who offered science and mathematics as their subject for practice teaching. The tools

used were : (i) the Minnesota Teacher Attitude Inventory; (ii) Self Perception Rating Scale; and (iii) the Flanders Interaction Analysis Category System. The data were analysed by analysis of variance and t test.

The findings were : (i) The training in Flanders verbal interaction technique contributed significantly to the attitude towards teaching, self-perception and classroom performance of secondary science and mathematics student-teachers. (ii) Teachers trained in FIACS made more use of interaction categories of acceptance of students' feeling, praise, accepting pupil ideas, pupil initiation and less use of categories of lecturing and giving direction. (iii) Student-teachers trained in FIACS became more indirect in dealing with their students. There were significant gains in behaviour ratios, indirect teacher talk, pupil talk, indirect to direct ratio, pupil initiation ratio, teacher response ratio, teacher question ratio and instantaneous teacher response ratio. The gain was less in direct teacher talk, teacher talk and content cross. The interaction variables, indirectness, indirect influence, praise and flexibility were found to have significant gains in the verbal behaviour of student-teachers trained in FIACS. The interaction variables, teacher talk, restrictiveness and restrictive feedback were found to have significant loss through the training in Flanders verbal interaction technique. (iv) The flow pattern of student teachers trained in FIACS showed the seven interaction models. The steady state of praise, acceptance, and pupil initiation appeared to have a gain and the steady state of lecturing and directions seemed to have a loss. (v) There was a loss in the transition from pupils' response in initiation to lecturing, direction or criticism, while there was gain in the transition from pupil response or initiation to praise, acceptance and questioning. (vi) The teachers' tendency was to react to the ideas and feelings of students and to follow the silence/confusion by direction or lecture.