

Teaching and Teacher Behaviour

A TREND REPORT

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Introduction

From the time teaching started to gain recognition as a profession, experts as well as common men began to wonder about the effectiveness of the teacher. The examples of Socrates, Drona, Plato, Christ and Buddha are of common knowledge. Whether mythological or historical, both the eastern and the western records strongly suggest that the famous teachers were known to attract a large number of pupils around them and their glory used to be reflected in terms of the achievements of their pupils.

It has been documented in our ancient literature that after a training period, testing competitions of Kshatriya princes were held to ascertain the learning outcomes attained by them. Put differently, it was a sort of public trial (test) of both the teacher and the taught. If a pupil failed to show mastery of knowledge and skills it indeed, indicated a failure of the both, maybe more of the teacher. The episode of Arjuna-Ekalavya rivalry is a classic example of the pupil-outcome criterion for judging teacher effectiveness. Traces of such tradition are evident even today in the fields of Indian music and dance. Our famous musicians and dancers proudly declare who their gurus are. Even in the academic field, it is customary for students to boast which famous university — Oxford, Harvard or Yale — they studied in or under whom they worked for their Ph.D. In turn, the institutions are proud to display and publicize the names of the students who have become accomplished in their respective fields. Thus, there is sufficient evidence to believe that teacher (teaching) effectiveness has been vie-

wed more in terms of what happens to a learner than what a teacher does. In other words, what is crucial is not the teacher's act or behaviour, but the pupil's act or behaviour.

This question has acquired greater significance since efforts are now being made everywhere to make basic (primary) education universal which, in turn, has created a need for the training of a large number of teachers. Mass education requires a massive teacher education programme. In this context, besides the qualitative aspect of education, the quantitative aspect of schooling has begun to be emphasized. It is interesting to note that as early as 1823 in India, a village master was paid in terms of the number of pupils he was able to enrol and retain. A British officer, named Fraser, made the following observations in his letter to the Chief Secretary, Fort William on 25 September 1823, extolling the benefit of teaching the children of peasantry of this country to read and write (Mukerjee, 1971): 'I find that one master manages with advantage 20 or 25 village boys. The master is allowed a rupee a month for each boy...'

One can infer from this that a teacher earns more if he enrolls a large number of children. However, he has to do his best to keep the enrolled children in the class month after month, which subsequently depends on how good a job he does in teaching the children. This practice appears to be quite effective in motivating a teacher to play his role as an agent and a technician more earnestly.

While making the bold pronouncement of making education an instrument for economic and social transformation of the nation, the Education Commission

(1964-66) also emphasized the important role of the teacher as an agent of the envisaged economic and social change as well as that of a technician. It made a clear-cut and forceful recommendation for improvement in the teacher education programme of the country. It stated:

A sound programme of professional education of teachers is essential for the qualitative improvement of education. Investment in teacher education can yield very rich dividends because the financial resources required are small when measured against the resulting improvements in the education of millions.

If the above statement is deciphered, the following assumptions stand out, which have a bearing on the planning and organization of research in the areas of teaching, teacher behaviour, teacher education, perhaps more appropriately in a broad perspective, on the state-of-the-art of teacher effectiveness.

Assumption 1

Sound professional teacher education is essential for the qualitative improvement of education.

Assumption 2

Small financial investment in teacher education can yield very rich dividends in terms of improvements in the education of millions (of learners).

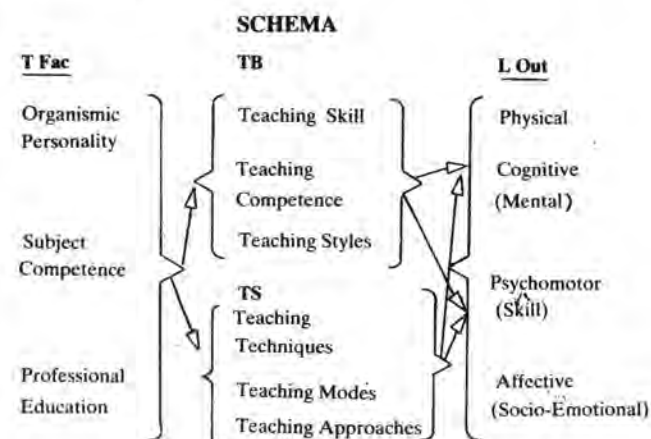
While a planner in the government raises a question about the utility of financial investment and the validity of smallness of investment, an academic questions the link between the professional teacher education and the quantitative and qualitative improvement of education. Thus, from the viewpoints of both economists and academics, as well as from sheer common sense, it is necessary to investigate the veracity of these assumptions.

If this is a necessity — and a scholastic obligation — one would raise the questions as to (i) what kind of research has been conducted since the first study on the subject, traced back to 1952? and (ii) what does the research reveal? The attempt in this report is directed to seek answers to these two questions. After examining the available evidence, it further endeavours to identify the weaknesses of and the gaps in the available information and to suggest areas and strategies for policy-related research in the future.

Evolving a Schema for Analysis and Classification of Research Studies

Someone else would have preferred to start the discussion on the schema by leaning more on the theoretical or scholastic content of the topic. But here it is chosen to derive the structure from the foregone presentation, believing that the statement of national policy on socially relevant subject(s) could be as good a source, if

not better, as the one deduced from a priori models of theory. As has been discussed at length, the ultimate criterion for judging a teacher, a teaching institution, a teacher education programme, or even an entire establishment engaged in imparting education, is the *Improvement in the Education of Millions of Learners*. In other words, whether it is the Teacher Factor (T Fac) Teacher Behaviour (TB) or Teaching Strategies (TS), these should result in developing the desired Learning Outcomes (L Out) in learners. These would help achieve an optimum physical, cognitive (mental), psychomotor (skill) and affective (socio-emotional) growth and development of the learner. Concrete evidence of such growth and development should form the basis of judging the effectiveness of a teacher, a teaching strategy, a teaching institution or system of education. Schematically, the emerging structure may be represented as follows:



Lest the schema becomes ambiguous, attention is drawn to the fact that it represents various probable relationships among the factors which pertain to education of children in general and teacher education in particular. Often, in the literature, these factors are referred to as independent-dependent, antecedent-consequent and presage-process-product variables. Some other terms are also in vogue. Four major relationships are envisaged as indicated below:

1. Teacher Factors affect Teacher Behaviour/ Teaching Strategies (T Fac-TB/TS).
2. Teacher Behaviour/Teaching Strategies affect Learning Outcomes (TB/TS-L Out).
3. Teacher Factors affect Learning Outcomes (T Fac-L Out), and

4. Teacher Factors affect Teacher Behaviour/ Teaching Strategies, which, in turn, affect Learning Outcomes (T Fac-TB/TS-L Out).

Using this schema a quick analysis was attempted to classify a few studies randomly selected from the earlier surveys. While it was found viable to group the studies under one or the other category, a need was felt to add two more categories to accommodate mono factor or non-correlational studies which described the characteristics of a teacher or teaching situation (D) or the development of a tool for measuring teacher factor, teaching skill, style, mode, approach, competence or whatever label is used for a variety of teaching situations (DI). Therefore, the following two categories were added to the four discussed above:

1. Descriptive Studies (D)
2. Development of Instrument (DI).

Classification

Since an altogether different rationale and approach are adopted to ascertain the trends of research in this area, not only all the studies reported in the earlier two surveys have been included in the analysis but relevant studies grouped under other areas, e.g., Teacher Education, have also been included. Such an identification and analysis, though most relevant, could not be undertaken for the new studies to be reported in this Survey, since this exercise required an enormous amount of time and labour. Thus, in the final count, 109 studies were at hand and the analysis resulted in the distribution presented in Table 1.

Table 1
FREQUENCY OF STUDIES UNDER DIFFERENT CATEGORIES AS PER THE SCHEMA

Survey	D	DI	T FAC- TB/TS	TB/TS- LOut	T FAC- TB/TS LOut	T FAC- LOut	Total
First Survey (1943-72)	3 (10.7%)	4 (14.2%)	10 (3)* 46.4%	2 (5) 25%	1 (3.6%)	0 (0.0%)	28 100%
Second Survey (1972-78)	1 (5) 13.6%	0 (2) 4.5%	12 (10) 50.0%	7 (4) 25.0%	3 (6.8%)	0 (0.0%)	44 100%
Third Survey (1978-82)	3 (8.1%)	1 (2.7%)	23 (62.2%)	6 (16.2%)	4 (10.8%)	0 (0.0%)	37 100%
Total	12 (11.0%)	7 (4.0%)	58 (53.2%)	24 (22.0%)	8 (7.3%)	0 (0.0%)	109 100%

Figures in brackets pertain to the studies reported under different chapters in the First and the Second Surveys.

Research Trends

Overall Trends

Before an attempt is initiated to discern the trends in Table 1, some significant points need clarification. First question that comes to mind is, Are the findings comparable? Even when the same relationship is investigated, researchers differ not only in the conceptualization and formulation of hypothesis but also in defining its operational aspects. While the statistical design and techniques, if properly selected, have a high degree of comparability, the procedures/tools of collection of data create enormous problems, for assuming uniformity and comparability. A social scientist, perhaps, has no answer to this fundamental question of fallibility of data, since he is dealing with a complex phenomenon of human behaviour. The second doubt may be raised about this very procedure of deriving the trend — general and specific — from different findings. As is well known, rarely a hypothesis is supported by all studies that are undertaken to test it. When, then, should one accept such a hypothesis as well established? Is it the number of studies? If the answer is yes, what is that optimum number? Should not a significant test support a trend? Put differently, should not this kind of exercise be subjected to a rigorous, critical examination using the same norms that are applied in evaluating a research study? The answer should be in the affirmative, since the commitment to scientific pursuits demands building up of a set of *generalizations* which could be useful to an average practitioner to guide him in his daily tasks and also to a policy-maker to take correct decisions.

Frankly, this trend analysis does not satisfy the above criteria. Hence, all caution must be exercised in making inferences from it. Very crude indicators such as larger, more, greater, etc., have been used in deriving the trends. Similarly, measurement of concerned variables, whether independent or dependent, has been assumed to be valid, i.e., measuring the same trait, concept or construct that it purports to.

A total of 109 studies carried out since 1952 were carefully examined and categorized as per the schema. The data presented in Table 1 reveal that the largest number of studies (58/109, 53.2 per cent) fall under category T Fac-TB/TS, followed by category TB/TS-L Out, comprising 24 studies (22.0 per cent). While category T Fac-TB/TS-L Out consists of eight studies only (7.3 per cent), no study has been undertaken in category T Fac-L Out. The share of Category D is twelve studies (11.0 per cent), while Category DI contains seven studies (6.4 per

cent). Except minor changes in the position of D and DI, the rank order of the categories as found for the overall data remains unchanged in the first and the second surveys, namely, T Fac-TB/TS, TB/TS-L Out, T Fac-TB/TS-L Out and T Fac-L Out.

Trends under Category D

Altogether twelve (11.0 per cent) researchers undertook studies to describe the teacher characteristics and teaching skills. Adaval (1952) described the qualities needed for successful teachers, while Manual (1964) enumerated the conditions required for quality teaching. Under the dichotomy of effective and ineffective teachers, Maheswari (1976) described the patterns of verbal behaviour, Arora (1975) differentiated between a host of organismic and environmental characteristics, Chhaya (1974) narrated the psychological traits and Koul (1977) identified the important attributes. Personality needs and traits were collected by Koul in 1972 and 1974, respectively. While Mathew (1980) identified the factors relevant to general teaching competencies, Shukla (1981) identified the major skills involved in mathematics teaching. Khajuria (1981) investigated the skills of interaction of successful teachers. Kulandaivel and Rao (1968) conducted a survey to identify the qualities of a good teacher as rated by students.

Two trends are discernible here. While most of the studies have tried to arrive at a general description of the teacher, a recent attempt aims at identifying the skills of teachers specific to a subject, namely, mathematics. No such attempt has been made to identify conditions specific to different subjects.

Trends under Category DI

The standardization of an inventory/observation schedule for measuring teacher efficiency was taken up by three investigators, viz., Jayamma (1962), Prasad (1970), Bhattacharya and Shah (1966). Deva (1966) developed a tool for predicting teaching success, whereas Upadhyaya (1975) constructed an aptitude scale for secondary school teachers. Devising a checklist of factors helpful in class teaching was the goal of Gupta's investigation (1979). Pandey (1973) prepared two instruments for measuring teachers' adjustment and their professional efficiency. Thus, altogether seven systematic attempts were made to develop tools for measuring teacher efficiency, during the period of last thirty years.

Trends under Category T Fac-TB/TS

Since this category has obtained more than 50 per cent of the total studies in the area, a further analysis was warranted. The data in Table 2 present the analysis in respect of the criterion variable Teacher Behaviour (TB) or Teaching Strategies (TS). Further, it throws light on whether the observations or measurements have been made on teachers or student-teachers, for it is considered a critical component related to teacher effectiveness in contrast to the effectiveness of the potential teachers or would-be-teachers.

The studies in this category have been on the increase from the First Survey to the Third Survey, from 46.4 per cent to 50.0 per cent and 62.2 per cent, while there has not been a corresponding increase in the total number of studies from the First Survey to the Third which has remained 28, 44 and 37 (see Table 1). Under this category 58.4 per cent of the studies have used the Flanders' Interaction Analysis Category System (FIACS) as a tool for assessing the teacher effectiveness in the classroom. Only one other category system, developed by Nayar (1976) at the Mysore University, has been used to measure cognitive interaction of pupils. The remaining twenty-five studies have used various tools/techniques/schedules to ascertain teacher competence, which has been defined in various ways. Out of 58 studies, 34 (58.6 per cent) studies have used teachers as subjects, while 24 (41.4 per cent) studies have used student-teachers as subjects. It is gratifying to note that the trend from the Second Survey has been towards the selection of teachers as subjects rather than would-be-teachers.

Table 2
FURTHER ANALYSIS OF STUDENTS UNDER CATEGORY
TFAC-TB/TS WITH REFERENCE TO TECHNIQUES AND
SUBJECTS

Survey	Subjects	(TB)		(TS)	Sub-total	Total
		Flanders' Technique	Other Technique	Teacher Competence		
First	Teacher	4	-	2	6	13
	Student teacher	2	-	5	7	
Second	Teacher	7	1	6	14	22
	Student teacher	6	-	2	8	
Third	Teacher	11	1	2	14	23
	Student Teacher	1	-	8	9	

Sub-total	Teacher	22	2	10	34(58.6%)
	Student	9	-	15	24(41.4%)
teacher					
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Total		31(58.4%)	2(3.4%)	25(43.1)	

Trend under Category TB/TS-L Out

The share of this category is 24 (22.0 per cent) studies out of the 109. However small it is, one has to commend this trend, for it shows the awareness and concern of a sizable number of researchers to validate the assumptions of strategies of teaching with respect to pupil outcome(s). While the percentage shares under this category were 25.0 and 25.0 in the First and Second Surveys, respectively, it came down to 16.2 in the Third Survey. Although perhaps accidental, there has been an increase of the same magnitude under Category T Fac-TB/TS, indicating a shift from testing effectiveness against the criterion variable of pupil outcome to teacher behaviour or teaching competence.

Substantial attempts were made to test the effectiveness of the programmed instruction method *vis-a-vis* other methods (Desai, 1966; Nagar, 1971; Shah, 1969; Sharma, 1971; Sharma, 1972) as well as of the objective-based instructional strategies (Dave *et al.* 1974; Dave, 1976; Kirkire, 1981). Some investigators, who used the FIACS, also tested its effectiveness against specific pupil outcomes (Government College of Education, Jabalpur, 1971; Sharma, 1972; Desai, 1973; Lulla, 1974; Padma, 1974; Patel, 1976; Shaida, 1976; and Pandey, 1981). Apart from these three major classroom teaching strategies, various other strategies were also tested. It is noteworthy that whatever strategies were tested, care was taken to define the pupil outcome more concretely and specifically in behavioural terms and the measurement of the same more precisely. Pillai (1978) investigated the relationship between the patterns of teaching and creative thinking. Masih (1976) checklisted the teacher behaviour to relate it to the hierarchical learning outcomes in biology. Roy (1977) investigated the effect of the three styles of classroom questioning on the hierarchical pupil achievement. Desai and Trivedi (1972) tried to relate the training of teachers in achievement motivation to the pupil academic achievement. Exemmál (1980) made a comparative study of various models in the teaching of biology. Shah (1981) conducted a study to relate some selected teaching strategies to academic achievement and creative thinking in science. Sundaralakshmi (1981) made an effort to study the effect of instructional strategies on both the

classroom climate and pupil attainment. Menon and Menon studied the question of direct involvement of pupils in the instructional process and its effect on their achievement.

Trend under Category T Fac-TB/TS-L Out

Only eight (7.8 per cent) out of the total 109 studies were classified under this category. It is necessary to point out that these do not truly fit into this structure. Since all the three components, viz., teacher factors, teacher behaviour or teacher strategies and learning outcomes, were present in these investigations, even though not in a linked manner, they have been so categorized. It is significant to note that though small in magnitude, there has been steady increase in this area from the First to the Third Survey, i.e., 3.6 per cent, 6.8 per cent and 10.8 per cent, respectively. This is indeed a commendable trend, for ultimately only this kind of total approach would be able to provide evidence for or against the aforesaid relationships.

The lone study of Jangira (1972) during the period of the First Survey made an attempt to investigate the relationship among the classroom behaviour training, teacher behaviour and pupil adjustment, after having controlled the effect of fourteen teacher factors such as sex, initial teaching ability, halo effect, maturation, etc. Malhotra (1976) investigated the interrelation among teacher attitude and adjustment, teacher behaviour and students' liking for teachers. Raijiwala (1976) conducted a study to investigate the effect of training in modifying the teacher behaviour (indirect) and its subsequent effect on pupils' adjustment in general and specific to teacher, school, peer or father as well as achievement in science. In a similar vein, a study was designed by Roka (1976) to ascertain whether different types of training in selective verbal behaviour patterns helped modify teacher behaviour and whether these patterns were related to hierarchical pupil achievement at the levels of knowledge, understanding and application in general science. Naidu (1980) and Tareen (1980) also studied such a triangular relationship among teacher training, teacher behaviour or teacher competence and pupil academic achievement. Keeping teaching competence or classroom instruction in focus, while Passi and Sharma (1982) studied the variables of teacher personality characteristics and pupil academic achievement, Raghava Kumari (1978) investigated teachers' attitudes and perceptions and pupil perception.

Trend under T Fac-L Out

No study was reported to have been undertaken in this

category. It is possible that the studies seeking to establish a direct relationship between teacher factors and pupil outcome might have been reported under some other areas such as Correlates of Achievement. From the point of view of developing comprehensive teaching theory, it is imperative that a search of existing evidence is made later and a total picture evolved.

Observations

General Comments

While discussing the trends under various categories, the strengths and weaknesses of some aspects of research studies were mentioned. However, it is necessary to offer critical comments on the important aspects of researches reviewed here.

Category T Fac-TB/TS accounts for 53.2 per cent of the total number of studies. The remaining 46.8 per cent of the investigations are distributed under the other five categories. This indicates a clear preference of researchers for this type of studies during the last three decades. The same trend is evident in each survey. Contrary to this trend, not a single study falls under Category T Fac-L Out. If this is not an artifact imposed by the classification system adopted for grouping the researches, it suggests their aversion to validate the assumed relationship against the true criterion variable of pupil outcome. This has created a serious gap of information which could be useful in taking policy decisions. On the other hand, a sizable number of studies (22.0 per cent) have been classified under Category TB/TS-L Out, which shows a genuine concern on the part of investigators to establish the validity of TB/TS models using pupil outcomes. Although 7.3 per cent of the studies have been grouped under T Fac-TB/TS-L Out, they do not represent true attempts of planning and investigating a twin-model hypothesis. Put differently, their objective was not to study a sequential relationship among T Fac-TB/TS-L Out. Since they reported evidence relating to T Fac-TB/TS, TB/TS-L Out and T Fac-L Out, even though separately, they have been so classified.

Can we interpret these biases for or against? Dave and Dave (1978) undertook an indepth analysis of the studies reported until the year 1978. All available Ph.D. and M.Ed. dissertations as well as independent researches were included. Altogether 167 studies were analysed. It is interesting to note that the percentages of M.Ed. studies falling under Categories T Fac-TB/TS and TB/TS-L Out were 56 and 33.3, respectively, thus closely following the trends reported for those of Ph.D.

and independent studies. One could venture to interpret that these combined trends reflect a sort of collective thinking on the part of the Indian education academics engaged in teacher education programmes.

The observations made by Dave and Dave (1978) are revealing. They commented: If this empirical fact is pitted against an often quoted and used definition of teacher effectiveness by Flanders and Simon (1969) that 'Teacher effectiveness is an area of research which is concerned with relationships between characteristics of teachers, teaching acts and their effect on education outcome of classroom teaching', the balance is obviously tested in favour of an *ad hoc* assumption of relationship between teacher factors and teaching acts, ignoring, if not evading, their effect on pupils' educational outcomes. This is found true in the subsequent analysis of additional thirty-seven studies conducted between 1978 and 1982. As was pointed out earlier, there has been a substantial increase of 12.2 per cent from the Second to the Third Survey in this area, notwithstanding the fact that it has a lion's share of 62.2 per cent during the period of the Third Survey.

Why should this have happened? Why has such a collective thinking evolved? Two likely explanations are:

1. As has been pertinently observed by the Education Commission (1964-66), teacher education colleges have been working in complete isolation. University departments of education are isolated from colleges of education, which, in turn, are isolated from schools.
2. This isolation has resulted in limiting the research to the relationship of different variables to the *Teacher Act*.

Further, in order to have an easy way out, quite often the target group has been student-teachers. This has produced a chain effect, adversely affecting all the aspects of research, namely, planning, conceptualization of problem, formulation of hypotheses, development of measurement instruments, procedures of collection of data and selection of statistical devices. In reality, it has become an unreal, in-camera study of an artificial phenomenon called teaching where all involved — teacher-educators, teacher-trainees and pupils — *act* rather than *behave*. It is indeed a close-circuit research. This close-circuit research culture has been and is being transmitted from one batch to another batch of budding teacher-educators and has been institutionalized at all levels. These points, along with many others which may emerge after the trend analysis under each category is completed, will be elaborated and synthesized with a view to projecting needs and direction of research in the

area and formulating a national policy of teacher education.

Specific Comments

Adoption and Adaptation of Models. Most of the researchers have borrowed concepts, tools/techniques, models, and statistical techniques from the West, particularly the U.S.A. The major areas that have been extensively explored are: interaction analysis, microteaching, achievement motivation, creativity and behavioural objectives (Bloom and Gagne). While no further modifications of models, tools or techniques suitable to the Indian situation are evident, at least in the area of behavioural objectives, some original innovations in research have been attempted by some researchers as intensive efforts were made to change the traditional examination system and instructional strategies. The studies attempting to define academic achievement further into mental-process-centric behaviours are good examples of indigenous work done in the country. Not only theoretical and conceptual models have been borrowed, but changes in styles and areas of research have been done as soon as they appeared in the Western literature. One very important difference that may be pointed out here is that while in the West criticism does not interfere or put a stop to research in a new area, nor does it deter the researcher to continue his exploration, in India, it is unceremoniously dropped. Irrespective of the areas, science education or creativity, achievement, modelling and so on, the continuity of research is hardly sustained. However, the research on interaction analysis seems to be a single exception. To a certain extent, sustained efforts are discernible in the area of micro-teaching. But even these researches, as observed in the general comments, have started becoming stereotyped and stagnant, requiring much needed validation against the criterion of pupil outcome.

By and large the Indian research appears to be quite extensive, a study here and a study there, and rarely sustained efforts in a particular area of research. After about forty years of research tradition in the universities, barring a few exceptions, one finds it difficult to identify one institution, a team of researchers and/or an individual who could be identified with a research or the development of an indigenous theory, model, or even with generating novel concepts, techniques, etc. In the area of research, no one appears to be outstanding. It is because of the habit of adoption and adaptation. The data reported give credence to the assertion that these borrowed secondary pick-ups have not been much pro-

ductive.

Instruments of Measurement. The greatest weakness of the Indian research has been measurement. It is so weak that one would be tempted to cast doubts on the validity of the concepts/constructs measured. This is because the researcher, in the absence of a national need-oriented policy reference, looks at his convenience rather than search for truth or excellence or even his commitments to the profession and, consequently, chooses the shortest cut to success, i.e., he makes use of paper-pencil tests to measure each and every kind of outcome. Even socio-emotional outcomes, performance skills, personality characteristics in particular, have been measured and are being measured by the paper-pencil tests only. The most disturbing fact has been that almost all tests are a replica of some or other foreign tests. The movement that started with the adoption of Binet's test of intelligence is still continuing in a large number of areas, creativity being the recent one, a fad nowadays. Reliability and validity of instruments have been at times missing and that has been a handicap for the reviewers in assessing the value of the instruments used for the collection of data. Furthermore, here again, it is amazing to note that while some appreciable efforts have been made to develop tests, the authors have not even bothered to accumulate results for or against their own instruments, once they were constructed.

Measurement of Learning Outcomes. Another serious drawback arises from the difficulty of the measurement of pupil outcomes. Of course, this relates to measuring teacher factors as well. Efforts have been concentrated on academic achievement and attitude. Very little attention has been paid to other educational outcomes, even to those which are relevant to within-the-classroom situation. For example, not a single study was reported on cooperation, a social characteristic of great significance to classroom situation. Because of heavy dependence on paper-pencil tests, measurement of characteristics in dynamic, actual situation has been avoided. There is an urgent need for moving away from the paper-pencil test measurement to action-oriented measurement of pupil behaviour. The whole exercise of the Indian researcher appears to be correlating different tests, claiming to measure certain characteristics. The height of negligence is that even certain non-intellectual processes are measured through the paper-pencil test. In order to get away from this kind of situation, the case study technique might be more fruitful. There is a real need, as Averch and Klein (1972) emphasized, to develop tests/tools/techniques to measure higher mental processes. A sound base has been already built by the basic work on

objective-based instruction and evaluation. Sustained efforts need to be made to exploit these indigenous efforts.

It appears like a vicious circle. One would not be able to judge whether it is the selection of a particular methodology — survey, correlational, experimental — or it is the choice of a strategy to study and, hence, the choice of a type of tool/technique/ instrument, or is it both that are responsible for this state of affairs? The educational research has not resulted in useful outcomes. A concrete example is found in the difficulty of interpreting results under Category T Fac-TB/TS. The reviewer has lamented at length about the scant findings reported under this category. The difficulty was experienced mainly in making any sense out of the data of an enormous number of characteristics obtained from a questionnaire, checklist, scale, etc., whose validity and reliability were doubtful. Interestingly, instead of validating the data, the researchers proceeded to collect a huge number of responses on other sets of characteristics in order to correlate them, which as pointed out above, always resulted in securing coefficient indices of 0.70+. The whole exercise could take hardly a week, inclusive of analysis.

Let an attempt of research on even a single characteristic of kindergarten children, say, cooperation, be juxtaposed against this type of research. A research worker could select a classroom and make random observations of even a single teacher in relation to a student or a set of students, in a variety of situations and groups. One cannot but be overwhelmed by the data he could obtain. How many teacher characteristics could he study and how much time will he require? Unfortunately, this has not been given a serious thought. The educational researcher can learn one thing from his counterpart in sciences, i.e., patiently observing a phenomenon in the natural setting or in the laboratory, waiting for reality to reveal itself. Piaget's greatness and Freud's excellence lie in this patience in search for reality.

Analysis of Data. Recently, there has been considerable improvement in the designs of studies undertaken. There is certainly a spurt in the use of experimental designs. It looks as if the researcher has been compensating for his weaknesses in collection of data by adopting sophisticated statistical techniques to analyse data. The use of pretest posttest experimental designs, when appropriately used, has brought about very valuable results. Like the attempt of breaking academic achievement into higher-mental-process-centric behaviours, the search for appropriate techniques and, consequently, the increase in the use of non-parametric

techniques have to be amply appreciated. It is heartening to note that the educational researcher has started questioning certain practices followed by his counterparts in the West. He has started distinguishing between what is permitted and what is not by statistical logic, and understanding how empiricism differs from statistical reasoning. He has also begun to comprehend the role of strategies, essentially as a tool, and not as an end by itself. This has helped now to make sharper statement of concept, better operationalization and proper selection of statistical techniques. The use of computer is also on the increase. And when it is used with a basic understanding and proper discretion, it has helped in increasing the sensitivity of measurement both at the stage of collection and analysis of data. Multiple regression and factor analysis, though used in a small number of cases, have brought out valuable results. However, there are some shortcomings which need to be pointed out.

1. Many times, rigorous designs have been employed as a fancy, rather than for meeting the need of the study. These designs do not yield fruitful results.
2. While the measurements are either on the nominal scale or at best on the ordinal scale, they are treated as if they are on the interval scale.
3. There is a gap between conceptual and operational statements of hypotheses. Here again, theory, concept and operational definitions are not separated.
4. Very little attention is paid to relate quantification, sampling, collection as well as analysis of data and their relevance to drawing conclusions, particularly the statistical rejection of a hypothesis and supporting a qualitative statement of a directional hypothesis. In other words, the distinction between logic and empiricism is lost sight of in concluding and interpreting the data.

Suggestions for Future Research

1. There exists a gap between what the policy-makers desire in terms of national development and what the educationists perceive as the role and function of education and research in education. In fact, there is hardly any study which has kept in focus the relationship between education and development in the context of national goals of economic development and social transformation as enshrined in the Constitution. This, in turn, has created an isolation of the educational institutions from the policy-makers.

ers and, as a result, researchers have pursued what they thought as important and relevant. Thus, the research on teacher effectiveness seems to have lost the need or relevance-orientation. Consequently, it has become too academic, a sort of art-for-art-sake exercise. This issue, as was pointed out earlier, has been further confounded with the controversies of basic versus applied research and academic freedom versus political (governmental) intervention, if not interference. Hence, there is an urgent need to bridge this gap by undertaking research which could provide adequate evidence to assess the contribution of education to national development. This will help to establish an essential link between national exigencies and academic obligations on the part of the researcher in education, which has been missing until now.

2. On the whole, a small number of studies have been carried out to validate the assumptions underlying various relationships among Teacher Factors, Teacher Behaviour/Teaching Strategies and Learning Outcomes using criteria of different pupil outcomes. For example, very few studies have been conducted using criterion variables other than scholastic ones. Non-intellectual and psycho-motor learning outcomes are hardly touched. Group outcomes and community changes have yet to find their place in the Indian schema of research. In the context of the shift of the objectives of education in the developing country like ours the question of quality, at least for time being, is becoming secondary, for the enrolment and retention of a mass of illiterate children has become a question of paramount importance. If there is any relevance of the researches that have been conducted on teacher education until now, it has a bearing on only within the classroom situation or the factors related to them. What is urgently needed is identification of characteristics of teachers which are related to the outside-the-classroom situations and factors related to them, for

example, how can one view the question of teacher effectiveness when the teacher act becomes a small element of learning by children.

3. The entire curriculum, in parts and whole, and its effect on teacher behaviour and teaching situation need to be investigated.
4. While a large number of studies have been undertaken to study the relationship between teacher training and its execution in the classroom, essentially a short duration study, the retention and sustenance of teacher training in the actual classroom, whatever kind of training it may be, is urgently required.
5. Severe criticism have been voiced against the use of **paper-pencil tests which have been considered to be poorly prepared with doubtful indices of reliability and validity.** Besides, measurements have been **made in static situations rather than dynamic ones.** In other words, in order to collect required information, the subject — teachers as well as pupils — will have to be put in different or novel but realistic situations in order to measure a variety of physical, mental, social and emotional outcomes. The future research needs to concentrate on this area.
6. Studies have hardly been longitudinal. As a matter of fact, even the four educational surveys brought out by the NCERT report the percentages of enrolment on non-cohort basis. Needless to mention that many characteristics of children as well as those of teachers, particularly socio-emotional ones, take considerable time for full development. In view of this fact there is a serious need for taking up longitudinal studies with respect to all pupil outcomes. For example, the following directional relationship among the factors could be taken up as a longitudinal study: Teacher training programme — regular teaching — individual, group and community changes — their involvement, participation and productivity in respect of national development. This of course ought to be planned as a national-level research undertaking.

ABSTRACTS: 1083—1121

- 1083.** BHAGOLIWAL, S., *A Study of Personality Characteristics Associated with Teaching effectiveness as Seen through Rorschach Technique*, Ph. D. Edu., All. U., 1982

The objectives of the study were: (i) to discriminate between the effective and the less effective teachers, (ii) to find out personality characteristics associated with each category of teachers using Rorschach Inkblot Test, (iii) to compare the two groups of teachers on Rorschach variables of personality, and (iv) to offer suggestions regarding the utility of these distinguishing characteristics for recruitment, training and placement of teachers.

The sample consisted of 264 teachers (120 male and 144 female) drawn from twelve higher secondary schools of New Delhi following the 10+2 pattern of education. They were all full-time trained teachers teaching Classes IX, X, XI and XII and had at least three years of experience. The teachers were matched with respect to sex, age, qualifications and experience. Out of the 264 teachers, fifty more effective and fifty less effective teachers were identified on composite teaching effectiveness criteria. For the selection of criterion group, Teacher Personality Characteristics Inventory, Teacher's Rating Scale, students' performance and student ranking proforma for subject teachers were used. For the assessment of personality, Rorschach Inkblot Test was used. A Rorschach rating scale was developed by the researcher on five major areas including twenty-nine minor components of personality. The areas of personality investigated were intellectual level — intellectual capacity, intellectual functioning, empathetic and imaginative function, differentiating and integrative function, efficiency vs. capacity of intellectual function, extent of interest, approach to environment, practical common sense; creative potential — creative potential through imaginal resources, creative potential in object and person relations; emotional — overall control, inner control, integration with value system, value system vs. impulse life, ego integration with tension and conflict, out control-socialized control, outer control through repression, out control through withdrawal, constricted control through repression, constricted control through withdrawal, emotional experience balance, experience balance at function level, introversive vs. extraversive tendencies, emotional responsiveness as well as motivational level of aspiration. The chi-square and Man-

Whitney U-test were used for data analysis.

The findings of the study were: (i) The more effective teachers were, by and large, characterized by their superiority over the less effective teachers with respect to their overall intellectual level as reflected in their intellectual capacity, intellectual functioning, empathetic and imaginative functioning, differentiating and integrative functioning, efficiency vs. capacity of intellectual function, extent of interest, approach to the environment and practical common sense. (ii) The more effective teachers were characterized by a fairly higher level of differentiation and integration in their cognitive and perceptual functioning. They had superior capacity for imaginative and original thinking. They had a balanced and healthy approach to everyday reality with good organizational interest and ability. They were capable of viewing the separate facts of reality as integrated whole; besides, these teachers were capable of uncommon abstract concepts. (iii) The more effective teachers were characterized by having more of creative potential indicated by imaginal resources reflected in object and person relations whereas the less effective teachers lacked productive resources. (iv) Inner control was better in the case of the more effective teachers who were better in their capacity to integrate impulse life with value system, in their easy acceptance, socialized controlled behaviour and capacity to deal with their tensions and conflicts and outer control. Besides, they had better control than their less effective colleagues in terms of expression of feelings and emotions in a socially approved way and maintained better outer control through withdrawal and also constricted control through repression and withdrawal as compared to the less effective ones. (v) Psychograms revealed that fantasy life dominated both the groups who used repressive measures to achieve control particularly evident in their outer control. The constricted control in the case of the more effective group was modified and better; their inner life was well integrated due to well developed value system which produced inner stability and enough strength to withstand frustrations as well as resultant anxiety. The more effective teachers handled their anxiety in a comparatively more introspective manner whereas the less effective group revealed either excessive control or over-indulgent behaviour. The affectional need of the more effective teachers did not unduly interfere with their responsiveness to emotional situations while the less effective group was ruled by immediate need for gratification and also tended to act out emotions without socialized restraint. (vi) The case study revealed that all the three cases of more effective group had well-developed value system, ego organi-

zation, impulse life well subordinated to the value system. In the case of the less effective group in two cases phantasy life dominated the personality and the third case used extremely constricted measures to achieve control wherein personal needs were not recognized nor were emotions expressed in impulsive behaviour. (vii) The more effective teachers had better experience balance on the whole and at the functional level the tendencies thereof were in the same direction indicated through ambivalent balance with slight introversion or extratension while the less effective teachers had these tendencies in different directions, extreme extratension or introversion reflected their poor adjustment. (viii) The more and the less effective teachers were alike in their respective emotional responsiveness. (ix) Psychograms relating to the experience balance indicated that the introversive balance was more prevalent than the extratensive balance and all types of introversive, extratensive ambivalent trends were present in both the groups. The only difference was that the more effective teachers had a well-integrated ego system which enabled them to behave in a socially approved manner, whereas the less effective teachers had more uncontrolled impulses which the underdeveloped value system was not able to organize and control and had to use constricted-repressive measures to achieve control lest they were expressed in impulsive behaviour. (x) More of the effective teachers had a narrower gap between their level of aspiration and imaginal and inner resources.

1084. BRIGHT, J.A. and DAVIS, J., *Social Interaction among the Teachers and Adolescent Pupils in the Classroom*, Meston Training College, Madras, 1978.

The investigation aimed at studying the teacher classroom behaviour with respect to four types of schools, namely, S.S.L.C. High Schools (A), Anglo-Indian High Schools (B), Matriculation High Schools (C) and Higher Secondary Schools (D). The hypothesis examined was the existence of significant differences in the mode of the teacher's talk and the teacher's questioning among the four types of schools.

The sample comprised 100 teachers (53 female and 47 male) of twenty-four schools of Madras city. Forty-nine teachers were from Type A schools, sixteen from Type B, eighteen from Type C and seventeen from Type D. Flanders Interaction Analysis Category System was used to study teacher behaviour. The criterion measures were Teacher Talk (TT) and Teacher Question Ratio

(TQR). Analysis of variance was used for data analysis.

The major findings of the investigation were: (i) The teachers from the four types of schools differed on TT significantly. (ii) The teachers from Type A schools differed significantly from the teachers of Types C and D schools in TT but not from those of Type B schools. (iii) The teachers from Type B schools differed significantly in TT from the teachers of Type D schools but not from the teachers of Type C schools. (iv) The teachers of types C and D had significant differences in their TT. (v) The teachers of the four types of schools differed significantly in the mode of TQR. (vi) Groups A and B and Groups B and C did not differ significantly in TQR whereas all other groups had significant differences in TQR.

***1085.** CHOUDHRY, S., *A Study of the Relationship between the Creative Thinking Abilities of Student-teachers and Their Classroom Verbal Behaviour*, Ph.D. Psy., Del. U., 1982

The objectives of the investigation were: (i) to study the current classroom practices of teacher-trainees and to compare them with established norms, (ii) to study the relationship between verbal creative thinking abilities and figural creative thinking abilities. (iii) to study the relationship between verbal creative thinking abilities of teacher-trainees and their verbal classroom behaviour, (iv) to study the relationship between figural creative thinking abilities of teacher-trainees and their verbal classroom behaviour, and (v) to predict classroom behaviour on the basis of creative thinking abilities, both verbal and figural together.

A sample of one hundred teacher-trainees being trained for secondary school teaching was selected from a college in Hissar, Haryana. The investigator observed two lessons per trainee delivered during the practice teaching sessions in Class VII. The tools used were Torrance Tests of Creative Thinking (Verbal and Figural Form A) and the Jangira Interaction Analysis Category System (JIACS).

The main findings of the investigation were: (i) Three-fourths of classroom transactions were taken up by the teacher's talk, as in the norms; a disproportionate part of the teacher's talk, lecturing and questioning was at factual level. (ii) A major part of the pupil's talk was also at factual level. (iii) Confusion or noise was practically absent. (iv) The verbal creative thinking abilities of the teacher-trainees were positively correlated with their figural creative thinking abilities. (v) There was significant

ant relationship between the creative thinking abilities (verbal and figural) and some of the indices of the classroom verbal behaviour; the pattern of relationship between the figural creative thinking abilities and the classroom behaviour was the same as that between the verbal creative thinking abilities and the classroom behaviour. (vi) High creative teachers increased pupil's freedom to participate by praising, accepting and developing their ideas. (vii) High creative teachers processed the content and talked more at convergent, divergent and evaluative levels and less at the factual level. (viii) In the classes of high creative teachers, pupils also talked less at factual and more at convergent and divergent levels. (ix) The factual level of the pupil's talk was highly related to the factual level of the teacher's talk. (x) The classroom verbal behaviour of the teacher-trainees could, to some extent, be predicted by creative thinking abilities, both verbal and figural combined, and particularly by the verbal originality scores.

***1086.** DUBEY, B.B., *Relationship between Pupil Characteristics and Classroom Behaviour of Teacher*, Ph.D. Edu., Gor. U., 1979

The aims of the study were: (i) to present a detailed process of interaction analysis and its application in the mathematics class of high school, (ii) to interpret the pupil characteristics and the classroom behaviour of the teacher which were inherent in them, (iii) to alert the prospective teacher to the importance of understanding the adjustment problems of pupils and teachers, to help him gain insight concerning the nature of teaching and learning process and to aid him achieve competence in the evaluation of classroom instruction, and (iv) to inculcate among teacher-trainees appreciation of responsibilities inherent in the role of teacher.

The single group design was used in the study. In all, 1,000 students of Class X studying elementary mathematics from different colleges of Jaunpur and 100 teachers teaching these students were selected for the study.

The findings of the study were: (i) The classroom verbal behaviour of the teacher had positive relation with the pupil characteristics. (ii) The teacher classroom verbal behaviour and the interest of the pupil had positive relation except in aesthetic, social and clerical interest factors. (iii) The classroom verbal behaviour of teachers had no positive relation with the attitude of pupils. (iv) The classroom verbal behaviour of teachers had positive relation with the achievement of pupils.

1087. EXEMMAL, J., *Construction of Certain Models for Teaching School Botany Using Environmental and Ethnic Resources and Testing the Efficacy of Such Models*, Ph.D. Edu., Ker. U., 1980

The major objectives of the study were: (i) to construct models for teaching botany using environmental and ethnic resources, (ii) to test the efficacy of the teaching models by comparing the achievement in botany of the treatment groups, (iii) to examine the effect of environmental approach on the attitude of pupils towards teaching and learning, and (iv) to compare the effectiveness of the environmental approach and the formal approach in realizing certain select educational outcomes.

The tools employed for the study were teaching models in botany, a rating scale on teaching models, an achievement test in botany, a scale for measuring the attitude of pupils towards science teaching and learning, a judgement schedule for teachers and pupils, a verbal group test of intelligence, a science interest inventory and a general data sheet. Six topics from the botany syllabus of Standard IX were selected for the construction of teaching models was the efficacy of the teaching models and tested experimentally (using parallel group design) by comparing the immediate post-teaching achievement, the delayed memory achievement scores and the extent of forgetting scores of the total sample and sub-sample of the environmental approach group and the formal approach group. The effect of the environmental approach on the attitude of pupils towards science teaching and learning was studied by comparing the pre- and post-attitude scores of both the groups. Comparative effectiveness of the environmental approach and the formal approach in realizing certain select educational outcomes was also studied by administering the judgement schedule for teachers and pupils. The experimental study was limited to eight schools. The rating scale was administered to 300 teachers and 100 experts.

The major findings of the study were: (i) The environmental approach was significantly superior to the formal approach in terms of immediate post-teaching and delayed memory scores. (ii) Significant difference existed between the rural and the urban students in their immediate post-teaching achievement when the groups were exposed to the environmental teaching. (iii) Pupils belonging to low SES groups were significantly superior to those belonging to high SES groups in their achievement when taught through the environmental approach. (iv) Pupils belonging to rural areas were significantly superior to urban students in their achievement when

taught through the environmental approach. (v) The environmental approach was superior to the formal approach in stimulating cognitive growth in pupils, in developing interests in scientific activities and in scoring high marks in the examination. (vi) The majority of the teachers and the experts who answered the judgement schedule were of the opinion that many of the higher concepts in science could be introduced at the school level if they were processed in simple manner and chances were provided for first-hand experiences.

- 1088.** GEORGE, M. and ANAND, C.L., *Effect of Microteaching on Teaching Self-concept and Teaching Competence of Student-teachers*, Dept. of Educational Research and Studies, NEHU, 1980 (NCERT-financed)

The major objectives of the investigation were: (i) to study the effect of microteaching on teaching self-concept of student-teachers in a control group and an experimental group separately, and (ii) to study the effect of microteaching as well as integration of skills on the teaching competence of student-teachers. Microteaching was treated as an independent variable, and teaching self-concept and teaching competence of student-teachers were treated as dependent variables.

The sample consisted of twenty student-teachers, selected from a group of sixty willing student-teachers from a training college in Shillong. They were divided into two groups of ten each as control and experimental groups. The matching was done on the basis of intelligence, sex, age, qualification and teaching experience. For equating them on intelligence, the Culture Fair Intelligence Test (Scale 3) was used. The Indore Teaching Competence Scale (ITCS) was used for finding out the teaching competence of student-teachers in terms of integration of teaching skills. Observation schedules and rating scales relating to the five basic skills — skills of probing questions, stimulus variation, reinforcement, explaining, and illustrating with examples — were utilized for giving feedback during the microteaching treatment. A self-rating Teaching Self-Concept Scale (TSCS) was used for measuring the teaching self-concept of student-teachers. The TSCS was constructed especially for use in the study. Means and standard deviations were computed for the pretest, posttest and gain scores on TSCS and ITCS for the control group and the experimental group. Significance of the difference between the means was tested by using t-test for correlated data.

The major findings of the investigation were: (i) There was significant difference between the pretest and the posttest mean teaching self-concept scores of the control group of student-teachers. (ii) There was significant difference between the pretest and the posttest mean teaching self-concept scores of the experimental group of student-teachers. (iii) There was significant difference between the mean gain scores in teaching competence of the control group and the experimental group of student-teachers. (iv) Microteaching facilitated enhancement of the teaching self-concept of student-teachers. (v) Microteaching proved effective in improving the teaching competence of student-teachers. (vi) The microteaching treatment followed by the summated strategy of integration of teaching skills was superior to the microteaching treatment based on independent teaching skills in improving the teaching competence of student-teachers.

- 1089.** GEORGE, M. and JOSEPH, K.J., *Effect of Microteaching on General Teaching Competence and Teacher Attitude of the B.Ed. Trainees*, Dept. of Educational Research and Studies, NEHU, 1978 (NCERT-financed)

The major objectives of the study were: (i) to discover if there was any significant change in the General Teaching Competence (GTC) of the B.Ed. trainees as a result of exposure to the technique of microteaching, and (ii) to discover if there was any significant change in the attitude of the B.Ed. trainees as a result of adoption of microteaching.

In this study microteaching was an independent variable and GTC and teacher attitude dependent variables. Sixteen B.Ed. trainees who were not deputed from schools and were capable of teaching through the medium of the English language were selected randomly from a college of education in Shillong. The Ahluwalia's Teacher Attitude Inventory, the Baroda General Teaching Competence Scale and Evaluation Proforma for Teaching Skills were used to collect data. Means and standard deviations of the raw scores for pretest, posttest I and posttest II were found. The analysis of variance technique was used to find out the significance of the mean differences between the pretest, posttest I and posttest II scores. For probing the data F-test and Scheffe method for multiple comparisons were used.

The major findings of the study were: (i) Intensive training and persistent practice in the five instructional skills influenced in varying degrees the sensitivity of the

B.Ed. trainees to assimilate partly other related pre-instructional, instructional and post-instructional skills and to integrate them in their repertoire of teaching behaviour in the teaching situation. (ii) Skills were not independent but inter-dependent. Systematic practice and mastery of some important skills improved the sensitivity of the trainees and in due course enabled them to acquire more skills and integrate them in the repertoire of the teaching skills. (iii) There was no significant difference in the teacher attitude scores of the B.Ed. trainees before and after exposure to the technique of microteaching. (iv) The students' reactions to the microteaching approach were positive and favourable generally.

1090. GUPTA, R.P., *A Study of Some Factors Considered to be Helpful in Class Teaching*, Ph.D. Edu., Luc. U., 1979

The study was designed (i) to devise a suitable checklist of factors considered to be helpful in class teaching, (ii) to find out which of these factors were helpful in class teaching by student-teachers, teachers, supervisors and M.Ed. students, and (iii) to find out differences, if any, in the views of student-teachers, teachers, supervisors and M. Ed. students about the usefulness of the different factors for actual classroom teaching.

A checklist of thirty-six different factors was devised for the purpose. The test-retest reliability of the checklist was 0.98. The sample consisted of 808 subjects out of whom 515 were student-teachers, 210 school teachers, 61 training college teachers and supervisors and 22 M.Ed. students.

The main findings of the study were: (i) The factors mentioned most frequently as helpful were the blackboard work, correcting oral mistakes, explaining difficult points, general knowledge, handwriting, knowledge of the subject, maintaining discipline, power of oral expression, revision of main points, skill in questioning, and the use of material aids. These were acknowledged to be helpful for class teaching by all the four groups of the sample. (ii) Next in order of frequency were the factors like correcting written work, drawing figures, dress and appearance, familiar example, home task, loud voice, preparing the plan, removing doubts, showing pictures and the style of reading. (iii) Spurious factors like completing the registers, dictating notes, faith in God, financial conditions, collecting fees and keeping confidential records obtained uniformly low

frequencies for all the four groups. (iv) The supervisors marked gestures, methodical procedure, the sense of humour and reciting quotations more frequently than the other groups. (v) The student-teachers group marked dress and appearance preparation of the plan and handwriting more frequently than the other groups. (vi) The school teachers group marked correction work, dictation of notes, faith in God, collecting fees and sound health more frequently than the other groups. (vii) The M.Ed. students marked the blackboard work, explaining difficult points, maintaining discipline and skill in questioning more frequently than other groups.

1091. JAIN, B., *A Study of Classroom Behaviour Patterns of Teachers in relation to Their Attitude towards Profession, Morale and Values*, Ph.D. Edu., JMI, 1982

The objectives of the study were to find out the relationships between (i) the teachers' attitude towards profession and the classroom behaviour patterns of teachers, (ii) the teachers' morale and the classroom behaviour patterns of teachers, (iii) the teachers' values and the classroom behaviour patterns of teachers, (iv) the teachers' attitude towards profession and the teachers' morale, (v) the teachers' morale and the teachers' values, and (vi) the teachers' values and the teachers' attitude towards profession, and to predict the classroom behaviour patterns of teachers through the teachers' attitude towards their profession, the teachers' morale and the teachers' values taken in combination.

The sample of the study consisted of 100 trained graduate-teachers (50 male and 50 female) teaching mathematics in Class VIII of government higher secondary schools of Delhi. Data regarding teachers' attitude towards profession, morale and values were obtained by the Teacher Attitude Inventory of S.P. Ahluwalia, Purdue Teacher Opinionnaire by Bentley and Rempel and the Hindi adaptation of Allport Vernon Study of Value by R.K. Ohja. Two mathematics lessons of each of the one hundred teachers were observed by the investigator using Flanders Interaction Analysis Category System. The interval between the first and the second observation of the lessons was approximately a week.

The findings of the study were: (i) Male teachers devoted more time in asking questions than female teachers. (ii) Pupils interacted differently in the classes of married, unmarried or deserted teachers. (iii) Teachers with a positive attitude towards child-centred practices, educational process, pupils and teachers de-

voted more time to asking questions in the classroom while guiding the more content-oriented part of the class discussions. (iv) Teachers with a positive attitude towards teaching profession, classroom teaching, child-centred practices and educational process reacted to ideas and feelings of pupils and frequently created an emotional climate in the classroom. (v) Pupils interacted more in the classes of teachers having a positive attitude towards teaching profession, pupils and teachers. (vi) There was significant positive relationship between teachers' status and teachers' questions. (vii) Teachers who had full freedom to discuss controversial issues in the classroom, asked more questions. (viii) Pupils interacted more in the classes of the teachers who enjoyed rapport with the principal. (ix) There was significant positive relationship between the social value and the proportion of indirect behaviour to direct behaviour including content emphasis (I/D). (x) Theoretical and aesthetic values were not significantly related to the affective behaviour of teachers (i/d). (xi) Pupils interacted less in the classes of teachers having political and religious values. (xii) Young teachers had more favourable attitude towards teaching profession, classroom teaching and educational process than older teachers. (xiii) Sex was not significantly related to any dimension of the teacher's morale. (xiv) There was significant positive relationship between the age of teacher and the religious value. (xv) There was significant negative relationship between the teaching experience and the teacher's attitude to classroom teaching. (xvi) Married, unmarried and deserted teachers differed with respect to theoretical value. (xvii) The interference of the community in educational programmes was not favoured by teachers. (xviii) The teacher's attitude towards educational process had significant negative relationship with teacher and community support to education. (xix) Satisfaction with teaching was positively related to the theoretical and political values. (xx) There was significant negative relationship between the curriculum issues and the political value. (xxi) The theoretical value was significantly negatively related with the teacher's attitude towards pupils and teachers. (xxii) Teachers with a high aesthetic value did not have a favourable attitude towards teaching profession and teachers. (xxiii) Teachers with high religious value had favourable attitudes towards teaching profession, educational process and pupils and teachers.

1092. JOGLEKAR, S.V., *Study of the Patterns of Influence of Eighth Grade Science Teachers of Greater*

Bombay, Ph.D. Edu., Bom. U., 1981

The main objectives of the study were: (i) to identify the patterns of the classroom behaviour of some selected science teachers on the basis of Flanders Interaction Analysis Category System, (ii) to compare the patterns of the classroom behaviour of male science teachers with that of female science teachers, (iii) to compare the patterns of the classroom behaviour of science teachers having experience of less than five years with those of science teachers having experience of more than five years, (iv) to compare the patterns of the classroom behaviour of trained science teachers with those of untrained science teachers, (v) to compare the patterns of the classroom behaviour of science teachers of different age groups, and (vi) to compare the patterns of the classroom behaviour of science teachers teaching in boys' schools, girls' schools and coeducational schools.

Fifty classes of Standard VIII from Marathi-medium schools in Greater Bombay were selected at random. Teachers teaching biology, chemistry and physics were observed, each twice. Thus, the number of teachers under study amounted to 150. The number of lessons observed was 300. Discipline-wise, the number of the teachers amounted to 150, but in practice some of the teachers taught more than one discipline. The actual number of teachers under study therefore was 74. An information proforma was given to the concerned teachers before the lesson. Six lessons, two in biology, two in chemistry and two in physics, were observed in each of the selected classrooms. For observations, Flanders Interaction Analysis Category System was used. Observations were recorded on the observation sheets. Matrices were prepared from the observations and necessary calculations were performed to compare different matrices. Master matrices were prepared and compared by using Darwin's likelihood criterion ratio. For all the twelve interaction variables, the t-test was used to test the significance of difference between the means of the two groups compared. When there were more than two groups for comparison, at first the technique of analysis of variance was used first. When F-ratio was found significant at 0.05 level, the t-test was used for further analysis of the data.

The main conclusions of the study were: (i) Mostly the teacher's classroom behaviour was direct. (ii) In general, male teachers did not differ from female teachers as regards their classroom behaviour. (iii) Experience in teaching had no special effect on the pattern of influence of teachers in the classroom. (iv) Training programmes had no positive effect on the classroom behaviour of

teachers. (v) The age of the teacher was not related to the patterns of his influence. (vi) Teachers teaching chemistry had more pupils' talk, high I/D ratio, more questions and rapid transition in the class than in the case of teachers teaching biology and physics. (vii) The type of the school had no definite relationship with the patterns of influence of teachers.

1093. KANWAL, N., *The Impact of Feedback on Modifying Teacher Behaviour—A Microteaching Approach*, Ph.D. Edu., Pan. U., 1979

The major objectives of the study were: (i) to develop the skills of probing questioning, stimulus variation, reinforcement, explaining and illustrating with examples in the student-teachers through microlessons, and (ii) to examine the effect of the skills of using probing questions, stimulus variation, reinforcement, explaining and illustrating with examples on general teacher competence.

The sample for the study comprised thirty-two student-teachers studying in Dev Samaj College of Education, Ferozepur. They were to be trained in microteaching skills using supervisors, and peer supervisors as sources of feedback. The tools used for collecting data were Standard Progressive Matrices, SES Scale by B. Kuppaswamy, Junior Index of Motivation, Baroda General Teacher Competence Scale, Observation Schedules for testing the skills of probing questioning and stimulus variations, prepared by Sassi and others, and Observation Schedules for testing the skills of explaining, illustrating with examples, and reinforcement developed at the CASE, Baroda. The data were analysed by using the statistical techniques of mean, standard deviation, correlations, difference between the two means, and analysis of covariance. Stanine scale was used to classify the raw scores into high, average and low categories, against a standard norm.

The major findings of the study were: (i) More than half (57.13 per cent) of the student-teachers were highly academically motivated and the intellectual level of 34 per cent of the total number of the students was above average, of 33 per cent average and of 22 per cent below average. (ii) In the skills of probing questioning, stimulus variation, reinforcement, explaining and illustrating with examples the student-teachers maintained progress both component-wise and as a whole, in all the four experimental groups. (iii) The relationship between the initial stage and after the theoretical orientation stage was not significant in the case of all the skills except

the skill of reinforcement, but the relationship between the final stage and the initial stage became significant both at 0.05 and 0.01 levels, with the exception of the skill of reinforcement. (iv) The feedback was an important source of variance which modified classroom behaviour, and increased the teaching efficiency of the student-teachers. (v) The feedback by the supervisors brought better results than the feedback by the peer supervisors. (vi) Microteaching helped in developing certain skills in the student-teachers thereby increasing their general teaching competence.

1094. KHAJURIA, D.P., *The Typical Patterns of Classroom Verbal Behaviour Exhibited by Successful Teachers of Language and Science*, Ph.D. Edu., Jammu U., 1981

The specific aims of the study were: (i) to identify successful teachers, and (ii) to find out their typical patterns of verbal behaviour.

The tools used were the mark-sheets of the students, headmasters' rating of teachers' success, and pupils' rating of teachers' success. Initially, 250 secondary school teachers teaching language and science were randomly selected. At the final stage, 72 teachers were selected for the study of their verbal patterns.

The main findings of the study were: (i) The science teachers exhibited patterns of asking questions, giving directions, soliciting initiated pupils' talk, sustained teacher initiated pupil talk, flexibility and teacher talk according to normative expectations. (ii) For the language teachers the patterns of higher proportion of student talk to teacher talk, the flexibility, content cross and total teacher talk were found to be of normative expectations. (iii) Science teachers resorted more to asking questions and lecturing than the language teachers.

1095. KIRKIRE, P.L., *Analysing the Impact of Objective-based Lesson Plans on the Classroom Verbal Interaction Behaviour of Teachers and on the Pupils' Achievement in Mathematics*, Ph.D. Edu., Indore U., 1981

The objectives of the study were: (i) to investigate the effect of teaching with the help of objective-based lesson plans upon the pupils' achievement, (ii) to investigate the effect of teaching with the help of objective-based lesson plans upon the classroom verbal interaction behaviour of teachers, (iii) to examine the variations in the

classroom verbal interaction behaviour of teachers teaching different types of lesson plans, namely, knowledge, understanding, drill and review, and (iv) to compare the classroom verbal interaction behaviour of different teachers teaching in different class groups.

The sample comprised forty-six pupil-teachers studying in the first year in the Basic Teachers Training Institute, Bijalpur, Indore, and seventy-two pupils of Class VI studying in schools situated in the city of Indore. The pretest-posttest experimental-control group design was employed in conducting the experiment. The pupil-teachers were randomly assigned to the experimental and the control groups. The mathematics achievement entry test and criterion tests were developed by the investigator, the split-half reliability coefficient and internal consistency coefficient were 0.92 and 0.94, respectively, for the mathematics achievement entry test and 0.39 and 0.54, respectively, for the criterion tests. The teachers were observed by using FIACS. Objective-based lesson plans were also developed. The inter-observer reliability was established. The mean, standard deviation, correlation, percentages and analysis of variance were used for analysing the data.

The findings of the study were: (i) There was no significant effect of assignments on the pupils' achievement. (ii) Teaching with the help of the objective-based lesson plans did not significantly affect the mean gain achievement. (iii) The manner in which the instructional material was used affected the classroom climate. (iv) Indirect teacher's behaviour did not help in increasing the achievement level. (v) The setting up of systematic objectives yielded better results. (vi) The teacher's behaviour was a stronger function of teachers and the teaching method than that of the class groups. (vii) The responsive behaviour of teachers was independent of differences between the teachers as well as differences between the classes.

1096. KUMAR, S., *An Investigation into the Questioning Patterns of Social Studies and Science Teachers in the English-medium Schools*, Ph.D. Edu., MSU, 1982

The major objectives of the investigation were: (i) to analyse the classroom questioning behaviour of social studies and science teachers of English-medium schools of Ahmedabad, Baroda and Rajkot in the context of total teaching behaviour, (ii) to study the questioning behaviour of social studies and science teachers, (iii) to study the kinds of questions used by teachers in class-

room teaching, (iv) to study the preceding and succeeding events of different kinds of questions, and (v) to study the association of different kinds of questions with students' response and initiation.

Out of thirty-seven schools which had got high and higher secondary classes, thirty-five schools were included in the study. Out of these schools, 205 teachers were observed twice with the help of modified version of Flanders Interaction Analysis Category System. The collected categories were tabulated in matrix form to represent pairs of numbers. From this, percentages of questioning from the verbal classroom interaction were computed. Similarly, percentages of students' response and initiation were found out. The data were analysed by using chi-square test.

The major findings of the investigation were: (i) The teacher dominated the classroom interaction and about 71.37 per cent of the total time was used by the teacher. Of this teacher's talk, questioning formed only 6.09 per cent. (ii) The possibility of a question to be followed by response got decreased with an increase in the level of complexity of questions. (iii) The questioning behaviour of social studies and science teachers differed significantly. Science teachers used total questioning, translation, interpretation, application and higher order questions to a greater extent and memory and routine type of questions to a less extent than social studies teachers. (iv) Different kinds of questions had relationship with students' response and initiation. Increase in the use of questioning increased students' response and initiation.

***1097.** MAHATMA, C.M., *Classroom Ethos and Their Relationship with Teacher Behaviour Characteristics and Teacher Morale*, Ph.D. Edu., SGU, 1980

The major objectives of the study were: (i) to make a survey of classroom ethos as perceived by the tenth grade students of Bikaner and Jodhpur ranges of Rajasthan, (ii) to identify the characteristic patterns, ALP themes and educativeness of tenth grade actual and ideal classrooms, (iii) to identify the actual and ideal ethos patterns of Hindi, social studies, mathematics and general science subjects, (iv) to predict the educative life of different classrooms of tenth grade in the light of educational ethos, (v) to find out the relationship between the A, L and P scores and characteristics of the teachers' classroom behaviour, and (vi) to examine the relationship between the A, L and P scores of classroom ethos and the different dimensions of the teacher's morale.

The study included 1,134 boys and 480 girls selected from schools belonging to five districts of Bikaner and Jodhpur ranges. Data were collected by using Thelen's ALP Classroom Ethos Instrument, Teacher Behaviour Characteristics Scale, and Teacher Morale Inventory. The data were analysed by using descriptive statistics such as mean, standard deviation, and product moment correlation.

The major findings of the study were: (i) Classrooms were generally characterized as personally-supportive milieu, less interactive and less democratic in the real teaching-learning situations. (ii) Students desired more autonomy for decision-making and interpersonal cooperation or support for effective group actions in the teaching-learning situations. (iii) Three basic elements which emerged into a characteristic pattern of tenth grade actual classroom could be described as (a) the individually interpersonal meaningful quest for personal cognitive outcomes rather than emphasising on group achievement in the imposed formal group structure, (b) the teacher-defined learning directions for group actions, and (c) the apathetic attitude towards the reality orientation of societal ideological awareness which was not conducive to striking a balance between theory and practice during the teaching-learning process. (iv) The classrooms of mathematics were generally characterized as co-operative supportive milieu interpersonally. The classrooms were oriented to the desired accomplishment of group tasks and the clarification of personal experience. (v) The authenticity aspect of tenth grade actual classrooms was significantly related to autocratic-democratic, harsh-kindly, evading-responsible, etc., characteristics of the teacher's classroom behaviour. (vi) An attempt was made to study the relationship between the A, L and P ethos in general and the fourteen dimensions of the teacher's morale in general. Out of the 42 relationships tested only one between 'productivity' and 'material and equipment' dimension of the teacher's moral was significant.

1098. MASSEY, M., *A Study of the Effects of Training in the Formulation and Usage of Behavioural Objectives on the Classroom Verbal Behaviour of In-service Teachers*, Ph.D. Edu., HPU, 1981

The objectives of the investigation were: (i) to study the effects of training in the formulation and usage of behavioural objectives on the classroom verbal behaviour of in-service teachers by comparing their pre-and post-training verbal behaviour, (ii) to study the classroom

verbal behaviour of the in-service teachers with no training in the formulation and usage of behavioural objectives at the initial and final stages of the experiment so as to examine the effects of 'no-training' on the verbal behaviour, and (iii) to compare the classroom verbal behaviour of the two groups of in-service teachers, one provided with the training in the usage and formulation of behavioural objectives and the other without any training.

The sample consisted of one hundred in-service female teachers teaching science to Classes IX and X in English-medium high and higher secondary schools in Simla, Agra, Kanpur and Delhi. The experimental group (fifty teachers) and the control group (fifty teachers) were observed for three periods of thirty minutes' duration using Flanders Interaction Analysis Category System (FIACS). The experimental group was trained in the formulation of behavioural objectives with the help of a programmed text on formulation of behavioural objectives. The teachers in the experimental group were further provided training in the usage of these objectives in actual classroom situations by observing each teacher in the group for six days continuously, for thirty minutes every day. After obtaining competency both in the formulation and usage of behavioural objectives, the experimental and the control groups were again observed for three periods of thirty minutes' duration. The content was controlled at both the stages of the experiment. Analysis and interpretation of the data were done on the basis of comparison of the experimental and the control groups before and after giving training in the formulation and usage of behavioural objectives in respect of ten interaction categories, sixteen behaviour ratios and ten interaction variables using Wilcoxon matched-pairs signed-ranks test.

The findings of the study were: (i) The in-service teachers, after training in the formulation and usage of behavioural objectives, exerted indirect influence on students, rewarded students' responses by praise and encouragement, attended to students ideas and integrated them into class discussion by asking more and more questions. (ii) They laid less emphasis on lecturing, were less authoritative, less commanding and less critical and encouraged students to supplement their answers with additional information based on independent judgement. (iii) The teachers showed significant gain in the pupil talk ratio, indirect talk ratio, indirect/direct (I/D) ratio, teacher response ratio (TRR), teacher question ratio (TQR), pupil initiation ratio (PIR), teacher question ratio (TQR), and teacher response ratio (TRR). (iv) The training led to reduction in talk ratio, content cross

ratio, steady state ratio and vicious circle. (v) Significant gains in indirectness, questions, praise and flexibility were observed with reduction in teacher talk, restrictiveness, restrictive feedback and negative authority. (vi) The flow patterns following the training revealed more short questions followed by short answers by students, frequent acceptance of ideas as well as clarification and use by teachers.

1099. MATHEW, R., *Factorial Structure of Teaching Competencies among Secondary School Teachers*, Ph.D. Edu., MSU, 1980

The study attempted to identify desirable teaching competencies of a physics teacher in the context of certain presage, process and product variables.

The study adopted two approaches. The different presage, process and product variables of teaching were measured and factor analysed to arrive at the set(s) of desirable teaching competencies. Secondly, the views of the students about their physics teacher were content analysed and a profile of a competent physics teacher was developed. Different variables included in the study were four presage variables, eighty-six teacher classroom behaviours under process variables and one product variable. Four presage variables studied were intelligence, teacher's attitude towards teaching, his interest in teaching and teacher's self perception of his classroom behaviour. The product variable was students' liking for their teacher. The sample in the pilot study consisted of twenty-three teachers whereas the sample for the final study comprised 130 teachers of Class IX teaching physics through the English medium in the secondary schools of Bangalore. In all, 2,300 students were randomly chosen to respond to the student liking scale and 100 students for interview. Seven tools used for data collection were the Standard Progressive Matrices, Teacher Attitude Scale by Grewal, Interest Inventory by Grewal, Observation Schedule standardized by the investigator, Teacher's Self Rating Scale developed by the investigator, Student Liking Scale developed by the investigator and an interview schedule. The statistical technique employed was the principal component method of factor analysis with varimax rotation.

The major findings of the study were: (i) Fourteen factors were identified. They were interpreted as general teaching competency, competency of the teacher's concern for students, competency of using audio-visual aids, competency of professional perception, competency of giving assignment, competency of illustrating with examples, competency of pacing while introducing, log

ical exposition, classroom management, use of questions, initiating pupil participation, use of blackboard, recognizing attending behaviour and competency of achieving closure. (ii) The opinions expressed by the students gave nineteen teaching behaviours liked by students. They were: creating interest and curiosity, difficult questions, clear explanations, keeping students attentive, pace of teaching, experiments, interesting examples, etc. (iii) The competencies identified through factor analysis related very closely with those expected of the teachers by the students.

1100. NAIDU, R.V., *A Study of Variations in the Classroom Behaviour of Teachers and Their Relationship to the Educational Achievement of Students in English, Science and Social Studies*, Ph.D. Edu., Osm. U., 1980

The main objectives of the investigation were: (i) to find out the extent of effectiveness of classroom behaviour of the teacher and the taught through an observation schedule process in English, science and social studies of Class X in the twin cities of Hyderabad and Secunderabad, (ii) to know the depth of the aspects of teaching, motivating, problem-solving, classroom organization and classroom management among the teachers who taught English, science, social studies to Class X students, (iii) to assess the educational achievement of Class X students in English, science and social studies, and (iv) to measure the students' assessment of attitude on the classroom behaviour of their teachers.

The sample consisted of thirty-seven schools of three categories (government, private and aided schools) from the twin cities of Hyderabad and Secunderabad. For the selection of the sample the stratified random sample technique was adopted. From these schools, one section from Class X in each school was chosen. The concerned subject teachers of these sections served as the sample for the teacher population. The tools employed were an observation schedule to observe the teacher-taught situation in the classroom, a rating scale for teachers to find out individual behaviour patterns which they adopt in the classroom while teaching a particular subject, achievement on two specific units in three subjects, and a rating scale for students to find out the classroom behaviour patterns of their teachers on the specially selected five items like accepting students' feelings, asking questions, giving directions, etc. The above four research tools were developed by the investigator. Mean, percentage and critical ratio were

employed to analyse the data.

The investigation gave the following findings: (i) In each subject, the verbal classroom behaviour of the teacher occupied the first place, followed by the evaluation of that day's lesson either by orally asking questions or by giving homework to the students. Among the rest of the aspects of classroom activities done by the teachers, the blackboard work occupied the third place in all the three subjects. The fourth place was credited to the item on teaching aids used by the teachers in all the three subjects and the last place was given to the item of demonstrating or discussing current events. (ii) There were no significant differences in the patterns of teaching of different subjects and exhibiting the various behavioural modes between the teachers whose age was 40 years and less and those whose age was 41 and above. (iii) The male and the female teachers had significant differences of opinion on the various patterns of behaviours to be performed in the classroom. The female teachers were more favourable and active in the classroom situation than the male teachers. (iv) There were no significant differences among the three subject teachers in the aspects of motivation, classroom organization and classroom management. (v) There was significant difference among the three subject teachers in the aspects of teaching and problem-solving in which the English teachers and the social studies teachers surpassed, respectively, the science teachers. (vi) There were significant differences between boys and girls of Class X in the educational achievement in English, science and social studies in the pre-teaching and the post-teaching situations. (vii) There were no significant differences in the age variables except in social studies. (viii) There were significant differences in the educational achievement in English, science and social studies between those aged 14 years and under and those aged 15 years and above, in the post-teaching situation. (ix) The students in English-medium schools had better achievement than the Telugu-medium students in a majority of the situations in all the three subjects, both in the pre-teaching and the post-teaching situations. (x) The performance of the students in physical science was better than in biological science both in the pre-teaching and the post-teaching situations.

1101. PADMINI, M.A., *The Relationship of Cognitive Interaction Pattern in Instruction to Some Selected Teacher Variables*, Ph.D. Edu., Mys. U., 1978

This was designed as a presage-process study. The ob-

jectives were: (i) to study the cognitive interaction pattern of instruction, (ii) to relate this pattern to different teacher variables, (iii) to find out how far these teacher attributes would predict the criterion variables, and (iv) to compare teachers and trainees in respect of the predictor variables and the criterion variables.

The study involved two kinds of variables, teacher variables and cognitive interaction criteria. The teacher variables selected were self-confidence (SC), introversion-extroversion (I-E), emotional-stability-neuroticism (E-N), intelligence, achievement and five attitudes — ATP, ASG, ASW, APG and ADP. The cognitive interaction pattern was represented by E-R, S-R, F-CD, S-R/E-R, F-CD/E-R and F-CD/S-R. A sample of 400 teachers and trainees (200 each) was chosen from high schools and teacher education colleges of Mysore city. Each of the student-teachers and teachers was observed teaching Classes VIII, IX and X for a full period of 40 minutes. Seven standardized tools were used: a system of Analysing Instruction (SAI)-I Cognitive Dimension developed by Nayar, Nafde's Non-Verbal Test of Intelligence (NVTI), Nayar's "Mysore Social Intelligence Test — Form M" (MY SIT), Basavanna's Self-confidence Inventory, Eysenck's Personality Inventory (EPI), Nayar's Mysore Teacher Attitude Scales — ATP, ASG, ASW and APG, and Wundt's Scale for Democratic Classroom Practices — ADP. The statistical techniques used were t-test, one way analysis of variance, and multiple regression analysis.

The findings of the study were: (i) Self-confidence was significantly related to E-R and S-R. (ii) Social intelligence was also significantly related to S-R. (iii) ASW seemed to be related to only S-R. (iv) APG was also significantly related to not only S-R, but also F-CD/S-R. (v) Self-confidence was significantly related to F-CD. (vi) E-N was significantly related to F-CD as well as F-CD/E-R. (vii) In respect of both the groups, multiple regression analysis did not indicate effective prediction of any of the cognitive interaction criteria.

1102. PANDEY, A., *Teaching Style and Concept Attainment in Science*, Ph.D. Edu., BHU, 1981

The objectives of the study were: (i) to evolve teaching styles on the basis of verbal interaction taking place in the classroom, (ii) to determine the effect of teaching style on science concept attainment at various levels, (iii) to identify the teaching behaviours commonly exhibited by science teachers, and (iv) to determine the effect of individual teaching behaviour on concept attain-

ment at various levels.

A sample of twenty-four postgraduate trained male science teachers having at least five years of teaching experience in secondary and higher secondary schools was selected. Another sample of 300 secondary school students studying in Class XI was taken from five schools of Varanasi. The samples were selected by employing the incidental purposive sampling technique. The tools used in the study were concept attainment test, instrument for analysing verbal teaching behaviour (both the tools were prepared or compiled by the investigator) and Group Test of General Mental Ability (Joshi). The statistical techniques used were calculation of percentages, different interaction analysis ratios, analysis of variance and t-test.

The findings of the study were: (i) All teaching behaviours were not frequently observed in the science teachers. The most rare behaviour was accepting the feelings of the students, the behaviour comprising student initiation also formed a rare category. (ii) All the teachers in the sample were direct teachers (value of I/D ratio ranged between 0.00 and 0.57). (iii) Accepting ideas and praising had significant positive effect on concept attainment at different levels as well as segments except for the segment of problems with which it had negative but insignificant effect. (iv) Justifying authority and giving management directions had significant positive effect on both the levels of concept attainment but its effect was insignificant on two segments (attributes and problems) of formal level. (v) Extended lecturing was negatively related with different levels of concept attainment and the segments of formal level, excepting for segments of problems and definitions with which it was positively correlated. (vi) The teacher-controlled purposeful silence had significant positive effect on one of the segments, i.e., problems. With others, although this behaviour was positively correlated, the correlation was not significant. (vii) The teacher's questioning had significant positive effect on both the levels, classificatory and formal, of concept attainment; however, its effect on the segments of formal level was not significant except for the segment "others" which consisted of mainly the items on supra-ordinate and subordinate concepts. (viii) Students response was positively and significantly correlated with both the levels of concept attainment and the segments attributes and 'others', while it was negatively correlated with the segments problems and definitions. (ix) Teaching styles had varying effect on both the levels of concept attainment as well as on total concept attainment. (x) The effect of teaching style was not significant for the attainment of problems seg-

ment of concept. (xi) Empathic and democratic teaching styles were on par as regards their effect on concept attainment even though the empathic style was slightly superior to the democratic style. (xii) Oratorical and traditional styles were inferior to empathic and democratic teaching styles. (xiii) Of the four teaching styles, the empathic style ranked first and the oratorical style the last. (xiv) Giving background information, encouraging student participation and student response and giving ample opportunity for students to think in the course of teaching were behaviours conducive to better concept learning.

1103. PASSI, B.K. and SHARMA, S.K., *A Study of Teaching Competency of Secondary School Teachers*, Dept. of Edu., Indore U., 1982 (NCERT-financed)

The objectives of the investigation were: (i) to study the relationship between the teacher's demographic variables (sex and age) and the teaching competency at the secondary level, (ii) to study the relationship between other presage variables (the teacher's attitude towards teaching, interest in teaching, self-perception for his teaching behaviour and intelligence) and the teaching competency at the secondary level, (iii) to study the relationship between the teaching competency of secondary language teachers and product variables in terms of academic achievement and pupils' liking of the teaching behaviour of their teachers and, (iv) to develop instructional materials for one of the identified teaching competencies required for the teaching of Hindi/English at the secondary level and to study its effect on the development of teaching competency.

The sample for the pilot study of the descriptive phase of the study consisted of seventy-two teaching-learning situations. In these teaching learning situations, thirty-six language teachers teaching Grades IX, X and XI and their pupils were involved. For the final study of the descriptive phase, a total number of 556 classroom teaching-learning situations (278 each at the time of teaching Hindi and English separately) were observed. A total of 107 teachers (forty-eight teachers teaching Hindi and fifty-nine teaching English) were involved in the study. These teachers taught Grades IX, X and XI in thirty-eight secondary schools of Indore district. In addition, data related to liking of the teacher's teaching behaviour from 9,360 pupils were collected. The achievement test in Hindi was administered to 766 pupils of Grade IX. For the purpose of validation of the instructional materials,

twenty-eight student-teachers who had offered Hindi as a teaching subject, were selected. From among them, two groups (experimental and control) were randomly formed. The various tools used were the Teacher Attitude Scale (Grewal), the Interest Inventory for Teachers (Grewal), Standard Progressive Matrices, Teacher's Self-rating Scale (Rama), the Pupil Liking Scale (Rama), the classroom observation schedule and achievement test in Hindi were developed by the investigator. The data were analysed by employing Principal Component analysis, Varimax rotation, t-test, correlation and analysis of co-variance.

The findings of the investigation were: (i) The competencies which were identified, shared a total variance of 76.80 per cent. The competencies were: giving assignment, loud reading, asking questions, introducing a lesson, managing the classroom, clarification, secondary loud reading, using the blackboard, using reinforcement, pacing, avoiding repetition, consolidating the lesson, dealing with pupils' responses, improving pupils' behaviour, audibility, using secondary reinforcement, recognizing pupils' attending behaviour, presenting verbal mode, and shifting sensory channel. (ii) The male and the female language teachers did not differ in their competency. (iii) There was positive significant correlation between the age of the language teachers teaching at the secondary level and their teaching competency. (iv) There was no significant relationship of the attitude of the language teachers teaching Hindi/English at the secondary level towards teaching, interest and intelligence with teaching competency, respectively. (v) There was a significant negative correlation between the self-perception of the language teachers teaching at the secondary level and teaching competency. (vi) There was significant positive relationship between the teacher's teaching competency, the liking of their pupils of their teaching behaviour and the academic achievement of the pupils of Grade IX in Hindi. (vii) The training of the student-teachers through instructional materials in microteaching setting improved the cognitive competency, emotional competency, and behavioural competency of loud reading and the competency of loud reading as a whole among the student-teachers. (viii) After the training by instructional materials, in simulated condition, the competency in loud reading among the student-teachers of the experimental group improved significantly more in the real classroom condition than among the student-teachers of the control group. (ix) There was no significant difference in the language teaching competency of the student-teachers of the experimental and the control groups in the real classroom condition.

- 1104.** PATEL, P.A., *A Comparative Study of the Effectiveness of Integrating Five Teaching Skills through the Summative Model and the Group with Vicarious Integration upon Teaching Competence of the Student-teachers*, R.P. Ananda College of Education, Borsad, 1976

The major objectives of the study were: (i) to find out general teaching competency of the student-teachers who were given training for some teaching skills (skills of probing questioning, skill of explaining, skill of using illustration with example, etc.) through the microteaching technique and used microteaching technique with integration of teaching skills through the summative model and microteaching technique along with vicarious integration and, (ii) to compare the general teaching competency of the student-teachers who were given training for the teaching skills through microteaching with integration through summative model and with vicarious integration.

The study was an experimental one. It followed a pre-test-posttest parallel group design. The Teacher Attitude Inventory (Ahluwalia), the Baroda General Teaching Competence Scale (BGTC) and the Indore Teaching Competence Scale (ITCS) were the tools used. The sample consisted of twenty student-teachers (for the academic year 1979-80) divided into two equal groups, by randomization.

The important finding of the study was: The integration of the component skills in the context of microteaching took place vicariously and it did not need deliberate planning such as a summative model.

- 1105.** PATEL, P.A., *Comparative Study of Effects of Microteaching under Simulated Condition and Microteaching under Real Classroom Condition upon General Teaching Competency and Attitude towards Teaching of Student-teachers*, R.P. Ananda College of Education, Borsad, 1978 (NCERT-financed)

The important objectives of the study were: (i) to find out the general teaching competency of the student-teachers who were given the treatment of teaching certain teaching skills through the microteaching technique under simulated condition, (ii) to find out the general teaching competency of the student-teachers under the real classroom condition, (iii) to compare the general teaching competency of the student-teachers

under simulated condition with that of the student-teachers under the real classroom condition, (iv) to find out the general teaching competency at the retention level of the student-teachers under simulated condition and that of the student-teachers under the real classroom condition, and (v) to compare the attitude of the student-teachers towards teaching under simulated condition with that of the student-teachers under the real classroom condition.

The experimental method was used with an experimental and a control group having ten student-teachers. The Ahluwalia Teacher Attitude Inventory, The Baroda General Teaching Competency Scale and Madhoo Patel's Intelligence Test (MPIT) were used to collect data.

The major finding of the study was that microteaching, under simulated condition and in the real classroom condition, produced the same effect in respect of general teaching competencies, attitude of student-teachers towards teaching and reactions of student-teachers towards the microteaching treatment.

1106. PILLAI, J.K., *Affective Tone in the Primary Classroom*, Dept. of Edu., MKU, 1979 (MKU-financed)

The study was an attempt to investigate the type of emotional climate prevailing in the primary schools in Madurai district. The major aims of the study were to find out (i) how children related to other children in the class, (ii) how the teacher behaved as a socio-emotional leader, and (iii) how the children related to the leader generated socio-emotional climate or the affective tone of the classroom.

The sample consisted of 372 teachers belonging to forty-nine primary schools in and around Madurai. The schools were drawn from urban, semi-urban and rural areas, managed by local authorities as well as private bodies. Affective Tone Analysis System — a system to analyse the verbal and some non-verbal behaviours of teachers — was developed on the basis of Flanders Interaction Analysis Category System. The tool attempted to find out what kind of atmosphere prevailed in the classroom by encouraging the kind of behaviour that contributed towards the acquisition of positive feelings and by limiting the kind of behaviour that resulted in bad feelings. It also measured the teacher effectiveness. The t-test was used to test the significance of difference of the

affective responses of teachers in different schools.

The major findings of the study were: (i) In general, all the teachers observed in this study exhibited more positive behaviours than negative ones. (ii) Positive non-verbal behaviours were greater in number than positive verbal behaviours. (iii) On an average, the teachers seemed to be quite stingy in the use of positive verbal feedback. (iv) In general, the urban teachers seemed to be using more verbal feedback, both positive and negative than the teachers from rural and semi-urban areas. (v) The teachers of the schools managed by municipalities and panchayat unions seemed to be more apathetic and had least percentage loading for verbal positive behaviours. On the other hand, the teachers of Kallar Reclamation school had a high ratio of positive/negative behaviour. (vi) The urban school teachers had higher affective interaction than the rural teachers and the teachers of privately managed schools exhibited more positive behaviour than those from the schools managed by local authorities. (vii) There was no significant difference in the affective responses of teachers in terms of sex and years of experience. (viii) The teachers praised the children's personal and social behaviours very rarely in the classroom, even when they deserved it.

1107. RAGHAVAKUMARI, A.S., *Teacher Attitudes and Perceptions, Affective Dimension of Classroom Instruction, and Pupil Perceptions*, Ph.D. Edu., Mys. U., 1978

This was a correlational type of study. The aims were: (i) to analyse certain aspects of the affective dimension of classroom instruction using SAI-II, (ii) to relate these variables to ten teacher attributes, (iii) to relate these affective criteria to four pupil perceptions, (iv) to find out the extent to which each of the affective dimension criteria could be predicted by the teacher attributes included in this study, and (v) to compare in-service teachers and in-training teachers in respect of the criterion variables and predictor variables.

The study involved three kinds of variables: (i) teacher attributes, (ii) affective dimension criteria, and (iii) pupil perceptions. Teacher attributes included five attitudes and five perceptions. The affective dimension was represented by directness-indirectness (D-I), dominance support (D-P), discouragement-encouragement (D-E), dissatisfaction-satisfaction (D-S), unpleasantness-pleasantness (U-P) and lethargy-enthusiasm (L-E). Pupil perceptions included were teacher's treatment, helpfulness, enthusiasm, and affectiveness — PPI.

PP2, PP3 and PP4, respectively. Seven standardized tools used were: (i) Nayar's SAI-II: Affective Dimension, (ii) Nayar's MYTAS, (iii) Wundt's scale, (iv) Patted's perception scales, (v) Basavanna's Self-Confidence Inventory, (vi) Nayar's MYSIT Form — M, and Pupil Perception Inventory specially constructed for this purpose. The sample consisted of teachers and trainees — 200 each chosen from high schools and colleges of education of Mysore city. Also ten pupils were randomly selected for each of the 400 lessons observed. Each lesson was observed for a full period of forty minutes. The statistical techniques employed were t-test, one-way analysis of variance, product moment coefficient of correlation, and multiple linear regression analysis followed by stepwise regression analysis.

The findings of the study were: (i) Teachers were superior to trainees not only in attributes like ATP, APG, ADP, IGP, IRP, SP, SC and SI, but also in five of the six affective dimension variables — D-P, D-S, U-P, L-E and D-E. (ii) In the case of teachers, only ATP had significant relationship with U-P and D-S. (iii) ATP had significant relationship with D-E, U-P and L-E. (iv) ASG, ASW and SC had significant relationship with D-P, D-E, D-S and L-E. (v) IGP and IRP were significantly related to D-E, D-S, U-P and L-E. (vi) SI was significantly related to all the affective dimension criteria except U-P. (vii) All the four pupil perceptions were significantly related to D-S. (viii) PP 2; PP 3 and PP 4 had significant positive relationship with L-E. (ix) PP 2 was significantly positively related to D-I. (x) PP 4 was significantly positively related to D-E. (xi) ATP + SI would predict D-I to the extent of 4.2 per cent. (xii) ASW + IGP would predict D-P to the extent of 4.0 per cent. (xiii) All except APG and SP would predict D-E to the extent of 14.0 per cent (SI + ATP + IGP + ASG + ASW...13.8 per cent). (xiv) SI + IGP + ASW + SC + ASG would predict D-S to the extent of 9.9 per cent. (xv) ASG + SP + ATP + SI + ASW would predict U-P to the extent of 10.4 per cent. (xvi) ASG + IRP + ATP + SI would predict L-E to the extent of 17.1 per cent (all the ten attributes ... 18.7 per cent).

1108. RAJAMONY, N., *A Comparison of Feedbacks through Flanders Interaction Analysis Category System, Analysis of Classroom Transactions and Videotape in the Modification of Technical Teacher Behaviour in Microteaching Sessions*, Ph.D. Edu., Pan. U., 1981

The study was conducted with a view to identifying ef-

fective modes of feedback for improving teaching skills for questioning, dealing with answers, reinforcement and stimulus variation in technical teachers and their overall teaching performance. The three modes of feedback studied were feedback through Flanders Interaction Analysis Category System (FIACS), feedback through Analysis of Classroom Transactions (ACTS), and feedback through Videotape (VT).

Thirty-six technical teachers sent by polytechnics for in-service education formed the sample for the experiment. The subjects were divided into three groups — electrical, civil and mechanical. The three modes of feedback were rotated in the three groups. The tools used for data collection were FIACS, ACTS, Videotape recorder, Raven's Advanced Progressive Matrices, teaching skills observation proforma, evaluation proforma for teaching performance, microlesson evaluation proforma and rating scale for the assessment of reactions of the subjects. Each subject underwent training through three microteaching cycles. Each microteaching cycle consisted of four microlessons with immediate feedback of one kind after each lesson. After each microteaching cycle was over, each subject delivered a 30 minutes' lesson in simulated conditions, which was evaluated by the investigator. During the experiment, 432 microlessons and 108 simulated lessons were observed in addition to 36 diagnostic lessons.

The major findings of the study were: (i) Feedback through FIACS resulted in a significant improvement of technical teacher behaviours in microteaching sessions with regard to (a) the skill of asking more clearly stated and more purposeful questions and securing greater involvement of students, (b) the skill of dealing properly with student's answers, (c) the skill of positively reinforcing the students' answers, (d) the skill of stimulus variation, and (e) the improvement of overall teaching performance. (ii) Feedback through ACTS resulted in a significant improvement of the technical teacher behaviours in microteaching sessions with regard to (a) the skill of asking more appropriate, more precise, more purposeful, more clearly stated, and more divergent questions and securing greater involvement of more students, (b) the skill of dealing more properly with students' answers, (c) the skill of reinforcing students' answers through non-verbal positive reinforcers, (d) the skill of getting more attention of students through stimulus variation, and (e) the overall improvement of teaching performance in regular classroom teaching. (iii) Feedback through VT resulted in a significant improvement of the teacher's classroom behaviour with regard to (a) the skill of asking appropriate, precise,

clearly stated, purposeful and divergent questions and securing greater involvement of students, (b) the skill of dealing more properly with students' answers, (c) the skill of reinforcing the students' answers through positive verbal and non-verbal reinforcers, (d) the skill of getting students' attention through stimulus variation, and (e) the improvement of overall teaching performance in regular classroom lessons. (iv) For the overall improvement of the skill of questioning, there was no significant difference in the effectiveness through the three modes of feedback. (v) There were no significant differences between the three kinds of feedback with regard to improving the skill of dealing with students' answers. (vi) There was significant difference between the three modes of feedback with respect to positive verbal and positive non-verbal reinforcement, FIACS being the most effective and ACTS the least effective for positive verbal reinforcement, and VT being the most effective and FIACS the least effective in the case of positive non-verbal reinforcement. (vii) Feedback through VT was the most effective in improving the skill of stimulus variation and that through FIACS the least effective. (viii) Feedback through VT was the most effective amongst the three modes of feedback in the overall improvement of teaching performance and that through FIACS the least effective.

***1109.** ROY, J., *A Study of Teacher Traits Associated with Classroom Interaction Patterns*, Ph.D. Psy., Cal. U., 1981

The major objectives of the study were: (i) to enquire into the relationship between a set of teacher traits and a set of behaviour patterns in the classroom as measured by Flanders Interaction Analysis Category System (FIACS) and (ii) to explore the possibilities of predicting teacher behaviour from teacher traits, and, if feasible, to deduce a concrete procedure for such a prediction.

The sample included 200 secondary school teachers of West Bengal. The FIACS, Teacher Personality Inventory, Chatterjee's Non-Language Preference Schedule, Cattell's Culture Fair Intelligence Scale 3 (Forms A and B) and Scale of Attitude towards Teaching as a Career were the tools used for data collection.

The findings of the study were: (i) Significant correlation existed between teacher response ratio (TRR) and self-confidence, leadership, emotional balance and sociability, attitude towards teaching as a career, intelligence and interest in fine arts and literature. (ii) Signifi-

cant correlation existed between TQR and self-confidence, leadership, emotional balance, sociability, intelligence and interest in literature, science and sports. (iii) Significant correlation existed between PIR and self-confidence, leadership, emotional balance, sociability, intelligence and interest in literature and sports. (iv) Significant correlation existed between TRR and self-confidence, emotional balance, sociability, attitude towards teaching as a career, intelligence and interest in literature. (v) Significant correlation existed between TQR and self-confidence, leadership, emotional balance, honesty and integrity, intelligence and interest in literature, science and sports. (vi) Significant correlation existed between CCR and self-confidence, leadership, emotional balance, sociability, attitude towards teaching as a career, intelligence and interest in literature, science and sports. (vii) Significant correlation existed between SSR and sociability, and attitude towards teaching as a career. (viii) Significant correlation existed between PSSR and self-confidence, leadership, emotional balance, intelligence and interest in literature. (ix) The highest significant correlation obtained was 0.539 between TQR and sociability and the lowest significant correlation was 0.198 between TQR and interest in fine arts. (x) The values of the multiple R obtained for each of the eight dependent variables with all the eleven independent variables taken together were mostly significant at the 0.01 level of confidence except in the case of SSR and PSSR.

1110. SHAH, B.B., *An Experimental Investigation of the Effects of Selected Teaching Strategies on the Development of Creative Thinking and Achievement in Science*, Ph.D. Edu., MSU, 1981

The objectives of the study were: (i) to find out the effectiveness of four teaching strategies on the development of creative thinking ability, and (ii) to find out the effectiveness of the four strategies on the achievement in science of Standard VII pupils.

The four groups of students from Standard VII and four student-teachers were selected for the experiment. A 4 × 4 Latin Square design was used for the study. These groups were taught by the selected teachers for fourteen weeks. Data were collected by using an intelligence test, Creative Thinking Test and an achievement test. The data were analysed using analysis of variance and test of significance of difference.

The major findings of the study were: (i) There were significant differences between the four selected

strategies in developing creative thinking and achievement in science at 0.01 level. (ii) The four strategies of teaching had significantly differential effects on the development of originality and flexibility of Standard VII pupils but not in the case of fluency. (iii) Strategy IV (i.e., lecturing with discussion, practical work, use of audio-visual aids) produced significantly higher mean scores for the achievement of the pupils than all other strategies. (iv) Strategy IV was more effective in developing creative thinking and its components than all other strategies. (v) The effects of strategies were dependent upon the level of intelligence, sex and creativeness of the pupils. (vi) Dominance of practical work did not show any significant superiority over lecture with respect to low intelligence and low creativeness. (vii) The results highlighted the importance of maximum use of audio-visual aids in classroom teaching for the enhancement of creative thinking.

1111. SHARMA, B.K., *An Exploratory Study of Certain Aspects of Classroom Behaviour of Science Teachers in the Macro- and Micro-teaching Situations using Interaction Analysis*, Ph.D. Edu., Avadh U., 1979

The objective was to study a reliable category system for first-hand systematic observation of classroom instruction in science. The hypothesis was: There was positive relationship between the process (sub-scores also included) of the STBI (Science Teacher Behaviour Inventory) and the outside variables, viz., personality traits and sex.

The sample consisted of science teachers of Uttar Pradesh selected by the cluster random sampling technique. The pilot study was undertaken on fifty science teachers (thirty male and twenty female). The classroom verbal behaviour was observed and encoded through Flanders Interaction Analysis Category System (FIACS). The sample for macro study consisted of 120 teachers, who were sub-divided into groups of forty and termed A, B, C, based on the percentage of marks at the graduate, postgraduate and B.Ed. levels. The sample for micro study consisted of twenty science teachers. The tools used for collecting data were Flanders Interaction Analysis Category System, adapted version of the Guilford Zimmerman Temperament Survey in Indian conditions, and Science Teacher Behaviour Inventory developed by the investigator. The techniques used in the study were tabulated tallies in the form of matrix, computed behaviour ratios, correlations, mean, stan-

dard deviation and t-test. The mathematical structure of STBI was ascertained through factor analysis.

The major findings of the study were: (i) Teachers' talk was six times more than students' talk. (ii) Very little time was spent on praising and developing students' ideas. (iii) There was no short question-answer pattern discernible in their teaching which was found in product type learning. (iv) Students got few opportunities to add to their own ideas or to initiate discussion on their own initiative. (v) The highest frequencies were covered by the cells (5.5) in which the teacher's lecture was 42.31 per cent, the second highest frequencies were occupied by the cell (10.10), i.e., silence or/and confusion which was 19.39 per cent. (vi) The teacher dominated in the class too much as shown by the structuring of the teaching (51.41 per cent of the total tallies). (vii) Over 6.5 per cent of the total time was spent in confusion when no meaningful activity prevailed. (viii) Over 5.5 per cent of the total time was spent on structuring the material when the teacher used resource material/charts/maps/diagrams and showed models/demonstrative experiments. (ix) The percentage of structuring the learning came to 10.8 per cent of the total tallies. This value indicated that the involvement of the students was quite low in the development of a lesson. (x) The nature of influence patterns of teachers was very much direct. (xi) Sex and grade did not play an important part in shaping the teachers' influence. (xii) The communication was relatively faster in the classes conducted by female science teachers than in classes conducted by male science teachers, whereas in the case of female science teachers, it had significant values with respect to friendliness and masculinity only. (xiii) Structuring the learning had a significant positive relationship with some personality components like general activities, restraint, ascendance, emotional stability, objectivity, thoughtfulness and personal relations. (xiv) Structuring classroom control had only three significant negative coefficients of correlation with ascendance, emotional stability and objectivity. In the case of male teachers, the structuring of classroom control had no relationship with any trait of personality. In the case of female teachers this element was correlated with restraint, ascendance, emotional stability and friendliness, while masculinity had positive relationship with this element. (xv) In the case of male science teachers, structuring the silent activities correlated negatively with friendliness and positively with personal relations. In the case of female teachers this element was correlated with restraint, ascendance and thoughtfulness in a negative direction but masculinity had a positive relationship with this element. (xvi) As re-

gards the structuring of teaching, the pupil-teachers had 50.22 per cent and 44.89 per cent in their first and fourth reteach sessions of the microteaching cycle. (xvii) For structuring the learning the pupil-teachers had 14.88 per cent in the first teach session and 20.03 per cent in their fourth reteach session. (xviii) The pupil-teachers spent 3.25 per cent time in the first teach session and 7.74 per cent time in their fourth reteach session towards the structuring of the material. (xix) The science teachers subjected to a feedback from STBI had significantly enhanced tendency of utilizing students' responses, effectively handling students' responses through showing models and demonstrating experiments followed by relevant questions. There was also a significant gain in their tendency of providing opportunity to the student to think. (xx) The STBI feedback was further observed to generate significant loss in lecturing by the teacher, the teachers' pauses and the note-taking tendency of students. (xxi) Six factors were extracted through the use of factor analysis, which covered 52.27 per cent of the total variance.

- 1112.** SHARMA, K.K. and PASSI, B.K., *Effect of Different Techniques of Feedback upon the Attainment of Skill of Gestures Related to Stimulus Variation among Teachers*, CASE, Baroda, 1976

The investigation was undertaken to study the effect of different techniques of feedback upon the attainment of the skill of gestures among teachers. The three different techniques of feedback studied were peer feedback, oral discussion, written comments. It was hypothesized that (i) there would be no differential effect of the three techniques of feedback upon the attainment of the skill of gestures, (ii) there would be no practice effect of lessons upon the attainment of the skill of gestures, and (iii) peer and self would not differ in their rating of the performance for the skill of gestures.

Parallel group design was followed on a sample of twenty-four student-teachers. Six student-teachers with postgraduate qualifications acted as peer supervisors. The dependent variable was teaching skill, namely, gestures by the teacher, related to stimulus variation. The controlling variables were marks and methods of teaching. The tools used were lesson evaluation proforma for the skill used by the peer supervisor and the self-evaluation proforma used by the teacher himself. Three-way analysis of variance was used for processing the data.

The major findings of the investigation were: (i) The three different feedback treatments produced no differ-

ential effect on the teaching skill of gestures. (ii) There was practice effect upon the attainment of the skill of gesture. There was difference in the acquisition of the skill of gestures from lesson to lesson. But the interaction effect of feedback techniques and practice lessons was not significant. (iii) The teacher (self) rated the attainment of the skill of gesture higher than the peers. But the interaction effect of feedback and the observer was not significant. However, the effect of simple interaction of lesson and the observer was significant. This indicated that a particular condition due to the lesson and the observer produced higher score than some other combinations. (iv) A particular treatment when coupled with a particular level of lesson and rated by a particular observer produced higher score than some other combinations.

- 1113.** SHARMA, S.K., *A Presage-Process-Product Study of Teaching Effectiveness of Hindi Teachers of Higher Secondary Schools of Indore District*, Ph.D. Edu., Indore U., 1981

The objectives of the investigation were: (i) to study the relationship between the teacher's demographic variables (sex and age) and teaching competency at the higher secondary level, (ii) to study the relationship between other presage variables (the teacher's attitude towards teaching, interest in teaching, self-perception for his teaching behaviour and intelligence) and teaching competency at the higher secondary level, (iii) to study the relationship between the teaching competency of higher secondary Hindi teachers and product variables (pupils' academic achievement and pupils' liking for the teaching behaviour of their teachers), (iv) to arrive at a cluster of factors (teaching competencies) required for effective Hindi teaching at the higher secondary level, (v) to develop instructional materials for one of the identified teaching competencies required for the teaching of Hindi at the higher secondary level, and (vi) to study the effect of developed instructional materials on the development of teaching competency among teachers.

The sample for the pilot study consisted of seventy-two teaching-learning situations in which thirty-six Hindi teachers teaching Grades IX, X and XI and their pupils were involved. For the final study, a total number of 220 classroom teaching-learning situations were observed. In the final study forty-eight teachers were involved. In addition to these teachers, data related to the students' liking of the teacher's teaching behaviour were collected from 2,340 pupils. The achievement test in

Hindi was administered to 766 pupils of Grade IX. For the purpose of validation of the instructional materials, twenty-eight student-teachers who had offered Hindi as a teaching subject were selected. From these twenty-eight student-teachers, two equal groups (experimental and control) were formed randomly. The various tools used were the Teacher Attitude Scale (Grewal), the Interest Inventory for Teachers (Grewal), the Standard Progressive Matrices, a teacher's self-rating scale and a pupil liking scale, the classroom observation schedule and achievement test of Hindi developed by the investigator. The data were analysed by employing Principal Component analysis, varimax rotation, t-test, correlation and analysis of co-variance.

The findings of the investigation were: (i) There was no significant difference in the competency of male and female Hindi teachers teaching at the higher secondary level. (ii) There was no significant positive correlation between the age of Hindi teachers teaching at the higher secondary level and their teaching competency. (iii) There was no significant relationship between the attitude of Hindi teachers at the higher secondary level towards teaching and their teaching competency. (iv) There was no significant relationship between the interest of Hindi teachers teaching at the higher secondary level and their teaching competency. (v) There was a significant negative correlation between the self-perception of Hindi teachers teaching at the higher secondary level and their teaching competency. (vi) There was no significant relationship between the intelligence of Hindi teachers teaching at the higher secondary level and their teaching competency. (vii) There was a significant positive relationship between the teachers' teaching competency and the pupils' liking for their teaching behaviour at the higher secondary level. (viii) There was a significant positive relationship between the teaching competency of teachers at the higher secondary level and the academic achievement of their pupils of Grade IX in Hindi. (ix) The identified competencies were: giving assignment, loud reading, asking questions, introducing a lesson, pacing, managing the classroom, presenting verbal mode, clarification, using the blackboard, using appropriate reinforcement, achieving closure, probing questioning, creating interest and improving pupils' reading behaviour. (x) The training of the student-teachers through the instructional materials in microteaching setting improved the cognitive competency, emotional competency and behavioural competency of loud reading among the student-teachers of experimental groups significantly more than the student-teachers of the control group. (xi) After the training

through instructional materials in simulated condition, the competency of loud reading among the student-teachers of the experimental group improved significantly more in the real classroom condition than that of the student-teachers of the control group. (xii) There was no significant difference on the language teaching competency of the student-teachers of the experimental and the control groups in the real classroom condition.

1114. SHASHIKALA, Y.S. and THIRTHA, L., *Needs and Teacher Behaviour*, Ban. U., 1977

The main aim of the study was to explore the relationship between the personality needs of teachers and their verbal behaviour in the classroom.

The sample consisted of 130 teachers from sixty-seven randomly selected secondary schools of Bangalore. The teachers taught social studies to students of Class IX. The tools used in the investigation were the Edwards Personal Preference Schedule to measure the needs of teachers and Flanders Interaction Analysis Category System to observe the classroom verbal behaviour. Each teacher was observed twice for about forty minutes. Product moment coefficient of correlation and F-test were the statistical techniques used for data analysis.

The main findings of the study were: (i) The i/d ratio was related significantly and positively to autonomy, implying that the teachers scoring high on autonomy manifested indirect behaviour to a greater extent. (ii) The teachers scoring high on affiliation responded negatively to students' talk. They were not supportive to students in the classroom. (iii) The teachers who responded positively to students' talk had greater need for achievement and exhibition and less need for heterosexuality. (iv) The teacher response to pupils' talk was positively related to exhibition. (v) The teacher questioning ratio in general had no relationship with any of the fifteen needs measured. However, the teacher's questioning ratio in relation to pupils' talk was related significantly to autonomy, succorance and endurance. The relationship was negative in the case of autonomy and succorance, and positive in the case of endurance. (vi) The teachers scoring high on nurturance and change had their pupils take greater initiation and were supportive to pupils.

1115. SHUKLA, S., *Identification of Major Skills involved in Mathematics Teaching at Secondary School Stage*, Ph.D. Edu., BHU, 1981

The objectives of the study were: (i) to isolate the

teaching skills involved in mathematics teaching, (ii) to prepare a list of teaching skills specific to the teaching of mathematics, determine their behavioural components and develop observation schedules for them, (iii) to prepare a teaching competence scale for mathematics teaching, and (iv) to establish the validity of identified skills.

The study was conducted in two phases. In the first phase an attempt was made to identify the teaching skills specific to mathematics teaching and in the second phase it was attempted to validate the skills through the microteaching approach by conducting an experiment on parallel group design. The sample consisted of 1,200 students of Classes IX and X studying in twenty high schools of Varanasi for locating twenty best mathematics teachers. Eight teacher-educators and ten research scholars trained in microteaching acted as experts for finalizing the list of major skills in mathematics teaching. For the validation study 100 B.Ed. student-teachers were included in the sample. The data were analysed by employing t-test, product moment coefficient of correlation and coefficients of concordance.

The main findings of the study were: (i) There were at least six distinct and specific mathematics teaching skills which were involved in the teaching of mathematics at the secondary school stage. These were: skill of developing a concept, skill of developing a principle, skill of applying inductive approach, skill of applying deductive approach, skill of figure-drawing and skill of applying problem-solving approach. (ii) Behavioural components of the skill of developing a concept were: identification of attributes, making important attributes dominant, classification and assessing the learning of the concept. (iii) Behavioural components of the skill of developing a principle were: identifying the concepts related to the principles, recalling component concepts, relating component concepts to form the principle and providing practice. (iv) Behavioural components of the skill of applying inductive approach were: giving suitable examples, using appropriate verbal and non-verbal media, arriving at generalization and eliciting new examples from the students. (v) Behavioural components of the skill of applying deductive approach were: clear-cut statement of the rule, identifying the constituents/terms of the rule, giving examples relevant to the rule and eliciting examples from the students. (vi) Behavioural components of the skill of figure-drawing were: identification of the elements of figure-drawing, using appropriate geometrical instruments, use of appropriate chalk, using appropriate labels, using dotted lines for new construction, numbering of figures, ap-

propriate positioning of figures and appropriate size of figures. (vii) Behavioural components of the skill of problem-solving approach were: exposure of the problem, recollecting known relations, finding out necessities required for the solution and analysing the given data in the light of what is required and the necessities. (viii) Six observation schedules prepared for observing and rating the microlessons on the identified skills had a high degree of interscorer reliability having coefficients of concordance ranging from 0.69 to 0.87. (ix) The twelve-item teaching competence scale for mathematics teaching had a high degree of interscorer reliability ($r = 0.69$). (x) Student-teachers trained in the identified skills through the microteaching approach scored significantly higher at 0.01 level of confidence on the mathematics teaching competence scale than their counterparts trained through the traditional approach. On the basis of this fact the validity of the identified mathematics teaching skills was established.

1116. SINGH, A., *A Study of Creativity in School Teachers as Measured by Mehdi's Tests of Creativity in relation to Their Self-concept, Attitude towards Teaching and Classroom Verbal Interaction*, Ph.D. Edu., Mee. U., 1978

The objectives of the investigation were: (i) to find out the relationship between creativity in teachers and their self-concept, (ii) to determine the relationship between creativity in teachers and their attitude towards teaching, (iii) to ascertain the relationship between creativity in teachers and their classroom verbal interaction, (iv) to study the difference between male and female teachers with regard to their creativity, (v) to study the relationship between teachers' classroom verbal interaction and their self-concept, and (vi) to determine the relationship between teachers' classroom verbal interaction and their attitude towards teaching.

The sample consisted of 100 trained graduate teachers in science working in higher secondary schools of Delhi. The study used Verbal Test of Creative Thinking, Personality Word List, Minnesota Teacher Attitude Inventory and Flanders Interaction Analysis Category System. The study applied the techniques of product moment correlation, analysis of variance and t-test for analysing the data.

The findings of the investigation were: (i) There was a positive and significant relationship between the verbal creativity in teachers and their self-concept. (ii) There was no significant relationship between the verbal

creativity in teachers and their attitude towards teaching. (iii) There was a positive and significant relationship between the verbal creativity in teachers and indirect/direct (I/D) teaching behaviour. (iv) There was no significant relationship between the verbal creativity in teachers and their indirect/direct teaching behaviour as measured by i/d ratio. (v) There was no significant relationship between the verbal creativity in teachers and confusion in the classroom. (vi) There was a positive and significant relationship between the creativity in teachers and their using students' ideas. (vii) There was no significant relationship between the verbal creativity in teachers and their convergent questions and acceptance of students' ideas. (viii) There was a negative and significant relationship between the teacher's verbal creativity and the teacher's talk in the classroom. (ix) There was a positive and significant relationship between the teacher's verbal creativity and the students' talk in the classroom. (x) Teachers with high verbal creativity significantly talked less, asked more divergent questions, and gave more time to students for thinking before responding to their questions than the teachers with low verbal creativity. (xi) Male and female teachers did not differ significantly in their verbal creativity. (xii) There was a positive and significant relationship between the indirect/direct (I/D) teaching behaviour of teachers and their self-concept. (xiii) There was no significant relationship between indirect/direct (i/d) teaching behaviour of teachers and their self-concept. (xiv) There was a positive and significant relationship between teachers' self-concept and encouragement of students' talk by them. (xv) There was a positive and significant relationship between teachers' self-concept and their divergent questions, using students' ideas and silence on account of students' thinking. (xvi) There was no significant relationship between the indirect/direct (I/D and i/d) teaching behaviour of teachers and their attitude towards teaching.

1117. SINGH, R.D., *Simulated Social Skill Training and Modification of Teacher Classroom Behaviour*, Ph.D. Edu., Gor. U., 1979

The study aimed at assessing the usability of Simulated Social Skill Training (SSST) in teacher training programme as well as its effectiveness in improving the classroom teaching behaviour. The specific objectives were: (i) to collect classroom behavioural data to decide whether the student-teachers who were given the treatment of training in a few selected social skills under SSST organization differed significantly in their clas-

sroom behaviour from those undergoing training in the traditional manner, and (ii) to inquire into the relative effect of SSST upon the attitude of student-teachers.

A simple pretest-posttest, control and experimental group design having five student-teachers in each group was used. The two groups were matched along the variables of age, sex, marital status, locality, economic status, marks at the graduate level, subjects at the graduate level, teaching subjects and experience. The pupil-teachers were selected from the B.Ed. class (1975-76) of T.D. College, Jaunpur. The student sample consisted of ninety students of Class VII of T.D.S. Inter College, Jaunpur. Social skills selected for the treatment were: (i) asking different types of questions, (ii) introducing the topic, (iii) reinforcement, (iv) probing questioning, and (v) increasing pupils' participation. Flanders ten category system (FIACS) was used to collect the classroom behaviour data and Ahluwalia's Teacher Attitude Inventory (TAI) was administered on student-teachers to measure their attitudes. Data obtained were analysed using Scott's pi, Darwin's likelihood ratio criterion test, and t-test.

The findings of the study were: (i) The classroom behaviour of student-teachers in desirable directions could be modified through SSST. (ii) The SSST technique was more effective than the traditional method in modifying the classroom behaviour of teachers. (iii) The SSST technique was also more effective than the traditional method in developing favourable attitude among student-teachers toward the teaching profession.

1118. SUNDARALAKSHMI, T.K., *Instructional Strategies — Their Effects on Classroom Climate and Pupil Growth*, Ph.D. Edu., MSU, 1981

The objectives of the investigation were: (i) to study the classroom climate in terms of variations in group characteristics, caused by each of the instructional strategies, (ii) to find out the relative effects of the strategies on the classroom climate, (iii) to study the effects of each strategy on the pupil's growth in terms of academic performance, need development, test anxiety, social relationships, initiative and classroom trust, and (iv) to find out the relative effects of the strategies on the pupil's growth when interchanged.

The experiment was conducted on two matched groups of ninth standard in Vidya Kunj High School, Baroda. The study was conducted for one full academic year consisting of two terms. In the first term, one group consisting of thirty-five pupils (twenty-three boys and

twelve girls) was treated with the teacher-facilitator strategy and another group consisting of forty pupils (twenty boys and twenty girls) was treated with the teacher-initiator strategy. In the second term the strategies were interchanged. Data were collected with the help of Ohio Social Acceptance Scale developed by Ohio University Elementary Teachers' Association, Classroom Trust Scale developed by Marie de Sales, Pre-Adolescent Initiative Questionnaire developed by Pareek and others, Achievement Motivation Inventory by Mehta, Test Anxiety Scale for Children developed by Nijhawan, a classroom interaction observation schedule and achievement tests developed by the investigator. The data obtained were analysed by calculating means, standard deviation and percentiles and by employing t-test. The data were also analysed qualitatively.

The major findings of the investigation were: (i) Both the strategies, namely, the teacher-initiator and the teacher-facilitator, tended to have positive influences on certain attributes of the classroom climate and the pupil's growth such as academic performance, initiative, classroom cohesiveness and acceptability, and classroom trust, though in varying degrees. (ii) Both the strategies did not affect need achievement significantly. (iii) The teacher-initiator strategy had a positive and greater influence on academic performance and initiative than the teacher-facilitator strategy. (iv) The teacher-facilitator strategy had comparatively greater positive influence on classroom trust, acceptability and cohesiveness. (v) Both the strategies indicated variations in their influence on test anxiety in each group.

*1119. SUTHAR, I.K., *A Study of Classroom Behaviour of Teacher-Trainees in the Context of Some Personality Variables*, Ph.D. Edu., SPU, 1981

The objectives of the investigation were: (i) to study the classroom behaviour of teacher-trainees in the context of twelve personality variables, through Flanders Technique of Classroom Interaction Analysis, (ii) to evaluate the significance of differences in the classroom behaviour of teacher-trainees in the context of personality variables, and (iii) to find out as to what extent relationship of classroom behaviour of teacher-trainees existed among the different groups of teacher-trainees.

Flanders ten categories system of classroom interaction analysis was selected as a tool for collecting data about classroom behaviour. For measuring personality

traits 16 P.F. Scale (form C) developed by Cattell was used. The sample consisted of 120 teacher-trainees from four different universities of Gujarat. Ten teacher-trainees were selected in such a way that they were highly loaded in one of the twelve personality variables under study, namely, emotional and mature, submissive and dominating, tough and sensitive, confident and insecure, conservative and experimenting, extrovert and introvert.

The main conclusions of the investigation were: (i) There was no significant difference in the classroom behaviour of emotional and tough teacher-trainees except in the case of I/D which was found to be significant at 0.05 level in favour of emotional teacher-trainees. (ii) The classroom behaviour of emotional and conservative teacher-trainees did not differ significantly. (iii) There was no significant difference in the classroom behaviour of submissive and tough teacher-trainees except in the case of Teacher Questioning Ratio (TQR) which was found to be significant at 0.05 level in favour of submissive teacher trainees. (iv) The classroom behaviour of submissive and confident teacher-trainees also did not differ significantly. (v) The classroom behaviour of submissive and conservative teacher trainees was insignificant except in the case of TQR. (vi) The classroom behaviour of mature and dominant teacher trainees also did not differ significantly. (vii) The classroom behaviour patterns of extrovert and emotional and extrovert and submissive teacher-trainees were insignificantly different. (viii) There was no significant difference in the classroom behaviour of extrovert and tough teacher-trainees except in the case of TQR. (ix) There was no significant difference in the classroom behaviour of sensitive and insecure teacher-trainees except in the case of Teacher Response Ratio (TRR) which was found to be significant at 0.05 level in favour of sensitive teacher-trainees. (x) There was no significant difference in the classroom behaviour of conservative and experimenting teacher-trainees except in the case of TQR which was found to be significant at 0.05 level in favour of experimenting teacher-trainees. (xi) The difference in the mean i/d ratio of extrovert and introvert teacher-trainees was significant at 0.05 level and it was in favour of extrovert teacher-trainees. (xii) There was no significant difference in the classroom behaviour of extrovert and conservative teacher-trainees except in the case of TQR which was found to be significant at 0.01 level in favour of extrovert teacher-trainees. (xiii) There was no significant difference in the classroom behaviour of introvert and conservative teacher-trainees. (xiv) Out of the twelve groups of teacher-trainees, ten groups,

namely, emotional, mature, sensitive, confident, insecure, experimenting, extrovert, and introvert, submissive and dominating showed indirect influence while the remaining two groups, tough and conservative, showed direct influence.

1120. TAREEN, J.A.K., *The Effect of Orientation to and Feedback through Interaction Analysis on the Cognitive Interaction Pattern, Teaching Competence and Certain Perceptions of Student-teachers*, Ph.D. Edu., Mys. U., 1980

The main objectives of the study were: (i) to find out whether the student-teachers who received interaction feedback treatment differed from those who received only conventional guidance in respect of each of the six interaction variables that together represented the pattern of cognitive interactions, overall teaching competence and each of the three teacher perceptions, (ii) to find out the differences among different subject groups in respect of gains in the six cognitive interaction variables, (iii) to find out the relationship between interaction variable gains and overall teaching competence gains, and (iv) to find out the relationship between six interaction variable gains and three teacher perceptions.

This was an experimental study involving three variables, namely, cognitive interaction criteria, teaching competence and teacher perceptions. The three tools used for obtaining data at the pretest and posttest stages were Nayar's System for Analysing Instruction — SAI-I: Cognitive Dimension, Nayar's Mysore Teacher Assessment Tools (MYTAT-1) and Patted's Teacher Perception Scales — IGP, IRP and SP. The total sample of fifty with twenty-five each in experimental and control groups was drawn with equal representation to five subject areas — English, Kannada, mathematics, sciences (physical and biological) and social studies. The two groups were not pre-matched on the basis of any relevant criteria. The pretest was given in the first week and the posttest in the last week of the four-week 'block practice teaching programme'. Group orientation was given at the end of the first week of practice teaching (after the pretest) in two sessions. Individual feedback in the form of time measures of different categories of interaction pairs was given thrice — at the end of the first, second and third weeks of practice teaching programme, on the basis of the observations and analyses of the lessons taught during the week. Statistical techniques used for data analyses were one-way analysis of variance, analysis of covariance and product moment coefficient

of correlation.

The findings of the study were: (i) Orientation and feedback had a highly significant effect not only on the pattern of cognitive interactions in instruction but also on the overall teaching competence. (ii) Progressive changes were observed in the experimental group. (iii) The two groups differed significantly in the pattern of cognitive interactions in the quantum of loss/gain in time units at different levels, the control group being lower than the experimental. (iv) The gains of the experimental group in teaching competence were higher than those of the control group. (v) There was no significant difference between the two groups in respect of IGP, IRP and SP. (vi) Subject of instruction caused no significant differences. (vii) Changes in both the groups showed movement in the desired direction towards the ideal pattern as conceived in SAI.

1121. THAKUR, S.K., *Personality Characteristics of Teachers Showing Direct and Indirect Verbal Behaviour*, Ph.D. Edu., HPU, 1980

The objectives of the study were: (i) to know the effect of age, sex and experience on teaching behaviour, (ii) to investigate differences, if any, in the personality characteristics of teachers, and (iii) to find out the cluster of traits or the factor structure of personality of teachers.

The teaching behaviour of 200 teachers was observed in their respective classrooms for twenty minutes on three different occasions with the help of FIACS. The students taught were from Classes VIII to XI. The personality characteristics of the teachers were measured on the 16PF Test. After arranging the scores of the teachers in descending order, fifty teachers falling between P_{25} and P_{75} were selected. The constellation of traits of teachers (direct and indirect) was also found out by using factor analysis. The group differences were measured and tested for significance on the variables of age, sex, and experience.

The study yielded the following findings: (i) The two groups of teachers (direct/indirect) differed significantly on nine of the interactional variables except the variable of MFR. (ii) There was no significant difference in the teaching behaviour of the direct/indirect teachers due to the variables of age, sex and experience. (iii) Four personality factors, namely, C, O, Q_3 and Q_4 , differentiated the direct and indirect teachers, significantly. (iv) There were seven unique factors which were responsible for direct and indirect behaviour of the teachers.