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Research in Teaching

A TREND REPORT

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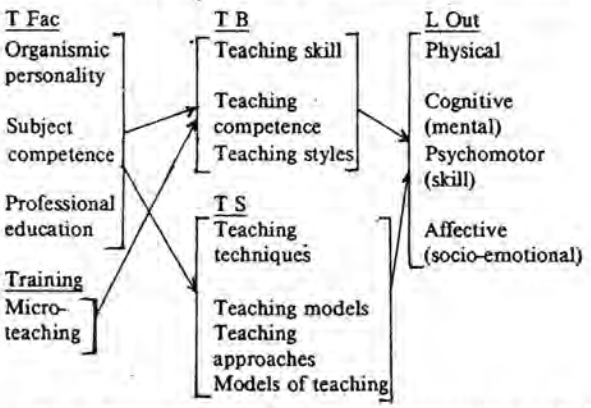
Three *Surveys of Research in Education* edited by Buch in 1974, 1979 and 1986 included trend reports related to Teaching and Teacher Behaviour. These trend reports were by Jangira and Sharma (1974), Padma (1979) and Dave (1986). The first trend report of 1974 reviewed the studies under the headings, coverage, design, methodology, procedure and tools, and analysis and interpretations. In 1979, Padma's trend report classified the studies broadly into three groups according to the nature of the work done. These were: teacher behaviour studies, tool construction studies, and other studies. The teacher behaviour studies were further classified as presage studies, process studies, presage-process studies, process-product studies and presage-process-product studies. Dave (1986) adopted a systems approach in analysing studies related to Teaching and Teacher Behaviour, which resulted in a schema for analysis and classification of research studies which was quite comprehensive. In the present trend report, the schema developed by Dave (1986) was extended and used for analysis and classification of research studies related to Teaching and Models of Teaching.

SCHEMA FOR CLASSIFICATION OF RESEARCH STUDIES

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 the millions of learners. In other words, whether it is the Teacher Factor (T Fac) Training, Teacher Behaviour (TB), or Teaching Strategies (TS), these should result in developing the desired learning outcomes (L out) in learners and an optimum development in cognitive, affective and psychomotor domains. 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 a system of education. Schematically, the emerging structure is represented in Fig. 20.1.

FIG 20.1 SCHEMA FOR CLASSIFICATION FOR STUDIES RELATED TO TEACHING AND MODELS OF TEACHING



The schema given in Fig.20.1 represents the probable relationships among the factors which pertain to education of children in general and teacher education in particular. Five major relationships are envisaged as indicated below:

1. Teacher Factors affect Teacher Behaviour/Teaching Strategies (T Fac—TB/TS).
2. Training of Teachers affects Teacher Behaviour (Training—TB).
3. Teacher Behaviour/Teaching Strategies affect Learning outcomes (TB/TS—L out).
4. Teacher Factors affect learning outcomes (T Fac—L out), and
5. Teacher Factors affect Teacher Behaviour/Teaching Strategies, which, in turn, affect learning outcomes (T Fac—TB/TS—L out).

There are some studies which describe the characteristics of a teacher or teaching situation (D) or the development of a tool for measuring a teacher factor or teaching skill, teaching style, teaching competence, etc. (DI). In order to accommodate such studies, the following two categories are added to the five discussed above:

1. Descriptive studies (D)
2. Development of Instruments (DI)

CLASSIFICATION

Along with the studies available in the earlier three surveys related to teaching and teacher behaviour, the relevant studies grouped under other areas, e.g. Teacher Education and Educational Technology, have also been included in the above-mentioned seven categories. Thus, in all, 194 studies have been reviewed and their categorywise distribution is given in Table 20.1

RESEARCH TRENDS

Overall Trends

In all, 194 studies related to the various aspects of Teaching and Models of Teaching have been included in this trend report. The largest number of studies (32 per cent) fall under category TB/TS—L out, followed by category T Fac—TB/TS (24.8 per cent) and Training —TB (23.7 per cent). The share of category D is 18 studies (9.3 per cent), while category DI contains 10 studies (5.1 per cent) and T Fac—TB/TS—L out contains ten studies (5.1 per cent), no study was conducted which can fall under category T Fac—L out. In the first and second surveys the rank order of categories were: TB/TS—L out, T Fac—TB/TS, Training—TB and T Fac—TB/TS—L out, except minor changes in the position of D and DI. This rank order of categories changed in the third and fourth surveys in which the rank order of categories were: training—TB, T Fac—TB/TS, TB/TS— L out, D and DI. This signifies the increased importance of training and its impact on teacher behaviour.

Table 20.1

FREQUENCY OF STUDIES UNDER DIFFERENT CATEGORIES AS PER THE SCHEMA

Survey	*D*	*DI*	*T FAC—TB/TS*	*Training -TB*	*TB/TS -L Out*	*T Fac-TB/TS-L Out*	*T Fac-L Out*	*Total*
First Survey (1943-72)	04 (00) 11.8%	04 (00) 11.8%	10 (00) 29.4%	02 (00) 5.9%	01 (12) 38.2%	01 (00) 2.9%	00 (00) 0.0%	34 100%
Second Survey (1972-78)	01 (5) 11.3%	0 (2) 3.8%	11 (00) 20. %	02 (9) 20.7%	11 (9) 37.7%	03 (00) 5.7%	00 (00) 0.0%	53 100%
Third Survey (1978-82)	03 (00) 5.1%	01 (00) 1.7%	14 (00) 23.7%	09 (9) 30.5%	06 (11) 28.8%	06 (00) 10.2%	00 (00) 0.0%	59 100%
Fourth Survey (1982-88)	05 (00) 10.4%	03 (00) 6.3%	13 (00) 27.1%	15 (00) 31.2%	12 (00) 25.0%	00 (00) 0.0%	00 (00) 0.0%	48 100%
Total	18 9.3%	10 5.1%	48 24.8%	46 23.7%	62 32.0%	10 5.1%	00 0.0%	194 100%

Figures in brackets pertain to the studies under different chapters in the First, Second and Third Surveys in Education.

Descriptive Studies (D)

Out of 194 researches, 18 (9.30 per cent) fell under the category of descriptive studies (D). These studies employed the survey method. Adaval (1952), Khajuria (1981) and Khanna (1985) described the qualities needed for successful teachers. Adaval (1952) reported that intelligence was an important factor in determining one's aptitude for teaching. Khajuria (1981) observed that successful science teachers exhibited patterns of asking questions, giving directions, soliciting initiated pupil talk, sustained teacher-initiated pupil talk, flexibility and teacher talk according to normative expectations.

For 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. Khanna (1985) found that successful teachers had traits which were positively helpful and valuable for the mental health of the individual whereas unsuccessful teachers had traits which tended to lead the person to a kind of maladjustment. A factorial study of certain personality variables of popular teachers in secondary schools was carried out by Koul (1972) who found that popular teachers distinguished themselves as more outgoing, intelligent, emotionally more stable, sober, conscientious, venturesome, toughminded, shrewd, placid, controlled and relaxed. Popular teachers were high on theoretical, social, political and religious values and were low on economic and aesthetic values. Manual (1964) enumerated the conditions required for quality teaching. Kulandaivel and Rao (1968) and Thakur (1976) conducted a survey to identify the qualities of a good teacher as rated by students. The common qualities found by them were: good teaching, kind and pleasing manners, good advice and guidance to pupils, regular and punctual attendance and equal treatment to all. Maheshwari (1976) reported that effective teachers used the categories of 'accepts feeling, praise, used student ideas, questions, student response and initiation', whereas ineffective teachers employed 'lecture, direction and authority' categories in their classroom behaviour.

General teaching competency, competency of teachers' concern for students, competency of using audio-visual aids, competency of professional perception, competency of giving assignments, competency of illustrating with examples, competency of pacing while introducing, logical exposition, classroom management, use of questions, initiating pupil participation, use of blackboard, recognizing attending behaviour and competency of achieving closure were the desirable teaching competencies of a physics teacher according to Mathew (1980). Passi and Sharma (1982) identified the teaching competencies of language teachers at secondary school level as 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' behavior, audibility, using secondary reinforcement, recognizing pupils attending behaviour, presenting in verbal mode, and shifting the sensory channel. The male and female language teachers did not differ in their competency. The pedagogical domain of teaching competency in English consisted of 12 competencies which were independent of each other (Choudhari, 1985). Singh (1985) found that teacher behaviour of secondary school teachers comprised eight skills, viz., skill of questioning, explanation, blackboard writing, reinforcement, introducing a lesson, summarizing the lesson, teaching aids, and illustrating with examples. Teaching behaviours of science, social science and language teachers were found to have ten factors, eight factors and seven factors respectively. The common factors to the teaching of science, social science and language subjects were skills of introducing a lesson, blackboard writing, questioning, reinforcement, summarizing the lesson, using teaching aids and explanations. Shukla (1981) identified teaching skills which were involved in the teaching of mathematics at the secondary school level as skill of developing a concept, skill of developing a principle, skill of applying the inductive approach, skill of applying the deductive approach, skill of figure drawing and skill of applying the problem-solving approach.

From the studies cited above, it appears that researchers have tried to arrive at a general description of teachers, and to identify the skills of teachers specific to subjects, namely, physics, mathematics, Hindi, English, and social science. There is a need to conduct such studies related to these subjects as well as others at various levels, so that one can arrive at a generalization. Attempts have to be made to identify teaching skills in the context of instructional objectives related to cognitive, affective and psychomotor domains. All this will help in giving new direction to teacher training programmes.

Development of Instrument (DI)

There are ten studies related to development of instruments. The researchers in these studies developed various instruments, viz., intelligence tests, interest inventories, personality inventories, attitude scales, aptitude scales, measures of teachers' adjustment and professional efficiency of teachers. Apart from these, instruments were also developed for measuring teacher efficiency and teaching effectiveness. The task of standardization of an inventory/observation schedule for measuring teacher efficiency was taken up by Jayamma (1962), Bhattacharya and Shah (1966), and Prasad (1970). Sherry (1964) developed a battery of psychological tests for predicting success in teaching. The battery

comprised an intelligence test, interest inventory, personality inventory and an attitude scale. A Process-Process Appraising Scale of teacher effectiveness was standardized by Bhalwankar (1984), while Sofat (1977) developed a self-evaluation scale of teaching effectiveness. Shukla (1981) developed observation schedules for rating micro-lessons on identified skills. Upadhyaya (1975) constructed an aptitude scale for secondary school teachers. A checklist of factors useful in classroom teaching was developed by Gupta (1979). Pandey (1973) developed two instruments for measuring teachers' adjustment and their professional efficiency. The reliability of developed instruments was established by using different methods of reliability testing. Validity was establised by using the usual methods of validity testing. Both reliability and validity coefficients were quite high. All these studies were conducted as the secondary school stage. Both primary and higher education stages have been left untouched. The development of instruments for measuring variables like creative teaching, risk-taking, tolerance for ambiguity, higher mental abilities, aesthetic value, sociological factors, etc. need to be undertaken.

Teacher Factors—Teacher Behaviour/ Teaching Strategy (T Fac—TB/TS)

Out of the 194 studies 48 (24.7 per cent) were related to teacher factors influencing teacher behaviour or teaching strategy. Out of these, 15 studies tried to explore the relationship between various demographic, and personality characteristics of teachers as well as student-teachers with their classroom behaviour (Quraishi, 1972; Santhanam, 1972; Singh, 1974; Mathew, 1976; Shashikala and Thirtha, 1977; Goel, 1978; Shashikala, 1978; Singh, 1978; Sharma, 1979; Thakur, 1980; Joglekar, 1981; Suthar, 1981; Choudhary, 1982; Jain, 1982).

Classroom Verbal Behaviour

The classroom verbal behaviour of teachers was studied in respect of demographic variables such as age, sex, training, experience, socio-economic status and modernity. These were not found to be related with classroom verbal behaviour of teachers as measured through Flanders Interaction Analysis Category System (Santhanam, 1972; Quraishi, 1972; Shashikala, 1978; Thakur, 1980; Joglekar, 1981). On the other hand, sex was found to influence classroom verbal behaviour of teachers (Santhanam, 1972; Sharma, 1979; Jain 1982). Creative thinking was found to influence classroom verbal behaviour of teachers (Singh, 1978; Choudhary, 1982). But on the other hand Mathew (1976) found that creative teacher personality did not influence the classroom verbal behaviour of teachers.

The classroom verbal behaviour of teachers was studied in respect of various personality traits. Quraishi (1972) found that teachers' verbal behaviour in the classroom was related to a small extent to their personality. Extrovert teachers were found to have greater interchange of classroom events than introvert teachers (Goel, 1978). Structuring the lecture had a significant positive relationship with personality components like restraint, ascendance, emotional stability, objectivity, thoughtfulness and personal relations. Roy (1981) reported a significant correlation between classroom verbal behaviour of teachers and their self-confidence, leadership, emotional balance, sociability, intelligence, and interest in literature and fine arts. Personality traits, like emotion, sensitivity, confidence, insecurity, extrovert, introvert, submissiveness and dominance, showed indirect influence on classroom verbal behaviour of teachers (Suthar, 1981). Lastly, Jain (1982) reported that male teachers devoted more time in asking questions than female teachers. Teachers with a positive attitude towards the teaching profession, classroom teaching, child-centred practices and the educational process reacted to ideas and feelings of pupils and frequently created an emotional climate in the classroom. Theoretical and aesthetic values were not significantly related to the effective behaviour of teachers. Teachers with a high aesthetic value did not have a favourable attitude towards the teaching profession but teachers with high religious value had a high favourable attitude towards the teaching profession, pupils and teachers.

Further, classroom verbal behaviour of teachers was studied in the context of attitudes towards various objects. Attitude towards democratic classroom procedures and attitude towards management were found to be related with indirect behaviour of teachers (Quraishi, 1972). The classroom verbal behaviour of teachers was found to be significantly related to attitude towards teaching (Singh, 1974), and also to attitude towards teaching as a career (Roy, 1981).

Shashikala and Thirtha (1977) reported that teachers scoring high on autonomy manifested indirect behaviour to a great extent. Teachers scoring high on affiliation responded negatively to students' talk.

Fourteen researches were related to prediction of teacher effectiveness, teacher efficiency or proficiency in teaching through personality traits (Debnath, 1971; Samantaroy, 1971; Sharma, 1971; Grewal, 1976; Gupta, 1976; Singh, 1976; Jain, 1977; Bhagoliwal, 1982; Pachauri, 1983; Subbarayan, 1985; Padmanabhaiah, 1986; Tharyani, 1986; Mahapatra, 1987; Rao, 1987).

Teaching Efficiency

In respect of teaching efficiency, Debnath (1971) reported that age, experience, academic achievement and professional training were significant determinants of teaching efficiency, whereas superior teaching efficiency went with a favourable attitude and good adjustment (Samantaroy, 1971). Debnath (1971) developed a questionnaire for measuring teacher efficiency, while Samantaroy (1971) developed a score card by following a model suggested by Cooperative Study of Secondary School Standards, Washington for measuring teaching efficiency.

Teacher effectiveness as a criterion variables was studied by Sharma (1971), Grewal (1976), Gupta (1976), Subbarayan (1985) and Tharyani (1986). Teaching aptitude, academic grades, socio-economic status, teaching experience and age, in the order of their arrangement, appeared to be sound predictors of teacher effectiveness (Sharma, 1971). The main predictors of teacher effectiveness were home, health, social, emotional, and total adjustments, dominance, submission, and verbal and non-verbal intelligence (Grewal, 1976). High effective teachers were more affectothymic, more intelligent, having more ego strength, more surgent, more self-sentiment less suspicious, less guilt prone and less radical (Gupta, 1976). Intelligence and knowledge in their respective subject areas were found to be the best predictors of teacher effectiveness (Tharyani, 1986). All these studies were conducted at the school stage, except Subbarayan (1985), who conducted a study at institutions at the higher stage. Teacher effectiveness as rated by colleagues and by self is significantly correlated with teachers' ability to do research and publication.

Teaching Effectiveness

Teaching effectiveness as a criterion variable was studied by Singh (1976), Bhagoliwal (1982), Wali (1985) and Padmanabhaiah (1986). Singh (1976) reported that most prominent needs of superior teachers were nurturance, achievement, counteraction and aggression. Their organizational pattern was logical and interpersonal relation as regards social behaviour and adjustment was of a very high degree. Further, superior teachers were less entangled in family problems or were able to solve them quickly and used more literary language. Bhagoliwal (1982) found that more effective teachers were characterized by a fairly higher level of differentiation and integration in their cognitive and perceptual functioning. They had a superior capacity for imaginative and original thinking. The affectional need of more effective teachers did not unduly interfere with their responsiveness to emotional situations. More effective teachers had a well-developed value system and ego organization. They had a narrow gap between their level of aspiration and imaginal and inner resources. Wali (1985) reported professional dignity (grade, salary, etc.), altrusitic temper, professional involvement, democratic temper and family background were correlated with teaching effectiveness. Padmanabhaiah (1986) observed that region, designation, age, experience and size of the family of teachers could significantly influence the level of teaching effectiveness.

Proficiency in Teaching

Intelligence, creativity, and interests were characteristically interrelated in promotion of proficiency in teaching (Jain, 1977). Pachauri (1983) found that reserved, relaxed, adjusted and controlled teachers were more proficient in teaching than those who were outgoing, tense, and possessed more anxiety. Further, less intelligent, imaginative, and trusted teachers with high aggression were better in teaching.

Deva (1966) reported that personality was the most important and intelligence the least important in predicting success in student teaching, whereas intelligence was considered to be the most influential predictor by Mahapatra in 1987. Rao (1987) found that content processes like categorization, application of principles and logical reasoning were meagrely employed, that too by a few effective science teachers. Dosajh (1956) using teacher trainees as sample reported that imagination and maturity were indicative of success in the teaching profession. Roy (1965) observed that a teacher's role as director of learning was the sole determinant of teacher effectiveness. Gurbaksh (1974) found that high vocational anxiety was inversely related to teaching success, but high general anxiety was not associated with teach-

ing success. In respect of cognitive interactions, Nayar (1976) reported that the higher the competence, the less seemed to be the quantum of expository teaching, and higher the level of cognitive interaction and discovery learning. Teachers did not exploit the higher level of interaction in content matter though that was a potent source of variation in cognitive interaction. Padmini (1978) found that multiple regression analysis did not indicate effective prediction of any of the cognitive interaction criteria. Mehta (1976) enquired into the communication pattern of teachers teaching history and its relationship with demographic factors. There was no relationship between the age of the teachers and their communication pattern in the classroom, and a similar result was found in respect of sex. Sex was negatively related with the teacher response ratio. Teachers having taken history at the graduate level as well as at the professional level did not differ from those who did not have history at both levels in their communication pattern in actual classroom situations. Kumar (1982) reported that teachers dominated classroom interaction and about 71.37 per cent of the total time was used by the teacher. The questioning behaviour of social studies and science teachers differed significantly. Science teachers used translation, interpretation, application and higher order questions to a greater extent and memory and the routine type of questions to a lesser extent than social studies teachers.

Linguistic and communicative abilities of high school teachers of English were studied by Singh (1984). It was observed that the speaking ability of three-fourths of the teachers was adequate, though it was deficient in its accuracy. Their writing ability was not adequate. Jain (1983) found that language teachers had most transitions from responsive lecturing to unresponsive lecturing, from involving direction, to harsh criticism and inattentative pupil response, from distressful silence to impersonal questioning and dismissing direction, and from attentive pupil response to involving direction, whereas science teachers had greater transitions from responsive lecturing to personal questioning, from personal questioning to involving direction, and from attentive pupil response to perfunctory use of pupil ideas.

Teacher Behaviour

Mehta (1972) and Singh (1985) conducted factor analytical studies related to teacher behaviour. Mehta (1972) factor analysed teaching ability of student-teachers and found teaching ability to be a factor which was loaded with achievement variables of training. High achievers were found to be more conscientious, venturesome, tender-minded and experimenting, whereas low achievers were more outgoing and imaginative, Singh (1985) found six factors common to the teaching behaviour of both male and female teachers: skill of questioning, blackboard writing, explanation, reinforcement, introducing a lesson and summarizing the lesson. The skill of illustrating with example was found to be specific to the teaching behaviour of male teachers. Skill of using teaching aids, and skill of questioning to develop critical awareness were specific to female teachers. Katiyar (1982) reported that surgency, dominance, exacting will power and intelligence optimally helped the acquisition of the skill of reinforcement. Further, the acquisition of the skill of explaining was optimally helped by suspiciousness, affecto-thymia, tender-mindedness, sensitiveness, self-sufficiency, resourcefulness, apprehensiveness, self-reproaching, exacting will power, being socially precise, surgency and imaginativeness. Lastly, the skill of stimulus variation was optimally helped by self-sufficiency, suspiciousness, affecto-thymia and imaginativeness.

Singh (1970) found that forecasting efficiency in theory papers was much more accurate when the prediction was done on the basis of a combination of intellectual and non-intellectual factors than when the prediction was done by taking these factors separately. The predictors for performance in teaching skill were measures of ascendance, extraversion, intelligence and early academic achievement. Sex, caste, locality of the schools, and religion were not found to affect teaching ability whereas private school teachers were found to have better teaching ability than government school teachers (Nair, 1974). Pillai (1979) reported that, in general, urban teachers used more verbal feedback, both positive and negative, than the teachers of rural and semi-urban areas. Urban schoolteachers had higher affective interaction than rural schoolteachers and the teachers of privately managed schools exhibited more positive behaviour than the teachers from schools managed by local authorities. While studying the factors helpful in class teaching, Gupta (1979) reported that 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 were found to be helpful in teaching.

From the studies presented in this category, it is evident that different aspects of teaching and teacher behaviours have been explored in the context of teacher factors. But no two studies draw similar conclusious; so it is difficult to draw generalizations. Further, some of the teacher factors have been left untouched, perhaps because the appropriate tools for measurement are not available. Apart from simple tools like FIACS, new tools and techniques have to be used for analysing teacher behaviour in the classroom. Technological developments, like the video camera, computer and closed-circuit television should improve the observation of process variables in the classroom.

Training-Teacher Behaviour

Of the studies reviewed in this report, 23.7 per cent are related to the influence of training on teacher behaviour of student-teachers as well as of teachers. These studies employed different experimental methods for studying modification oi teacher behaviour, including teaching skills, teaching competencies, and teaching styles. The micro-teaching technique, training in the Flander Interaction Analysis Category System (FIACS) and feedback strategies were used to modify teacher behaviour Roy (1970), Pangotra (1972), Sharma and Passi (1976), Sharma (1977), Kanwal (1979), Rajamony (1981), Mishra (1983) and Misra (1985) studied the effect of different types of feedback upon classroom behaviour of student-teachers as well as teachers. Four feedback strategies, Flander's Interaction Category System, Teachers' Self-Rating, Teachers' Peer Rating, and Pupils' Observations of the Learning Atmosphere were successful in bringing about a 60 per cent improvement in teachers' behaviour (Roy 1970). Pangotra (1972) reported that student-teachers who received feedback through the Flanders Interaction Category System made significant gain in the predicted direction in their use of the specific teacher verbal behaviour. Sharma and Passi (1976) observed that peer feedback, oral discussion and written feedback treatments did not produce differential effect on the teaching skill of gestures. Sharma (1977) reported that discussion was the most effective technique of providing feedback by the peer supervisors for the attainment of the skill of body movement. Similarly, written feedback was effective in the case of the skill of shifting sensory channels. Feedback by supervisors brought better results than feedback by peer supervisors (Kanwal 1979). Flanders Interaction Analysis Category System (FIACS), Analysis of Classroom Transactions (ACTS), and feedback through video tape (VT) as sources of feedback were equally effective in improving skill of questioning and skill of dealing with students' answers in case of technical teachers (Rajamony, 1981). Further, feedback through VT was the most effective. Self-rating was found to be the most effective sources of feedback but peer-rating and student-rating were also effective in changing teacher behaviour (Mishra, 1983). Vasishtha (1976) reported that training in the Flanders Verbal Interaction Category System contributed significantly to the attitude towards teaching, self-perception and classroom performance of secondary science and mathematics student-teachers. The teaching behaviour of teachers could be changed in a positive direction if they were appraised with the sum total of their teaching in the form of feedback information by way of self-rating and class-rating (Misra, 1985). The inservice teachers, after training in the formulation and usage of behavioural objectives, exerted an indirect influence on students, rewarded students' responses by praise and encouragement, attended to students' ideas and integrated them into classroom discussion by asking more and more questions (Massey, 1981). The classroom behaviour of student-teachers in desirable directions could be modified through simulated social-skill training (Singh, 1979).

Researches on microteaching started in the latter part of seventies, Passi and Shah (1973), Singh (1974), Bhattacharya (1975), Das, Passi and Singh (1976), Joshi (1977), Lalithamma (1977), Passi (1977), and Patel (1978), compared the effectiveness of microteaching technique vis-a-vis the conventional student teaching practices and interaction analysis in terms of development of teaching competency. Microteaching technique was found to be effective in developing teaching competency. Singh (1974) observed that student-teachers trained through microteaching changed their verbal behaviour in the classroom. Patel (1978) and the GCPI (1977) found that microteaching, under simulated conditions and in real class-room conditions, produced the same effect in respect of general teaching competencies. Ray (1978), Jangira and Mattoo (1980), and Jangira, Singh and Mattoo (1981) revealed that teachers showed a significant gain on general teaching competence due to the training in teaching skill using microteaching. The effect of microteaching in developing general teaching competency and certain teachers factors was studied by George and Joseph (1978) George and Anand (1980), Bhattacharjee (1981)

and Singh (1984). All these studies reported that microteaching proved effective in improving the teaching competence of student-teachers. Vaze (1976) while studying the effects of modelling and mircoteaching on the acquisition of certain skills in questioning among student-teachers found that microteaching was the best treatment for acquiring skill in asking probing questions. The symbolic modelling treatment did not differ significantly from audio modelling treatment.

Patel (1976); Sharma and Bhattacharjee (1980); Lalitha (1981); Das, Passi, and Jangira (1982); Sharma and Bhattacharjee (1982); Bawa (1984); Bhatia (1984); Dave (1987); and Ekbote (1987); studied the effectiveness of different strategies of integration of teaching skills as intervention training for facilitating transfer of microteaching gains. Patel (1976) reported that integration of the component skills in the context of microteaching took place vicariously. The summative model as well as the additive model of integrating teaching skills were found to be effective in improving the integration competency of student-teachers (Sharma and Bhattacharjee, 1980, 1982). Training in integration of skills in simulated conditions did not improve teaching competency of student teachers (Lalitha, 1981). The summative model as well as the model of integration tended to improve teaching competence as well as the quality of the integration of teaching skills (Das, Passi, and Jangira, 1982). Exposure to integration-based instruction helped teachers to increase ability to integrate various teaching skills effectively (Bava, 1984). An additive strategy was found to be effective in developing competence in integrating skills (Bhatia, 1984). A miniteaching model of integration was found superior to a summative model of integration and a traditional model of integration in terms of development of teaching competence among student-teachers (Dave, 1987). Ekbote (1987) reported that integration strategy was found effective in terms of the improvement it made in the student-teacher's performance in classroom teaching. Chathley (1984) compared bi-clustered, tetra-clustered and hexa-clustered strategies of integration of skills in terms of general teaching competence. Among the trainees in physical sciences, the tetra-clustered and hexa-clustered strategies were more effective, while among the trainees in languages, the three integration strategies were equally effective in improving their general teaching competence. Among the social science trainees, the tetra-clustered strategy was more effective than the bi-clustered and hexa-clustered strategies in improving general teaching competence. Yadav (1983) not only studied the effect of training in classroom questioning behaviour on teaching competence of student-teachers but also studied its effect on pupil achievement. Training in classroom questioning behaviour resulted in improved question delivery behaviour of teachers as well as improvement in pupil achivement. Mukhopadhyay (1981) compared the effectiveness of microteaching and the modular approach in developing teaching competencies among polytechnic teachers. Both these approaches were found to be equally effective in developing teaching competency. Sheth (1984) evolved a strategy of developing teaching skills in secondary school teachers. The strategy was in the form of a self-instructional multimedia package synchronized with microteaching technique for developing the teaching skills and it was found to be effective in developing teaching skills. The four-year integrated BEd course was found to be effective in comparison to the traditional one year BEd course in terms of teaching competence and role performance (Singh, 1985).

It is thus evident that microteaching technique stands out as an effective technique of training for improving teaching competence of teachers teaching at the school stage. This technique is yet to be tried out with teachers teaching at institutions of higher learning. An attempt was made to find the best source of providing feedback to teachers during microteaching training, but generalizations are difficult to formulate. Training in integrating the skills was attempted by a large number of researchers. There is need to carry out similar studies at different stages of education, ranging across different subjects. Research work needs to be done for giving new inputs to teaching and training institutions in India.

Teacher Behaviour/Teaching Strategy Learning Outcome

Out of 194, there are 62 (32.0 per cent) studies which are related to the effect of teacher behaviour or teaching strategy on learning outcomes. The maximum number of studies were completed in this category. The same trend continued all through the four surveys. The studies employed the experimental method as well as the survey method.

The classroom behaviour of a teacher will influence the learning outcome of students. This hypothesis was explored by various researchers like the Government College of Education, Jabalpur (1971), Jangira (1972), Lulla (1974), Patel (1974), Desai (1977), Gupta (1977),

Pavanasam (1977), Dubey (1979) and Yadav (1987). There was a positive and significant relationship between pupil's favourable attitude towards teacher and teacher talk with a high percentage of indirect talk and a low percentage of direct talk (Government College of Education, Jabalpur, 1971). Jangira (1972) found that pupils taught by indirect teachers scored higher on adjustment to school, adjustment to teacher, general adjustment, dependency, and classroom trust. Indirect teacher influence had a favourable effect on motivation, classroom organization, and attitude towards teacher (Patel, 1974). Pupils taught by such teachers attained higher achievement scores as compared to their counter parts. (Lulla, 1974). Training in Flanders Interaction Analysis Category System modified teachers' indirect behaviour positively, which further affected pupils' achievement, pupils' classroom trust, initiative and adjustment towards home, school and peers (Desai, 1977). The verbal creativity of pupils was significantly related with teacher verbal behaviour (Gupta, 1977). Indirect behaviour of teachers influenced achievement, achievement motivation, value orientation, classroom trust and dependency (Pavanasam, 1977). Classroom verbal behaviour of teachers had a positive relationship with the achievement and interest of pupils (Dubey, 1979). Indirectness in teacher behaviour was found positively related with pupil attitudes towards their teachers but not related with student achievement in biology at high school level (Yadav, 1987).

Teaching Patterns

The effect of teaching patterns on pupils' attainment was studied by Sharma (1972), Shaida (1976), Padma (1976), Roy (1977) and Pandey (1981). Sharma (1972) found that narrow questions as compared to open questions were more effective with respect to pupil attainment in terms of knowledge objectives. On the other hand, Shaida (1976) found that the teaching pattern of narrow questions with feedback was significantly effective in the development of knowledge and retention as compared to narrow questions with no feedback. The lecturing-problem-solving approach, questioning-answering-problem-solving approach, questioning-answering-feedback-problem-solving approach, and lecturing-no-problem-solving approach were all found to be equally effective with respect to the development of applicational ability in science of standard VII pupils (Padma, 1976). Pandey (1981) found that oratorial and traditional styles were inferior to empathic and democratic styles of teaching science. The effect of patterns of teaching on creative thinking among adolescents was studied by Pillay (1978) and he found that the treatment of the creative teaching method, when compared with the traditional method, did not produce a different effect upon general creative thinking and its sub-parts such as, seeing problems, unusual uses and consequences of eighth graders. Roy (1977) investigated the effect of three styles of classroom questioning on hierarchical pupil achievement and found that lecturing, questioning and response with feedback, and the questioning-response-feedback sequence teaching styles had equal effect on the development of knowledge and application abilities and total achievement of pupils. Masih (1976) attempted to determine which of the selected teaching methods or combinations of them had a significant relationship with the attainment of specific learning outcomes of students in biology. It was found that teachers with higher class means on several learning outcomes emphasized pupil-centred methods, utilized the laboratory, used project and laboratory discussion combination methods for solving new problems. The environmental approach was superior to the formal approach in teaching biology in terms of immediate post-teaching and delayed memory scores (Exemmal, 1980).

Instructional Strategy

Experimental work related to the development of instructional strategy was started in 1978 at CASE, Baroda. So far, 15 studies have been conducted at various levels in different institutes. Sansanwal (1978) developed a strategy of teaching Research Methodology. The strategy comprised programmed learning material, discussion, seminar, library reading, test and discussion of test performance. Jeyachandran (1980) compared three strategies, namely, teacher with programmed filmstrip, programmed filmstrip without teacher and the conventional method in terms of achievement of students. This study was conducted at school level for teaching history. Chakraborty (1978) studied the effectiveness of strategy S_1 (lecturing and questioning-answering) strategy8 S_2 (lecturing and questioning–answering by using behavioural objectives), and strategy S_3 (discussion by using instructional materials) on the development of knowledge, comprehension, application ability and total achievement in geography of pupils of standard IX. Mullick (1979) compared multimedia programmes with a book format programme in terms of achievement

of students. Seshadri (1980) developed an instructional strategy for teaching mathematics to class IX students. The components of the strategy were: introduction by the teacher, programmed learning materials, games or group activity, post-test, and discussion of performance on post-test and feedback sessions. An instructional strategy comprising programmed learning material, library reading, discussion and practical work was designed by Shah (1980) for teaching the course on Educational Evaluation at the BEd level. Kumar (1981) studied the effect of four teaching strategies on the development of creative thinking and achievement in science. Sunderlakshmi (1981) investigated the effect of instructional strategies on both the classroom climate and pupil attainment. Ravindranath (1982) developed a multimedia instructional strategy for teaching biology at secondary school level. The strategy comprised 12 components, namely, introduction by the teacher, programmed learning material, lecture, team teaching, inquiry technique, pupil activities with teacher demonstrations, discussions, audio-visual presentation, narration of biographical sketches of scientists, summary, criterion test and feedback exercises and assignments. Joshi (1987) developed an instructional strategy for teaching elements of science to class IX students. The strategy comprised programmed learning material, assignments, experiments, demonstration, discussion, test and discussion on the performance at test. All these studies reported that richness could be brought into the teaching–learning process through these strategies which was not possible through traditional methods. The developed instructional strategies were also found to be effective in terms of reaction of students towards different components of instructional strategy.

Further, Singh (1983) reported that programmed instruction, Bloom's mastery learning strategy influenced achievement motivation more than the conventional method of teaching. Kirkire (1981) found that assignments as well as objective-based lesson plans did not significantly affect the achievement of students in mathematics. The strategy developed, when used in any science subject like biology, demanded integration of knowledge from different disciplines of science (Talegaonkar, 1984). Singh (1986) investigated the teaching strategies used for preparing students for the CPMT and The IIT competitive entrance examinations. It was observed that a lecture-cum-chalk board strategy was mostly used in physics and chemistry and rarely in zoology and botany teaching in the CPMT. On the other hand, in the IIT, lecture-cum-chalk board, question–answer followed by testing, review-cum-discussion, and assignment-cum-clarification strategies were used in teaching chemistry, physics, and mathematics subjects. Patankar (1984) studied the opinions of students and teachers of postgraduate classes regarding objectives of various teaching techniques like lecture, seminar, tutorial, practical, field trip and assignment.

Models of Teaching

In India, during the last few decades, efforts have been made to study the classroom behaviour of teachers through Flander's Interaction Analysis Category System which equips them to change their teaching behaviour so that development in the cognitive and affective domains of pupils can be brought in. Efforts were also made to identify teaching skills for teaching different subjects. Also the microteaching technique was researched for improving upon general teaching competence. Later, different strategies of integration of teaching skills were tried out. Another group of researchers tried to find out the teaching patterns which are conducive for developing cognitive and affective behaviour. It is generally agreed that the objectives to be achieved through the teaching –learning process are multidimensional in nature. It is also felt that a particular method or technique may not be appropriate for achieving the multi-dimensional objectives. This led researchers to explore the use of various methods and techniques in an integrated fashion which resulted in the development of new instructional strategies. The greatest emphasis was on development of the cognitive domain. All these efforts did little for achieving the all-round development of the personality of the child. In other words, cognitive, affective and psychomotor behaviour must be developed in a balanced and integrated fashion. Models of Teaching have great potentiality for achieving this goal of education.

Joyce and Weil (1980) developed more than 20 models which were grouped on the basis of their chief emphasis— the way they approached educational goals and means. They have classified models into four families. These are Information Processing Models; Social Interaction Models; Personal Models; and Behaviour Modification Models. Information Processing Models share an orientation towards the information-processing capability of students and ways they can improve their ability to master information. Various models of this

family are the Inductive Thinking Inquiry Model, Scientific Inquiry Model, Inquiry Training Model, Concept Attainment Model, Cognitive Growth Model and the Advance Organizer Model.

Social Interaction Models emphasize the relationships of the individual to society and to other persons. Among models falling under this category are the Group Investigation Model, Social Inquiry Model, Laboratory Method, Jurisprudential Inquiry Training Model, Role Playing Model, Value Discussion Model and the Social Simulation Model.

Personal models share an orientation towards the individual and the development of selfhood. Among models of this family are the Non-directive Teaching Model, Awareness Model, Synetics Model, Conceptual Systems Model and the Classroom Meeting Model.

Behaviour Modification Models were evolved from attempts to develop efficient systems for sequencing learning tasks and shaping behaviour by manipulating reinforcement. Exponents of reinforcement theory, such as Skinner (1957) have developed these models and operant conditioning as their central mechanism. Among the various models were the Programmed Instruction Model, Managing Behaviour Model, Relaxation Model, Anxiety Reduction Model, Assertive Training Model and the Simulation Model.

Related to Models of Teaching, this vital area of research, the first study at Ph.D. level, was completed in 1983 by Chitriv at Nagpur, while at M.Ed. level the first study was conducted in 1979 by Buddhisagar at Indore. By now a large number of studies have been completed. These relate to studies where in models of teaching have been used for teaching and for training of teacher educators and student-teachers in Models of Teaching. In short, the studies relate to the teaching and training aspects of Models of Teaching. Various models of teaching such as the Advance Organizer Model (Buddhisagar, 1979; Patania, 1980; Malik, 1985; Rajoriya 1986; Panda,1986; Senapati, 1986; Rajoria, 1987. The Inquiry Training Model (Katyal, 1985; Dubey, 1986), the Concept Attainment Model (Kumaria, 1985; Pani,1985; Das,1986; Behari, 1986; Gangrade, 1986, 1987), the Cognitive Growth Model (Senapaty,1985); the Jurisprudential Inquiry Model (Tiwari, 1986); and the Non-Directive Model (Sahani, 1986) have been investigated wherein teaching has been done with the help of Models of Teaching.

Related to Models of Teaching, six PhD studies were completed. These were by Chitriv (1983), Ghosh (1986); Pandey (1986), Buddhisagar (1987); Sushma (1987) and Baveja (1988). While comparing the Concept Attainment Model and Advance Organizer Model with traditional methods in terms of performance on the concept knowledge test, Chitriv (1983) found that the Advance Organizer Model as well as the Concept Attainment Model were significantly superior to the traditional method, whereas the Advance Organizer Model was superior to the Concept Attainment Model for teaching mathmatical concepts to XI grade students. Prose-passage type and pictorial type advance organizers facilitated the retention of Life Science subject matter even after an interval of four weeks (Ghosh, 1986). Ghosh also observed that instructional strategy with a pictorial type of advance organizer was found to be better than the prose-passage type of advance organizer. Pandey (1986) reported that both the Advance Organizer Model and Inquiry Training Model were significantly superior to the traditional method in terms of pupil achievement, whereas all the three were equally effective in terms of pupils' attitude towards social studies. The Advance Organizer Model and Operant Conditioning Model were significantly superior to the traditional method in terms of achievement of B Ed students in educational psychology (Buddhisagar, 1987). The Concept Attainment Model and Biological Science Inquiry Model were found to be significantly superior to conventional teachng in terms of class VIII pupils' achievement (Sushma, 1987) The Concept Attainment Model and Inductive Thinking Model were found to be superior to the traditional method in terms of concept attainment and retention (Baveja, 1988).

Programmed instruction is based on the theory of operant conditioning as is the Operant Conditioning Model which has been used in developing programmed learning material. Programmed learning material has been compared with conventional methods of teaching (Shah, 1964; Desai, 1966; Sharma, 1966; Shah,1969; Kulkarni, 1969; SIE Gujarat 1970a; 1970b; Nagar, 1971; Sharma, 1971; Sharma, 1972; Joshi, 1972; Mehta,1973; Pandya, 1974; Reddy, 1975; Patel, 1975; Govinda, 1976; Chandrakala, 1976; Sabharwal, 1978; Parlikar, 1979; Pandey, 1980; Inamdar, 1981; Suthar, 1981). All these studies reported that programmed learning material was significantly superior to conventional methods of teaching in terms of achievement. Further, these experimental studies were conducted both at school as well as college levels and covered various academic subject areas. It may, therefore, be said that the Operant Conditioning Model has been used in developing instructional material. There is a need to use

this model during teaching and find out whether it helps in modifying the behaviour of pupils in desired directions.

New efforts have been made in training teacher educators and, in turn, student-teachers in Models of Teaching. Passi, Singh and Sansanwal (1985) developed a training strategy for training teacher educators in Models of Teaching. The training comprised orientation in the theory of the model, lesson plan guide, teaching analysis guide through lectures and discussion. This was followed by demonstration lessons and practice in quadro. The training strategy was found to be effective in terms of theoretical understanding of the model and a favourable change in teacher educator's reactions towards models of teaching. In this study, the Concept Attainment and Inquiry Training Models were taken up. This strategy was replicated on a different sample of teacher education in 1986. The models of teaching considered were the Advance Organizer Model and the Jurisprudential Inquiry Model. A national project related to Value Clarification was completed in March 1988. In this project, the Value Discussion Model and Jurisprudential Inquiry Model were studied. This project was completed by the Department of Education, Devi Ahilya Vishwavidyalaya, Indore, in collaboration with the Department of Teacher Education, Special Education and Extension Services, NCERT. Again in 1988, a new batch of teacher educators were trained in the Value Analysis Model for studying its impact on the value clarification ability of student-teachers. New models of teaching are being investigated, new indigenous training approaches have been designed. The only PhD study related to training has been by Awasthi (1988) who found that the Continuous Demonstration with Pair Practice (CDP) strategy and Intermittent Demonstration with the Quadro Practice (IDP) strategy were found to be equally effective in terms of theoretical understanding of the Concept Attainment Model, while in terms of teaching competency, the IDP-Practice strategy was significantly superior to the CDP-Practice strategy.

On the basis of studies presented in this category, it may be said that the conventional method of teaching different subjects at various levels was found to be less effective than various innovative teaching patterns like programmed instruction, instructional strategies and models of teaching in terms of achievement of students. In spite of this, it is difficult to determine which instructional strategy, pattern of teaching or model of teaching is most appropriate for teaching different subjects at various levels. This is due to the fact that no two studies are alike in all respects such as, design, sample, tools, treatment, dependent variable, etc. The researchers took achievement as a criterion variable. There is need to deviate from this traditional approach to selecting a criterion variable. In the case of some studies, the criterion variable belongs to the affective domain. The psychomotor domain seems to be out of sight of researchers. In the case of Models of Teaching, Joyce and Weil (1980) have given instructional effect as well as nurturant effect for each model. Thus, studies may be designed in developing tools to measure these effects and thus facilitate study of the effectiveness of the model of teaching in terms of instructional and nurturant effects.

Teacher Factor/Teacher Behaviour/ Teaching Strategy/Learning Outcome

There was a steady increase in the number of studies in this area up to the Third Survey, but no study was reported in the Fourth Survey which could be classified in this area. Ten studies of the earlier surveys have been classified in this area with a little conceptual constraint.

Jangira (1972) investigated the relationships among classroom behaviour training, teacher behaviour and pupil adjustment after employing appropriate controls. Teachers trained through Flander's Interaction Category System exhibited indirect classroom behaviour which was liked by students (Malhotra, 1976). Training in Flander's Interaction Category System modified the teachers' indirect behaviour positively, which in turn affected the academic achievement of pupils (Raijiwala, 1976). Roka (1976) reported that, apart from the training in the theory and practice of interaction analysis, additional training in interactive behaviour, such as asking divergent questions, lecturing and student response significantly affected achievement at understanding and application levels. Naidu (1980) and Tareen (1980) also studied relationships among teacher training, teacher behaviour or teacher competence and pupil academic achievement. Passi and Sharma (1982), and Sharma (1981) investigated the relationship between presage, process and product variables of Hindi and language teachers. It was found that training through instructional materials in simulated condition improved teaching competence, which ultimately facilitated the achievement of pupils in the classroom. Keeping classroom instruction in focus, Raghavakumari (1978) studied teachers' attitudes and perceptions, and

pupil perception. The classroom ethos and its relationship with teacher behaviour characteristics and teacher morale were investigated by Mahatma (1980). From these studies it is evident that achievement in school subjects was the criterion variable. Learners' outcome should have been extended beyond the cognitive domain. The affective and psychomotor domains should have also been explored.

OBSERVATIONS

Design/Research Method

In the area of Teaching and Models of Teaching, various methods, viz., correlational, survey and experimental, were used by the researchers. It is important to note that the frequency of the experimental studies is increasing. Pre-experimental design, quasi-experimental design, and true experimental design have been employed.

Some studies have employed true experimental designs, namely, pretest post-test control group design, and post-test only control group design. Perhaps in educational researches, true experimental designs may not be applicable because they require random selection of subjects and control of extraneous variables. Both these conditions are difficult to satisfy in educational researches involving large numbers of human beings. In actual practice, researchers are forced to take intact classes. Similarly, the control of extraneous variables is difficult. Under such circumstances, quasi-experimental designs are more appropriate for conducting experiments. Appropriate use of experimental design will facilitate validation of results.

Sample

Studies falling under Teaching and Models of Teaching have employed random, purposive, stratified purposive, stratified random, multistage random, and cluster random techniques. A large number of studies were carried out on student-teachers and pupils of high schools. The sample size ranged from very small to medium-sized. Some researchers and evaluators have questioned these small-size sample studies. But the available methodological facilities have come to the rescue of such small-sample studies. Apart from this, these small-sample studies have gone deeper in their treatment, and this justifies their stand as far as the quantum of work is concerned. The case study, interdisciplinary, and qualitative approaches have contributed meaningful insight into the complexities of related phenomena. However, research studies related to the elementary stage, college stage, etc. must be undertaken in future.

Instruments of Measurement

Researchers have developed tools to measure factors related to both cognitive and affective domains. In some cases, standardized tools have been used as they are, and somtime these tools were adopted to suit the objectives and conditions. There is need to develop new tools for measuring variables, such as higher mental abilities in different subjects, tolerance for ambiguity, logical thinking, and concentration power.

Measurement of Learning Outcomes

Another serious drawback arises from the difficulty of 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 within the classroom situation. This might be because of heavy dependence on paper-pencil tests. There is therefore an urgent need for moving away from the paper-pencil test measurement to action-oriented measurement of pupil behaviour. Of late, efforts have been made to measure higher mental processes but these also do it through paper-pencil tests. One of the reasons for using these tests may be that they give the researcher numerical data which can be analysed using sophisticated statistical techniques. There is a need of deviation from quantitative analysis to qualitative analysis. Researchers need to be oriented to the qualitative approach too.

Analysis of Data

The attempt to break academic achievement into different components, including 'higher-mental-process', the search for appropriate statistical techniques, and, consequently, the increase in the use of non-parametric techniques have to be appreciated. Multiple regression and factor analysis, though used in a small number of cases, have brought valuable results. Most of the research studies have adopted only quantitative methods of analysing data. In addition to the quantitative approach, the researchers need to use qualitative methods

of data analysis. This will help them in developing new and more comprehensive perspectives.

CONCLUSIONS

1. The general qualities of popular teachers have been explored by a few researchers in the past. These qualities have been measured with the help of available tools—MMPI, 16 PF, TTCT, etc. Some researchers have even-designed new tools for measuring some variables, like intelligence, adjustment and teaching aptitude. There is an urgent need to identify new variables and profiles of special teachers working in varying conditions of schools, grades, subjects, nature of students, geographical area, etc. It is necessary that researchers should develop the profile of teachers teaching in Navodaya schools, in tribal schools, in rural single-teacher schools, and overcrowded urban schools. In the same manner, profiles of teachers teaching different subjects, like languages, social sciences and sciences have to be developed through research. What will be the teachers' profile vis-a-vis varying emphasis on objectives related to cognitive, affective, and psychomotor domains? Research ought to answer these questions.

2. There is a fortunate trend of continuity in research in teacher behaviour where Flanders' Interaction Analysis Category System (FIACS) has been consistently employed across subjects, grades and regions. The FIACS measures democratic-authoritarian aspects of classroom climate. The democratic behaviour of the teacher is very important but it does not reflect other aspects of desired classroom behaviour such as creative classroom climate, problem-solving environment, environment of developing inquiry training skills, risk taking, environment for personality unfolding in a non-directive manner, environment conducive for developing humour and fantasy and imagination. Apparently, the measurement of such types of classroom environment is difficult. Some observation systems are already available for measuring some of the cited classroom behaviours. Nevertheless, some new observation schedules/systems need to be developed. Today it is possible to use these observation systems because video recording of behaviours in the classroom is possible. The need is to develop instruments to measure new variables.

3. Studies have been carried out to examine underlying relationships among Teacher Factors, Teacher Behaviour/Teaching Strategies and Learning Outcomes. Very few studies have been conducted by using non-intellectual and psychomotor learning outcomes. It is expected that new studies will be undertaken in this direction.

4. Teaching skills in respect of subjects such as Hindi, English, physics, mathematics, science and social sciences have been identified. The findings reflect that there are some general skills which cut across the school subjects, and there are some subject-specific skills. The identification of these specific skills at different levels of education and for various subjects has to be encouraged through research. In addition to this, there is need to identify skills for developing inquisitiveness, higher mental abilities, risk-taking behaviour, analytical abilities, scientific outlook, value clarification skills, nationalism, etc. In other words, objective-based specific skills need to be identified. Recently attempts have been made by D Lima and Sugandhi (1986) to identify teaching skills in the context of the Inquiry Training Model. Similarly, new sets of teaching skills may be identified with reference to the Concept Attainment Model, Advance Organizer Model, Non-Directive Model, Value Discussion Model, Jurisprudential Inquiry Model, Operant Conditioning Model, etc.

5. Microteaching technique is effective in developing general teaching competence as well as specific teaching competence. Also, attempts have been made to find out the best strategy of integration of skills. More systematic efforts are needed in this direction. The integration of skills may vary with resect to class size, facilities available, organizational set-up, school climate, and characteristics of teachers. During the process of integration the feedback mechanism plays an important role. In this age of technology, new feedback mechanisms may be evolved which will make the development of skills and their integration more effective.

6. Models of teaching as an area of research is emerging in a significant manner. Instructional effects and nurturant effects for each of the models of teaching have been hypothesized. For the Concept Attainment Model, the hypothesized effects are improved concept building strategies, inductive reasoning, tolerance of ambiguity, sensitivity to logical reasoning in communication; for the Inquiry Training Model the effects are scientific process skills, strategies for creative inquiry, spirit of creativity, autonomy in learning, tolerance of ambiguity. The effectiveness of each model of teaching should be studied in the context of these variables. This activity will demand the development of new tools of measurement. Apart from this, the worksheets, the teaching analysis guides, and lesson plan formats have to be de-

veloped and their impact studied on the achievement of these objectives studied for which a given model of teaching has been designed.

7. The literature covers three approaches to training in models of teaching. The three approaches are: The 'Understanding First' approach, the 'Quick Overview and Real Thing' approach, and the 'See the Real Thing First and Find Out Later' approach. One may compare these approaches in terms of different types of dependent variables. Further, there is a need to develop a new training strategy which takes into account the training of teachers, training of student-teachers, and using the model of teaching in the classroom.

It is, thus, expected that in future Indian researchers will monitor their research activities in the context of new demands from the teacher, on the one hand, and the National Policy on Education, the New Teacher Education Framework, and research gaps in teaching and models of teaching, on the other.

ABSTRACTS: 1178-1204

1178. BHALWANKAR, A.G., *A Study of Effects of Expository and Guided Discovery Methods of Teaching Mathematics on the Achievements of Students of Different Levels of Intelligence* Ph.D. Edu., Poona U., 1985

The objectives of the research were (i) to study the differential effect of guided discovery and expository methods of teaching mathematics on the achievements of students, (ii) to compare the effects of guided discovery and expository methods of teaching mathematics on the achievements of students of different levels of intelligence measured in terms of knowledge, comprehension and application objectives, (iii) to study the differential effects of guided discovery and expository methods of teaching mathematics on the retention of the students, (iv) to compare the effects of guided discovery and expository methods of teaching mathematics on the retention measured in terms of knowledge, comprehension and application objectives with respect to students of different levels of intelligence, and (v) to study and compare interaction pattern associated with guided discovery and expository methods of teaching mathematics.

The basic design of the experiment was 2×3 factorial design. One factor was method at two levels—expository and guided discovery method and the other factor was intelligence at three levels—high, middle, and low intelligence of the students. In order to control the effect of pre-achievement on subsequent achievement, a pre-achievement test was administered. The criteria used for studying the comparative effectiveness of these two methods were achievement scores on test items based on knowledge, comprehension, and application objectives. Retention of the content was also measured by administering the same test after three weeks of the conclusion of the experiment. In order to study the interaction pattern associated with the expository and guided discovery methods, all the lessons were audiotaped. These lessons were analysed by using a specially designed observation system for instructional analysis. The conclusions were drawn by using various statistical techniques such as t-test, ANOVA and ANCOVA.

Major findings of the study were: 1. Guided discovery and expository methods were equally effective on knowledge and comprehension objectives with respect to both immediate post-test as well as retention test. 2. The expository method was more effective than the guided discovery method on the criterion of scores on application objectives with respect to students of high intelligence. 3. The guided discovery method was more effective than the expository method on the criterion of percentage of retention scores on the application objective in the case of students of low intelligence. 4. The guided discovery method was more effective than the expository method on the criterion of percentage of retention scores with respect to total achievement of the students of middle intelligence. 5. The guided discovery method was associated with an indirect pattern, whereas the expository method was associated with a direct pattern. 6. Teachers' indirect behaviour decreased with decrease in level of intelligence. 7. The expository method was significantly more effective than the guided discovery method on the criterion of scores on the application objective test items in the case of students of high intelligence.

The main educational implication of this study is that one cannot be rigid in the use of teaching methods. All teaching methods are effective in certain situations and not so effective in other situations. Content and objectives determine the methods to be used.

1179. BUDDHISAGAR, M., *Development and Comparison of Instructional Material Developed by Using Advance Organizer Model and Operant Conditioning Model for Teaching Educational Psychology to B.Ed. Students,* Ph.D. Edu., DAVV, 1987

The objectives were (i) to develop two types of instructional material, namely, material based on the Advance Organizer Model and the Operant Conditioning Model for teaching educational psychology to BEd students and to study their effectiveness in terms of achievement of students on criterion tests and reaction of students towards the instructional materials, (ii) to compare the achievement of students who have studied through the instructional material based on the Advance Organizer Model and Operant Conditioning Model and those taught through traditional methods by taking intelligence as covariate, (iii) to study the effect of treatment, intelligence, attitude towards teaching profession and their interactions on overall achievement of students, (iv) to study the effect of treatment, intelligence, creativity and their interactions on overall achievement of

students, (v) to study the effect of treatment, personality, creativity, and their interactions on overall achievement of students, (vi) to study the effect of treatment, attitude towards teaching profession, personality, and their interactions on overall achievement of students, (vii) to study the effect of treatment, attitude towards teaching profession, creativity, and their interactions on overall achievement of students, (viii) to study the change in reaction of students towards Programmed Learning Material (PLM) and Advance Organizer Material (AOM) separately, and (ix) to study the students' reaction towards PLM and AOM separately with respect to their levels of intelligence, creativity, personality and attitude towards the teaching profession.

The study was carried out at two stages. At the first stage the instructional materials were developed. For this, 109 BEd students admitted during the 1983-84 academic session in the University Teaching Department of Education, Devi Ahilya Vishwavidyalaya, Indore, were taken. The sample for the second stage comprised 139 students admitted during the 1985-86 academic session in the University Teaching Department of Education, Devi Ahilya Vishwavidyalaya, Indore. These students were divided into three groups. The study was designed on the lines of post-test only central group design. There were three levels of treatment and three groups of students. The treatments were randomly assigned to the three groups. Group I received the treatment of linear PLM, group II received the treatment of AOM and group III was given the treatment of traditional method. Four topics were taken up for experimentation. These were learning, transfer of learning, memory and forgetting, and mental health and adjustment. The achievement of students on criterion tests and reaction of students towards instructional material constituted the dependent variables. Attitude towards teaching profession, creativity, extraversion-introversion were the independent variables. Intelligence was measured with the help of Advance Progressive Matrices developed by Raven. Attitude towards the teaching profession was measured by using the attitude scale developed by Katti and Bannur. The split-half reliability coefficient was 0.76 while self correlation of the scale in full length was 0.96. The Torrance Test of Creative Thinking (Figural form B) was employed for measuring creativity. Its interscores reliability was 0.90. The relationship between scores on TTCT and measures of intelligence was 0.06 in the case of figural creativity. The extraversion-introversion trait of personality was measured with the help of the Maudsley Personality Inventory. Its split-half reliability was 0.71 for neuroticism and 0.42 for extraversion. Achievement was measured with the help of criterion tests developed by the investigator. A Reaction Scale was also developed by investigator for measuring reaction towards PLM and AOM separately. The data were analysed by computing mean, percentiles, and using $3\times2\times2$ factorial ANOVA with unequal cell size followed by t-test and chi-square technique.

The findings were: 1. The instructional materials PLM and AOM were found to be effective in terms of achievement of students on different criterion tests and reaction of students. 2. The PLM as well as AOM were found superior to the traditional method, and PLM and AOM were equally effective when students' mean achievement scores were adjusted with respect to intelligence. On the other hand, when the overall mean achievement score of students was not adjusted with respect to intelligence, AOM was found to be superior to PLM. But AOM as well as PLM were superior to the traditional method. 3. Intelligence was found to affect significantly the overall achievement of students. Highly intelligent students were found to achieve high. 4. Attitude towards the teaching profession did not affect significantly the overall achievement of students. 5. There was no significant effect of creativity on overall achievement of students. 6. There was no significant effect of personality on overall achievement of students. 7. There was a significant effect of interaction between treatment and intelligence on overall achievement of students. Further it was found that low intelligent students could be taught effectively with the help of AOM. 8. There was no significant effect of interactions between treatment and attitude towards teaching profession, treatment and creativity, treatment and personality, intelligence and creativity, creativity and personality, attitude towards teaching profession and personality, attitude towards teaching profession and creativity, between treatment, intelligence and attitude towards teaching profession, between treatment, intelligence and creativity, between treatment, attitude towards teaching profession and personality, between treatment, attitude towards teaching profession and creativity, between treatment, creativity and personality on overall achievement of students. 9. There was significant effect of interaction between intelligence and attitude towards teaching profession on overall achievement of students. Further it was found that, as the degree of favourable attitude towards teaching profession decreased, the overall achievement of high intelligent

students increased sharply while that of low intelligent students decreased sharply. 10. Students belonging to different levels of intelligence, creativity, extraversion-introversion dimensions of personality and attitude towards teaching profession had equally favourable reactions towards PLM as well as AOM.

1180. CHOUDHARI, K., *A Factorial Study of the Teaching Competencies of Teachers Teaching English at the Secondary School Level,* Ph.D. Edu., SNDTU., 1985

The objectives of the study were (i) to identify the competencies required of a teacher teaching English at the secondary school level, (ii) to explore how the competencies identified varied with demographic variables of teachers, viz., sex, age and educational qualifications, (iii) to determine the relationship of the competencies identified with the presage variables of teacher's intelligence, her attitude towards teaching, her interest in teaching, (iv) to determine the relationship of the competencies identified with the product variables of pupil achievement in English and pupil liking for the teacher, and (v) to investigate how the competencies identified varied with contextual variable of rural/urban teachers.

This was a correlational survey study. It had two phases: a factorial phase and a correlational phase. The sample consisted of teachers teaching English drawn by the stratified random sampling method. Data were collected with respect to 178 teachers from Pune and Indore district. Teachers were administered Raven's Standard Progressive Matrices, the Teacher Attitude Scale, the Interest Inventory and the Self-perception Scale. Teachers were observed twice in the classroom with the help of a tool constructed by the researcher. A random sample of 20 students of each teacher observed was administered the Pupil Liking Scale. Students' final examination marks were taken as the indicator of pupil achievement. Clusters of teacher behaviours observed were obtained by factor analysis using the principal component method with varimax rotation. The significance of the difference between scores obtained by teachers on these clusters was found out with respect to demographic variables using t-test. The relationship of competencies and pupil achievement was found out by product-moment correlation.

The major findings of the study were: 1. The pedagogical domain of teaching competency in English consisted of 12 competencies which were independent of each other. 2. The competency 'Structuring Questions' accounted for 32 per cent variance and correlated significantly with both the product variables. 3. All the competencies correlated positively with the product variables. 4. The contextual variable of location of school had an effect on half the number of competencies. 5. The demographic variables of teacher, sex and educational qualifications had been found to have an impact on almost half the number of the competencies. 6. Teachers' intelligence and attitude were found to be associated with some of the competencies.

***1181.** HANS, R., *Relationship among Teaching Style, Learning Gains and Teaching Effectiveness,* Ph.D. Edu. Mee. U., 1986

The objectives of the study were (i) to compare teachers in respect of their personality attributes having direct and indirect teaching influence styles, (ii) to compare the effects of two teaching styles on learning gains in classroom situations, (iii) to compare the perception of the students in respect of teaching styles. The hypotheses formulated were; (1) Teachers with direct teaching influence style and indirect teaching influence style would significantly differ in their personality attributes. (2) Students taught through indirect teaching influence style would make greater learning gains than those taught through direct teaching influence style. (3) Students taught through indirect teaching influence style were likely to perceive such a teaching style as more effective than those taught through direct teaching influence style.

The present causal comparative-cum-experimental study was conducted in Bijnor district of UP, 60 teachers teaching either biology or civics to grade XI students, and 300 civics students and 300 biology students from class XI were selected, using stratified random sampling procedure. Standardized achievement tests on botany, zoology and political science were constructed. Other tools used were Progressive Matrices (Raven), Teacher-Pupil Interaction Analysis Scale (Flander), a Hindi adaptation of Cattell's Sixteen Personality Factors Questionnaire (Kapoor) and the Teaching Effectiveness Rating Scale. The data were analysed using t-test and ANOVA.

The major findings of the study were: 1. The indirect teaching style teachers in general were characterized by higher scholastic mental capacity, higher ego strength,

less dominance, weaker super ego, alaxia, autia, shrewdness, radicalism, group adherance and a high self-concept. 2. The indirect teaching style teachers were characterized by lower mental scholastic ability, lower ego strength, dominance, strong super ego, protension, alertness, conservatism, self-sufficiency and low integration. 3. The teachers with a normal teaching style had been found to have an average position in respect to the 11 personality traits. 4. Intellectually superior teachers tended to adopt indirect teaching style and less superior teachers adopted direct teaching style. 5. Young teachers used to teach through indirect style of teaching and elder teachers adopted direct teaching style. 6. Teachers teaching through an indirect teaching style were able to develop greater learning gains among their pupils than teachers teaching through a direct teaching style. 7. Indirect teaching style teachers were perceived by their students to be more effective in teaching than the direct teaching style teachers.

1182. JAIN, R., *Nonverbal Classroom Interaction Patterns of Language, Social Studies and Science Teachers*, Ph.D. Edu., Mee. U., 1983

The objectives were (i) to compare nonverbal interaction patterns of language, social studies and science teachers, and (ii) to compare nonverbal interaction patterns of male and female teachers. The hypotheses were: (1) There is significant difference in verbal and nonverbal interaction patterns of language, social studies, and science teachers. (2) The male teachers differ significantly from female teachers in using verbal and nonverbal interaction patterns. (3) The amount of direct verbal behaviour has a significant relationship with the amount of restricting nonverbal behaviour. (4) The amount of indirect verbal behaviour has a significant relationship with the amount of encouraging nonverbal behaviour.

The sample comprised 299 student-teachers. The cluster random technique was employed to select the sample. The sample belonged to six training colleges of Rajasthan University. The age of subjects ranged from 18 to 37 years. The observation instrument was the French-Galloway adaptation of the Flander's System for Interaction Analysis called Indirect-Direct Encouraging-Restricting (IDER) which considered both combined verbal and nonverbal as well as the nonverbal dimensions of classroom interaction.

The IDER system consisted of 20 types of nonverbal behaviour which were classified in two categories, namely, encouraging and restricting. The encouraging category comprised: 1. Acceptance, 2. Congruent, 3. Implement, 4. Personal, 5. Responsive, 6. Involve, 7. Firm, 8 and 9. Receptive, and 10. Comfort. On the other hand the restricting category consisted of: 11. Indifferent, 12. Incongruent, 13. Perfunctory, 14. Impersonal, 15. Unresponsive, 16. Dismiss, 17. Harsh, 18 and 19. Inattentive, and 20. Distress. The data were analysed by using chi-square test, t-test, and by computing percentages and correlation.

The findings were : 1. Male language teachers had a greater tendency towards responsive lecturing, unresponsive lecturing, attentive pupil initiation, impersonal asking questions, inattentive-student talk response, inattentive-student talk initiating, and distressful silence. Female language teachers seemed to have greater behaviours of 2, 4, 6, 8, 10, 12, and 16 categories than male language teachers. 2. Male social studies teachers used 9, 12, 15, 17, 19, and 20 behaviour categories more. Female social studies teachers used 2, 5, 6, 7, 10, and 16 behaviour categories more. 3. There was a greater tendency for 4, 5, 8, 9, 13, 15, and 19 categories in male science teachers. Female science teachers used 2, 3, 10, and 20 categories more than male science teachers. 4. Language teachers showed a greater tendency for 3, 4, 6, 7, 10, 13, 16, 17 and 20 categories in comparison to social studies teachers, while social studies teachers used 5, 14 and 15 categories more than language teachers. 5. Social studies teachers used 5, 8, 14, 15, 16, 18, and 19 categories more than science teachers. Science teachers had a greater tendency for 3, 4, 6, 9, 10, 13 and 20 categories than social studies teachers. 6. There was a greater tendency for 6, 7, 8, 14, 15, 16, 17, 18, 19, and 20 categories in language teachers than science teachers and 3, 4, 5, 9, 10 and 13 categories in science teachers than language teachers. 7. Female language teachers showed significant difference from male language teachers for E/R ratio and S/T ratio. 8. There was significant difference between male and female social studies teachers for E/R ratio. The female social studies teachers showed a greater tendency for this behaviour. 9. There was no significant difference between male and female science teachers for any ratio. 10. Language teachers differed significantly from social studies teachers for I/D ratio and S/T ratio. 11. Science teachers had higher I/D ratio than social studies teachers. 12. There was significant difference between language and science teachers for I/D and I/D ratio. Science teachers showed greater tendency for these behaviours. Language teachers seemed to have more

student-talk than science teachers. 13. There was a significant difference between male and female teachers with regard to E/R ratio. 14. There was significant difference between male and female language teachers for encouragement, restrictiveness and directness. Female language teachers were more encouraging nonverbally than male language teachers. Male language teachers had more restricting nonverbal behaviour and more direct verbal behaviour than female language teachers. 15. Female social studies teachers had more nonverbal encouragement. Male social studies teachers used more nonverbal restrictiveness. 16. There was no significant difference between male and female science teachers for encouragement, restrictiveness, indirectness, and directness. 17. Social studies teachers were significantly more direct in their verbal behaviour than language teachers. 18. Science teachers had significant difference regarding encouragement and indirectness from social studies teachers. Science teachers showed a greater tendency for these behaviours. Social studies teachers had more directness than science teachers. 19. Science and language teachers differed significantly on encouragement and indirectness. Science teachers were more encouraging nonverbally and more indirect in their verbal behaviour. 20. There was significant difference between male and female teachers with regard to encouragement and restrictiveness. 21. There was no significant relationship between the amount of encouragement, nonverbal behaviour and indirect verbal behaviour. 22. There was no significant relationship between the amount of restricting nonverbal behaviour and direct verbal behaviour. 23. It appeared that personal questioning and attentive pupil response followed each other for all teachers. Sometimes this sequence was interrupted by involving direction and distressful silence. 24. Attentive pupil response was followed by involving direction, responsive lecturing and implementary use of pupil ideas for all teachers. 25. Male language teachers had larger transitions from responsive lecturing to unresponsive lecturing, from impersonal questioning to inattentive pupil response, and from inattentive pupil response to involving direction, whereas female language teachers had greater transitions from harsh criticism to involving direction, from personal questioning to attentive pupil response and from attentive pupil response to involving direction. 26. Male social studies teachers had greater transitions from involving direction to impersonal questioning and inattentive pupil response, and from distressful silence to harsh criticism while in female social studies teacher, attentive pupil response was followed by impersonal questioning, responsive lecturing and involving direction more. 27. Personal questioning and attentive pupil response followed each other more quickly in male science teachers than in female science teachers. 28. Female language teachers had more comforting silence whereas male language teachers had more distressful silence. 29. Female social studies teachers had more responsive lecturing events and comforting silence events while male social studies teachers had more unresponsive lecturing events and distressful silence events. 30. Unresponsive lecturing was more for male science teachers while comforting silence and distressful silence were more for female science teachers. 31. In language teachers, attentive pupil response was followed by involving direction while it was followed by responsive lecturing in social studies teachers. 32. Social studies teachers had more transitions from responsive lecturing to unresponsive lecturing, from involving direction to impersonal questioning and inattentive pupil response, and from distressful silence to impersonal questioning, responsive lecturing and dismissing direction while science teachers had larger transitions from attentive pupil response to perfunctory use of pupil ideas. 33. Attentive pupil response was followed by responsive lecturing more in social studies teachers and attentive pupil response was followed by involving direction more in science teachers. Responsive and unresponsive lecturing was more for social studies teachers while comforting and distressful silence was more for science teachers. 34. Language teachers had more transitions from responsive lecturing to unresponsive lecturing, from involving direction to harsh criticism and inattentive pupil response, from distressful silence to impersonal questioning and dismissing direction and from attentive pupil response to involving direction whereas science teachers had greater transitions from responsive lecturing to personal questioning, from personal questioning to involving direction and from attentive pupil response to perfunctory use of pupil ideas.

1183. JAIN, R., *Proficiency in Teaching as a Function of Creativity, Intelligence and Interests,* Ph.D. Psy., Agra U., 1977

The objectives were (i) to explore the area of proficiency in teaching as it specifically related to personality make-up of the teacher, (ii) to note characteristic influences of the five components of creativity, intelligence and ten

areas of interest upon proficiency in teaching so that better predictive value of these variables could be attained, (iii) to study both first and second order interactions between the variables for deeper understanding of the problem in view, (iv) to assist, on the basis of findings, in the programmes of selection of teachers as well as to provide relevant items of information for activity programmes in teachers' guidance.

The sample consisted of 160 subjects drawn through a multistage random sampling technique. They belonged to different levels of creativity, intelligence and interest. The Creativity Test developed by N.S. Chauhan and G.P. Tiwari was used to measure creativity. Intelligence was measured with the help of the General Mental Ability Test developed by M.C. Joshi. Chatterjee's Non-Language Preference Record was used to measure interest. Its split-half and KR 20 reliability coefficients ranged from 0.61 to 0.96 and 0.69 to 0.95 respectively. The Teacher Efficiency Scale developed by N.S. Chauhan and Rashmi Jain was used to measure teacher efficiency. Its test-retest reliability ranged from 0.57 to 0.78. Data were analysed with the help of factorial design analysis of variance of equal cell size.

The findings were: 1. Intelligence promoted proficiency in teaching and it tended to demote proficiency in teaching only when it was low. 2. Creativity components were prositively effective correlates of proficiency in teaching. For innovative and adventurous experiments and experiences, teachers should have a good 'creativity-reserve'. To make creativity as a promoter of teaching proficiency, high interest in scientific pursuits was a must; low interest in literary, medical and technical pursuits went against the promotive role of creativity. 3. Interests as sets of attention and preferences behind choice-behaviour, provided continuity to proficiency in teaching, as well as guided it in a characteristic way. 4. Potential teachers must possess a high level of creativity related to creative production, originality, flexibility, and ingenious solution to problems. 5. Intelligence, creativity and interests were characteristically interrelated in promotion of proficiency in teaching.

1184. KATHURIA, R.P., *The Effect of Teacher Led, Self Learning, Peer Group Discussion and Mass Media Approaches of Teaching Population Education to Classes IX and X on Knowledge, Attitudes and Beliefs of the Students about Population Explosion in India*, M.P. Field Office of NCERT, 1984

The objectives were (i) to experiment and determine as to which approach to population education was more effective in imparting knowledge and developing desired attitudes and beliefs and then to recommend its use in teaching topics related to population.

The four approaches experimented and tested in this study were (i) the usual teacher-led approach, (ii) the peer group discussion approach based on prior study of instructional material, and the groups reacting and discussing pros and cons of the issue, (iii) the self-instructional approach, and (iv) the mass-media approach. Fifty secondary schools, mostly from Bhopal Division and a few from Betul District, were chosen for this experiment which was conducted through the teachers. Orientation of teachers was conducted and 14 schools were assigned the teacher-led approach, 13 the peer-group approach, 9 the mass-media approach and 14 the self-instructional approach. The actual student participation was 283 in teacher-led, 175 in peer-group, 129 in self-instructional and 175 in mass-media approach.

The major findings were: 1. The peer-group discussion approach and mass-media approach were equally successful. 2. Peer-group and mass-media approaches were found to be better than the teacher-led approach. 3. The mass-media approach excelled the self-learning approach. 4. With regard to rural and urban settings of the schools and the students, it was found that self-learning and peer-group approaches were more suitable for rural settings and the mass-media approach for urban settings. 5. In regard to gain in knowledge of population it was found that students having less than two brothers and those having more than two sisters gained more knowledge than others. 6. When approaches in relation to number of sisters the students were compared, it was found that mass media excelled over the teacher-led approach, irrespective of number of sisters the students had. In case of students having less than two sisters, the mass media approach was found to be better than self-learning. However in the case of students having more than two sisters, the peer-group discussion approach was better. 7. In regard to the level of mother's education of the students, there was no difference in any approach. However, if the mother was educated up to secondary level, peer group and mass media were found to be equally effective and better than the teacher-led approach. If the mother was educated up to college level, then the mass media approach excelled over others. 8. Considering the level of father's education, it was found that sons of secondary school and college educat-

ed fathers gained more knowledge than others. If the father was illiterate there was found to be no difference in the gain in knowledge of the students. 9. With regard to effect of approaches on attitudes of the students, no significant difference was found on any count. 10. On analysis of impact of approaches on beliefs, it was found that girls developed stronger beliefs in population education than boys. 11. On comparison of approaches in regard to sex of the students, it was found that the self-learning approach excelled the peer-group approach in affecting beliefs among the boys.

***1185.** KOUL, L., *A Study of the Effects of Mastery Learning Strategies on Achievement Motivation and Test Anxiety of Socially Disadvantaged Group in Himachal Pradesh,* Dept. of Education, HPU, 1986 (UGC financed)

The main objectives of the study were (i) to study and compare the effects of mastery learning strategies on achievement motivation of socially disadvantaged students imparted instruction through Bloom's mastery learning strategy (LFM), Keller's Personalized System of Instruction (PSI), and conventional methods of teaching, and (ii) to study and compare the effects of mastery learning strategies on test anxiety of socially disadvantaged students imparted instruction through Bloom mastery learning strategy (LFM), Keller's Personalized System of Instruction (PSI), and conventional method of teaching.

Three groups randomized pretest–post-test design was used in the conduct of the study. For imparting instruction in the subject of science, Government High School, Kalpa, and Government High School, Giabong, were selected randomly from all the high schools of the tribal area of District Kinnaur of Himachal Pradesh. Two groups of 20 students each were selected at random from each of the sections A and B of the tenth grade of Kalpa High School and a cluster of all 20 students studying in the tenth grade of Giabong school were chosen for conducting the study. For imparting instruction in social studies, Government High School, Kalpa, and Government High School, Sangla, were selected randomly from all high schools of Kinnaur District. Two groups of 25 students each were randomly selected from the tenth grade students of the Kalpa school and a group of 25 students was randomly chosen from the students of the tenth grade of the Sangla school. The groups to be imparted instruction through mastery learning strategies were designated as 'experimental groups' and the groups to be imparted instruction through conventional methods of teaching as 'control groups'. For measuring achievement motivation Achievement Values and Anxiety Inventory (AVAI) and Achievement Motivation Test (1978) by Prayag Mehta were used while the Test Anxiety Scale by V.P. Sharma was used to measure test anxiety.

The findings of the study were: 1. The achievement motivation, of the students studying science, measured as scores on AVAI, taught through mastery learning strategies was significantly higher than that of groups taught through conventional methods of teaching. However, both the mastery learning strategies, namely, LFM and PSI, were equally effective in enhancing achievement motivation. 2. Achievement motivation (measured with TAT) of the science group imparted instruction through Keller's PSI was found to be significantly higher than that of the groups imparted instruction through Bloom's LFM and conventional methods of teaching. However, Bloom's LFM and conventional methods of teaching were found to have the same effect on achievement motivation. 3. Achievement motivation (as measured by AVAI) of the group of social studies students imparted instruction through PSI and conventional methods of teaching was significantly higher than that of the LFM group. 4. Achievement motivation (as measured by TAT) of the groups taught through mastery learning strategies did not differ significantly from that of the students imparted instruction though conventional methods in social studies. 5. Mastery learning strategies were found to be significantly equally effective in affecting the test anxiety of the groups of students as compared to conventional methods of teaching. However, there was a decrease in magnitude of the test anxiety of students imparted instruction through mastery learning strategies.

The present study has great educational implications. Since achievement motivation is a facilitating factor while test anxiety is a debilitating factor for achievement, the use of mastery learning strategies can be effective in enhancing achievement motivation, in reducing test anxiety and, consequently, may lead to better academic achievement by the students, especially those belonging to disadvantaged groups of tribal communities.

1186. MAHAPATRA, P.L. *Comparative Role of Intelligence, Attitude and Vocational Interest towards Success in Teaching,* Ph.D., Edu., Utkal U., 1987

The objectives of the study were (i) to develop a scale for

measuring teaching success, (ii) to find out the relation of intelligence, attitude and interest towards teaching success, (iii) to determine the predictive power of the predictors of the criterion in terms of percentage, (iv) to identify the predictor having the highest predictive power for success in teaching, and (v) to find out the relative position of other predictors.

The sample of the study comprised 420 BEd students studying in six government teacher training institutions and one women training college of Orissa. In the process of selection of the sample all the 1020 student-teachers of the above institutions were administered Patel's Teacher Efficiency Inventory. On the basis of test scores, 105 potential teachers were selected from each of the four categories, men and women, and rural and urban. Other tools used for the investigation were a Teaching Success Scale prepared by the investigator, Cattell's Culture Fair Intelligence Test Scale—3, Ahluwalia's Teacher Attitude Inventory, and Samal's Social Service Scale of the Vocational Interest Inventory. The test–retest reliability coefficient of the Teaching Success Scale was found to be 0.83. The concurrent validity coefficient of this test was studied against the Teacher Efficiency Inventory. The concurrent and predictive validity coefficients of the Teaching Success Scale were 0.56 and 0.63 respectively. The critical ratio and multiple coefficients of correlation were used for drawing conclusions.

The major findings of the study were: 1. Regional backgroud did not have a significant effect on all the four variables studied. 2. Sex had a significant effect on these variables, namely, teaching success, intelligence, attitude towards teaching and vocational interest. 3. The coefficients of correlation between teaching success and intelligence, attitude, and interest were 0.38, 0.27 and 0.25 respectively and were significant at 0.01 level of significance. 4. The coefficient of multiple correlation between teaching success and predictor variables was found to be 0.44 and was significant at 0.01 level of significance. 5. The combined predictive power of all the three predictors in predicting the criterion was found to be 23 per cent. 6. The predictive value of intelligence and attitude towards teaching success was 20 per cent, attitude and interest towards teaching success was 11 per cent and intelligence and interest towards teaching success was 19 per cent. 7. Among all the three predictors, the contribution of intelligence was 13 per cent. intelligence was considered to be the most influential predictor.

1187. MISHRA, P.K., *A Comparative Study of Different Feedback Methods for Changing Teacher Behaviour*, Ph.D. Psy, Utkal U., 1983

The main purpose of the study was to find out the relative impact of feedback from different sources in modifying teacher behaviour. The hypotheses of the study were (1) There would be significant and positive behavioural changes in student-teachers as a result of receiving feedback from different sources. (2) The group that received feedback from a larger number of sources would show better behavioural changes in comparison to groups receiving feedback from a smaller number of sources. (3) Peer observations and teacher's self-rating as sources of feedback would be comparatively more effective than feedback from other sources.

The sample of the study consisted of 160 teacher-trainees randomly selected from teacher training colleges of Orissa. These subjects were assigned to 16 equal groups, including one control group. Teacher behaviour Rating Scales standardized by Gage, Runkel and Chatterjee (1963) were administered. The experimental group received feedback from different sources like the students, peers, the supervisers and themselves in the pretest situation and their ratings were again recorded in the post-test situation for comparison. But the control group did not receive any feedback. Various statistical measures like mean, SD, 't' test, analysis of variance, correlation, Duncan's New Multiple Range Test were used in the study.

The major findings of the study were: 1. The post-test mean performances were better than the pretest mean performances. 2. The difference between post-test and pretest mean performances were mostly significant. 3. There were significant and positive behavioural changes in the student teachers as a result of receiving feedback from different sources. 4. Increasing the number of feedbacks had some facilitatory effect in changing teacher behaviour, but it did not always bring better results. 5. Self-rating was found to be the most effective source of feedback but peer-rating and student-rating were also effective in changing teacher behaviour.

1188. MISRA, R., *A Study of the Effect of Self-Rating and Class-Rating as Feedback on Teacher's Classroom Behaviour*, Ph.D. Edu., Avadh U., 1985

The investigation was designed to find out the effect of

self-rating and class-rating as feedback on teachers' classroom behaviour and was aimed at formulation of a classroom teaching feedback system for teachers.

The sample consisted of 74 lecturers and 2671 students drawn from twelve intermediate colleges in Sultanpur district.

To supply feedback to the teachers through self-rating a tool was prepared by the researcher. The researcher first listed 107 qualities or traits pertaining to the desired classroom behaviour of teachers. Out of these, the top 20 traits were selected with the help of students, teacher educators, college teachers, secondary school principals and educational administrators. These traits were taken as the criteria for self-rating and class-rating.

The main findings of the study were: 1. The teaching behaviour of teachers could be changed in a positive direction if they were apprised with the sum total of their teaching in the form of feedback information by way of self-rating and class-rating. 2. The difference between feedback effect by self-rating and class-rating was highest for language teachers. 3. Experienced teachers showed significant but low effect as compared to fresh teachers. 4. Female teachers were highly susceptible to behaviour change through feedback.

1189. PACHAURI, G.K., *Proficiency in Teaching as a Function of Personality Factors, Frustration (Regression and Aggression) and Sex,* Ph.D. Psy., Agra U., 1983

The objectives were (i) to study the individual as well as the collective impact of personality factors and sex, and two modes of frustration on proficiency in teaching, (ii) to study the interaction between personality factors and sex, personality factors and mode of frustration, mode of frustration and sex in as many as 40 studies for proficiency in teaching, and (iii) to study the interaction among personality factors, modes of frustration and sex in influencing proficiency in teaching.

The sample consisted of 160 teachers (80 males and 80 females) teaching in different intermediate colleges of Agra city. It was selected by employing the stratified random sampling technique. The Frustration Scale by N.S. Chauhan and Govind Tiwari was used to measure frustration. Personality was measured with the help of the 16 PF Questionnaire adapted in Hindi by S.D. Kapoor. The test–retest reliability ranged from 0.61 to 0.83. The Teacher Efficiency Scale by N.S. Chauhan and Rashmi Jain was used to measure teaching efficiency. The test–retest reliability coefficient was 0.78. Data were analysed with the help of factorial design analysis of variance of equal cell size followed by t-test.

The findings were: 1. Female teachers were more proficient in teaching than male teachers. 2. Teachers who were highly aggressive and regressive of either sex were more proficient in teaching. 3. Reserved, relaxed, adjusted and controlled teachers were more proficient in teaching than those who were outgoing, tense, relaxed and who possessed more anxiety. 4. Outgoing female teachers with low regression were more proficient in teaching. 5. Relaxed teachers of either sex were more proficient than tense teachers. 6. Teachers possessing high anxiety were more proficient in teaching. 7. Teachers who were highly aggressive and regressive of either sex irrespective of their personality were more proficient. 8. Less intelligent, imaginative trusted teachers with high aggression were better in teaching. 9. Female teachers belonging to the high regression group wanted drastic changes in the present structure for imparting education in their respective areas. 10. Male teachers demanded greater need of change in imparting education in comparison with femal teachers.

1190. PADMANABHAIAH, S., *Job Satisfaction and Teaching Effectiveness of Secondary School Teachers,* Ph.D. Edu., SVU, 1986

The objectives of the study were (i) to estimate the general level of dissatisfaction among secondary school teachers, (ii) to find out the influence of personal and demographic variables on teachers' job satisfaction or dissatisfaction, (iii) to find out the relationship between job satisfaction and job-related variables, job satisfaction and (job discrimination index and job involvement), and general satisfaction variables (family satisfaction and life satisfaction), (iv) to identify the personality factors which influenced the level of job satisfaction of teachers, (v) to develop an instrument for measuring teaching effectiveness, (vi) to find out the influence of personal and demographic variables on teaching effectiveness, (vii) to find out the relationship between teaching effectiveness and each one of the job-related variables and general satisfaction variables, (viii) to identify the personality characteristics that contributed to or affected teaching effectiveness, and (ix) to develop multiple regression equations in order to predict job satisfaction and teaching effectiveness with the

help of different groups of independent variables.

A total of 960 secondary school teachers (from 180 schools situated in both rural and urban areas) from all the three regions of the state served as subjects for the study. In all, 180 heads of institutions and 2160 students were used for obtaining the ratings on the teaching effectiveness of 960 teachers included in the sample. The tools used included, (i) a job satisfaction scale, (ii) a job discrimination index, (iii) a family and life satisfaction scale, and (iv) a rating scale to measure teaching efffectiveness—all developed by the investigator after establishing the validity and reliability of the instruments. Data were also collected using an adapted version of, (i) Lodahl and Kejner's Job Involvement Scale, (ii) Cattell's 16 PF Questionnaire, and (iii) Scheier and Cattell's Neuroticism Scale Questionnaire (NSQ). The data were analysed employing appropriate statistical techniques like chi-square, critical ratio, and F-ratio, and Multiple R.

The major findings were: 1. The teachers in general (72 per cent) were dissatisfied with their job. 2. The teachers in general were satisfied with the factors of job satisfaction—HM, suitability, students and coteachers and were dissatisfied with factors like policy matters, physical facilities, management policies, nature of work and activities of others. 3. All the personal and demographic variables, except the variable 'Qualifications of the teachers', could significantly influence the level of satisfaction with various job factors but not the total job satisfaction. 4. Male and female teachers were not significantly different in the level of their overall job satisfaction/dissatisfaction. 5. There was no significant difference between the teachers working in rural and urban areas in their level of satisfaction/dissatisfaction with their job as a whole. But the two groups were significantly different in their level of dissatisfaction with policy matters and management policies. 6. The teachers working in high schools were significantly more dissatisfied with physical facilities than those working in junior colleges. This may be due to very poor physical facilities existing in most of the high schools. 7. Married and unmarried teachers were significantly different in their level of satisfaction with only three job factors, viz., policy matters, suitability and students. 8. The three groups of teachers with low, average and high discrimination indices were significantly different in the level of their satisfaction with all the jobs factors as well as with their job as a whole. 9. Among the 16 Personality Factors described by Cattell, Factors C,L,N and Q_2 and the other personality factor Neuroticism of the teachers, could significantly influence their level of job satisfaction. 10. Among the 11 personal and demographic variables studied, only five—region, designation, age, experience and size of the family of the teachers could significantly influence the level of teaching effectiveness. 11. The multiple correlation between job satisfaction and the four independent variables—job discrimination index, job involvement, family satisfaction and life satisfaction—put together was 0.373. 12. The multiple correlation between teaching effectiveness and job satisfaction was 0.078. 13. All the four variables—job satisfaction, job involvement, life satisfaction and family satisfaction—put together could obtain a multiple correlation of 0.109 with teaching effectiveness. 14. Out of 35 variables studied only a few possessed significant coefficients of correlation with teaching effectiveness.

The educational implications are: (1) The government should extend the fringe benefits such as medical reimbursement, travel concessions to the teachers and higher educational facilities to their children free of cost. (2) There should be more intensive in-service training programmes which would enable all the teachers to know the recent developments in the practice of teaching. (3) The authorities should extensively involve senior teachers in policy-making with regard to the conduct of examinations and preparation of textbooks.

1191. PASSI, B.K., SINGH, L.C. and SANSANWAL, D.N., *Models of Teaching—Developing Training Strategy*, NCERT, New Delhi, 1985

The objectives were (i) to study the effectiveness of training in the Concept Attainment Model (CAM) in terms of, (a) understanding of, and (b) reaction towards the model, (ii) to study the effectiveness of training in the Inquiry Training Model (ITM) in terms of, (a) understanding of, and (b) reaction towards the model, (iii) to study the resultant willingness of teacher educators to implement the models in teacher education programmes, and (iv) to develop a strategy of training in Models of Teaching. The hypotheses were: (1) At the end of training in CAM, teacher educators will have greater understanding of the model. (2) The teacher educators will have favourable reaction towards the model as a result of the training. (3) At the end of the training in ITM, the teacher educators will have greater understanding about the model. (4) The teacher educators will have favourable reactions towards the model as

a result of training. (5) Willingness to implement the two models, CAM and ITM, will be developed in teacher educators as a result of training.

A purposive sample of 45 teacher educators was taken as subjects of the study. The teacher educators were invited to attend an eight-day workshop on Models of Teaching held at Devi Ahilya Vishwavidyalaya, Indore, in April 1985. The subjects represented 25 institutions from nine states and five union territories. The single group pretest-post-test design was employed in the study. The treatment comprised orientation in the theory of model, a lesson plan guide, and a teacher analysis guide through lectures and discussion. This was followed by demonstration lessons and practice. The tools used were: Theory check-up for CAM and ITM developed by Bruce Joyce and M. Weils at Indore, Theory check-up for CAM and ITM developed at Indore, Reaction Scale for CAM and ITM, and Willingness Scale for implementation of models developed for the study. The data were analysed by computing mean, standard deviation, coefficient of variation, and by employing t-test and chi-square test.

The findings were: 1. Training in CAM did bring significant favourable change in teacher educators' reactions towards CAM. 2. The level of understanding of CAM did not influence teacher educators' reactions towards CAM. 3. Training in CAM in the form of lecture, demonstration, discussion and peer practice plus feedback did enhance the understanding of teacher educators' theoretical aspects of CAM. 4. Training in ITM in the form of lecture, demonstration, discussion and peer practice, plus feedback did enhance the understanding of teacher educators' theoretical aspects of ITM. 5. Training in ITM did bring about favourable reactions of teacher educators towards ITM. 6. The understanding of ITM did not influence teacher educators' reactions towards ITM. 7. The teacher educators were willing to implement models of teaching in the teacher education programme if a support system was available. 8. The training strategy comprising theoretical discussion, demonstration, and peer practice plus feedback was found effective in terms of developing understanding, favourable reactions and willingness to implement models of teaching in a teacher training programme.

1192. PRAKASHAM, D., *A Study of Teacher Effectiveness as a Function of School Organizational Climate and Teaching Competency,* Ph.D. Edu., RSU, 1986

The objectives of the study were (i) to study the effect of school organizational climate on teacher effectiveness, (ii) to study the effect of teaching competency on teacher effectiveness, and (iii) to study the effect of school organizational climate on teaching competency.

The sample of the study consisted of 800 teachers teaching in classes IX, X and XI of different higher secondary schools of Raipur and Bilaspur districts of Madhya Pradesh, along with 92 principals of these schools. In all, 504 teachers were teaching in government schools, 73 in local body schools, 163 in private, non-Christian schools, and 60 in Christian schools. The relevant data were collected by employing the School Organizational Climate Description Questionnaire by Moti Lal Sharma, the General Teaching Competency Scale by B.K. Passi and M.S. Lalitha, and the Teacher Effectiveness Scale by Parmod Kumar and D.N. Mehta. Mean, T-values, coefficient of correlation, ANOVA and F-ratios were computed for analysing the data.

The findings of the study were: 1. Teachers working in an open school climate were better in teaching competency and teacher effectiveness than those employed in schools with autonomous, familiar, controlled, paternal and closed climates. 2. Teachers working in schools situated in industrial areas were found better in teaching competency than teachers working in semi-urban and rural, areas whereas teachers of semi-urban and rural areas were better in teacher effectiveness than the teachers of industrial areas. However, teachers working in schools situated in urban areas were better than teachers of all other areas on both teaching competency as well as teachere effectiveness. 3. No significant difference was found in the teaching competency and teacher effectiveness of the teachers working in government and non-government schools in global terms. However, teachers working in schools run by local bodies were found better in teacher effectiveness and teaching competency than those working in government schools, Christian schools and non-Christian schools. 4. No significant difference was observed between male and female teachers on the tests of teaching competency and teacher effectiveness on the global scale, though female teachers were found moderately better in teaching competency under all types of variations, whereas, they were found moderately better than male teachers in teacher effectiveness only under Christian management. In other types of variations no significant differences were observed in the teacher effectiveness of male and female teachers. 5 A positive and significant relationship was observed in the teacher effectiveness and

teaching competency of teachers in different types of organizational climates. 6. Among the various independent variables affecting teacher effectiveness, the main effect of teaching competency was found significantly higher than territorial variations or school organizational climate. The main effect of management types as well as sex on teacher effectiveness was found significant, and the joint interaction of territiorial variations and sex as well as territorial variation and teaching competency and sex was found to have a significant interactional effect on teacher effectiveness. No other interactional effect besides these was found to affect teacher effectiveness.

1193. PANDEY, S.N., *Effectiveness of Advance Organizer and Inquiry Training Models for Teaching Social Studies to Class VIII Students,* Ph.D. Edu., BHU, 1986

The objectives of the study were (i) to compare the effect of the Advance Organizer Model, Inquiry Training Model and Conventional Teaching in terms of pupils' achievement in social studies, (ii) to compare the effect of the Advance Organizer Model, Inquiry Training Model and Conventional Teaching in terms of pupils' attitude towards social studies, and (iii) to study the pupils' reactions towards the Advance Organizer Model and Inquiry Training Model.

The tools used in the study for collecting data were: 1. Samanya Mansik Yogyata Parikshan by M.C. Joshi, 2. Socio-Economic Status Index Scale by R.P. Varma, and P.C. Saxena, 3. Uplabdhi Parikshan by the researcher, 4. Samajik Adhyan Ke Prati Chhatra Abhivritti Tálika by the researcher, and 5. Shikshan Ke Prati Chhatra Pratikriya Suchi by the researcher.

A purposive sampling technique was used in the study. The final sample comprised 86 students of class VIII. Two experimental groups formed Advance Organizer Model group and Inquiry Training Model group consisted of 29 and 28 students respectively. The control group consisted of 29 students. All the students included in the sample were boys in the age group of 13-14 years. ANOVA, t-test and chi-square test were used for drawing conclusions.

The major findings were: 1. The treatments had different effects on the pupils' achievement. 2. The difference in means of gain scores in achievement due to Advance Organizer and Conventional Teaching was significant at the 0.05 level. 3. Difference due to Inquiry Teaching Model and Conventional Teaching was significant at the 0.01 level and the difference due to Advance Organizer Model and Inquiry Training Model was not significant. 4. There was no significant difference between the Advance Organizer Model and the Inquiry Training Model, Advance Organizer Model and Conventional Teaching, and Inquiry Training Model and Conventional Teaching, in terms of pupils' attitude towards social studies. 5. Pupils reacted favourably towards the Inquiry Training Model and Advance Organizer Model.

1194. RAO, P.T., *Classroom Teaching of Effective Science Teacher—An Analytical Study,* Ph.D. Edu., MSU, 1987

The main objectives of the study were (i) to identify effective science teachers on the basis of selected criteria, and (ii) to analyse the teacher behaviour of selected effective science teachers with respect to their content processing behaviour, interactive behaviour, and teaching skill behaviour.

The study adopted the survey method of research. The investigator identified two sets of criteria for identification of effective teachers, (i) the rating criterion of heads of institutions, teachers, and pupils; and (ii) the achievement criterion. The sample for the first objective consisted of 110 experts, researchers, teacher educators, and science teachers and 215 secondary school teachers of 54 secondary schools of Mysore city. For the second objective, 17 effective teachers were included in the sample. The self-made tools used for data collection were previous knowledge achievement tests, criterion achievement tests, verbal and nonverbal components of teaching skills and observation schedules. In addition to these, Hough and Duncan's 'Observation Systems for Instructional Analysis' was made use of. Data were collected through administration of tests, observation of classroom teaching behaviour of teachers and recording teachers voice through audio-cassette recorders. Data were analysed through content analysis approaches, 't' test and ANCOVA.

Major findings of the study were: 1. Among the content-processes employed by the effective science teachers to process the components of content, irrespective of the topics and subject, analysis and assumption content processes were found common with all the teachers. 2. Other content processes like categorization, application of principles and logical reasoning were meagrely employed, only by a few effective teachers.

3. There was no concurrence in interactive patterns observed with the teachers. 4. Some of the teachers were moderately interactive, whereas a few were not at all interactive. 5. Teacher-initiated interactive patterns were often observed with all the effective science teachers. 6. Among the teacher-initiated interactive patterns, substantive interacive patterns were found in common with all the teachers, although there was a variation of degree in making use of such key interactive patterns from teacher to teacher. 7 Explaining skills like providing information and clarification were seen consistently with all effective science teachers without any particular sequence or pattern. 8. Some of the effective science teachers were found to be using certain new component teaching activities like drawing and derivation which could be considered as component teaching skills. 9. The coordination between verbal and nonverbal skills was not prominent although using the blackboard, gestures, movement, focussing, and silence and nonverbal cues were observed with all verbal skills.

1195. SAYED, N.A., *The Relationship between Cognitive, Personality and Biographic Variables and Preference for Teacher Behaviour of Secondary School Students,* Ph.D. Edu., Kar. U., 1987

The major objectives of the inquiry were (i) to study the relationship between, (i) the cognitive style of students and preference for teacher behaviour, (ii) personality variables and cognitive style of students, (iii) personality variables of students and preference for teacher behaviour, (iv) biographic variables and cognitive style of students, (v) biographic variables and personality variables of students, and (vi) biographic variables of students and preference for teacher behaviour.

Adopting the stratified random sample technique, 20 schools were selected from Dharwad district giving regard to boys' and girls' schools, management, locality and medium of instruction of schools. Further, by using the technique of cluster sampling, the student sample was selected. From each of the schools, one section of X standard was selected and all the students in these sections were involved in the study. The data were collected from 894 students using three tools and a personal data sheet. Witkin's Group Embedded Figures Test was administered to measure the field dependent–field independent cognitive style of students. For collecting data about personality traits of students, Cattell's Jr-Sr. High School Personality Questionnaire was used. Teacher behaviour was observed by the Flanders Interaction Analysis Category System. The preferences of the students for teacher behaviour were obtained by asking students to write down on a sheet of paper the names of the teachers teaching them the main subjects in the order of their preference for them. Data were analysed using descriptive, differential and inferential, and multivariate analyses.

The major findings of the study were: 1. Field dependent students were found to be reserved, less intelligent, affected by feelings, excitable, assertive, having weaker super ego, uncontrolled and tense. 2. Boys were found to be field independent as compared to girls. Children of self-employed and professionals were found to be field independent when compared to children of salary-based employed and unskilled labourers. Students of aided schools were found to be field independent when compared to the students of government schools. Urban school students were found to be field independent when compared to rural school students and students of English-medium schools were found to be field independent when compared to the students of Kannada- medium schools. 3. Field dependent students preferred teachers who spent more time on indirect than on direct behaviour, and on asking questions. The field independent students preferred teachers who spent more time on reacting to the ideas and feeling of the pupils. 4. Students who preferred indirect to direct teacher behaviour were more reserved, less intelligent, affected by feelings, had weaker super ego, were tough minded and uncontrolled. Students who preferred teachers with high TQR were reserved, less intelligent, had weaker super ego, were tough minded and uncontrolled. Students who preferred teachers with high CCR had stronger super ego, were controlled and relaxed. Students who preferred teachers with high TQR 89 were reserved, affected by feelings, had weaker super ego, were tough minded and tense 5. Boys preferred teachers with high CCR and TRR 89 ratios. Girls preferred teachers with high I/D, TRR and TQR ratios. Students of government schools preferred teachers with high I/D, TQR 89 ratios. Students of aided schools preferred teacheres with high CCR ratio. Students of rural schools preferred teachers with high I/D, TRR, TQR and TQR 89 ratios. Students of Kannada-medium schools preferred teachers with high I/D and TQR ratios. Students of English-medium schools preferred teachers with high TRR and CCR ratios. 6. Boys were found to be warm hearted, obedient, enthusiastic, having stronger super ego, tender-minded, group dependent and uncontrolled than girls. Children

of professionals were more intelligent followed by the children of self-employed, salary-based employed and unskilled labourers. Children of self-employed had stronger super ego followed by children of professionals, unskilled labourers and salary-based employed. Children of professionals seemed to be more adventurous followed by the children of self-employed, unskilled labourers and salary-based employed. Students of government schools were found to be more excitable and assertive than the students of aided schools. Students of urban schools were found to be more intelligent and obedient than the students of rural schools. Students of Kannada-medium schools were found to be more warm hearted, less intelligent, less assertive, having weaker super ego, less tender minded and less self sufficient than the students of English-medium schools. 7. Principal component analysis (factor analysis) revealed that there was a definite difference between the field-dependent and field-independent groups on the factor structure as far as the personality variables were concerned. 8. Profile analysis showed that the profiles of the field-dependent and field-independent groups were not similar. 9. The canonical correlation analysis revealed that the two sets of variables (the personality variables and the teacher behaviour ratios) correlated significantly.

The educational implications of the study are: (1) Individual differences in cognitive functioning exist, and to help each student capitalize on his natural urge to understand it would be worthwhile to diagnose his cognitive style. (2) Cognitive style and personality have an apparent relationship. It would be advisable for the teachers to understand this relationship and the outcome of this, which may help improve the performance of students. (3) A high priority of curriculum design should be the developement of educational programmes that accommodated unique abilities of the individual students. (4) Becoming sensitive to the child's cognitive style may influence teaching strategies also.

1196. SHETH, D.H., *Evolving a Strategy of Developing Teaching Skills in Secondary School Teachers*, Ph.D. Edu., SGU, 1984

The objectives were (i) to evolve a strategy in the form of a self-instructional multimedia package synchronized with microteaching technique for developing the teaching skills of silence and nonverbal cues, stimulus variation, illustrating with examples, reinforcement, and explaining in secondary school teachers, (ii) to validate the self-instructional multimedia package developed, (iii) to explore its feasibility to study the effect of experimentation in the improvement of scores of Behaviour Coding System of secondary school teachers, and (iv) to study the perceptions of teachers about the strategy. The hypotheses were: (1) There will be a significant gain in the scores of secondary school teachers in Behaviour Coding System from pretest to post-test after development of the selected skills. (2) The gains in the scores of secondary school teachers in Behaviour Coding System are retained even after three months of the development of the skills through auto-instructional strategy. (3) Experience and sex have no significant effect on the scores of Behaviour Coding System at pretest, post-test and retention test level. (4) There will be significant gain in the scores of the teaching competence of the selected skills from 'teach to reteach session'. (5) Experience and sex have no effect on the scores of the teaching competence of the selected skills from 'teach to reteach' session.

Thirty-two preservice and inservice secondary school teachers were puposively selected. Sixteen of them were inservice teachers teaching in the secondary sections of Gujarati-medium schools of Surat and Bulsar districts. The remaining 16 were trainee teachers of education colleges of South Gujarat University. The tools used were a background information sheet, Attitude Inventory Scale I & II, Teachers Perceptions Scale about the Multimedia Package, Multimedia Package Course Evaluation Schedule, Interview Schedule, Behaviour Coding System and Observation Sehedule for different teaching skills. To test the hypotheses, t-test involving correlated means was applied.

The major findings were: 1. The group included in the study showed significant gains at 0.01 level in the mean scores on self-evaluatory observation schedules for teaching skills. 2. The group showed significant gain at 0.01 level in the mean scores on Behaviour Coding System after their training through self-instructional strategy. 3. The group retained the gains in the mean scores on Behaviour Coding System even after a period of three months. 4. Teacher self-analysis using feedback from videotape was an effective vehicle for improving teaching skills. 5. The attitude of teachers towards different aspects of teaching was favourable prior to multimedia package course. 6. The utility of microteaching technique for practising various skills was highly appreciated by the participants. 7. Participants found the package course very interesting. 8. Teachers were quite

satisfied with the package course so far as its educative importance was concerned. They found it quite well-planned and self-explanatory.

Teacher effectiveness, if viewed in terms of certain teaching skills, can be developed and measured. Self-instructional skill-based material should be used in developing various teaching skills in a relatively short duration.

1197. SINGH, H., *Effective Teaching Strategies Used for Preparing Examinations as Perceived by the Students,* Ph.D. Edu., Mee. U., 1986

The objectives were (i) to identify teaching strategies used for botany and zoology for preparing students for the CPMT competitive examination, (ii) to identify teaching strategies used for physics and chemistry for preparing students for the CPMT and IIT competitive examination, and (iii) to identify teaching strategies used for teaching mathematics for the IIT competitive examinations

The purposive sampling technique was used for seleeting the sample. IIT and CPMT coaching teachers and students were the subjects of this study. The data were collected through participant uncontrolled observation and non-directive unstructured interviews. The data were analysed through frequencies and percentages.

The findings were: 1. Lecture-cum diagramatic presentation was mostly used in zoology and botany and rarely in physics and chemistry teaching in CPMT. 2. Mostly lecture-cum-chalk-board strategy was used in physics and chemistry and rarely in zoology and botany teaching in CPMT. 3. Question-answer followed by testing strategy was used in all the four subjects, viz., zoology, botany, chemistry and physics teaching in CPMT. 4. In CPMT, review-cum-discussion strategy was used in teaching zoology, botany, chemistry and physics. 5. For IIT, lecture-cum-chalk-board, question-answer followed by testing, review-cum-discussion, and assignment-cum-clarification strategies were used in teaching chemistry, physics and mathematics subjects.

The implications are: (1) These strategies may be used by polytechnic, B V Sc. and other medical and engineering coaching institutes involved in preparing for competitive types of entrance examinations. (2) These strategies may be employed by such types of coaching institutes which provide objective based teaching for jobs such as Bank Recruitment Tests, and Clerks Grade Examinations in different professions. (3) These teaching strategies may be used in classroom situations for improving the results of the students.

1198. SINGH, O., *Effects of Mastery Learning Strategies on Certain Non-Cognitive Variables of High School Students,* Ph.D. Edu., HPU, 1983

The major objective of the study was to compare the effects of programmed instruction, Bloom's mastery learning strategy and the conventional method of teaching on self-concept, achievement motivation and test anxiety of students after taking instruction in social studies. A sample of 181 students of grade IX was drawn from Government High School, Kuthera. Jalota's General Mental Ability Test was administered to all the students. Subjects were matched on the basis of general mental ability test scores and, finally, three groups each of 30 subjects were framed. The subjects were assigned to these groups on the basis of subject-to-subject matching. The three groups were assigned to different teaching strategies at random. After the completion of teaching of the selected content, tests of self-concept, achievement motivation, and test anxiety were administered to the three groups. Analysis of covariance was used to analyse the data and draw conclusions.

The main findings of the study were: 1. Progammed instruction, Bloom's mastery learning strategy and the conventional method of teaching did not significantly affect the self-concept of high school students after taking instruction in the subject of social studies. 2. There was significant increase in the achievement motivation of high school students after taking instruction in social studies through Bloom's mastery learning strategy in comparison with those students who received instruction through programmed instruction. However, there was no significant difference in achievement motivation of the groups of students which took instruction through Bloom's mastery learning strategy and the conventional method of teaching. But there was signficant difference in achievement motivation of the groups which got instruction through programmed instruction and the conventional method of teaching. 3. Programmed instruction, Bloom's mastery learning strategy and the conventional method of teaching did not signficantly affect the test anxiety of high school students after taking instruction in the subject of social studies.

1199. SINGH, PRABHAKAR, *A Factor Analytic Study of Teaching Behaviour*, Ph.D. Edu., BHU, 1985

The objectives of the research were (i) to study the factorial nature of the teaching behaviours of secondary school teachers, (ii) to study and compare the factorial structure of teaching behaviour of science, social science and language teachers, (iii) to study and compare the factorial structure of the teaching behaviour of male and female teachers, and (iv) to study and compare the factorial nature of the teaching behaviour of urban and rural school teachers. The null hypotheses were: (1) There is no difference in the factorial nature of the teaching behaviour of science, social science and language teachers. (2) There is no difference in the factorial nature of the teaching behaviour of male and female teachers. (3) There is no difference in the factorial nature of teaching behaviour of rural and urban school teachers.

This was an analytical study. The sample comprised 180 secondary school teachers randomly selected from 24 schools of the Varanasi region. The sample of 180 teachers was equally divided among science, social science and language teachers—60 each. The number of male and female, and urban and rural teachers was equal. The tool used in this study was the Teaching Behaviour Observation Sehedule prepared by the investigator. The principal component method was employed for factor analysis.

The following conclusions were drawn: 1. Teaching behaviour of secondary school teachers was found to have eight skills, viz. skill of questioning, of explanation, of blackboard writing, of reinforcement, of introducing a lesson, of summarizing the lesson, of teaching aids, and skill of illustrating with examples. 2. Teaching behaviour of science teachers was found to have ten factors, of social science teachers eight factors, and of language teachers seven factors. The seven factors common to the teaching of all three subjects were skill of introducing a lesson, of blackboard writing, of questioning, of reinforcement, of summarizing the lesson, of using teaching aids and of explanations. Three factors—skill of illustrating with examples, skill of attending to pupils' difficulties, and skill of maintaining classroom discipline—were found specific to science teaching. Skill of responding to pupils' questions was specific to social science teaching while no factor was found specific to language teaching. 3. Teaching behaviour of male teachers was composed of seven factors while that of female teachers of eight factors. The six factors common to the teaching behaviour of male and female teachers were skill of questioning, of blackboard writing, of explanation, of reinforcement, of introducing a lesson and of summarizing the lesson. The skill of illustrating with example was found to be specific to the teaching behaviour of male teachers. Skill of using teaching aids, and skill of questioning to develop critical awareness were specific to female teachers. 4. Teaching behaviour of urban and rural school teachers had eight factors. The common factors were the skill of explanation, of questioning, of blackboard writing, of introducing a lesson, of reinforcement, and of summarizing the lesson. The skill of using teaching aids, and the skill of asking with examples were specific to the teaching behaviour of urban school teachers while the skill of convergent questioning and the skill of illustrating with examples to the rural school teacher.

1200. SOFAT, S.L., *Construction and Standardisation of Self-Evaluation Scale of Teaching Effectiveness of Secondary Teachers*, Ph.D. Edu., Punjabi U., 1977

The major objective of this study was to construct and standardize a self-evaluation scale to be used by secondary school teachers in Punjab for measuring their own teaching effectiveness. Other objectives of the study were, (i) to find the relationship of self evaluation by the teacher with his external evaluation by principals or headmasters, and (ii) to find out the difference in the teaching effectiveness of teachers in relation to sex, experience, subject taught category and school category.

A sample of 500 teachers was taken to prepare the self evaluation scale. This sample included 350 men and 200 women teachers, 140 science and 410 non-science teachers, 302 teachers having teaching experience of less than 10 years and 248 teachers having teaching experience of more than ten years. The sample teachers were selected from 12 districts of Punjab. These teachers were administered, (i) the Self Evaluation Scale of Teaching Effectiveness, and (ii) The Socio-Economic-Status Scale developed by the researcher.

The Self Evaluation Scale for Teaching Effectiveness had 43 items on a five-point scale having weightage of 4 to zero. The items were concerned with teachers' organization and personality and the relationship established with the class. The test-retest reliability of the scale was 0.86. The validity established against the ex-

ternal criterion of headmaster's opinion came out to be 0.45. Percentile norms were established on the basis of sample subjects separately for sex, school category, and subjects taught by the teacher.

The findings of the study were: 1. The correlation coeffficient between the scores of teachers' self evaluation and external evaluation by students and headmasters was positive and significant. 2. Women teachers were more effective than men teachers. 3. The teachers working in government and private schools were equally effective. 4. Teachers working in urban schools were more effective than those in rural schools. 5. Teachers working in girls schools were more effective than those working in boys or coeducational schools. 6. Teachers working in boys and coeducational schools were equally effective. 7. More experienced and less experienced teachers were equally effective. 8. Science and non-science teachers were equally effective. 9. Socio-economic status of teachers affected their teaching effectiveness.

1201. SUBBARAYAN, P., *A Study of Relationship between Teacher Effectiveness, Research and Publication, and Self-concept,* Ph.D. Edu., And. U., 1985

The major objectives were (i) to develop and standardize a teacher effectiveness battery, (ii) to compare the ratings of students, colleagues and self, and self and students, (iii) to find the relationship between research and publication ability and teacher effectiveness, and (iv) to find the relationship between teacner effectiveness and self-concept. Hypotheses formulated for verification in this study were: 1. Students' ratings of teachers do not correlate significantly with the rating of colleagues. 2. Colleagues' ratings of teachers do not correlate significantly with the self-ratings of teachers. 3. Students' ratings of teachers do not correlate significantly with the self-ratings of teachers. 4. There is a significant relationship between a teacher's effectiveness and his ability to do research and publish his findings. 5. There is significant relationship between teacher effectiveness and self-concept.

The standardized student evaluation form was administered to a group of 521 final year postgraduate students. The 91 identified effective teachers, as per students' choice, were rated by two of their colleagues; the selection of colleagues being random. The 69 teachers who were evaluated as effective teachers, both by students and colleagues, were administered the self-evaluation rating scale. The tools used were the Visakha Teacher Effectiveness Battery (VTEB), Saran's Self-concept Inventory (SC-I), Research and Publication index Card (RPIC), Student Evaluation Form, Colleague Evaluation Form, and Self-evaluation Form.

Major findings were: 1. Students' ratings of teachers significantly correlated with colleagues' ratings of teachers. 2. Colleagues' ratings of teachers significantly correlated with the self-ratings of teachers. 3. Self-ratings of teachers significantly correlated with students' ratings. 4. Teacher effectiveness as rated by colleagues and self significantly correlated with teachers' ability to do research and publish findings. But no relationship was found between teacher effectiveness as rated by students and teachers' ability to do research and publish. 5. The relationship between teacher effectiveness and his self-concept was significant. 6. Male and female teachers did not differ significantly in respect of teacher effectiveness. 7. Teachers who had 15 or more years of experience did not differ from those of less experience in general factors of teacher effectiveness, but significant difference was reported in respect of professional factors. 8. Teachers of 45 years or above did not differ significantly from those who were below 45 years of age. 9. Professors, readers and lecturers did not differ significantly from one another in respect of teacher effectiveness.

1202. THARYANI, D.K., *A Study of the Important Factors Affecting Teacher-Effectiveness of B.Ed. Students,* SCERT, Pune, 1986

The objectives of the study were (i) to examine the role of IQ, attitude, academic achievement, and content knowledge factors on the teacher effectiveness, (ii) to examine and identify the factors favourable for high teacher effectiveness, and (iii) to examine and identify the factors responsible for low teacher-effectiveness.

Ninety-three student-teachers of K.K.College of Education, Pune, formed the sample for the present study. On the basis of the average of the 20 practical lessons given during one year, 20 high achievers and 20 low achievers were selected for the present study. A seven-point rating scale prepared by the K.K. Teachers College was used for measurement of teacher effectiveness. An attitude scale prepared by the same college was used for measurement of attitude of teachers towards pupils. The NVTI was used for measurement of IQ. A content

test in all the methods was administered. The examination results were collected as indicators of students' academic achievement. The percentile rank score and rank difference coefficient of correlation were used for analysis of data.

The findings of the study were: 1. The IQ of teacher-trainees was found to be a useful predictor. 2. Teachers' attitude towards their pupils did not show any significant relationship with teacher behaviour in the case of high achievers. 3. In the case of low achievers, it showed a negative significant relationship. 4. Students' knowledge in their respective subject area was found to be the best predictor.

1203. WALI, M.N., *Factorial Study of the Teaching Correlates of Teaching Effectiveness*, Ph.D. Edu., BHU, 1985

This study of teaching effectiveness sought to find out the relationships between various demographic and social correlates (such as age, caste, rural-urban background) academic background of teachers (experience, qualifications), motives, values, needs, job satisfaction and teaching effectiveness, and to extract factors from these correlates.

For this purpose, Edwards' Personal Preference Schedule, the Sherry-Verma Personal Values Questionnaire, Ahluwalia's Teacher Attitude Inventory as well as a teacher's personal data sheet were used. Two tools, a Job Satisfaction Inventory and a Teacher Effectiveness Scale were developed by the investigator. Test-retest and split-half correlation coefficients were 0.86. Validity was found out by correlation with parts of existing inventories. The teaching effectiveness scale depended on principals' ratings. Validity was established by finding r with marks obtained by students of a teacher as well as by other criteria. Split-half reliability was 0.96 and test–retest (after a gap of two weeks) was 0.63. A sample of 129 science and mathematics teachers in the age range of 25 to 60 teaching in 15 secondary schools of Varanasi division was taken. The tools were administered to them individually. The principals rated them on the Teacher Effectiveness Scale. All nominal variables were also quantified and a 66×66 correlation matrix was prepared. Correlation coefficients of the background variables with the criterion variable were calculated.

The findings were: 1. Correlation coefficients for educational qualification, salary, experience, family education and sources of income were significant. 2. Correlation coefficients for attitude to educational process, identity with the job, democratic value, family prestige value, and a few needs were significant. 3. Six factors emerged from out of the correlation matrix, and they were designated as professional dignity (grade, salary, etc), altruistic temper, professional involvement, democratic temper, family background and humility.

Implications for teacher preparation, such as inculcating proper values, proper selection and giving due importance to family background have been drawn on the basis of the study of the six factors.

1204. YADAV, P.S., *Effect of Mastery Learning Strategy on Pupils' Achievement in Mathematics, their Self-concept and Attitude towards Mathematics*, Ph.D. Edu., Kur. U., 1984

The objectives of the study were (i) to compare the mean achievement scores of two groups of pupils taught mathematics with and without the use of mastery learning strategy, (ii) to compare performance scores of two groups of pupils taught mathematics with and without the use of mastery learning strategy, (iii) to compare the attitude towards mathematics of two groups of pupils taught mathematics with and without the use of mastery learning strategy, and (iv) to compare the mean self-concept scores of two groups of pupils taught mathematics with and without the use of mastery learning strategy. In persuance of these objectives it was hypothesized that the groups of pupils taught mathematics through mastery learning strategy would score significantly higher on the criteria of achievement, attitude towards mathematics and self-concept.

The study employed a pretest post-test control group design involving two groups of pupils, the experimental group using mastery learning strategy, and the control group using the conventional method of teaching mathematics. The sampling unit for the study was the school. Six high schools in a rural area of Haryana were selected and paired in three sets each comprising one from the experimental group and the other from the control group, matching them on the basis of institutional characteristics. Three schools were assigned to the experimental group and three to the control group. The experimental group had 173 students of grade IX in five sections taught by five different teachers. The control group had 189 students of grade IX in five sections taught by five different teachers. The students in the ex-

perimental and control groups were equated on their scores on intelligence, socio-economic status and previous knowledge in mathematics. The sample students were administered the following tools: (i) the Mathematics Attitude Scale which had a split-half reliability of 0.85 and had content validity; (ii) the Mathematics Achievement Test which had a split-half reliability of 0.73 and had content validity; (iii) the Swatva Bodh Parikshan—a test of self-concept developed by Sherry *et al.*, having test-retest reliability 0.733 and validated against content. The data so collected were analysed with the help of t-test.

The findings of the study were: 1. Before the experimental treatment, the experimental group (mastery group) of pupils and the control group (conventional group) of pupils evinced no significant differences in respect of their achievement in mathematics, self-concept and attitude towards mathematics. 2. After the experimental treatment, the experimental group of pupils exhibited a significantly higher achievement in mathematics than the control group of pupils and higher gain scores of achievement in mathematics. 3. Different percentile achievement scores of the experimental group of pupils were found to be significantly higher than those of the control group of pupils at post-test stage. 4. The achievement distribution curve in the case of the experimental group of pupils in respect of their post-testing was highly skewed in the positive direction, whereas it was nearing normal in the case of the control group of pupils. There was minimum overlapping in the two curves, showing thereby the large differences in achievement of the experimental and control groups. 5. When the achievement distribution curves in the case of gain scores of experimental and control groups were compared, it was found that the curve in the case of the control group extended to the negative side, which implied that some of the pupils in control group did not show a positive gain. 6. After the experimental treatment, the experimental group of pupils evinced a more positive attitude towards mathematics that the control group of pupils. 7. After the experimental treatment, the improvement in self-concept of the experimental group of pupils was found to be significantly higher than that of the control group of pupils.

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