

Chapter Two

REVIEW OF RELATED LITERATURE AND STUDIES

Research on teaching and teaching competence represents a vast field. Gage's, " A Handbook Of Research On Teaching " gives an indication of time and energy devoted to this area of inquiry by 1963, in America; and further studies have poured out since. However it is only comparatively recently that researchers in the field of education have begun to study the interaction between teacher and his pupils in the classroom and determine what effect instruction in and observation with interaction analysis has on the attitudes and performance of teachers.

The present chapter contains a description of some of the research conducted in the general direction of identifying effective teacher behaviour. For over three decades, studies on teacher effectiveness and the like, have been going on, especially in the U.S.A. The early research grew out of dis-satisfaction with the existing methods of supervision and feeding back of information to the teacher regarding his teaching behaviour, attitudes and effectiveness.

Most of the research studies to be reviewed may suggest that no one pattern of teacher behaviour is superior to another under all conditions. In several studies contrasting patterns are described and named and different consequences for the various patterns reported. The literature reviewed also reveals that interaction analysis is still at the exploratory stage. It is little wonder that the review of research which follows is sketchy and in some ways, relatively inclusive.

Attempts to measure interaction between a teacher and his pupil go back to 1914, when Horn tried to measure the extent of pupil participation in the classroom. The earliest systematic studies of spontaneous pupil and teacher behaviour were those of Anderson (1937) and his colleagues. The ball was set rolling with the beginning made by Anderson (1939), when he wrote his article, "The Measurement of Domination And of Socially Integrative Behaviour In Teacher's Contacts With Children."

Anderson et al, (1939), discovered that the behaviour of the teacher sets the climate of the class; integration stimulates further integration, and domination stimulates further domination. When a teacher establishes a higher proportion of integrative contacts, pupils show more spontaneity, initiative, voluntary social contributions and contributions to problem solving. On the contrary when a teacher has a higher proportion of dominative contacts, the pupils are more easily distracted from school-work and show greater compliance to teacher domination.

A few years after Anderson started his work, Lippit and White (1943), working with Kurt Lewin, carried out laboratory experiments to analyse the effects of adult leaders' influence on boys' groups. It is reported that extensive compliance occurs when a generalized condition of dependence is established. Additional research revealed minor variations of the theme they had established. Withall showed that a simple classification of the teacher's verbal statements into seven categories produced an index of teacher behaviour almost identical to the integrative - dominative ratio of Anderson, et al.

Flanders (1951), created laboratory situations in which one pupil at a time was exposed to contrasting patterns of teacher behaviour. A sustained dominative pattern was consistently disliked by pupils, reduced their ability to recall the material studied, and produced disruptive anxiety as indicated by galvanic skin response and changes in heart beat rates. The opposite trends were noted in pupil reactions to integrative contacts.

In a large cross sectional study, which did not use observation of spontaneous teacher behaviour, Cogan (1956), administered a single paper-and-pencil instrument to 987 eighth-grade students in 33 classrooms. The instruments contained three scales: (a) a scale assessing student perception of the teacher, (b) a scale on which student reported how often they did require school work, and (c) a scale on which student reported how often they did extra non required school work. Cogan found that students reported doing more assigned and extra school work when they perceived the teacher's behaviour as falling into the integrative pattern rather than the dominative pattern.

Cyphert and Spaight (1964), reviewed 188 fairly recent studies on teacher education and reported that the quality of research in this field of study is rather poor. Only six projects included a measure of teaching behaviour; most of the projects were surveys; none of the studies included a measure of the college instructor's teaching behaviour. Apparently the instructor's behaviour is not perceived as a significant variable in the effectiveness of a teacher education programme.

Faced with incomplete knowledge about how best to help others change their teaching behaviour or how such behaviour might

be effectively developed, it would seem prudent to evaluate all existing programmes as well as innovations and try to find out if they lead to many changes in teaching performance. Research on helping others change has begun. Most of the work lies ahead. It is little wonder that the review of research which follows is sketchy and, in some ways, relatively inconclusive.

RESEARCH ON INTERACTION ANALYSIS:

A number of studies have been conducted using Interaction Analysis. First, there is the early work of Anderson (1937), Withall (1949), and others who have shown that it is useful to categorise minute segments of classroom verbal behaviour. This early research, alongwith the work of Bales (1951), and Lewin, Lippit and White (1939), shows clearly that the behaviour of an instructional leader does affect children in ways which can be studied and understood.

Flanders, Medley and Mitzel and others who have persistently worked on the problems of classroom observation are the scholars who have contributed to what may be most significant educational knowledge thus far uncovered. What are some of the findings from interaction analysis research that make it such ' optimistic research ' ?

1. Interaction Analysis has been taught to several thousand teachers. Many of these teachers have stated that it was the one technique they had heard of that helped them solve their everyday teaching problems.
2. Research by Soar (1966), Medley and Mitzel (1964), Bellack (1967) and others seem to paint a picture of the usual classroom that many professional educators recoil from.

Interaction Analysis has helped us identify specific teacher behaviours that can be modified and thus produced more flexible teaching patterns.

3. The results are not conclusive, but there is enough evidence in studies by Amidon (1959), Flanders (1960), Soar (1966), and Furst (1967), to question some of our basis assumptions about the nature of effective teaching. An example of this can be found in Flanders' early research as well as in Furst's more recent study. Both of these studies seem to show that more flexible teachers produce high achievement in children. Powell's (1967), and Whber's (1967), studies also support this conclusion.

Interaction Analysis was first taught to teachers with the goal of teacher change by Flanders (1963). Flanders found that teachers who were indirect in the beginning of training changed more during the training programme than did teachers who were direct at the beginning of training.

The first project which utilised interaction analysis in pre-service teacher education was conducted by Hough and Amidon (1964). They taught interaction analysis to one group of student teachers; the other group studied learning theory. They found that college supervisors rated the student teachers who had learned interaction analysis as better than student teachers who had been taught learning theory.

Amidon (1967), tested the following hypotheses while studying the effects of teaching interaction analysis to student teachers.

Student teachers taught interaction analysis were

1. rated by impartial observers as more effective teachers than student teachers not taught interaction analysis;
2. more indirect at the end of their student teaching experience than student teachers not so taught;
3. perceived by their pupils as being more indirect at the end of student teaching than were student teachers not so taught;
4. had more positive attitudes towards teaching at the completion of student teaching than students not taught interaction analysis;
5. student teachers supervised by those cooperating teachers who had been trained in interaction analysis were rated as more effective teachers than student teachers working with cooperating teachers not trained in interaction analysis.

Amidon (1966), in presenting findings from a pilot study reported that student teachers who knew interaction analysis talked less in the classroom, were more indirect in their use of motivating and controlling behaviour, were more indirect in their overall interaction patterns, used more extended indirect influence, and accepted pupils' ideas in an extended fashion more than did student teacher not so trained in interaction analysis. Amidon reported that student teacher who were taught interaction analysis used significantly less extended criticism and fewer direction than student teacher who were not so trained.

Simon (1966), compared student teacher trained in interaction analysis with those trained in learning theory. Both of these groups of student teachers were observed teaching in two different classes;

one they identified as their favoured class; and the one they identified as their unfavoured class. She found only one difference when the student teacher behaviour in favoured class was compared with their behaviour in unfavoured class; they used significantly more praise when working with their favoured classes. She reports a number of differences in behaviour due to the type of the training. Student teacher trained in interaction analysis used more praise, less criticism, more extended indirect influence than student teacher trained in learning theory. These comparisons were made when student teacher were teaching their favoured classes.

Simon, et al trained a group of student teacher to use the Flanders interaction analysis technique before the students taught. The control groups was taught learning theory. Both groups of subjects were then observed twice a week during their student teaching experience by the researchers (Simon, et al). During these observations, the Flanders categories were used. The result were in the expected direction. Student teacher trained in Flanders technique were more accepting, less critical, and less directive than student teacher not trained in interaction analysis. There was also a tendency for student teacher who learn interaction analysis to have more student initiated talk, more extended student initiated talk and less silence or confusion than student teacher taught learning theory.

Zahn (1965), found that student teachers who learned interaction analysis developed more positive attitudes towards student teaching than did a control group of student teachers who were not taught interaction analysis.

Amidon in a pre-service teacher training project with approximately 250 secondary education student teacher (Feb. 1965 to June 1967), using Flanders system of interaction analysis reports the effects on the verbal behaviour of student teachers. Significant findings from the initial stages of the project are that student teachers trained in interaction analysis are more indirect, elicit more student talk, use more extended indirect influence and are less direct than student teachers trained in learning theory.

A number of investigations have centred on the use of interaction analysis with student teachers. (Amidon, 1966; Amidon, Furst, Simon, Hough, Kirk and Zahn, 1965; Amidon and Powell, 1965; Furst, 1965; Hough and Amidon, 1964 a; 1964 b; Hough and Ober, 1966; Kirk, 1964; Lohman, Ober and Hough, 1967; Moskowitz, 1966; Romoser, 1965; and Simon, 1966). Generally the results of these investigations indicate that student teachers trained in the use of interaction analysis:

1. stimulate a greater orientation of student - initiated verbalization,
2. employ criticism more infrequently,
3. offer fewer directions,
4. utilize more indirect teaching patterns, and
5. more frequently accept and use student ideas.

The Department of Education at Temple University has been teaching interaction analysis to the students for two years. This has been done as part of an experiment in which student teachers have learned either interaction analysis or taken the conventional

course in learning and educational psychology. One of the most interesting and significant things about the course in interaction analysis has been the reactions of the students. At the end of the semester evaluation forms in the learning theory sections and the interaction analysis sections were filled out anonymously by the students. As a group, the students are extremely enthusiastic about interaction analysis. Many feel that the course is the best that they have ever had. Many feel that they have gained valuable insight into their teaching and that this insight will carry over after they have become teachers.

Kirk (1963), conducted a study with student teachers in elementary education in which interaction analysis was taught to the experimental group and compared this group with student teacher who had no training in interaction analysis. He found that the experimental group talked less, had more pupil initiated talk, and more often accepted pupil ideas than did student teachers in the control group.

The research indicates that training in interaction analysis does affect the behaviour of student teachers. Several of the studies reviewed in this chapter have tested the affects of training in interaction analysis on the behaviour of student teacher.

In a study in which twenty pre-service teachers were taught the Flanders system of interaction analysis as compared with a control group taking a traditional student teaching seminar, Hough and Amidon (1964), found that student teachers in the experimental course were given significantly higher ratings by their supervisors, became significantly more positive on teaching attitudes test and

found the course significantly more challenging, interesting and professionally meaningful than students in conventional studies.

In a series of doctoral studies testing the interaction between certain measures of personality, attitude and training on the verbal behaviours of teachers in simulated teaching conditions (Hanny, 1966), student teaching (Ober, 1966 and Kirk, 1963) and elementary school teachers (Hill, 1966) it was found that training in interaction analysis did have an effect in each case which allowed the trained teacher to increase his use of some indirect behaviours or decrease his use of some direct behaviours. In no case was a significant difference reported in a directions contrary to the hypothesized. Although the student teachers in the experimental group in the Ober study were observed four to twelve months after instructions, there were significant differences in the hypothesized direction between those that had been taught the Flanders system and those that had not.

Richard D. Zahn in his study to determine what effect instructions in and supervision with Flanders' system of interaction analysis would have on the attitudes and performance of student teachers, selected 92 elementary education students, and their cooperating teachers, who were undergoing their junior year student - teaching experience. The 92 students were assigned to four equal groups, three of which received conventional instruction and supervision. The fourth group received instruction and supervision using interaction analysis. One group experiencing conventional instructions and supervision was instructed and supervised by the investigator. So was the group with which interaction analysis was used.

The instruments used were: the Dogmatism Scale (D - Scale), A Personality Inventory, The Teaching Situation Reaction Test (TSRT), The Teacher Attitude Inventory and the student teacher performance was rated through use of the cooperating teacher's evaluation form to be used in evaluating classroom participation of practicum students. The following results emerged from the study:

1. Student teacher undergoing instruction and supervision using interaction analysis had more positive teaching attitude after student teaching than those students undergoing conventional supervision and instruction.
2. The student teacher undergoing instructions and supervision using interaction analysis tended to modify their teaching attitudes more positively than student teacher undergoing conventional instructions and supervision, regardless of the attitude of the cooperating teacher.
3. Student teacher with Dogmatism Scale scores that were above average but not more than one standard deviation above the mean tended to change their attitudes positively if they experienced instruction and supervision using interaction analysis.
4. Student teachers with Dogmatism Scale score one standard deviation below the mean were judged to be significantly more proficient in their student teaching performance than those student teacher one standard deviation above the mean, regardless of the kind of supervision received.

John B. Hough and Edmund Amidon prepared a paper on "Behavioural Change in Student Teachers". In the spring semester of 1963, the authors introduced an experimental section of a course in the teaching - learning process in the secondary - education teachers preparation programme at Temple University. This experimental section of the course was taught in conjunction with the regular student teaching experience, and it combined the teaching of the Flanders system of interaction analysis with the teaching of instructional theory and an experimental human relations laboratory. The findings of this study seem to indicate that the combination of experiences provided for the experimental group was effective in that it had the predicted effect on the behaviour of the student teachers and on changes in attitudes and understandings associated with effective teaching. However, the limitations of the experimental design of this study make it impossible to make a definitive state^{ment} of the causes of superiority of the experimental group.

Research to the use of Interaction Analysis in Inservice Teacher Training:

One of ~~the~~ Flanders' (1960) first studies employing the use of interaction analysis disclosed that indirect teachers behaved more indirectly when first introducing and explaining goals in the classroom and when new material was being presented to the class. These same indirect teachers behaved more directly after this initial period of time in the classroom. The results of this investigation also revealed that students learned more from indirect than from direct teachers. This investigation pointed out

the fact that teacher flexibility rather than the dichotomies of direct versus indirect influence might predict teaching success.

Flanders, Clarke, Davies, Dawson, and Storlie (1961), used interaction analysis in a nine week inservice training programme which included fifty five teachers. The 55 teachers made significant gains in the use of indirect statements.

Flanders, (1963), showed that some progress was made in this project by the teachers.

Georg A. Jeffs (Oct. 1968), made a study on ' the effect of training in interaction analysis on the verbal behaviour of teacher.' He concluded:

1. A decided increase in the use by teachers of accepting, clarifying and expanding student ideas (category 3) was noted from first and second semester. This finding is supported by the Teacher Response Ratio (TRR) and The Instantaneous Teacher Response Ratio (TRR 89).
2. A very pronounced increase in student statements which were not predictable, not teacher elicited, and not restricted in scope (category 9) was noticed during the second semester of the programme.
3. A marked increase in the number of student responses which were stimulated by the teacher and somewhat restricted in scope was discovered between the first and second semester.
4. Teachers became more indirect in approach to motivation and control during the second semester of the programme.
5. A prominent decrease in the use of questions by teachers was noted between the first and second semester. This was supported by Teacher Question Ratio and Instantaneous Teacher Question Ratio.

6. Teacher initiation decreased while teacher response and student initiation increased during this period of time.

Investigations by Furst and Amidon (1962, 1965), and Giammatteo (1965) discovered that teaching styles of first, second, third and fourth grade teachers tended to be direct while the teaching styles of fifth and of sixth grade teachers tended to be more indirect. Amidon and Giammatteo (1965), discovered that 23 elementary school teachers assessed as 'superior' by their supervisors: (1) talked less, (2) accepted student initiated talk more, (3) dominated the classroom less, (4) used criticism less, (5) used directions less, (6) used indirect verbal behaviour more, (7) asked broader questions, and (8) elicited more student initiated verbalization.

E. Amidon and Carl Hoffman conducted an inservice teacher training programme with 24 elementary school teachers in the University of Temple. The 24 elementary school teachers were trained in the use of Flanders system of interaction analysis. Another measuring instrument was a sociometric instrument to measure changes in positions of the class isolates. The purpose of the study was to determine whether training in interaction analysis can help a teacher to help integrate isolates into the classroom structure. The findings support the hypothesis.

Flanders (1963), conducted a project in which teachers were trained to observe classroom interaction with a set of categories emphasizing different patterns of teacher influence. Fifty one junior high school teachers participated in two different types of inservice training programmes, each lasting nine weeks in the middle

of the academic year. The purpose of the inservice training was to increase the flexibility of teacher influence and to increase the use of those teachers' behaviours which support pupil participation in the classroom learning activities. Emphasis was given to principles of teacher influence which were concerned with when a teacher should purposely increase and decrease the freedom of pupil participation. Each teacher was observed by specially trained staff observers before and after inservice training. The specific objectives of training were assessed as pre-training and post-training measures of spontaneous teaching acts in the teachers' regular classes.

RESEARCH RELATED TO FEEDBACK:

Many educators and social scientists have pointed out that supervision is primarily a social process which involves interaction between two or more people. The most important elements of supervisory relationship appear to be concerned with the ability of the supervisor to communicate effectively with teachers. Educators have spoken these words for many years and yet little systematic research has been focussed on the study of the supervisory process.

A study of the improvement of teaching through supervision seems to necessitate a focus on three problem areas:

1. Interaction of the teachers and supervisor as they attempt to discuss what the teacher is doing and how he can improve.
2. The description of interaction between teacher and class which serves as the basis of the supervisory conference.

3. The social skills involved in any group situation.

In order to work on these problems, the supervisor must be given a tool for assessing the effects of feedback on the teachers or student teachers. The tool provided to the supervisor here, is the Flanders Ten Category System and was provided to the supervisors by training them in the use of Flanders system of interaction analysis. Feedback is essential to the improvement of teaching skill and it was provided through the use of interactionmatrix. The matrix summarized the data collected through the use of the Ten Category System of Interaction Analysis. Matrix helps a teacher to determine, whether or not his teaching intentions are met.

E.J. Amidon and E. Powell studied the effect of interaction analysis as a feedback system in teacher preparation and concluded:

1. Student teachers who knew interaction analysis talked less in the classroom than those who were trained in learning theory.
2. Student teachers who learned interaction analysis were more indirect in their use of motivating and controlling behaviours than those who were trained in learning theory.
3. Student teachers who were taught interaction analysis were more indirect in their overall interaction patterns than student teacher who were trained in learning theory.
4. Student teachers who were taught interaction analysis used more extended indirect influence than student teacher who were trained in learning theory.

5. Student teachers trained in interaction analysis used more extended acceptance of student ideas than student teachers who were trained in learning theory.
6. Student teachers trained in interaction analysis used less extended direct influence than student teachers who were trained in learning theory.

In general, when student teachers are trained in interaction analysis, they become more indirect, accepted more student ideas, and criticised less than student teachers not so trained.

Since Flanders found that teachers of children who had high achievement and positive attitudes were more indirect, accepted more students ideas and used less criticism than teachers of children with low achievements and negative attitude, there appears to be substantial evidence that interaction analysis training is helping to produce teachers with appropriate teaching skill.

Joseph C. Bondi in the University of Florida, investigated the effect of interaction analysis feedback on the verbal behaviour of student teachers. The results of the study show that student teachers who received interaction analysis feedback differed significantly from those students who did not received such feedback in their use of the following verbal teachers behaviour:

1. they used more praise;
2. they accepted and clarified students ideas more;
3. they used more indirect teacher talk as opposed to direct teacher talk;
4. they used more extended praise;
5. they had more use of extended student ideas;

6. they used more positive effective talk;
7. they accepted student ideas more after teacher initiated student talk;
8. they used more positive reinforcement after teacher initiated student talk;
9. they used less corrective feedback;
10. they criticized students less;
11. they asked more questions;
12. they used less lecture;
13. they gave less direction.

In addition, there was significantly less teacher initiated talk and significantly more student initiated student talk in the student teacher group receiving feedback.

Nipper George L. found out that an immediate reinforcement of desired behaviour and recurrence of that behaviour.

Zahorik, John A. is only endorsing the above mentioned fact when he accepts it as a premise for his study as when he says that teacher verbal feedback is a significant instructional behaviour helping the pupil adjust and his future output in terms of his goal.

While Richard Bloom, constructed a four category scale to establish that the larger the ratio of ' Feedback' to ' Response Elicitation ' the greater is the likelihood of learning.

One experiment (Allen, Mc Donald, and Orme, 1967), was conducted to compare several methods of distributing practice and feedback when the later employed videotaped performance of the learner. Intern teachers were assigned to one of the four groups,

each of which received varying amount of practice between feedback sessions. The groups were:

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|----|---------------------|-----------------------|
| 1. | Immediate feedback | massed practice; |
| 2. | Immediate feedback | distributed practice; |
| 3. | Delayed feedback | distributed practice; |
| 4. | Reinstated feedback | distributed practice. |

Significant treatment differences were in favour of group 1 over group 4, in the initial acquisition of probing behaviours.

Mc Donald, Allen and Orme (1965), disclosed that offering discrimination training during the videotaped playbacks of intern lessons produced significantly greater increase in selected teacher behaviours than did confirmation or self feedback procedures.

Young (1968), showed the value of videotape as a feedback technique in helping teachers to analyse their behaviour. Videotape feedback is unique to the extent that the teacher can review his own teaching performance using the objective, audio visual record provided by the videotape. Likewise teacher supervisor conferences are based on a common frame of reference rather than on the subjective record and memory of each.

Bush (1965), pointed out to the value of micro teaching as a teacher training technique at Stanford University. Meir (1967), indicated that 'Interaction Analysis as developed by Flanders, is quite suitable for micro teaching analysis.'

Richard E. Ishler, College of Education, University of Toledo, Toledo, Ohio; conducted a research project with 34 student teachers. Seventeen student teacher in experimental groups received feedback; whereas no feedback was given to a control group of 17.

The verbal behaviours of each of the student teacher was measured 10 times by the use of the withall's Social Emotional Climate Index. The findings showed:

1. The experimental group became significantly more learner centred than did the control group;
2. the experimental group was significantly more learner centred than their cooperating teachers;
3. The control group was significantly less learner centred than their cooperating teachers.

Jeffery Kirk, Lehigh University, Bethlehem, Penna; trained thirty teachers in Flanders system and provided feedback about their verbal behaviour. Kirk found that behaviour of these student teachers could be changed. After training they encouraged more pupil initiated talk, reduced the amount of patterning involving teacher question and pupil response and resisted the trend to increase the number of directions given to a significantly greater degree than did student teachers not taught the Flanders system.

RESEARCH RELATED TO AFFECTIVE ASPECTS OF TEACHING-LEARNING:

Anderson (1945, 1946, 1959), may be considered one of the pioneers in researching the effective environment of the classroom. One of the Anderson's reports (1959), stated the following:

Integration in the teacher induces integrative behaviour in the child. Children with more dominating teacher showed significantly higher frequencies of non confirming behaviour directly supporting the hypothesis that domination incites resistance. The behaviours of children also supported the further hypothesis that severe domination produces not resistance but submission.

Withall (1951, 1952), pointed to the importance of the social and/or psychological climate of the classroom when he developed what he called the ' Social Emotional Climate Index.' Withall categorises teacher statements into seven classifications (1-7 of Flanders System).

As a result of his investigation, he offered several conclusions related to classroom environment; (a) dependency of learner upon the teacher is not desirable; (b) offering opportunity to the learner to make free choices is desirable; (c) problem solving is enhanced when the teacher offers verbal expression of understanding.

Perkins (1951), using Withall's technique discovered that an integrative type of classroom leadership (Less direct and with flexibility) produced more evidence of learning in children than the dominative (more direct and with less flexibility) type of classroom leadership

Medley and Mitzel (1959), reported positive correlations between the emotional climate of the classroom and student teacher rapport, group problem solving, reading growth and teachers' self ratings.

Soar (1966), revealed that teachers with more indirect teaching styles produced greater evidence of growth in reading comprehension in elementary school pupils than did teachers with direct teaching styles.

TEACHER EFFECTIVENESS:

Teacher effectiveness is an area of research which is concerned with relationships between the characteristics of teachers, teaching acts and their effects on the educational outcomes of classroom teaching. The research which is reviewed herein permits

cautious optimism and indicates that the tools long needed for the analysis of teaching learning process are gradually being developed. This optimism is in contrast with the conclusions reached in past reviews. For example, Morsh and Wilder (1954), concluded after reviewing research on teaching effectiveness published between 1900 and 1952, " No single, specific, observable teacher act has yet been found whose frequency or percent of occurrence is invariably (and) significantly correlated with student achievement."

In the past decade, however, research has begun to relate certain teacher behaviours to specific consequences in the climate of the classroom and in the academic achievement of pupils. The shift has been from subjective evaluations to a more objective counting of teacher pupil interactions, using more sophisticated observation systems, and handling the larger quantities of data by taking full advantage of computer capability. Further discriminations and additional relationships now seem within reach as future research builds on present progress.

Anderson and Hunka (1963), spotlight areas in research on teaching effectiveness. They discuss studies which have used predictor or criterion variables and conclude that this research has reached a dead end. Attempts to built a theory of teaching from a statistical description of what is happening fail to prescribe what should be happening. Even examples of best of teaching may not provide the theoretical basis for the most effective teaching.

Gage (1955), considers why researchers continue to search for relationships between teacher characteristics and pupil growth when their rewards are so meagre. His tentative answer is that

the need for knowledge in this area is pressing. He suggests that the upsurge in the amount and quality of research on teaching in the past ten years may have made the results of research done prior to that time obsolete. He concludes that a review of literature at the present time allows for the selection of five global characteristics which seem to be components of effective teaching. The five, he selects are: (1) warmth, (2) cognitive organization, (3) orderliness, (4) indirectness, and (5) problem solving ability.

Medley and Mitzel (1963), substantiate Gage's conclusion that much of the work on teacher effectiveness must be discarded as irrelevant either because the criteria of teaching effectiveness have been invalid or because no objective measures of teacher behaviour have been used. After discussing assumptions underlying collections of classroom observational data and limitations of studies utilizing rating scales they note that more powerful statistical methods will help to identify relationships between teaching behaviours and their effects.

Fattu (1962), and Howsam (1960), both reviewed the research on predictor criteria and teacher effectiveness and concluded that such research had failed to substantiate links for such characteristics as intelligence, age, experience, cultural background, socio-economic background, sex, marital status, scores on aptitude tests, job interest, voice quality, and special aptitudes. There were slight positive correlations shown between scholarship and teaching effectiveness although no particular course or group of courses has been shown to be a predictor. Professional

knowledge has proven to be a more successful predictor, particularly for teaching performance.

Biddle (1964), after independently reviewing recent research on teacher effectiveness, declared a need for agreement on educational effects that the teacher is to produce in order to determine the components of teacher effectiveness.

Ryana (1963), and Smith (1962), discuss the need for conceptual framework for understanding the research findings on teacher effectiveness.

Ryans utilizes a system analysis approach and discuss the general implications of the studies reviewed. This review includes an extensive listing of terms used to describe teacher behaviour patterns as compared with terms used by researchers. Smith reviews four major studies on teacher effectiveness and notes that the value of these studies lies in their describing what the teacher is doing rather than in trying to label the teacher with a global title such as autocratic or dominative. He points out that there are probably no pure types of teacher and therefore, teacher behaviours need to be described so that the particular mixtures of teaching behaviours are not burried under broad category headings.

RESEARCH LINKING PROCESS AND PRODUCT

Pupil Attitudes and Achievement:

The early history of relationships between classroom processes and their consequences has been summarized by Withhall and Lewis (1963, pp 687-710), Medly and Mitzel (1963, pp 254-297), and Remmers (1963, pp 330-342), in the Gage's handbook.

To illustrate progress this may be the first review that can marshal a set of widely separated research studies which provide statistically significant support for a particular type of relationship, between process and product. The primitive quality of our present knowledge is exemplified by the concepts, methods of quantification, and lack of specificity to be found in the relationship. Nevertheless, it can now be stated with fairly high confidence that "The percent of teacher statements that make use of ideas and opinions previously expressed by pupils is directly related to average class scores on attitude scales of teacher attractiveness, liking the class, etc. as well as to average achievement scores adjusted for initial ability." Most of the studies to be reviewed in this section provide either direct or indirect support for this relationship, while only a few fail to provide such support, and none provides counter evidence of a significant but negative finding.

In work started before 1957, but published later by Flanders (1965), the above process product relationship was supported in four separate studies. In all four studies 51 teachers were observed who had been selected to be representative of a larger sample.

In Michigan, Morrison (1966), found significant evidence supporting the same relationship for positive pupil attitude scores, as well as adjusted achievement gain scores of language usage, social study skills, and arithmetic computation and problem solving. She observed 30 sixth grade teachers drawn from a sample of 102, located in 15 different school districts.

In Pennsylvania, Lashier (1965), found statistically significant support for the same relationship in eight grade science classrooms involving 239 pupils and ten student teachers. Nelson (1964), found similar support in a study of learning linguistic skills.

In a small study involving six high school English teachers near Detroit, Johns (1966), found that pupils exposed to teachers who made more use of their ideas and opinions not only had more positive attitudes, but were also more likely to ask thought provoking questions during class discussions. The incidence of such pupil questions is extremely low, may be less than one percent of all verbal communication. A finding independently supported by Dodi (1966), in California and Parakh (1965), in New-York.

Pankratz (1947), located five 'high' and 'low' teachers of high school physics, from a sample of thirty, by using principal ratings, class averages of a pupil attitude inventory, and a teacher situation reaction test completed by each teacher. These ten classes were visited for six class periods by an observer who coded verbal interaction by a system developed by Hough who expanded Flanders' ten categories. Among other findings, this study supported the proposition that five more effective teachers determined by the three scores indicated above, made more use of the ideas and opinions expressed by pupils at the 0.01 level of confidence.

Amidon (1961), conducted a study to show that not all pupils, but only those classified as 'dependent' by their scores on a

special scale, learned more principles of geometry.

Filson (1957), showed that when the behaviour patterns of role playing teachers made more use of pupil ideas and opinions, there was less dependence on the teacher. The task in the Filson experiment, was making judgements about the form of music being heard.

Flanders (1963), found similar differences during an inservice training project for classroom teachers.

In all studies cited thus far, some form of systematic classroom observation was employed to quantify classroom interaction in order to provide a process variable. Cogan (1963), provided statistically significant report for the same process product relationship by administering a questionnaire to 987 junior high school pupils in 33 classes. The questionnaire provided (a) one score for the pupils' perceptions that their ideas were central to decisions and actions taken in the classroom, another score (b) indicated how much of the regularly assigned work was completed, and a third score (c) indicated how much extra work, not regularly assigned was completed. The positive relationship found between the (a) to (b) and the (a) to (c) scores can be constructed as supporting the same process product relationship; provided one is willing to accept pupils' perceptions as valid measure of teacher behaviour. The pupils' perceptions of the teacher behaviour were, in effect, a process variable, though such a distinction is open to question because teaching behaviour itself was not assessed directly. The pupils' report of how much work they accomplished, which was corroborated by teacher ratings of pupil effort, is clearly a product variable.

Miller (1964), created controlled experimental treatments on the responsive directive dimensions suggested originally by the work of Hughes (1959). He found that junior high pupils in the classes of responsive teachers had significantly more positive attitudes, used significantly higher levels of thinking than did pupils in the opposite treatment.

These studies failed to provide support for the notion that the teacher's acceptance and use of pupil ideas is related to product variables as stated.

Snyder (1966), studying classroom interaction in high school physics classes, did not find supporting evidence. It appeared that these teachers rarely made use of pupil ideas and apparently there was little cultivation of inquiry even in laboratory sessions. Thus, it is possible, although not certain, that there was not enough variation among classroom processes within his sample to provide enough treatment contrast to test the process product relationship.

Several researchers investigated the use of teacher praise statements, a type of teacher behaviour which is usually positively correlated with making use of pupil ideas and opinions, and its effect on product variables.

Reed (1961, 1962), found statistically significant, positive correlation (+ .20 to + .40) between certain types of teacher behaviour, as perceived by the pupils, such as 'warmth', 'demand' and 'using intrinsic motivation', and a product variable of 'pupil interest in science'. The sample included 38 classes of ninth grade general science involving 1,045 pupils.

Dollins, et al (1960), carried out an experiment involving varying degrees of teacher praise in fourth grade classroom and decided that more praise helped pupil adjustment, but did not affect arithmetic achievement.

Furt (1967), reanalyzed the original Bellack (1965), data by contrasting the classroom discourse in the high school classes which scored highest and lowest on achievement. The unit of study, the tests, the textbook, and the number of teaching days were the same in all classes. The high achieving classes differed from the low by having more responsive teacher behaviour, less teacher talk and more extended pupil talk just as has been found in similar studies which involved the Flanders categories. In terms of the Bellack categories, the same contrast involved more variety of substantive logical processes, moderate amounts of teacher structure of the learning activities, and moderate pace of teaching cycles. One overall concept which seems to encompass the inferences from both category systems is that teacher influence was more flexible in the high achieving classes.

Observation systems for quantifying process variables are undergoing rapid and continuous development. For example, papers which were read at the annual conventions of several different societies in 1966 and 1967 report changes which until recently had not been officially published. Apparently the most current information about an observation system must be obtained from the researchers involved.

In the studies linking process to product variables which have been reviewed thus far, the research design called for using a score based on a process variable, in order to classify teachers

into two or more groups which were then used to make comparisons. For example, in studies making use of Flanders' categories, some teachers were classified as 'indirect', in contrast with 'direct', in order to make certain comparisons such as adjusted pupil achievement. The net effect of this use of systematic classroom observation, was not to explain teaching behaviour, but to use the data in order to assign a teacher into a particular experimental treatment group based on a teaching pattern. Subsequent analysis would then shed some light on the differences in educational outcomes when two types of teaching were compared. The primitive nature of such contrasts is self-evident since it is obvious that teaching patterns vary from one situation to the next.

INDIAN STUDIES:

Some studies have also been conducted in India during the past few years using the technique of interaction analysis and objectively assessing the work in the classroom, so that effective remedial steps for improvement could be undertaken subsequently. The publications by the Centre of Advanced Study in Education, Baroda give an account of various research projects, seminars, and summer institutes that took place in India during the past few years.

A study by Pareek and Rao (1970), reports the findings of a study of classroom observations covering a sample of 50 teachers in Delhi that (i) a little over 14% time was spent in silence and confusion; (ii) only 2 teachers in the sample used/accepted students' ideas; (iii) teachers in general used classroom more for information giving and less for establishing rapport with pupils.

51

Buch and Santhanam (1970), in a pilot study found that ten category system of classroom interaction analysis perfected by Flanders could be profitably used in Indian Schools to investigate the distinctive patterns of teacher classroom behaviour. The report contains a vivid description of the patterns of influence exhibited by English Language teachers observed.

Buch and Santhanam (1970), in a study conducted in Baroda Secondary Schools discovered confirmatory evidence on the adoptability of Flanders Ten Category System of classroom observation. The study also revealed that teachers talk 69%, students talk 21% and 10% time is spent in silence and confusion.

Buch and Santhanam (1970), studying the Relative Effects of English & Science on the Classroom Communication Phenomena, report that as for significance of differences between the two subjects, the correlation co-efficients and percentage 't'-tests that the frequency distributions in the two subjects are very highly correlated but the differences are suggested by the 't'-tests to be not significant.

Buch and Quraishi (1970), studied the classroom influence of social studies teachers in Baroda and have reported that

- (i) teacher talk is nearly 8 times greater than student talk;
- (ii) indirect-direct teacher talk ratio is 0.17;
- (iii) most of the indirect talk is in the form of asking questions;
- (iv) teachers use 6 positive statements for every five negative statements to motivate the students and to command or reprimand them respectively;
- (v) periods of silence are mostly broken by teachers;
- (vi) very little time is spent in praising and developing students' ideas.