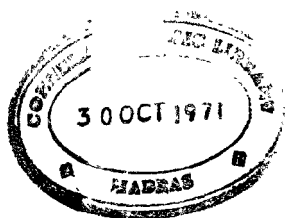


COMMUNICATION IN CLASSROOM

Editors

M. B. Buch

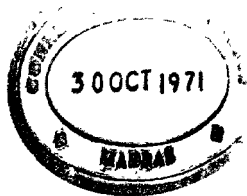
M. R. Santhanam



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FOREWORD

The major problem in the area of school education is to influence the classroom instructional process. It is only when the instructional process is improved, the benefits of new curricula, new textbooks and other new innovative ideas will bear fruits. The communication process of the teacher in the classroom has been found to be mainly responsible for the proper educational growth of the child. The verbal interaction between the teacher and the student creates the climate of freedom or restriction for the pupils in the classroom. In Indian Universities not much attention has been paid to studying and analysing the teacher's verbal behaviour. The Centre of Advanced Study in Education of the M. S. University, Baroda has rightly selected this neglected though important area of study. The investigations going on in the Centre and the studies sponsored by the Centre through the Co-operative Project on Productive Teaching are likely to throw adequate light on the dynamics of the instructional process in Indian Schools. It is hoped that the Centre will resist the temptation of adding new areas of studies and concentrate its efforts on this important area for a few years to come. Sustained studies in the area of classroom interaction will pave the way, it is hoped, to develop a rational theory of instruction.

I am sure teacher educators in the country will take a cue from the present studies of the Centre of Advanced Study in Education and initiate co-operative studies aimed at developing sound tradition of research in the area of instruction.

ISHWERBHAI J. PATEL

Chairman

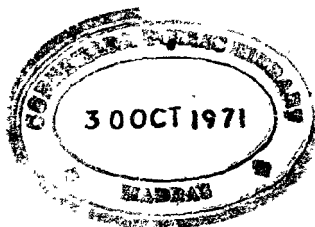
Gujarat State Board of Teacher Education

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We wish to express our deep sense of appreciation to those institutions which participated in the National Seminar on "Classroom Interaction and Teacher Behaviour", held at Baroda in January 1969. The findings of the work by Dr. Udai Pareek and Shri Venkateswara Rao which were discussed in seminar have also been printed in Indian Education Review Vol. 5, No. 1, January 1970. With their courtesy we have reprinted this study in this book. We are also thankful to Mr. N. K. Jangira who presented the paper in the Seminar and which has been printed in the Quest in Education.

M. B. B.

M. R. S.



CONTENTS

- | | | |
|---|---|--------|
| 1 | Introduction | 1-7 |
| 2 | The Basic Theoretical Assumptions | 8-11 |
| 3 | Studies in India | 12-20 |
| 4 | "The Classroom Verbal Behaviour of Selected Teachers in Baroda Secondary Schools"—By M. B. Buch and M. R. Santhanam | 21-50 |
| 5 | "The Influence Patterns of Male Social Studies Teachers as determined by Flanders Interaction Analysis System"—By M. B. Buch and Z. M. Quraishi | 51-68 |
| 6 | Patterns of Influence in Social Studies Teachers—By M. R. Santhanam, Z. M. Quraishi and Miss T. P. Lulla | 69-118 |

7 "The Patterns of Classroom Influence Behaviour
of Fifth Grade Teachers of Delhi"—By Dr. Udai
Pareek and Shri T. Venkateswara Rao 119-147

8 "Interaction Analysis—Some Considerations"
—By Shri N. K. Jangira 148-162

Reference materials available in the CASE
Library 163-165





INTRODUCTION

The Persistent Problem

Not a single day passes without someone or the other, connected with education, complaining of falling standards in educational institutions. Several reasons are adduced. One school of thought might say that it is the inevitable price being paid for quantitative expansion attempted in fulfilment of our constitutional 'directive'.

When confronted with the problem of 'falling standards', to attempt to ascribe it to quantitative expansion, though not completely untrue, is *petitio principii*. All the young ones that are born have a constitutional right to be educated and we have a moral obligation too, to give them a 'quality education'.

In the matter of qualitative improvement in education, our efforts ought to be multi-dimensional. We cannot, of course, say, that we can achieve this by improving things on a particular front. There have to be, *inter alia*, content enrichment, consequent periodic revisions of syllabii, improving teacher training programmes, bringing about administrative and organisational improvements so that the teachers will have a healthier 'morale' and many other such improvements.

But the question arises whether all this abracadabra will solve the persistent problem facing us. At this point we are cornered. Perhaps, in our frantic bid to set things right we have gone wrong in terms of priorities. Something significant has been miserably lost sight of. What is that loophole in our line of thinking?

Could it be a lack of purpose? We have, of course, the goal of 'qualitative improvement' in education. One feels

that this statement of objective is too general to suggest any specific strategy of improvement.

Don't we feel that there should be something rather 'specific' the improvement of which should be our primary concern, because of its importance in the scheme of things? Are we, then, conscious of any such 'specific' thing towards which to direct our efforts? If no, is it not a pointless effort and a meaningless waste of resources?

Alice, we are told, in Wonderland asked the Cheshire Cat, "Would you tell me please, which way I ought to go from here?" "That depends on where you want to go" said the Cheshire Cat meaningfully.

"I don't care where, much" said Alice.

"Then it does not matter which way you go" said the Cheshire Cat again meaningfully.

We are afraid the literary conversation aptly describes our efforts in this direction. Proper identification of the area of emphasis is a necessary prelude to our efforts at qualitative improvement.

The Probable Answer

The monumental Report of the Education Commission (1964-66) opens its half-a-million word report with the statement "The destiny of India is now being shaped in her classrooms". They would have, possibly, made this comment in a figurative manner, by way of underscoring the significance of the contribution of 'education', to "National development", a contention of thematic significance to the Commission, what with its title "Education and National Development".

We, however, would like to take the statement in its literal sense and we can be sure that we are not guilty of any distortion or misrepresentation of fact.

It is, indeed, the classroom, and what goes on in the classroom—that should be the first and foremost concern in our crusade against the 'fall in standards'. In other words, the classroom interaction between the teacher on the one hand and the students on the other, as also among the students themselves, should be improved obviously because it is this interaction which is the manifestation of the methodology the teacher adopts to 'teach' the students.

Efforts undertaken with a view to improving 'teaching-learning' situation in the classroom must, perforce, therefore, concentrate on devising ways and means of identifying the factors that go to make the interaction effective and fruitful. That, in turn, might suggest strategies for the developmental schemes in this connection.

The best way of studying a classroom situation is through actual observation of classes when in regular session. As early as in the beginning of this century the noted American Pragmatist John Dewey laid emphasis on classroom observation of teacher behaviour as he unmistakably believed that an understanding of actual classroom communication might contribute to the nature of 'teaching-learning' process going on in the classroom.

Although classroom observation has been there in our training programmes for a long time now, efforts to develop objective and reliable scales of observation are of recent origin. In the traditional methods observational procedures did not lend themselves to any quantification and as such relied on the subjective estimates of the observers. Times are changing. Yesterday's firm educational shibboleths are fast becoming the popular fallacies of today. When we concede so much of importance to improvement of teaching through classroom observation we can ill-afford any 'subjective' observational estimate. That, perhaps, would be a remedy worse than the disease.

The observational scales developed should not only be such as to suit the purpose of observation but should also have certain 'built-in' devices against subjective estimation by the observers. The problem is aptly described by Flanders (1960) as when he says that "even trained observers struggle with the same biases that distort the testimony of witnesses at the scene of an accident."

Benefiting from a knowledge of these inherent impediments to objective observation of a live classroom situation, a ceaseless endeavour was made to evolve reliable scales of measurement with which to observe and assess the 'classroom climate'.

Interaction analysis using a valid observational tool seeks to minimise the aforesaid inherent limitations of actual observation and permits a systematic record of spontaneous flow of acts in the classroom.

Of the several observational tools developed (Anita Simon and Boyer, E. Gil, 1968), the system developed by Ned. A. Flanders is found suitable for use in India where we cannot afford costly electrical and electronic gadgets for use in the process of observation and subsequent analysis, which might be essential in respect of some other tools of observation.

Flanders' interaction analysis instrument, consisting of ten categories is designed for observation only of verbal communication in the classroom and non-verbal gestures etc. are not to be taken into account.

The readers will find the procedure of observation using this tool developed by Flanders, described in the studies being reported in this compilation.

The chief purpose of observation of classroom 'teaching-learning' process, using Flanders' device is to identify the patterns of teacher behaviour for, as is set out in the first chapter, it has been established that teacher classroom behaviour, to a large extent, sets the 'climate' in the classroom and conditions 'learning' of the students.

Giles (1954), Kilpatrick (1949), Taba (1948) and Weston and others (1949) firmly urge a warm, friendly, democratic atmosphere in classes. After all, living in a society like ours, which places high premium on cooperation, mutuality of purpose, democratic life etc. requires a kind of school experience for children which emphasises these values. That, then, for our purpose, means that classroom situation must be modelled along democratic principles. An "indirect" (democratic) approach on the part of the teacher by encouraging and inviting pupil participation, enlarges their freedom of expression which is likely to result in greater learning by them, 'ceteris paribus'. On the contrary a "direct" (authoritarian) teacher behaviour, by curbing or curtailing the students' freedom of action would hamper their learning. The qualifying condition of this prognosis is the relative 'unawareness' of the goals on the part of the pupils. Well, that, in general, is the characteristic of the Indian students.

Naturally, therefore, if we could, using Flanders' technique, investigate the predominant teacher behaviour patterns in Indian classrooms, we will consequently be able to evolve remedial strategies of reconstruction of our whole concept of teaching methodology.

About what follows

Now let us say a few words about the contents in this volume.

In chapter II we are presenting the basic assumptions underlying the attempts to observe and measure classroom verbal communication and to have the observational results as the guiding criterion for changing teacher behaviour in the right direction. They, thus, serve as the rationale of such studies.

The idea of classroom interaction analysis is getting diffused widely throughout in India. Chapter III seeks to supply information relating to the genesis and development of the concept

in India, by describing the different projects undertaken, both current and completed, in India.

There are, in all, four studies and one article included in this volume. The scheme is such that each study is presented as such and is followed by Editors' comments. Next to these four studies which come as chapters IV, V, VI, and VII comes chapter VIII containing the article by Mr. N. K. Jangira, followed by Editors' comments.

In the end is given a list of reference materials available in the CASE library.

A New Deal

The technique is challenging and the modus operandi of instructional improvement promising. The studies being reported in this volume, we expect, will serve as an eye-opener to us and let us hope we will henceforth shed the cloak of complacency, recognise the realities, however unpalatable they may be, and seek to embark upon a grand programme of 'New Deal' to Indian Education.

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THE BASIC THEORETICAL ASSUMPTION

Attempts to improve 'teaching-learning' process in the classroom situation, by means of actual observation, everywhere, are being taken up in right earnest. Development and use of valid and effective tools of observation are all, however, to be supported by theoretical rationale lest the efforts should become a fruitless endeavour.

One may attempt to enumerate the various theoretical assumptions which are basic to the very idea of interaction analysis, as follows:—

1. In a normal classroom situation it is verbal communication which is predominant. This ubiquitous verbalism is a fait accompli. Probabilities are, in any school classroom, "better than 60 percent that one would hear someone talking".
(Flanders 1965)

2. Eventhough along with the use of spoken language, there might be resort to non-verbal gestures in the classroom, verbal behaviour can be observed with higher reliability than most non-verbal behaviour and also it can reasonably serve as an adequate sample of the total behaviour in the classroom.

We can normally assume that verbal statements of a teacher are consistent with his non-verbal gestures and, in fact, his total behaviour. This assumption was found sustained in terms of experience in Minnesota Studies. (Flanders 1966).

3. The teacher exerts a great deal of influence on the pupils. Pupils' behaviour is affected to a great extent by the type of teacher behaviour (hence we call it as teacher influence) exhibited. (Anderson and others 1946).

4. Teacher's classroom behaviour in particular exerts a crucial influence on the pupils. (Flanders 1960).
5. The relation between students and teachers is a crucial factor in the teaching process and must be considered an important aspect of methodology. (Haggerty 1932).
6. It has been established that social climate is related to productivity and to the quality of interpersonal relations. It has been proved that a democratic atmosphere tends to keep work at a relatively high level even in the absence of the leader, (Lewin and others, 1939).
7. Children tend to be conscious of a warm acceptance by the teacher and to express greatest fondness for the democratic teacher. (Perkins H. V. 1950).
8. The role of classroom climate is crucial to the learning process. (Perkins 1950).
9. The teacher classroom verbal behaviour can be observed objectively by use of observational techniques designed to "catch" the natural modes of behaviour which will also permit the process of measurement with a minimum disturbance of the normal activities of the groups or individuals. (Wrightstone J. Wayne, 1958).
10. Research has revealed ways and means by which observer error may be reduced. These include clearly determined definitions of the behaviour to be observed and structured forms for recording observations immediately, thus minimising observer interpretation or inference. (Wrightstone J. Wayne, 1958).
11. Changing teacher classroom behaviour through feedback is possible (Flanders, 1963), though how much change can occur and more knowledge relating to the permanence of these changes will require further research. (Flanders, 1963, 1966).

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STUDIES IN INDIA

The movement has caught the attention of theorists and research workers in India as early as in 1963.

1. Dr. Prayag Mehta, then in N.C.E.R.T., has been working on 'Motivation Development' and has necessarily been paying attention to the allied problem of 'understanding and changing Teacher Behaviour', in the light of classroom interaction analysis. All the ideas representing his line of thinking form the content of a booklet published since then.*

It is interesting to recollect how the gamut of discussions in the booklet is wide enough to present a proper perspective of the entire idea with all its ancillary concepts.

2. The Department of Educational Psychology and Foundations of Education, in the National Institute of Education (N.C.E.R.T.) has undertaken a project on "Changing Teacher Behaviour Through Feedback". The project, which, at the time of writing this is still going on, covers a total of 54 teachers, drawn from 17 middle schools. All the teachers handle class VI.

The study, it is claimed, seeks to extend the "feedback" phenomenon from the frontiers of classroom Interaction Analysis so as to be based on (i) self-ratings, (ii) peer-ratings and (iii) pupil-ratings of teacher's classroom behaviour, as well.

A 20-item questionnaire on a six-point scale was administered to the teachers themselves for self-rating, fellow-teachers and pupils. Though the items would be the same in all the three, the response mechanism would vary among the three groups.

* "Understanding Classroom Behaviour—A Manual"—by Dr. Prayag Mehta, National Council of Educational Research and Training, 1967.

In addition to these 'ratings', results of classroom interaction analysis by an outsider (trained observer) make up the "feedback" to the teachers. The design of the study necessarily, therefore, has required observation of each teacher on two occasions—'pre-feedback stage' and 'post-feedback stage'.

It is in this connection that the study has used Flanders' ten-point observational tool.

Since all the field work and data collection are over, it is hoped that the final report would be available by about the end of November, 1970. Even as one makes a forecast that the results of the study are likely to be very interesting and revelatory, a by-product of the study has come out in the form of a paper by Mr. Biswanath Roy and Mr. K.B.P. Sood, presenting some interim findings based on classroom observations using Flanders' technique.

The paper states that on analysis of the observations their two hypotheses—namely (i) that there may be some noticeable differences in teacher behaviour under varying teaching materials (subjects) and (ii) that sex may have a role to play in teacher behaviour are sustained. It is revealed, the paper says, that 'high lecturing, direct influence and less student participation were noticed in science and social studies classes in comparison with the mathematics and language classes'.

It is however important to note that the study was not carried out in accordance with any rigid statistical design, as admitted in the paper cited. But the findings, nonetheless, point to the presence of certain significant functional relationships borne by (i) 'sex of the teachers' and (ii) 'teaching materials' (subjects) on the patterns of teacher influence in the classroom.

(3) Another major project of immense significance is on 'Mental Health and Classroom Behaviour', which is currently being pursued by Dr. Uday Pareek, Professor of Social Sciences,

National Institute of Health Administration and Education. As is implicitly claimed by the title, the findings of this research project may well be expected to revolutionise our basic thinking in regard to classroom interaction. Possibly, very significant relationships between mental health and classroom behaviour, lying latent in the 'interaction' manifestations in the classroom situation, might be unearthed.

(4) There have been as many as twelve courses conducted by N.C.E.R.T. These courses were chiefly taken by lecturers working in Universities. These lecturers, having been initiated into the concept of Achievement Motivation and briefed about the allied aspects of classroom learning and interaction analysis, later, in turn, have been organising smaller seminars for diffusing the message further so as to reach wider sections of teachers and other workers in this area of research.

(5) So far, a series of six Summer Institutes have been organised on 'Learning, Motivation and Group Processes' by N.C.E.R.T. In all, at the rate of about 25 participants per Summer Institute, as many as 150 persons have so far been enlightened in the intricacies of these inter-dependent aspects, which either directly or indirectly impinge upon the instructional work in the actual classroom situation.

The first in the series was held in Mysore in the Year 1965. Dr. Prayag Mehta, conducted the Institute which was held under the joint auspices of N.C.E.R.T. and U.G.C. The responsibility has later been passed on to N.C.E.R.T. alone, which has been conducting the Summer Institutes ever since then, in different places, year after year.

The last in the series, organised by the Department of Educational Psychology and Foundations of Education, National Institute of Education (N.C.E.R.T.), took place in Baroda under the direction of Dr. M. B. Buch, Head of the Centre of Advanced Study in Education. The Institute which was in session from May 18th to June 21st, 1970, assumes added signi-

finance on account of the choice of the venue. Baroda is often said to be, rightly so, in the vanguard of educational progress. The M. S. University of Baroda, Baroda, can be rightly proud of having the only 'Centre of Advanced Study in Education' in India. The centre has a team of researchers working on different aspects of teacher influence in the classrooms.

'Classroom Interaction Analysis and Teacher Behaviour' and CASE.

Special mention must be made about the work going on in the Centre of Advanced Study in Education, (CASE), M. S. University of Baroda. The CASE is engaging its attention currently on a few major projects. One of the projects is on 'Classroom Interaction Analysis and Teacher Behaviour'.

As mentioned earlier, Dr. M. B. Buch is guiding research in this area both at doctoral and post-graduate levels.

The CASE, in view of its being the only centre of its kind in the whole country, occupies a unique position in the hierarchy of research bodies in the field of Education in India. It is therefore suitably equipped for pursuing research at a relatively high degree of competence and sophistication. The research work done in the CASE is naturally therefore designed in such a way that it has meaning for the entire country and not just to the immediate environs of the University to which it is attached.

For nearly a year now, the CASE has been working in this field. It should be mentioned that there are actually some twenty-six (15) different observational tools developed for use in classroom interaction analysis. Largely, it is the purpose with which the observation is undertaken that decides the choice of the particular tool.

The 10-point observational tool developed by Ned A. Flanders is the one being accepted in CASE studies for the simple reason that this happens to be a tool that can be used without the help of any sophisticated gadget. A careful and vigilant

observation by an active observer,* properly trained and continually in consultation with other observers for discussion of elusive events of classroom communication, would do for an effective and reliable capture of a classroom communication, episode, if the Flanders' tool of observation is used. Hence the emphasis on this tool of observation.

By way of disseminating the message of classroom interaction analysis and teacher behaviour, the CASE organised in Baroda a seminar, on an all-India basis, from January 18th to January 24th, 1970. The seminar, attended by 38 participants, had the benefit of the counsels of Dr. Prayag Mehta, Professor of Research, Indian Institute of Mass Communication, New Delhi and Dr. Uday Pareek, Professor of Social Sciences, National Institute of Health Administration and Education, New Delhi. The seminar was primarily a business session, as well as a deliberative forum.

Systematic training was imparted to the seminarians, in the observation of classroom interaction using Flanders' system and in the complete process of analysis of observations through the use, construction and study of matrices.

Some of the participants who had been even otherwise engaged in studies of classroom behaviour reported their 'findings' while some others who had been keeping themselves abreast of all the loud thinking going on in this field contributed some 'papers'—all these formed the subject matter of discussions in the seminar.

In fact, the article by Mr. N. K. Jangira, appearing elsewhere in this 'compilation', was one, presented by him, in the seminar.

A micro-study which was a part of a wider study undertaken jointly by Dr. M. B. Buch and M. R. Santhanam appearing elsewhere in this compilation, was also reported in the seminar. As the seminar was drawing to its close, the participants became fully trained and qualified to be independent observers and

parted on a note of promise to the CASE that they would, as a 'follow-up' to the seminar, conduct series of observations in their leisure time and contribute to the fund of knowledge in this area. The CASE volunteered that it would act as a 'clearing house' for all the participants as they, on return to their respective places, started the work. The help from the CASE, it was assured, would not only be confined to supply of needed literature, provision of expertise and guidance in formulating research designs etc. but also arranging, to the extent possible, occasional meetings for the persons pursuing research work in this area so that a useful exchange of findings could take place. Also in the seminar, it was felt that CASE should initiate a cooperative project in the area of classroom communication analysis and teacher behaviour.

Close on the heels of the seminar the CASE began formulating schemes of cooperative research involving individuals and institutions. That was the initiative on the part of the CASE. The 'follow-up' to the seminar was well under way. The call from the CASE was responded to by a number of individuals and institutions, some of whom were participants in the seminar, and they agreed to work in collaboration with the CASE on a project decided upon through mutual consultation. It took a concrete shape very soon and the cooperative venture known as Cooperative Project on Productive Teaching (COPPT) came into its being, with an initial complement of 19 'institutional members', and 7 'individual members'. The list is expanding further.

The COPPT, which is a useful exercise in the semantics of collaborative research, has the benefit of direction from of three scientists in this field—namely Dr. M. B. Buch, Dr. Prayag Mehta and Dr. Uday Pareek.

The principal objectives of COPPT are:

- (a) To take up studies in the area of Interaction Process Analysis in the Classroom.

- (b) To study the communication behaviour of teachers in classroom.
- (c) To use the results of Interaction Process Analysis to modify teacher behaviour.
- (d) To take up such studies in the area of instructional process and pupil-teacher communication behaviour as would help in developing a picture of the psychological phenomena going on in the classroom.

COPPT and CASE

In view of its being the only Centre in the area of Education in the country, the CASE has a special role to play with respect to COPPT. The CASE has taken up the following responsibilities:—

- (1) The CASE will provide a forum for the members of COPPT to meet and share their experiences and results of research and investigations.
- (2) The CASE will convene, at least one meeting of COPPT members every six months. In these meetings the studies undertaken by COPPT members will be discussed and new studies will be planned.
- (3) The CASE will provide training and research facilities at its head-quarters and also extend its services to its members undertaking investigations in their institutions.
- (4) The CASE will assist the members of the COPPT in the technical aspects of research viz. formulating the proper research design, tabulation and analysis of data etc.
- (5) CASE will also supply bibliography and annotated reference material to members of COPPT, if the circumstances so demand.

‘It is the first step’ it is often said, ‘which is difficult.’ By way of helping the members a step further, the CASE spelt out an exhaustive list of suggested projects, as follows:

(1) A study of students' attitudes towards teachers with direct or indirect influence.

(2) The effect of the knowledge of classroom interaction on the attitudes of teachers towards teaching.

(3) Indirect influence in the classroom as a function of teachers' familiarity with the interaction process analysis.

(4) Use of interaction process analysis in micro-teaching in changing the behaviour of teachers under training.

(5) Effectiveness of the use of interaction process analysis in the student teaching programme.

(6) Use of interaction process analysis in the in-service education of teachers.

(7) The effect of feedback, using interaction process analysis on teacher behaviour.

(8) A normative survey of classroom behaviour of teachers of a specific subject in a particular grade in India.

(9) A study of the classroom behaviour of teachers in relation to certain personality characteristics.

(10) A study of the relationship between teacher influence in the classroom and pupils' achievement.

(11) A study of the relationship between teachers' classroom influence and pupils' attitudes.

(12) A study of the relationship between classroom behaviour of teachers with students' achievement motivation.

(13) A study of the effect of classroom behaviour of teachers on gifted and under-achieving pupils.

(14) A study of the relationship between classroom behaviour of teachers and response patterns of the pupils.

In addition to these separate projects, a common project, wherein, all the participating members would work together has been proposed. The title of the project is; "A normative survey of classroom behaviour of teachers of different subjects of secondary schools."

This project would cover a sample of 360 teachers teaching History/Social Studies and 390 teachers teaching English, both in class IX only. The sample has been distributed over both the institutional and individual members.

Three observations each of 20 minutes' duration are proposed for each teacher, in the sample. The three observation spells will have to be spread over three teaching periods. The members have been called upon to collect all the relevant particulars in the prescribed proforma, in respect of the teachers observed.

The CASE has also suggested that every member of COPPT might endeavour to train up at least a team of five observers and to determine inter-observer reliability at the conclusion of the training. It has also spelt out a time-table whereby the members have been requested to complete the observations by the end of July or August, 1970, according as whether the schools in their respective areas reopen in June or later. The results from this normative study, would provide referential standard scores in these subjects and that is bound to provide a fillip to the movement.

THE CLASSROOM VERBAL BEHAVIOUR OF SELECTED TEACHERS IN BARODA SECON- DARY SCHOOLS

M. B. BUCH and M. R. SANTHANAM*

I. Introduction

English is taught in Indian schools, chiefly as a foreign language. The language occupies a vantage position in so far as it serves as the effective vehicle of almost all branches of knowledge. An effective mastery of the language is a prelude to acquisition of all modern knowledge.

The teaching of English has received special attention in the country both at the level of the States and the Centre. The Central Institute of English at Hyderabad and a large number of *English Institutes* in various states are engaged in studies and programmes aimed at improving the English education programmes and programmes for preparing teachers at the school stage. It must however be pointed out that very few programmes for improving the preparation of English teachers are based on research findings which may lead to sound modification of teaching practice and classroom behaviour.

There is a need to pay more attention to teacher personality, the effects of teachers' classroom behaviour and the implication of these effects for teacher education. The present study has been an *exploratory study* to study the classroom behaviour of selected teachers of English in the English medium schools of Baroda.

II. Objectives

The major objectives underlying this study are :—

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- (i) to explore the possibility of using Flanders' ten-category system of classroom interaction analysis in Indian schools,
- (ii) to explore the classroom behaviour of teachers of English as exhibited through the teacher-pupil verbal interaction.

III. Procedure

(a) *Tool*: As mentioned earlier, Flanders' ten category system of classroom interaction analysis is selected as the tool to be used for this study. This system measures only the verbal behaviour of teachers. Attention is mainly focussed to study to what extent the teacher's behaviour is indirect or direct and to what extent the teacher's verbal behaviour provides freedom of response to pupils.

(b) *Training*: Prior to undertaking the observational study, the investigators had a series of extensive training programmes in the technique of classroom interaction observation. Following sustained training the inter-observer reliability using Scott's Coefficient of Correlation was found to be consistently above 0.85.

(c) *Sample*: There are six English medium schools in Baroda with about 30 teachers teaching English. The investigators observed 11 teachers.

The eleven teachers are serving in four different schools. While all the schools available for visits and observation at the time, were visited, the choice of teachers for observation was done by random selection.

Five male teachers and six female teachers constitute the sample. The age of the teachers ranged from 29 to 61 years, the oldest being a male teacher. The range with regard to their recency of training lay from 2 to 30 years. It is, perhaps it should be, the oldest teacher aged 61 who has had his training at the remotest period (as far back as 30 years).

On the whole, six teachers reported having had pre-training service ranging from 2 to 7 years. The range in respect of their post-training service lay from 2 to 29 years. The quantum of experience of teaching English as a subject, for all the eleven teachers ranged from 2 to 29 years.

As regards the classes observed, standards VI and VII were handled by two different teachers, one each. Four other teachers were taking standard VIII; two other teachers standard IX; and three other teachers standard X. The uneven representation given to the different standards, in the sample, though apparently an inconsistency, is not likely to affect the relation of the objective of the study, which are very general.

(d) *Scheme of observations:* The programme was designed such that each teacher was observed for two periods. The second observation was made when the teacher took the same class on the occasion immediately next to the first observed occasion. The second observation episode was therefore, in content, a continuation of the first one.

It may be of significance here to mention that the exact period (whether I, II, III or IV—etc.) on the day of observation when each observation was made, was recorded.

The interval between the two observations in respect of each teacher, in terms of hours was recorded and was found to vary between 40 minutes and 43 hours, 08 minutes.

The interval time was calculated by measuring the time lag between the exact closing time of the first observation and the commencing time of the second one.

Although the duration of the periods was nearly uniform, in the case of individual observation, 'effective observation period' was computed and recorded by deducting the amount of time "to be disregarded" from the total time of observation. Certain happenings like a visitor coming to the class, a circular being brought, or even the teacher or the student 'writing on black-board', were disregarded as 'no verbal interaction

periods'. Adequate 'ground rules', of course, had been developed for providing guidelines to the investigators in the matter of their remaining consistent in the various observations.

As a result, therefore, the duration of 'effective observation' for each teacher and each observation varied. The total period of effective observation for all the 11 teachers, in respect of the series of first observations, worked out to 5 hours, 3 minutes and 4 seconds yielding a total of 7482 tallies; and the total period of effective observation with regard to the second series of observations, worked out to 5 hours 3 minutes and 50 seconds, yielding a total of 7304 tallies. On the whole, for a total of 10 hours 6 minutes and 54 seconds of effective observation a grand total of 14786 tallies were recorded.

(e) *Ground Rules*: For an effective, objective and consistent observation, it is imperative that a set of pre-set guidelines be followed in categorising the doubtful communication events. The referential ground rules developed have to be in consonance with the observation and recording of verbal behaviour of the teacher and the students.

Some of the important ground rules followed are given below:

(i) Teacher reading from the book is put in category 5.

(ii) Pupil reading from the book is put in category 8.

(iii) Teacher or student writing on the black-board is to be treated as "no verbal interaction period" and hence was ignored. A marginal note instead of a clumsy and useless series of 10's was made.

(iv) Also were ignored, after making necessary marginal notes, likewise, the occasions when a visitor came to the class, a circular was brought, the teacher excused himself for a while away from the class, pupils wrote either from the book or the black-board. These are all, beyond any shadow of doubt, "no verbal interaction periods".

(e) Other 'ignored', types of events included 'students' silent reading' and 'teacher dictating' with the students taking down;* and students suddenly plunging into a quarrel.

(f) *Matrix Tabulation*: Separate 10 by 10 matrices were prepared for each teacher and for each observation which yielded 22 matrices. The two matrices representing two observations for each teacher were later 'combined'. Thus eleven 'combined matrices' representing the eleven teachers were obtained. Again a 'Master Matrix' representative of the entire sample of eleven teachers was prepared by 'combining' all the eleven individual 'combined matrices'.

The process of combining matrices was carried out by cell-by-cell addition of frequencies, as described by Flanders.

IV. Discussion and Interpretation

While it is perfectly possible as well as desirable to attempt detailed interpretation from individual matrices which will throw light on the classroom behaviour of different teachers observed, the investigators confine the discussion and interpretation to the 'Master Matrix', for reasons of expediency.

The combined matrix for all the eleven teachers and its derivative, the percentage matrix are given in appendices A and B respectively. A close study of the matrices aided by the marginal notes made during the course of observation, results in interesting and informative revelations.

(a) *A Preview*: Certain basic ratios serving as introductory indices help us to scan for a general initial picture of the interaction pattern observed. The emerging basic data, as a framework of reference, would help us to better and more revelatory

* The alternative to ignoring 'teacher dictating' would be to classify it as a 5, which would result in a long series of 5's with 10's in between. At the stage of interpretation, this far from depicting the actual happening would be deceptively suggestive of the teachers not having been sufficiently continuous in their information-giving.

details, when certain significant areas of the matrix are later taken up for analysis and interpretation. The following are the basic data:

(i) Teacher talk 69 percent.

(ii) Student talk 21 percent.

(iii) Nearly one-seventh of student talk is student-initiated (479/3128).

(iv) Only one-fifth of teacher talk is indirect (The I/D ratio = 0.2).

(v) Ignoring the emphasis on content, the teacher verbal behaviour nearly strikes a neutral pose as between direct and indirect patterns (The i/d ratio = 0.502).

(vi) Nearly one-tenth of the time is debited on the side of 'silence, pauses or confusion' (The percentage of column ten total is 9.59).

(vii) There are three cells (5-5, 8-8 and 10-10), all of them lying on the 'steady-state' diagonal, that are significant by virtue of containing not less than 3 percent of tallies each. The implication is that 'information-giving' was very intense and sustained to the extent of 44.35 percent. The next heaviest cell—viz cell 8-8 whose load of 12.01 percent of frequency is well over two times the amount of teacher-controlled student talk immediately following teacher talk (column eight, row one to seven total = 4.72 percent).

With the cell 4-8 carrying a light frequency of 2.41 percent the presence of a heavy load in 8-8 cell counsels caution in the search for the significance of the cell. A consultation of the marginal notes reveals that at least in the case of three out of the total eleven teachers, pupil reading from the book was ordered by the teacher and was observed 'sustained' in occurrence. The event being coded as '8' has been causal for inflation of the frequency in this cell.

The load of 4.04 percent in the cell 10-10 indicates that silence, confusion etc. was sustained to the extent of about one-twentyfifth of the total time.

The general picture presented by the matrix, however, is not unusual in terms of the normative expectations spelt out by Flanders. He sets a range of 50 percent to 80 percent for teacher talk and assigns a range of 25 to 40 percent to student talk. Also he delimits silence etc. to about 10 percent.

(viii) Sustained students' self-initiated talk is 1.17 percent while sustained acceptance/use of students' ideas is 0.59 percent.

(ix) The emotional affect is to the extent of 5.49 percent (sum of column totals one to three) which strikes a contrast to the emphasis on content and business at hand which is as high as 58.59 percent (sum of column totals four and five).

(b) *Distribution Pattern of Frequencies:* A total of 14,786 tallies are distributed over as many as 88 cells leaving the remaining twelve cells empty. All of them are transition cells. They are 1-2; 1-3; 2-1; 3-1; 1-6; 1-8; 4-1; 6-1; 7-1; 7-3; 9-8 and 10-1. Among the significant losses, the share of 'Constructive Integration' area of the matrix is to the tune of 4 cells. The loss of the 'Content Cross' area is one cell only—viz. 4-1.

(c) *Constructive Integration Area:* With four of the nine cells comprised in this area, containing 'nil' frequency the pattern of distribution of frequency in the remaining five cells is an indication to the sequential quality and the extent of the 'reward' component of teacher behaviour.

A little over one-third of all 'feeling tone' acceptance (category one) by the teachers is sustained. (0.05 percent out of 0.14 percent). The combined shift from praise/encouragement to the clarification and development/acceptance of students' ideas and vice versa (0.18 percent + 0.06 percent = 0.24 percent) is about one-fifth of the combined 'sustained

use of these two principal means of reward (0.65 percent + 0.59 percent = 1.24 percent).

The total extent of use of these indirect means of reward is 5.49 percent (0.14 percent + 2.66 percent + 2.69 percent). The extended indirect component which works out to 1.53 percent (0.05 percent + 0.65 percent + 0.18 percent + 0.06 percent + 0.59 percent) shows that a little more than one-fourth (1.53/5.49) of the total recourse to these means was 'constructive' as distinguished from the 'incidental' and 'expedient' use of these means in furtherance of certain other communication events. For example the incidental and expedient use of praise/encouragement following teachers, questions is 0.13 percent and that following students' responses is 0.72 percent.

It is very clear that praise/encouragement and acceptance of students' ideas serve as powerful means of reinforcement and reward. Acceptance of students' responsive ideas is 1.21 percent while the students' self-initiated talk is acknowledged to the extent of 0.56 percent. The former is over twice as much as the latter. This relationship lends added significance to the finding that teacher-controlled student talk (17.91 percent) was nearly six times the students' self-initiated talk (3.25 percent).

(d) *The Vicious Circle*: Resort to direct means cannot always be undesirable. But there can be no two opinions on the hypothesis that a high recourse to orders and commands following criticism and vice versa, in association with 'sustained' orders and commands and criticism unerringly points to the problems of classroom management and control and the consequential punitive action by the teachers.

The total load in the four 'extended direct' cells (0.72 percent + 0.20 percent + 0.20 percent + 0.64 percent) is 1.76 percent (cf. index 'd' in Appendix B).

It is disconcerting to note that the total load of 'vicious circle' cells (1.76 percent) is even greater than that of 'constructive integration' cells (1.53 percent).

(e) *The Steady-State Diagonal Cells:* The ten steady-state cells 1-1, 2-2,.....10-10) lie on the diagonal from upper left to lower right as distinct from the other transition cells. The event—sequences coded in these cells were observed to occur in a sustained fashion for spells of over three seconds each.*

All the ten cells claiming a total of 9901 tallies account for 67 percent of the total occurrence of observed events. The teacher talk constituent of this (the seven steady-state cells in column one to seven) is a total of 7355 tallies. This works out to nearly 72 percent of total teacher talk. The residual 28 percent indicates the poor flexibility on the part of teachers to move from one category to another. The pupil performance as revealed by the combined load in the two steady-state student talk cells 8-8 and 9-9 viz. 1949 which works out to 62 percent of total student talk appeals better from the view point of capacity for flexibility. But then one remembers the basic fact that the Flanders system of ten-categories is designed more for studying teacher behaviour than for analysing student talk.

As has been mentioned earlier the most heavily loaded cell is cell 5-5 with a frequency of 44.35 percent and it lies, as it very often happens, on the diagonal.† This means that in-

* The inherent limitation of the 10 by 10 matrix analysis is that reconstructing steady-state or even transitional—'event-sequences' is limited to time intervals of six seconds. A sustained occurrence of an event for 9 seconds, for example would be 'under-represented' as two tallies in the respective steady-state cells. The two tallies except in conjunction with recorded observations, can never tell us whether they relate to the sustained occurrence of the event for 9 seconds or to two different occasions of sustained occurrence of the event, of over three seconds each.

† A point of interest is that even the next two heavily loaded cells—viz. cells 8-8 and 10-10 also are diagonal cells.

formation-giving, as an event, was 'sustained' to the extent of 44.35 percent with reference to the total time. The 'sustained' fashion of information-giving, however bears 0.89 percent to total information-giving (6557/7411).

A total of 12 percent of total communication seems concentrated in the cell 8-8. Sustained student reading, of course, at the instance of the teacher, is, as has been said earlier, partly causal for the inflation in this cell. The load in this cell however bears a proportion of 0.67 percent to the total occurrence of this event viz. students' responsive talk (1776/2649). This indicates that teacher-solicited student talk was more 'sustained' than otherwise.

The significance of the cell 10-10 with the next heaviest load of 4.04 percent is that about 0.42 percent of the total occurrence of silence, pause and confusion was 'sustained'.

Next in concentration of frequency comes the cell 4-4 with a load of 2.64 percent. This is the extent to which the teacher questioning was elongated with a view to making it better understood.

To a nearly comparable extent occurred teacher questioning immediately following 'content delivery' (cell 5-4 with a load of 2.19 percent). Questions immediately following 'information-giving' may besides being useful, in effect, as any interrogation, could serve to reinforce the reception of information even as it is fresh. The point being hypothesised is that questioning primarily as a tool of testing and generally as a mode of invitation to pupils to participation in verbal communication, could be more useful in the context of 'content delivery' than otherwise.

The cell 9-9 comes next in this order with a load of 1.17 percent. This is the highest cell load in the column representing, naturally therefore, more than one-third of the total occurrence of this event (173 out of 479).

A discussion of the respective loads in the two cells 3-3 and 9-9 could be of contextual significance in so far as the former

indicates the teachers' sustained constructive* concern for students' self-initiated talk and the latter the extent to which the students come up in a 'sustained' fashion with their own ideas. The load in the cell 3-3 is about half that in the cell 9-9. It should be safe to postulate that as the proportion of the former to the latter approximates to unity the 'constructive' attitude of the teachers would become more rewarding and hence fruitful. In commonplace parlance the proposition could be simplified to mean that sustained acceptance of students' sustained self-initiated and freely-expressed ideas should be as much as the latter is, for full and effective mobilisation of pupil initiative.

Deserving a special mention is the cell 6-6 which with a load of 0.72 percent comes next in this order of succession based on the degree of concentration of frequency, on the diagonal. The cell being the second-heaviest in the concerned column accounts for about one-fifth of the total occurrence of the event (122/578). While this is the proportion of the 'sustained' occurrence of the event, the heaviest cell 8-6 with a load of 0.95 percent indicates the occurrence of the event following pupils' response as being to a still greater extent *viz.* nearly one-fourth of the total occurrence of the event (140/578).

As the investigators consult the marginal notes, the significance behind the heaviest concentration in the cell 8-6 is largely due to the teachers ordering 'sit down', 'stop', 'next' and so on in the context of the students giving verbal responses or reading from the book by turns. The desirability or otherwise of a heavy load in the cell 8-6 will be discussed later in the context of teacher reactions to student talk.

That the cell 5-6 with a load of 0.67 percent comes immediately next to the 'steady-state' cell 6-6 (0.72 percent) indicates that nearly to an equal extent the ordering and commanding following 'information-giving' was resorted to.

* As evidenced by their accepting and using the pupils' self-initiated idea.

Tallies in this cell could occur whenever the teachers asked the pupils to read or write or do anything, following lecturing.

Calling for our comment comes next the cell 2-2 with a load of 0.65 percent. The implication is that nearly one-fourth of all praise or encouragement was 'sustained' (96/391). A separate and detailed discussion of the pattern of use of praise and encouragement by teachers is in store for the readers.

The cell 7-7 with a load of 0.64 percent causes concern not only in so far as it implies that nearly half of all criticism (95/210) was 'sustained' but also it turns out to be the heaviest loaded cell in the column. In other words, criticism mostly was sustained.

The cell 8-7 with a load of 0.21 percent, the second heaviest cell in the column shows how nearly once every seven times, on an average, criticism was resorted to, following students' responsive talk. This is an index to the degree of teachers' impatience of pupils' inaccurate response or incorrect reading etc. Such unveiled criticism could do unimaginable damage to the students' interest and enthusiasm. Criticism, basically an effective disincentive to students, is at times a powerful punitive measure.

That criticism following orders and directions (cell 6-7 with a load of 0.20 percent) was almost as much as criticism following students' responsive talk (cell 8-7 with a load of 0.21 percent) should again cause concern. As we have already seen, the cluster of frequency in this cell could decisively supplement the information relating to the pattern of teacher criticism preceding teacher directions etc.

The students' disregard for teacher directions etc. will provoke more outbursts of anger of teachers in the form of further criticism. (cf. the cells 7-10 and 10-7 with loads 0.22 percent and 0.14 percent, respectively).

Also significant is the striking parity between the frequencies in the cells 7-9 and 9-7 (0.03 percent in each). As much of

pupil overt resistance to teacher criticism was there as there was teacher criticism provoked by pupil overt resistance.

It is to be admitted that this may be only partly the case, for even innocuous self-initiated statements from students could trigger criticism from the more impatient of the teachers. By no stretch of imagination, we can equate such inadvertent student statements with overt resistance.

The load in the cell 1-1 (0.05 percent) indicates that one-third of the total teacher acceptance of students' feelings has been 'sustained' (7/21). To exactly the same extent, there has been teacher acceptance of students' feelings in the context of information-giving, as is clear from the cell 5-1 with a load of 0.05 percent (7/21).

(f) *Content Cross*: That part of the communication which primarily concerned with 'content delivery' to the students is collectively revealed in these cells. The nomenclature is derived by the relative arrangement of the cells which form themselves into a 'cross'. A clue to the emphasis on subject matter, as distinguished from emotional aspects, comes from the sum of columns four and five. In this case the two columns claim a total of 8662 (1251 + 7411) out of 14786 tallies. The percentage works out to nearly 58.60 which cannot be unusual in any classroom situation. It is worth recollecting in this context that the heaviest loaded cell in the matrix 5-5 which is found to lie on the diagonal forms part of the 'Content Cross'.

A further examination of the pattern of distribution in the different cells in this area yields some interesting information. Short answer drill situations are easily identified from this 'cross'. A reference to the relative loadings in the cells 4-8, 8-4, 8-3, 3-3 and 3-4 is required. Teachers' questions evoke answer from students and the answers are accepted and clarified by the former and there are more questions. The proportionate loadings in the cells 4-8 and 8-4 are 2.41 and 0.78, respectively. The sum of the loadings in the cells 8-3 and 3-3 is 1.80 percent

(1.21 percent + 0.59 percent) while the load in the cell 4-8 is 2.48 percent. We cannot, of course, drive towards any hasty and possibly erroneous conclusion that this large proportion between the load in the cell 4-8 and the sum of loadings in the cells 8-3 and 3-3 indicates that most of students' ideas were accepted and clarified. It is safer, as also more enlightening to fathom the nuances in this connection. As for the cell 8-3 it only indicates the extent of 'acceptance of students' ideas immediately after their occurrence. By no stretch of imagination we can generalise that all the 8's preceding and therefore provoking 1.21 percent of tallies in the cell 8-3 were in response to 4's that is 8's following 4's and therefore participating in the build-up of tallies in the cell 4-8. A similar argument applies as well to the cell 3-3 in which case the steady-state of 3's might have been as much in the context of 9's or even any other coded event as in the context of 8's.

We therefore appreciate the need for an exercise of caution in the interpretation of the pattern of distribution in the cells 4-8, 8-4, 8-3, 3-3 and 3-4 for an indication to the extent of short answer drill situation in the communication observed. We, nevertheless, can safely presume that this pattern does serve as a rough index at least of the drill situation.

Another interesting feature is that drill sequences occurring in a fast manner are more often coded as 6's and 8's rather than as 4's and 8's. The cells 6-8 and 8-6 carry 0.98 percent and 0.95 percent loadings, respectively. Again with an element of restraint we can summarise that this near-parity also positively indicates the speedy short answer drill situations.

A point of theoretical importance in this connection is that the emphasis on subject matter is not limited to the 'cross' but also spills over to columns 3 and 6. This is very clear because acceptance and clarification of students' ideas and orders and commands could be as much in the context of content as otherwise. The sum of columns 3 and 6 works out to 6.52 percent (2.69 percent + 3.83 percent).

(g) *The use of praise:* The use of praise can be studied by analysis of the pattern of distribution of tallies in the different cells in column two of matrix. It should be remembered that category 2 stands for not only praise but also encouragement and jokes cut by teachers. When students are struggling to answer questions, teachers are seen prompting and these, are, of course, clear instances of encouragement. When teachers deliberately or even otherwise repeat the answer given by a student, the teacher's act invokes a '2' and this, beyond any shadow of doubt, serves as an effective reinforcement.

In column two, the sum of rows one to seven reveals the total use of praise by the teachers in 'teacher talk'. The amount of praise occurring in such context is nearly 44 percent of all praise statement (172/391).

Praise or encouragement in direct reaction to student behaviour is to be looked for in the two cells 8-2 and 9-2. Totally, these two cells carry a load of nearly 50 percent of all praise statements (195/391).

Praise or encouragement occurring after teacher-controlled and teacher-directed student talk exceeds that uttered in support of student-initiated and unpredictable student statements, by about 12.5 percent of total praise. (122-73/391).

Words of praise or encouragement, uttered following spells of silence, work out to just 6 percent of the total praise used (24/391).

Praise or encouragement, as a whole, constitutes 3.82 percent of total teacher talk. It is interesting to note that this compares favourably with the teachers' accepting and clarifying students' ideas which is 3.74 percent of the total teacher talk.

For further examination of the use and effect of praise or encouragement, the different cells in the row two should be consulted. On the whole, the teachers used as much as about 62 percent of all praise or encouragement as the launching pad for all seven types of teacher talk (sum of row two columns

one to seven with reference to the total *viz.* 391). Barring the sustained praise cell 2-2, it is the cell 2-5 which is the heaviest loaded one in this cohort of seven cells. The frequency in the cell 2-5 being 58, it is clear that nearly as much as 15 percent (58/391) of all praise served as the supporting cushion for delivery of at least 0.78 percent of all content (58/7411).

The immediate effect of praise or encouragement in terms of student behaviour is given jointly by the two cells 2-8 and 2-9. In all, 26.6 percent of all praise or encouragement (104/391) served to trigger at least 3.3 percent of all student talk. There can be no gainsaying the fact that praise or encouragement serves as an effective bait for student participation. Even the shy and the recalcitrant can be roped in by resourceful teachers if they ingeniously wield this wand of magic *viz.*, praise and encouragement. Care should, however, be taken to see that use of praise etc. does not become indiscriminate or superfluous in which case the teachers would only be making themselves the 'laughing stock' for the students. An exercise of restraint should regulate a judicious resort to praise and encouragement for fruitful results.

(h) *Teacher Reaction to Student Statement:* How the teachers react to student talk is to be gathered from analysis of rows eight and nine, columns one to seven. Teachers' sympathetic reaction to students' feelings and their positive concern for what they say, as exhibited by their praise and encouragement and acceptance and clarification of students' ideas are all revealed in a crystal-clear manner in the pattern of distribution of tallies in the different cells in rows eight and nine, columns one to three.

The teachers' constructive attitude is exhibited more with regard to students' responsive (teacher-directed and teacher-controlled) talk than their own self-initiated talk (sum of frequencies in the cells 8-1, 8-2 and 8-3 *i.e.* 1.94 is greater than the sum of frequencies in the cells 9-1, 9-2 and 9-3 *i.e.* 1.05 percent). Teachers chose to put questions, again to a greater

extent after students' responsive talk than their self-initiated talk (The frequencies in the cells 8-4 and 9-4 are 0.78 percent and 0.30 percent, respectively). The incidence of the former is over two and a half-times more than that of the latter. By way of content delivery, 1.26 percent and 0.37 are the loads in the two cells 8-5 and 9-5 respectively. That information-giving followed students' responsive talk, to a greater extent than it did students' self-initiated talk need not provoke any surprise. It is but natural for any classroom situation. What should, however, engage our attention and earn a complimentary remark is the relative frequency position in the two cells 9-5 and 9-3 which bear 0.37 percent and 0.55 percent. The happy revelation is that the teachers to a greater extent were accepting and clarifying students' self-initiated talk than they allowed it to just trigger further spells of information-giving. Teacher must be doing more constructive work when they keep up a receptive poise and an encouraging and rewarding attitude by accepting students' self-initiated talk than when they choose to make it an occasion just for further information-giving. The relative load in the cell 9-3 is perhaps one of the most reliable indices of teachers' positive reaction to students' own expressions.

The load in the cell 8-6 is 0.95 percent. Mostly, as the marginal notes confirm, the tallies in this cell were provoked when teachers ordered 'sit down', 'stop' etc. whereby they were either giving a quietus to or attempting a termination of students' responsive talk. Student loud reading, by turns, at the instance of the teachers result in series of 8's followed by 6's. One other common classroom situation that provokes this sequence of 8's followed by 6's is the short answer drill situation.

To the extent of 0.21 percent (cell 8-7) the teachers criticised just after students' responsive talk. We can only say so, by way of reconstructing the classroom event sequences. It would be erroneous to conclude that all the 0.21 percent frequency was directed against the preceding piece of students' responsive

talk for, not on all occasions, it was students' incorrect answer or faulty reading etc. that courted teachers' condemnation and criticism. On a fairly large number of occasions, criticism from the teachers was triggered by uncoded non-verbal classroom occurrence. But, then, there is no gainsaying the fact that nearly one-seventh (0.21 percent out of 1.43 percent) of all teacher-criticism was following, although not wholly provoked by, students' responsive talk.

Teachers' non-encouraging and perhaps hostile attitude to students' self-initiated and free talk is portrayed best through the size of load in the cell 9-7, while their apathy towards the students' free talk is indicated by the load in the cell 9-6 which is an indication of the teachers' impatience of the students' own and free expression. The frequency in the cell 9-7 is 0.03 percent and that in 9-6 is 0.19 percent.

On the whole, as much as 10.2 percent of all teacher talk has been in direct reaction to student talk, either in acceptance and encouragement thereof or in disapproval, condemnation and termination thereof (the total of tallies in rows eight and nine and columns one to seven to the sum of column totals one to seven i.e. 1050 out of 10245). This is made up of teacher talk following students' responsive talk and that following students' self-initiated talk. They are approximately in the ratio of 5:2 (760:290).

(i) *The Prompt to Student Talk:* Pupils' active participation in classroom communication is a sine qua non for effective learning.

It is an assumption that verbal behaviour of both students and teachers is reasonably representative of their total classroom behaviour. Also, it is axiomatic to state that it is the teachers' classroom behaviour that primarily sets the climate and influences the course of classroom communication. In other words, the pattern and extent of student participation are patently decided by the teacher behaviour. In general, authoritarian teacher

behaviour could be repulsive to pupil participation whereas democratic teacher behaviour would be permissive of pupil participation.

How pupil participation is prompted, as revealed by the pattern of distribution of frequencies in the different cells in column eight and nine, especially rows one to seven, could serve to retrace and identify the factors responsible for useful pupil talk.

It could also help us to track down and apprehend the factors (the classroom events) responsible for restricting and limiting free and self-initiated student talk.

As is generally the case, in both the columns, the steady state cells—viz. 8-8 and 9-9 carrying frequencies of 12.01 percent and 1.17 percent, respectively, are the highest loaded cells in their respective columns. Questions from teachers are an effective and promising bait to attract student participation. The loads in the two cells 4-8 and 4-9—viz. 2.41 percent and 0.78 percent are second-heaviest in their respective columns. On closer examination, we find that about 15.5 percent of all student talk was triggered off by the use of questions by teachers. (357 + 128 out of 3128). (cf. cells 4-8 and 4-9).

The proportion, borne by students', of 'sustained' responsive talk to their controlled talk in response to questions (1776:357) which is nearly 5:1 is overwhelmingly greater than that borne by students' 'sustained' self-initiated talk to their self-initiated talk following teacher questions (173:128 which is about 5:4).

As much as 5.24 percent of all student talk could occur in the context of information-giving by teacher (cf. cells 5-8 and 5-9; 112 + 52 out of 3128).

The effect of praise and encouragement, in terms of pupil participation, works out to 3.3 percent of all student talk (cf. cells 2-8 with 58 tallies and 2-9 with 46 tallies. 58 + 46 out of 3128), while the contribution of teachers' acceptance and clarification of students' ideas resulting in further student

talk (cell 3-8 and 3-9) is about 0.86 percent of all teacher talk (15 + 12 out of 3128).

The sizeable load in the cell 6-8 viz. 114 indicates that commands were responsible for controlled student talk to, at least, 4.6 percent of all student talk (144 out of 3128).

Criticism by teachers has been causal for limiting student talk. Naturally, when teachers resort to criticism the students are simply silenced. There was only 0.58 percent of all students talk following teacher criticism (13 + 5 out of 3128 —cf. cells 7-8 and 7-9). The cell 8-9 with a load of 5 tallies indicates that there was very little possibility for students to dovetail their teacher-controlled talk with their own ideas.

On the whole, nearly as much as 30.5 percent of all student talk is 'immediately' following teacher talk (sum of columns eight and nine, rows one to seven out of all student talk). There is no insinuation however, that students' 'sustained' talk as also their talk following spells of silence or confusion were not caused by teacher talk. After all, in the ultimate analysis all student talk is to be ascribed to teacher talk.

(j) *The Flow of Communication*: The flow of communication is characterised by intermittent spells of discontinuity in the form of silence or confusion, both in the case of teachers and students. An examination of the column ten, yields information relating to the degree of continuity or otherwise involved in the flow of communication. A word of caution might be uttered in this connection so that we could draw inferences relating to the flow pattern in a realistic manner. Although, the use of category 10 becomes meaningful and necessary also, as recommended by Flanders, on occasions which otherwise do not warrant category 10, as, for example when a number of students in answering a question or reading a given passage take turns where category 10 is inserted to indicate the 'turn' occurring. Also a 10 might constitute a meaningful pause, especially in the case of teachers, who can ingeniously manoeuvre the instrument such that their teaching is punctuated

with purposeful pauses. It might help pace the content delivery such that it is best likely to be received and digested by the students. It is not always, therefore, that 10's are to be looked upon as being unwanted spells of discontinuity.

The category 10, on the whole, has occurred to the extent of 9.59 percent to which the largest share comes from the steady-state cell with a load of 4.04 percent. It may be mentioned that the cell is carrying a significant quantum of load in that the load signifies that category 10 occurred in a steady state of spells of over three seconds each for a little over one-twenty-fifth of the total communication.

The second largest contribution to this category is from cell 4-10 with a load of 1.79 percent. Some part of this frequency might indicate that students, instead of immediately responding to questions, allowed spells of silence or confusion to intervene following questions from the teachers. Following the spells of silence or confusion, the possibilities are that the teachers might have either repeated the questions or supplied some 'prompts' in which case it would be a case of 4 or 2, following 10 or the pupils might have answered the questions where it is a case of 10-8. The cells 10-2, 10-4 and 10-8 could throw some light in this regard. While there has been some prompting or encouragement (category 2) following spells of silence or confusion as is indicated by the frequency of 0.22 percent in 10-2, that the frequency in the cell 10-4 (1.35 percent) is greater than that in the cell 10-8 (1.18 percent) may have something significant for the interpreters. The chances of questions either by way of reiteration or by way of elongation, following spells of silence or confusion, are more than those of pupil responsive talk following spells of silence or confusion.

Information-giving being followed by spells of silence or confusion (cf. cell 5-10) with a load of 1.41 percent is less than spells of silence or confusion being followed by 'information-giving' (cf. cell 10-5 with a load of 1.72 percent).

Of the total verbal communication, the quantum of silence or confusion preceding student talk is 1.53 percent (sum of cells 10-8 and 10-9) and that following student talk is 0.87 percent (sum of cells 8-10 and 9-10).

Another aspect of the flow of communication is the flow pattern in terms of sequence which, when diagrammatically presented, might help reconstruct, to some extent, the interaction observed. That will help us visualise the pattern in which the relative degree of occurrence of the various events observed. In other words, with the help of the Flow Pattern Diagram one can identify the most frequently occurring event and the next most frequently occurring event and so on.

The Flow Pattern Diagram is presented in Appendix C.*

To draw the diagram, one should make some careful examination of the relative loads in the different cells. The cell with the highest frequency is located and the pair of events in the particularised order of sequence represented by the cell is the most frequently occurring 'event sequence' and is used as a starting point to reconstruct the interaction in the form of a diagram.

From this highest frequency cell, one can start forward or backward, in terms of sequence. The row of any cell indicates the most likely third event following the pair of events represented by the given cell. The column of the cell, on the other hand, indicates the event which would have most probably preceded the pair of events represented by the cell. A clockwise scanning of the matrix would facilitate proper reconstruction of the Flow Pattern.

If, however, the highest frequency falls into a transition cell and not a steady-state cell, the row or column of either number in the pair can be studied to retrace or advance the sequence of events.

* The flow is indicated, for the sake of reference, in Appendix A also.

A flow pattern diagram is drawn with reference to the tabulated matrix.

The cell 5-5 is the most heavily loaded one, signifying sustained lecturing. The next most likely event is that the teacher will ask a question. (Now go ahead to the concerned steady-state cell—namely 4-4). Next, the most likely following event is students' answering, which is category eight. (Again go to cell 8-8). The next most likely event is lecturing by teacher, which is category five. Alternatively, at this point, a near equal probability is that the eight will be followed by clarification of students ideas which is three. Following clarification, the next most likely event is lecturing.

In the diagram represented in the Appendix C, seven steady-state cells are shown as rectangles. The size of the rectangles very crudely indicates the relative frequency of the respective steady-state pair. Transitions between rectangles, wherever desired, are indicated by arrows.

The rectangles and the transitions put together account for 12868 tallies which is about 87 percent of the total communication observed.

The patent purpose served by the diagram, besides depicting the flow of patterns, is to highlight the major weaknesses of the communication. In this diagram it is clearly seen that sustained clarification of students' ideas and sustained praise or encouragement are relatively poor.

Of all the transitions it is that from four to eight which scores highest—namely 357 and the next highest transition is found to occur from five to four namely 324. As regards teachers' acceptance and clarification of students' ideas, the diagram very clearly portrays, such constructive attitude on the part of the teachers as being twice as much with regard to students' teacher-controlled responsive talk (8-3 transition carries a frequency of 163) as in respect of students' self-initiated talk (9-3 transition carries a frequency of 83).

From the diagram, the rectangles and inter-connecting arrows can be read and analysed for further revelations, which we have, earlier in the course of our discussion, unearthed. The chief purpose, therefore, in developing such a flow pattern diagram is to depict all the major steady-state cells with the significant transitions among them so that a bird's eye view is secured.

The diagrammatic summary that it is, is a useful adjunct to the frequency as well as percentage matrices.

V. Limitations

The present study, so far described, it is to be admitted, has evidently been exploratory and descriptive rather than evaluative for the simple reason that we do not have a Master Matrix providing average normative frequencies for the different cells of the matrix, in respect of English as a subject. In the absence of such a ready set of standard scores, the interpretations of the matrix have perforce to be descriptive and not evaluative.

There is, therefore, an urgent need for developing standard scores for all school subjects—and to be more precise, for all possible integral units or variety of tasks that would go into the different school subjects.

VI Conclusions

The study has amply served to realise the objectives set out. The numerous and far-reaching inferences that have been made through interpretations of the matrix are enough evidence to indicate the usefulness of Flanders ten point scale of measuring classroom interaction to study teacher behaviour and vouch for its usability in Indian conditions.

This tool of observation of classroom interaction, when used by properly trained personnel, can be a more effective as also more objective—and hence, more reliable—alternative to the traditional procedures of classroom observation, hitherto

being followed, which are largely subjective estimates of teacher behaviour.

The interaction analysis as an index of teacher effectiveness possesses great potentialities both in teacher training programmes and in in-service training programmes wherein desired modification of teacher behaviour might be attempted in the light of the interaction analysis results.

APPENDIX 'A'
COMBINED MATRIX FOR 11 ENGLISH TEACHERS

	1	2	3	4	5	6	7	8	9	10	TOTAL
1	7	-	-	1	9	-	1	-	2	1	21
2	-	96	26	35	58	23	5	58	46	44	391
3	-	8	88	65	143	26	2	15	12	24	383
4	-	19	2	390	49	34	8	357	128	264	1251
5	7	36	1	324	6557	99	15	112	52	208	7411
6	-	6	10	53	82	122	29	144	10	122	578
7	-	7	-	11	21	29	95	13	5	29	210
8	2	122	167	115	183	140	31	1776	5	108	2649
9	5	73	83	44	34	27	4	-	173	16	479
10	-	24	6	213	255	78	20	174	46	597	1413
TOTAL	21	391	383	1251	7411	578	210	2649	479	1413	14786
%GT	0.14	2.66	2.69	8.38	50.21	3.83	1.43	17.91	3.25	9.59	100.09
%TT	0.21	3.82	3.74	12.21	72.34	5.64	2.05	TEACHER TALK=10245 (69.34%)			
								STUDENT TALK=3128 (21.16%)			

COLUMN 1 TO 7 TOTAL = 10245

COLUMN 1 TO 4 TOTAL = 2046

COLUMN 1 TO 3 TOTAL = 795

COLUMN 1 TO 3&6-7 = 1583

APPENDIX B
PERCENTAGE MATRIX FOR 11 ENGLISH TEACHERS

	1	2	3	4	5	6	7	8	9	10	TOTAL
1	0.05	-	-	0.01	0.05	-	0.01	-	0.01	0.01	0.14
2	-	0.65	0.18	0.24	0.40	0.16	0.03	0.39	0.31	0.30	2.66
3	-	0.06	0.59	0.44	0.97	0.18	0.01	0.10	0.11	0.23	2.69
4	-	0.13	0.01	2.64	0.33	0.23	0.06	2.41	0.78	1.79	8.38
5	0.05	0.31	0.01	2.19	44.35	0.67	0.10	0.76	0.36	1.41	50.21
6	-	0.06	0.07	0.36	0.62	0.72	0.20	0.98	0.10	0.72	3.83
7	-	0.05	-	0.07	0.14	0.20	0.64	0.08	0.03	0.22	1.43
8	0.01	0.72	1.21	0.78	1.26	0.95	0.21	12.01	0.03	0.73	17.91
9	0.03	0.46	0.56	0.30	0.37	0.19	0.03	-	1.17	0.14	3.25
10	-	0.22	0.06	1.35	1.72	0.53	0.14	1.18	0.35	4.04	9.59
TOTAL	0.14	2.66	2.69	8.38	50.21	3.83	1.43	17.91	3.25	9.59	100.09

A. i/d RATIO = 0.200 (COLS 1 TO 4 / COLS 1 TO 7)

B. REVISED i/d RATIO = 0.502 (COLS 1 TO 3 / COLS 1 TO 3 + 6 & 7)

C. EXTENDED INDIRECT = 1.53 (SUM OF CELLS 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3)

D. EXTENDED DIRECT = 1.76 (SUM OF CELLS 6.6, 6.7, 7.6 & 7.7)

E. 3.3 CELL FREQUENCY = 0.59 PERCENT

F. 9.9 CELL FREQUENCY = 1.17 PERCENT

G. TEACHER TALK = 69.29 PERCENT

H. STUDENT TALK = 21.16 PERCENT

Editors' Comments

This is the report of an investigative survey undertaken by the authors, with the two-fold purpose of exploring the possibility of using Flanders' ten-category system of classroom interaction analysis in Indian schools and to explore the classroom behaviour of teachers of English.

The authors feel that in view of the importance of the study of English in this country, it is a sorry state of affairs that developmental efforts in the direction of English education programmes are, mostly, not based on research findings. This gap marks a major flaw in the orientation of our instructional improvement efforts. The present study may be expected, therefore, to fill this gap and also to serve to indicate the possible lines of further research in this area.

The study covered a sample of 11 teachers, five of whom were males. All the teachers had varying levels of experience of teaching English as a subject in schools, ranging from 2 to 29 years.

As might be clear from the size and structure of the sample, the study was not undertaken in conformity with all the rigours of a research design. It was a sort of pilot study which was embarked upon spontaneously.

Each teacher was observed for two periods and the observation by the trained observers proceeded on the basis of a set of well-discussed and properly assimilated ground rules. On the whole, a total of 14786 tallies, distributed over 88 cells of the matrix, representing 'effective' observations for 10 hours, 6 minutes and 54 seconds, were recorded.

The important findings stemming from the analysis of the observation, using matrix tabulation, etc. are :

- (i) that teachers talk 69 percent;
- (ii) that students talk 21 percent;
- (iii) that only one-fifth of teacher talk is indirect (i/d ratio = 0.2);

- (iv) that the teachers are found to be nearly as 'direct' as they were 'indirect', when emphasis on content is ignored (i/d ratio = 0.502);
- (v) One-tenth of time was spent on silence/confusion;
- (vi) the 'Extended Indirect' component of teacher talk is only 1.53 percent as against 1.76 percent of 'Extended Direct' component;
- (vii) 72 percent of all teacher talk is accounted for, by the seven steady state cells which shows poor flexibility on the part of teachers (28 percent) for shifts between categories;
- (viii) the emphasis on content has been to the extent of 58.6 percent;
- (ix) nearly 4 percent of all teacher talk has been in the form of praise/encouragement;
- (x) about 10 percent of all teacher talk has been in direct reaction to student talk while as much as 31 percent of all student talk was immediately following teacher talk.

The paper, despite the limitations as admitted in the paper itself, is characterised by a thorough-going analysis of all the various details that could be culled out from such a matrix study. The value of the paper is substantially heightened by a discussion (and also an appended diagrammatic illustration) of the 'flow pattern' of communication. It serves to highlight the flow pattern in a vivid manner.

Had only a larger sample been covered, according to a well constructed research design, the study could have facilitated comprehensive comparative analysis with regard to sex, age-levels and such other bio-factors of the teachers.

The paper, however, is a useful reference for the research workers in this area.

THE INFLUENCE PATTERNS OF MALE SOCIAL STUDIES TEACHERS AS DETERMINED BY FLANDERS INTERACTION ANALYSIS SYSTEM.

M. B. BUCH and Z. M. QURAISHI*

Introduction

Now a days we often hear that the teaching standards of the schools are falling down; that teachers do not know how to teach; that they have failed to create interest in the subjects and that they do not motivate the students to learn. Why is this happening ? To seek an answer to all these questions one has to go to the core of the problem and make a thorough enquiry into the modes and ways the teacher employs to impart knowledge. This can easily be done by observing the teacher when he is teaching.

Recent researches with classroom observation techniques have proved their worth in this direction and have helped in recording and understanding classroom interaction between teacher and taught more specifically than a few decades ago.

The present paper is second in the series on classroom interaction analysis and makes use of Flanders Interaction Analysis technique for analysing the interaction process in the classroom. The research had the following objectives :

- (1) To study the patterns of influence of male social studies teachers in selected schools of Baroda.
- (2) To study their influence patterns in relation to age, experience, qualifications, and methods of teaching offered at the B.Ed. level, and

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- (3) To study the efficacy of Flanders Interaction Analysis technique in Indian Schools.

Procedure

Description of Tool: Flanders Interaction Analysis Technique was the basic tool of research used in this study. This was developed by Flanders in the early 1950's as a research tool to relate children's attitudes to patterns of teacher influence (1) But its utility did not confine only to this. On the contrary, because of its versatility it became very popular with people working in the various educational fields. To the writers knowledge the technique has been used in the study of teacher-behaviour and achievement (2); in differentiating teachers of high achieving classes and low achieving classes (4); in inservice programme (5); in evaluating teacher effectiveness (7); in comparing the influence patterns of teachers belonging to schools of large church membership and small church membership (3); and in the study of pupil involvement (8). The total bits of information collected by interaction analysis is well in excess of 1250000 (6).

In Flanders' tool, there are ten categories in the system which are divided into teacher-talk, students talk and silence. Categories of teacher talk are further divided into direct and indirect statements. Students talk is divided into student response and student initiation. Unlike many other observation systems this system is mainly concerned with verbal interaction process between the teacher and the students and provides information about the extent the teacher allows and encourages student participation by becoming integrative (indirect) and restricts response (thereby, not allowing participation) by becoming dominative (direct) in his approach.

Method of Observation: The observer sits on the last bench of the classroom and observes teacher when he is teaching. At an interval of every three seconds he writes down the category number which best represents the communication event just completed. For instance when the teacher is lecturing the

observer puts 5; when he asks questions he puts 4; when the student replies he puts 8; when the teacher praises he puts 2; and when again the teacher starts lecturing he puts 5. This procedure of recording the events goes on at a rate of 20 to 25 observations per minute. In the end, a long series of numbers is obtained, which is entered in a 10×10 matrix. When matrix is prepared, two numbers are taken at a time. The first number stands for row and the second number for column. Thus each number in a series once becomes row and once column.

Sample: Seventeen male teachers, belonging to ten Gujarati medium schools in Baroda, were observed, each twice, in the same class for the same subject. All of them were teaching social studies. Their age ranged from 27 years to 44 years with an average of 37.21 years. Their pre-training experience ranged from 1 to 5 years and post-training experience from 5 to 8 years. The average teaching experience as regards social studies was 11.3 years. Two teachers were B.A., S.T.C.'s; two had done T.D. after graduation; six were B.A., B.Ed.'s and seven were Masters of Arts with B.Ed., as their professional qualification. Of the 17 teachers, 9 had offered social studies as one of the methods of teaching at T.D. or B.Ed. level, while the remaining had offered some other subjects.

Preparation of Matrix: For each observation a separate 10×10 matrix was prepared. Later, both the matrices of the same teacher were combined. In this way there were seventeen different matrices. For preparation of a master matrix, all the 17 matrices were combined. Combining process of matrices was carried out by cell-by-cell addition of tallies, as suggested by Flanders. The total tallies found in the master matrix were 19135.

Interpretation of Matrix

Looking at the master matrix (vide appendices A and B) we find that the total of 19135 tallies are spread over 77 cells of the matrix (23 cells being without any tally). On the whole

15719 (82.65 percent) tallies are of teacher talk; 2005 (10.48 percent) tallies were the result of student talk and 1411 (7.38 percent) tallies stand for periods of silence, confusion or pauses. The time spent on teacher talk is nearly eight times greater than the time spent on student talk.

The teachers are very much direct in their talk as shown by the I/D ratio of 0.17. This means that for every 17 indirect statements the teachers made 100 direct statements. Similarly, we have the i/d ratio which is equal to 1.2. This ratio is a measure of positive and negative reinforcements. The teachers used 6 positive statements (acceptance of feeling, ideas and encouragement) for every 5 negative statements (direction and criticism).

Steady-state Cells: In the matrix, there are two types of cells namely "steady-state cells" and "transition cells". The steady-state cells lie on the diagonal from upper left to lower right of the matrix. All sequence pairs in which the two numbers (1-1; 2-2; 3-3.....) are identical are tabulated in the steady-state cells. Such pairs result when either the teacher or student remains in a particular category for more than three seconds. All the other cells are transition cells.

The highest frequency loading in 5-5 cell lying on the diagonal reveals that teachers, in all, spent 62.51 percent of time in providing information through lecture, in a 'sustained' fashion, and they remained, for so much of time, in spells of over three seconds each, in that particular category.

The 2-2 cell revealed that the teacher extends praise for more than three seconds by long encouraging statements.

An above average frequency in 3-3 cell often means that the teacher develops the ideas of students with considerable care. In the matrix, it will be seen that nearly two percent of teacher talk is spent in developing, clarifying, and building students' ideas.

The cell 4-4 with a frequency of 565 (3. percent) denotes that teachers, to the extent indicated, asked lengthy questions or repeated them for clear understanding.

The 8-8 cell contains 933 frequencies with a percentage of 4.88. This means that the students' answers were very broad and elaborate.

About 4.21 percent of time is lost in silence as is shown by the matrix. But a careful scrutiny of column ten brings out the fact that large number of pauses are preceded by lecture and questions. Two inferences can be drawn from this,—that the lecture was not continuous and that the questions, presumably being difficult, the students required some thinking before giving the answer.

Constructive Integration Cells: Cells 1-1; 1-2; 1-3; 2-1; 2-2; 2-3; 3-1; 3-2 and 3-3 are known as constructive integration cells. The 2-3 cell represents the shift from praise to clarification and development of student's ideas while the 3-2 cell is a shift from clarification of student's idea to praise. These cells in combination with clarification of feeling, category one, indicate teacher's concern with positive motivation and reward. In the matrix, we find that the shift from praise to clarification and vice versa is very negligible. Instead, there is a sustained clarification and development (3-3 cell) of ideas by the teacher.

Vicious Circle: The four cells 6-6; 6-7; 7-6 and 7-7 are known as vicious circle cells and throw light on the management of disciplinary problems of the classroom. In the present matrix, the total time spent for directing and criticizing students is 2.03 percent which is very insignificant. A very thin loading of frequencies in 6-7 and 7-6 cells indicate that the students did not offer overt resistance to teachers' directions in any appreciable manner.

Content Cross: Rows 4 and 5 and columns 4 and 5 represent the content cross in the matrix. How much time the teacher has spent in providing information and how much time he spent on asking questions is revealed in these rows or

columns. A glance at master matrix will show that the total number of tallies in content cross is 14341, which is equal to 75.44 percent.

Within the content cross, a number of patterns representing typical classroom situations can be identified. For instance, in cell 4-8 there is a load of 718 frequencies, in cell 8-4 there are 279 tallies and in cell 8-3 there are 371 tallies. This distribution reveals that there was very little short answer drill situation. Instead the teachers have devoted more time on accepting and clarifying student ideas (3-3 cell). Following clarification of ideas the teachers moved to give further information as indicated by sizeable frequencies in 3-5 cell.

Use of Praise: The use of praise is analyzed by noting the distribution of tallies in column two. All praise statements occurring in teacher talk appear in column two, rows one to seven. Such praise occurs in sustained teacher talk and differs from direct praise given to student action or behaviour. In the matrix under study 29 (.16 percent) frequencies account for sustained praise and 36 (.19 percent) frequencies account for direct praise to the student responses. Direct reaction to student action is very effective in learning.

Teacher reaction to student statements: Rows eight and nine, columns one to seven provide information about teachers' reactions to student talk. Teachers who are genuinely concerned with what the students say and clarify and accept their ideas produce higher frequencies in the eight and nine rows, columns one to four, particularly 8-3 and 3-3 cells. In the present matrix cells 8-3, 8-4 and 3-3 are heavily loaded. This brings to our notice that most of the time students' responses were followed by either their acceptance by the teacher or a fresh question from him. There are very few tallies in row nine column one to four compared to row 8. Thus the teachers' positive concern for students' ideas was exhibited more in respect of teacher solicited and teacher-controlled student talk.

How students' talk is prompted: Columns 8 and 9 rows one to nine reveal the particular circumstances in which students begin talking.

As expected, there is heavy loading of frequencies (718) in the cell 4-8. This means that the teacher initiated talk by putting a question and the students reacted to it by answering. The answers are of very broad nature, lengthy and elaborate which is obvious in 8-8 cell. However, there are only 5 frequencies in 8-9 cell which indicated that the students had very little chance to add their own ideas to their teacher-controlled talk. Frequencies in cell 6-8 are the result of teachers' orders or commands to answer a question.

Applied interpretation: A number of inferences can be drawn from the matrix.

The teachers under study are very active and extremely direct in their teaching. They talked for 82.65 percent of time, in contrast to the student talk for 10.48 percent of time. Thus the time spent on teacher talk was nearly eight times greater than that spent on student talk. Silence and pauses consumed about 7.38 percent of time. Teachers initiated less and responded more. For every 100 direct statements they made only 17 indirect statements while for every 6 positive reinforcements they used 5 negative reinforcements in the form of direction and criticism. Their indirect talk was mainly in the form of asking questions and sustained development of students' ideas. Very little amount of praise was used by the teacher over half of which occurred as soon as the student ceased answering.

Some of the relatively high cell frequencies are found in steady-state cells (4-4; 5-5; 8-8 and 10-10). This suggests that teachers and students spent spells of more than 3 seconds each in questioning and answering respectively. The tempo of exchange was slower than might occur in drill situation. Most of the pauses being preceded by lecturing, questioning, answering it is indicated that the lectures were not continuous, and that the students took some time before giving an answer.

Teachers were slow in reacting to students' talk and most of the students' responses were followed by lecture and questions. Periods of silence were also broken by teachers' questions and lectures.

So far we have discussed the general patterns of influence of all the teachers. However it is felt that a comparison of I/D and i/d ratios with respect to age of teacher, teaching experience, qualifications and methods of teaching offered at T.D. or B.Ed. level would provide additional information. Though such a small sample would not yield any significant difference it was still thought worthwhile to peep into the effect of these variables.

For the sake of convenience and feasibility the teachers were grouped with a class interval of 5 with respect to their age and experience and their I/D and i/d ratios were compared along with the percentage of teacher talk and student talk. The results are shown in the following two tables :

TABLE I

Verbal behaviour of teachers according to age

Gr. No.	Age in Years	N	Percent talking time			I/D	i/d
			Teachers	Pupils	Silence		
1	26-30	1	79.82	14.97	5.22	.13	.33
2	31-35	6	77.08	13.85	9.07	.32	3.89
3	36-40	7	81.32	10.50	8.18	.19	.55
4	41-45	2	90.78	3.96	5.26	.04	.01
5	46-50	0	0	0	0	0	0
6	51-55	0	0	0	0	0	0
7	56-60	1	78.02	13.15	8.83	.21	0

In Table I, where the teachers are grouped with reference to their age, out of the seven groups that emerge only two, namely, group 2 and group 3 are composed of sizeable number of teachers so as to justify comparison. We find that older age is associated with more teacher talk and also a 'markedly smaller extent' of 'indirect' behaviour. In fact, in the matter of exhibiting positive motivation and reinforcement, the younger group comes out with an i/d ratio of 3.89 which is over seven times heavier than that for the other, older group *viz.* 0.55.

TABLE II

Verbal behaviour of teachers according to teaching experience

Gr. No.	Experi-ence in years	N	Percent talking time			I/D	i/d
			Teachers	Pupils	Silence		
1	1-5	1	84.42	12.72	2.46	.17	.05
2	6-10	6	82.08	11.06	6.81	.20	4.17
3	11-15	8	78.24	12.08	9.68	.23	.96
4	16-20	0	0	0	0	0	0
5	21-25	1	91.06	2.07	6.87	.02	.01
6	26-30	1	78.02	13.15	8.83	.21	0

Table II shows the verbal behaviour of teachers with reference to their teaching experience. Here again, we will compare only groups two and three because of the same reason given in the above paragraph. We find that teachers with an experience of 11 to 15 years talked nearly four percent less than the teachers with 6 to 10 years of experience. The proportion of silence was greater in classes under more experienced teachers (11 to 15 years). However, teachers with less experience (6 to 10 years) used positive reinforcement and motivation over four times more than the teachers with 11 to 15 years of experience.

TABLE III*

Verbal behaviour of teachers according to qualifications

Gr. No.	Qualifications	Percent talking time			I/D Ratio	i/d Ratio
		Teachers	Pupils	Silence		
-1	B.A.; B.Ed. (N = 8)	78.00	12.55	9.45	.23	1.54
2	M.A.; B.Ed. (N = 7)	82.66	10.26	7.08	.19	1.1

In table III, we find that teachers with master's degree talked 4 percent more than graduate teachers and their proportion of I/D and i/d ratios was also less compared to graduate trained teachers.

TABLE IV†

Verbal behaviour of teachers regarding methods of teaching offered (social studies)

Gr. No.		Percent talking time			I/D Ratio	i/d Ratio
		Teachers	Pupils	Silence		
1	Teachers who offered methods of Social Studies (N = 9)	74.41	14.55	11.04	.24	1.4
2	Teachers who did not offer methods of Social Studies (N = 5)	81.67	9.75	8.58	.22	1.6

* Teachers holding Secondary Teachers Certificate as Professional qualification are not included.

† One teacher did not mention the subjects. Teachers with S.T.C. were excluded.

Table IV represents the groups which offered Social Studies as one of the methods of teaching in T.D. or B.Ed. course. It is apparent that teachers offering Social Studies in T.D. or B.Ed. level encourage more student participation and use more indirect statements compared to teachers who have not offered the Social Studies subject.

For want of time, it is admitted, that the statistical significance of these differences, using Darwin's formula, as suggested by Flanders, could not be found out.

Conclusions:

- (1) The nature of influence patterns of teachers is very much direct.
- (2) Teacher talk is nearly eight times greater than student talk.
- (3) Teachers uttered 17 indirect statements for every 100 direct statements, the proportion being about one-sixth.
- (4) Teachers used 6 positive statements for every five negative statements to motivate the students and to reprimand/command them respectively.
- (5) Most of the indirect talk is in the form of asking questions.
- (6) Very little amount of time is spent in praising and developing students' ideas.
- (7) There is no short question-answer pattern which is generally found in drill situation.
- (8) Criticism or justification of authority on the part of teachers is very insignificant.
- (9) Periods of silence are mostly broken by the teachers.
- (10) Students got little opportunity to add their own ideas to their teacher-controlled talk.

- (11) Teachers with less than 10 years of experience talked nearly 3 percent more than the teachers with more than 10 years of experience.
- (12) I/D and i/d ratios of graduate trained teachers were slightly greater than post-graduate trained teachers.
- (13) Age, experience, qualifications, and methods of teaching certainly play an important part in shaping teachers' influence.
- (14) Flanders' Interaction Analysis Technique could be extremely useful in our country, what with its practical value. (It does not require any financial aid except some spare time and zeal).

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APPENDIX A
COMBINED MATRIX

	1	2	3	4	5	6	7	8	9	10	TOTAL
1	-	-	-	-	-	-	-	-	-	2	2
2	-	15	15	4	17	2	1	9	-	3	66
3	1	5	371	31	95	4	1	87	1	88	684
4	-	1	6	565	94	24	8	718	9	155	1580
5	-	8	-	509	11962	69	11	14	13	175	12761
6	-	-	2	28	58	256	18	19	-	62	443
7	-	-	1	14	24	5	110	12	-	15	183
8	-	36	246	279	280	31	14	933	5	101	1925
9	-	-	4	3	22	1	1	2	42	5	80
10	1	1	39	147	209	51	17	131	10	805	1411
TOTAL	2	66	684	1580	12761	443	183	1925	80	1411	19135
% GT	.01	.35	3.58	8.76	66.68	2.33	.94	10.05	.43	7.38	-
% TT	.01	.42	4.35	10.05	81.18	2.82	1.16	TEACHER TALK = 15719 (82.65%) STUDENT TALK = 2005 (10.48%) SILENCE = 1411 (7.38%)			

APPENDIX B
PERCENTAGE MATRIX

	1	2	3	4	5	6	7	8	9	10	
1	-	-	-	-	-	-	-	-	-	.01	
2	-	.08	.08	.02	.09	.01	.005	.05	-	.02	
3	.005	.03	1.94	.16	.50	.02	.005	.45	.005	.46	
4	-	.005	.03	3.00	.49	.13	.04	3.75	.05	.81	
5	-	.04	-	3.11	62.51	.36	.06	.07	.07	.91	
6	-	-	.01	.15	.30	1.34	.09	10	-	.32	
7	-	-	.005	.07	.13	.03	.57	.06	-	.08	
8	-	.19	1.29	1.46	1.46	.16	.07	4.88	.03	.53	
9	-	-	.02	.02	.11	.005	.005	.01	.22	.03	
10	.005	.005	.20	.77	1.09	.27	.09	.68	.05	4.21	
TOTAL	.01	.35	3.58	8.76	66.68	2.33	0.94	10.05	.43	7.38	
		←12.65→		←69.95→		←10.48→					
	T T	E O	A T	C A	H L	E L	R 82.65%	S TOTAL	TU 10.48%	DENT 73.8%	SILENCE

A 1/D RATIO= 17 (COL 1-4/COL 5-7)

B 1/d = 1 2 (COL 1-3/COL 6-7)

C EXTENDED INDIRECT= 2.14 (SUM OF CELLS
1-1, 1-2, 1-3, 2-1, 2-2, 3-1, 3-2, 3-3)

D EXTENDED DIRECT= 2.03 (SUM OF CELLS
6-6, 6-7, 7-6, 7-7)

E 3-3 CELL = 1.94

F 9-9 CELL = 22

G. TEACHER TALK = 82.65

H. STUDENT TALK = 10.48

NB TOTAL OF ROWS AND COLUMNS MAY NOT BE THE SAME BECAUSE OF ROUNDING UP OF FIGURES

Editors' Comments

This slender report of 15 pages describes an explorative-cum-analytical-cum-evaluative study undertaken by the authors, covering a total of 17 male teachers, teaching Social Studies, drawn from 10 Gujarati medium schools in Baroda. While the avowed objectives are laudable, the less sympathetic of the sceptic readers, it is feared, might feel that too much is attempted out of too little.

The report, takes off from a diagnostic introduction pointing to the inadequate and ineffective teaching methods of teachers in schools and hence calling for probe, which serves, as the authors themselves make out, as the rationale of the study.

The report then traverses through the familiar areas of 'description of the tool' (Flanders' ten category system) and 'mode of observation'.

The brief, but useful, 'on passant' description of the different studies wherein the Flanders' technique had been used, besides high-lighting the versatility of the instrument makes inspiring reading. That is, perhaps, one of the praiseworthy features of the report.

Every one of the 17 teachers having been observed twice, all the 34 matrices, when 'combined' result in a 'master matrix' yielding a grand total of 19135 tallies, distributed over 77 cells which, therefore, nearly leaves one-fourth of the matrix empty.

The significant pieces of information sought from the data in the matrix, though very limited, do not fail to draw our attention to certain prominent features of classroom interaction patterns observed.

The teachers talked 82.65 percent which is of the alarming magnitude of 'near eight' times of student talk which is 10.48 percent. With the category 10 (silence/confusion) claiming 7.83 percent of communication events, the persistent loquacity of the teachers, in general, is evidently causal for the strikingly diminutive size of student talk. What is more, the teachers

were very much 'direct' in influence (I/D ratio being a meagre 0.17) and were not sufficiently 'integrative' in approach (i/d ratio being 1.2)*

What turns out to be the most highly disturbing feature of the interactions sequences observed is the 'near disregard' for category one which stands for 'appreciation of the students' feelings' by the teacher. This category has the dubious distinction of having occurred only twice, once in the context of 'teachers' use/acceptance of students' ideas' and another following a spell of silence. Perhaps, what is more disquieting is that the report is surprisingly silent about the relative neglect of this category by the teachers. But then, this reticence, we believe, is unintentional.

Emphasis on content is unduly heavy, namely 75.44 percent.

Periods of silence have been mostly broken by the teachers.

Most of the indirect talk of the teachers has been in the form of asking questions.

After fathoming the matrix for these and some other revelations, the authors proceed to realise the analytical objective, namely to study the influence patterns of the teachers in relation to the four different variables.

It is in this connection that the lack of a proper research design to guide the size and nature of the sample, is woefully betrayed. The size of the sample, taken by itself, is not only too little to suffice for such an analytical venture; also its composition has been so varied and heterogeneous that the process of the analysis of the data is wanting in validity on account of the further diminution of the size of the sample resulting from the 'grouping' of the teachers according to some class intervals and taking only two of them for study.

The authors' statement that "for the sake of convenience and feasibility the teachers were grouped with a class interval

* The computation of I/D and i/d ratios follows their earlier version- viz. I/D is computed by dividing the sum of columns 1 to 4 by that of columns 5 to 7 while the i/d ratio is calculated by dividing the sum of columns 1 to 3 by that of columns 6 and 7.

of 5 with respect to their age and experience" is an unconvincing alibi for the inherent limitation of the size and nature of the sample.

Incidental to the process of grouping is the further dwarfing of the sample, as mentioned earlier. Two groups of only 6 teachers and 7 teachers each, as regards 'age' and of 6 teachers and 8 teachers each as regards 'teaching experience' come up for the comparative investigation.

Findings are that "older age is associated with more teacher talk and also a markedly smaller extent of 'indirect' behaviour" and in fact, the younger teachers have put up a far better performance in terms of i/d ratio. On the question of experience, it is found that relatively more experienced teachers have sizeably scored over the other group, in terms of i/d ratio. But then, the fact remains that with the class intervals, in respect of both age and experience, being in such close succession to one another, it is a moot point that the age of 35/36 and the stage of 10/11 years of experience could be so very decisive in terms of effect on teacher behaviour patterns. Larger samples need be studied for such far-reaching generalisations.

As with the variables of age and experience so also in respect of 'qualifications' and 'methods of teaching Social Studies', some pruning is being done in the sample. A group of 8 teachers who are B.A., B.Ed.'s is compared with another of 7 teachers who are M.A., B.Ed.'s. It is found that the teachers with Master's degree talked more than the others and also that the I/D and i/d ratios were less in the case of the former.

A group of 9 teachers who had offered 'methods of teaching Social Studies' in their T.D. or B.Ed. is compared with another of 5 teachers who had not. It is found that learning of the methods of teaching Social Studies in the training programme is associated with more 'indirectness'.

As mentioned earlier, one feels, that such far-reaching implications should need further empirical verification for acceptance.

PATTERNS OF INFLUENCE OF SOCIAL STUDIES TEACHERS†

M. R. SANTHANAM, Z. M. QURAIISHI and T. P. LULLA*

I. Introduction

The Education Commission (1966-66), in its report, while urging vitalisation of professional studies, points to a basic weakness in this area which, the Commission believes, is mainly responsible for the comparatively low status of professional studies in training institutions. The diagnosis is the absence of adequate research on problems under Indian conditions.

We are in full agreement with the Commission on this diagnosis. Efforts must be made to undertake programmes of research oriented towards improving education in our country.

Improvement in education will not come about by any miracle. Hard and sustained endeavour with proper direction is required for achieving any success in this field of scholarship.

A good deal of attention has been directed in the recent past to the techniques of revitalising classroom teaching in Indian schools. The Secondary Education Commission, in its report, devotes one full chapter to a discussion on dynamic methods of teaching, discussing the objectives of the right techniques, the values of the various activity methods and the different ways

† Based on the observations made by the last two writers, Mr. Z. M. Quraishi and Miss T. P. Lulla.

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in which these methods and techniques could be adapted to suit different levels of intelligence and so on.

Still the picture presented by our schools, in general, is dismal and the much 'sought-after' improvement in classroom teaching is as elusive as ever like a will-o'-the-wisp.

Improvement of classroom teaching by suitable development of social-emotional climate in the classroom has been the subject of concerted research abroad, especially in the U.S.A. Teacher classroom behaviour, it is believed, is the chief ingredient of the right type of classroom climate. Focus of attention, has therefore, been on studying the patterns of teacher influence (classroom behaviour) using reliable observational tools developed for the purpose.

Out of the many school subjects, Social Studies merits the attention of the reserchers. Studies by Chase, W. Linwood (1949), Harper, Charles A (1937), and Outland, George E. and Janes, Louis T. (1940) reveal student dislike for Social Studies courses. The major complaints, such as dullness, uselessness, excessive memorisation of names, dates and events, and the like, are not attributable to the content of the Social Studies but rather to the ways in which it is organised and presented. One of the major challenges is that of developing more effective classroom procedures.

Of the several bio-factors of teachers that could be affecting teacher classroom influence, the 'sex' of the teacher might be one important variable. At the secondary school level women teachers have been found to be, to a greater extent, friendly, responsible, stimulating, and showing favourable attitudes towards pupils, and democratic classroom procedures, entertaining permissive educational viewpoints and verbal understanding, than men teachers. (J. W. Getzels and P. W. Jackson; Handbook of Research on Teaching, American Educational Research Association, Rand McNally and Company, Chicago, 1963, quoting Ryans, D. G., 1960).

In secondary schools in India, there are at least, 28 women teachers for every 100 men teachers. (as estimated for the year 1965-66, by the Education Commission—vide the report, Table 3.3, page 63). And the trend is on the increase, in this proportion.

Systematic observation of classroom behaviour of men and women teachers in respect of the subject of Social Studies in Indian schools is one of the urgent research problems with us. The task is Himalayan. Through sustained and systematic work we should undertake extensive observational investigations so as to gain insight into the effects of these and, of course, a number of other important variables, in operation, in the realm of classroom interaction. That will be the prelude to developing remedial reorientation measures for our teachers to become more effective.

By way of an humble beginning in this direction, the study reported in the following pages, was undertaken by the writers.

II. Objectives

The major objectives of the study are.....*

(1) to investigate the patterns of teacher classroom behaviour of some selected Social Studies teachers in some secondary schools, and

(2) to identify the distinctive points of contrast and areas of similarity in terms of teacher behaviour, as between the men and women Social Studies teachers observed.

III. Method

(a) *Tool*: Flanders ten-category system of classroom verbal interaction analysis is used for observation in this study.

(b) *Observer Training*: Following sustained training to the observers the inter-observer reliability was found to be consistently above 0.85, in terms of Scott's phi-coefficient, as suggested by Flanders (1966).

* In the present report however only the findings of the comparative study are given (objective 2).

(c) *Sample*: The sample consists of 36 teachers teaching Social Studies in Baroda High Schools. This total is composed of 19 women and 17 men teachers.

(d) *Scheme of Observations*: Each teacher was observed for two periods uniformly and the observations were done on the basis of a set of pre-discussed ground rules.* To add to the consistency of observations, the observers met at frequent intervals and discussed the unusual and intriguing events observed. These regular discussions contributed to the evolution of an accepted code of guidelines which served as a frame of reference in all cases of communication events defying easy coding.

(e) *Matrix Tabulation*: Two master matrices one representing 17 men teachers and the other 19 women teachers have been developed. Due to the variation in the relative number of individuals in the two groups, their respective percentage matrices were constructed and used for projecting all the interpretations.†

The two master matrices, and their derivatives, the two percentage matrices are given in Appendices A, B, C and D respectively.

The combined matrix, developed for the purpose of testing for statistical significance, is given in Appendix 'E'.

IV. Discussion

(a) *General*: A perusal of the two master matrices in Appendices A and B, ere we delve deeper into discussion with their respective percentage matrices provides us with an initial quota of information relating to certain general features of the communication patterns observed. The information gathered

* For an exhaustive list of the ground rules followed, the other report by Dr. M. B. Buch and M. R. Santhanam appearing elsewhere in this brochure, may be consulted.

† All the references in terms of percentages made in the course of this Report are those counted with reference to the grand total of each matrix, except where otherwise stated.

serves as the synoptic perspective in which can be viewed the other details stemming from the percentage matrices.

(i) While in the case of the 19 women teachers as many as 22173 tallies were recorded, there is a total of 19133 tallies depicting the communication events of 17 men teachers. On an average, each women teacher caused 1167 observations and each man teacher 1125 observations. This means that for every woman teacher there have been 42 more observations than is the case with a man teacher. Based on these figures we find that in the classroom of women teachers, the communication events were relatively faster than in the case of those of men teachers.

(ii) Incidentally the number of vacant cells in the matrix in respect of the women teachers is 30 while it is 23, in the case of the matrix relating to the men teachers. The implication is that shifts from one category to another were less widespread in the case of women teachers than in the case of men teachers.

(iii) A striking feature is that none of the women teachers had ever any use for category one, while the men teachers too found the need for this category on just two occasions only. In view of the number of occasions being exceedingly limited the position therefore leaves no consolation even to the men teachers either.

(b) *Certain Descriptive Indices:* The following indices help us to plumb the profundities of the fascinating subject of classroom interaction analysis, in a vivid manner.

(i) The women teachers talk 75.183 percent and the men teachers talk 82.142 percent.

(ii) The students in the classes of women teachers talk 13.292 percent while those in the classes of men teachers talk 10.489 percent.

(iii) The student-initiated components of the student talk are 2.41 percent (71/2947) and 3.99 percent (80/2005)

respectively for the students under women teachers and men teachers respectively. It is interesting to note therefore that though the students under men teachers were allowed to talk less compared to those under women teachers the 'self-initiated' component thereof was decidedly larger than its counterpart in the case of the students under women teachers.

(iv) The I/D ratios (col. 1-4/col. 1-7) for women teachers and men teachers are 0.18 and 0.15 respectively. (3016/16670 for women teachers and 2332/15717 for men teachers).

(v) Leaving aside the emphasis on content the proportion of regard for emotional aspects accounts for 0.5 in the case of women teachers (616/1255) and 0.55 (752/1376) in the case of men teachers. It means that the men teachers were more 'indirect' though to a slight extent, than 'direct' as compared to the women teachers who struck a neutral pose in the matter of being 'direct' and 'indirect'.

(vi) Looking for the 'significant cells' containing over three percent of tallies, we see how there are five such cells in the matrix representing women teachers (4-4, 5-5, 8-8, 10-10 and 4-8) and four such cells in the matrix representing men teachers (5-5, 8-8, 10-10 and 4-8). It is worth noting that 'sustained questioning' (cell 4-4) is 'significant' in the case of women teachers alone while the other 'significant' cells are the same for both the categories of teachers. As if consistent with the sustained questioning of a 'significant order' the sustained teacher-controlled responsive student talk is decidedly more (cell 8-8 with 7.153 percent tallies) in the case of students under women teachers than (cell 8-8 with 4.887 percent tallies) in the case of students under men teachers.

In the matter of responding to short questions the students under women teachers score more (cell 4-8 with 4.248 percent tallies), than their counterparts under men teachers (cell 4-8 with 3.753 percent tallies).

All this is possibly the result of the men teachers being overwhelmingly pervasive leaving little chance to students to talk as compared to women teachers in their communication patterns. Further evidence is available from the respective load in the cell 5-5 indicative of sustained lecturing which is 62.52 percent for men and 54.485 percent for women. Further confirmation comes from the fact that men teachers talk 82.142 percent while the women teachers talk 75.183 percent.

The effect of this 'pervasiveness' of men teachers is not just some deprivation of opportunity for student talk. It reverberates in the realm of pauses and silence too as is seen through the index of 'sustained silence' (cell 10-10 with the 8.086 percent tallies for women teachers and the corresponding cell 10-10 with 4.107 percent tallies for men teachers). Even the total of silence etc. is 11.528 percent for women teachers while it is only 7.274 percent for men teachers. Further evidence to establish the garrulity of men teachers stems from the fact that while the total silence of 2.689 percent tallies could precede teacher talk in the case of women teachers, only a total silence of 2.430 percent tallies preceded teacher talk in the case of men teachers (cf. row ten columns one to seven in the respective matrices).

As is usually the case all these 'significant' cells with the exception of cell 4-8 are steady-state cells lying on the diagonal from left top to bottom right.

The general picture presented by the two matrices does not however, fit in well with the range of normative expectations spelt out by Flanders. Against a normative expectation of a range of 50 to 80 percent for teacher talk the men teachers' talk of 82.142 percent obviously exceeds the limit while the women teachers' talk of 75.183 percent lies within the bounds. As regards student talk, with the normative range being given as 25 to 40 percent, the student talk in the matrices relating to both the groups of teachers is woefully falling short of the

expectations. In so far as it is nearer the range in respect of students under women teachers (student talk 13.291 percent) than it is in respect of students under men teachers (student talk 10.489 percent) the women teachers may be said to be 'less' guilty of violation of the right of the students to talk.

Further analysis of the relative segments of student talk and silence etc. reveals that in the case of women teachers a boost to student talk could have come from a dwindling of the time spent for silence and pauses which evidently is in excess of the maximum limit set which is 10 percent (11.528 percent) had the concerned women teachers sought after it.

(vii) A feature of happy relief for men teachers from this position of being apparently too vociferous is that the sustained self-initiated talk of students (cell 9-9) and sustained 'acceptance' use of students' ideas by teachers (cell 3-3) are both consistently more pronounced in the case of men teachers than in the case of women teachers (For women teachers the cells 3-3 and 9-9 carry 1.493 percent and 0.081 percent tallies respectively while for men teachers they carry 1.939 percent and 0.220 percent respectively). They indeed are real though not spectacular, *amends* by men teachers.

(viii) One other point in favour of men teachers is that the emotional effect in their case is to the extent of 3.928 percent while it is far lower than this in the case of women teachers who have this only to the extent of 2.780 percent (sum of column totals one to three).

(ix) However, as if to prove that what is gained on the swings could be lost on the roundabouts the emphasis on content and business on hand is much higher (74.953 percent) in the case of men teachers than (69.522 percent) in the case of women teachers (sum of column totals four and five).

There is reason, as will be explained shortly later, to believe that the men teachers could have struck a gainful bargain had they tried to barter away part of the emphasis on content for

netting in more on the emotional front by means of resort to categories two and three. Strategically that could have been profoundly possible. The men teachers seem to have been comparatively on a vantage ground as is gathered from the following details:

(1) Total acceptance and use of students' ideas is 3.574 percent for men and 2.661 percent for women (col. three total).

(2) Shift made from acceptance/use of students' ideas to 'lecture' (cell 3-5) is more pronounced in the case of men teachers (0.497 percent) than in the case of women teachers (0.383 percent).

(3) The combined transition from praise/encouragement to acceptance/use of students' ideas and vice versa (cells 2-3 and 3-2) is much higher (0.104 percent) in the case of men teachers than in (0.041 percent) in the case of women teachers

(4) The cell 3-3 carries a load of only 1.493 percent in the case of women teachers while in the case of men teachers it is 1.939 percent.

The evidence gathered from the foregoing details is that while the men teachers have shown relatively greater capacity for creating constructive emotional climate (points (1), and (3) and (4) above) they could also have exercised restraint in their shift from category three to five, however irresistible the provocation might have been. On this score the women teachers' performance is noteworthy (point (2)). They have not after all, allowed what little 'sustained acceptance/use of students' ideas', they had to drain off into stale and sterile unilateral lecturing.

(c) *Relative Distribution Pattern of Tallies:* While in the case of women teachers the matrix leaves as many as 30 cells vacant the number of vacant cells in the matrix relating to men teachers is only 23.

Women Teachers' Matrix: The lion's share of the vacant cells in this matrix namely 19 cells, constituting Row one and Column one owes its origin to the thorough disuse that category one was left in. On the whole, of the 30 vacant cells in this matrix only two (cells 1-1 and 2-2) are steady-state diagonal ones, all the others being transition cells.

Among the significant losses may be mentioned that of the 'constructive integration' area of the matrix. The loss is of the order of 6 cells. The 'Vicious Circle' cells are all loaded. It is thus disconcerting to note that while out of a cluster of 9 potentially significant 'Constructive Integration' cells as many as 6 could be lost all the four of the despicable band of 'vicious circle' cells should be loaded ones.

The share of the loss on the part of the 'Content Cross' area of this matrix is 11 cells.

Men Teachers' Matrix

Out of the total of 23 vacant cells those lying in row one and column one are as many as 16 which clearly shows that category one had been used to an exceedingly limited extent. The corresponding matrix (Appendix B) indicates that category one was used on two occasions one in the context of acceptance/use of students' ideas and another as being preceded by a spell of pause/silence. These are too few and far between.

Had the category one been used to a greater extent, which should not have proved difficult, particularly in view of the men teachers' demonstrated (as described earlier) capacity for casting in 'constructively' the emotional aspects in the communication flow, not only would the number of vacant cells have been curtailed but also incidentally the weight of 'constructive integration' area would have been boosted substantially.

As in the case of the matrix relating to women teachers, while there is no loss whatsoever from the 'vicious circle' area,

the loss sustained by the 'Constructive Integration' segment is to the extent of 4 cells. That only 4 out of the 9 cells comprising the segment should have been lost while the corresponding loss by women teachers is 6 cells adds to the consolation the men teachers gather from the fact that only 8 cells from 'Content Cross' are left empty while the corresponding loss sustained by women teachers is a total of 11 cells.

Of all the 23 vacant cells in this matrix, again, only one (cell 1-1) is a steady state cell, all the other ones being transition cells.

(d) *Constructive Integration*: The manner and the extent to which the teachers strive for securing emotional attunement with the students by means of well-delivered verbal rewards are clearly indicated in the distribution pattern of frequencies in the nine cells comprised in this area namely, columns one to three rows one to three. The gains made through such verbal rewards as 'accepting the feeling tone of the students', 'praising/encouraging' and 'accepting/using the ideas of students', in view of their constructive contribution to the promotion of the needed (for effective learning) congenial 'social-emotional' climate in the classroom is technically called as 'constructive integration'.

The patterns of distribution of tallies in these cells would thus highlight the 'reward' component of teacher behaviour.

As mentioned earlier, while as many as 6 cells from this area are lying vacant in the matrix relating to women teachers, in the matrix relating to men teachers as few as 4 cells are left vacant.

The steady-state sequences that are conspicuously absent in the matrix relating to women teachers are 1-1 and 2-2 while in the matrix relating to men teachers such a sequence that is conspicuously absent is 1-1 only. Further, in both the matrices there has been no mutual transition between categories one and two. Obviously all this void in a vital sphere is on account

of the relative disuse that category one has been subjected to, by both sets of teachers. A grievous disregard has resulted in a gaping omission.

The sum of the loads in all the cells within this area, technically called 'Extended Indirect' is 1.534 percent in the case of women teachers and 2.126 percent in the case of men teachers. Concern for emotional effect exhibited by the men teachers is thus relatively more than in the case of the women teachers. The total use of these three categories (column totals one to three) works out to 2.780 percent and 3.928 percent for women and men teachers respectively. That means that the relative amounts of use of these three categories in contexts other than as 'Extended Indirect' are 1.246 percent and 1.802 percent (2.780 percent-1.534 percent and 3.928 percent-2.126 percent) for women and men teachers respectively. The significance is that men teachers used these three categories otherwise than as 'Extended Indirect' also to a 'greater' extent than did the women teachers.

On closer examination of the constituent structure of the Constructive Integration areas in the two matrices one is struck with the alarming state of discrepancy in the relative size of the 'praise/encouragement' component therein. While the women teachers used it to the meagre extent of 0.005 percent the men teachers had use for as much as 0.104 percent (sum of cells 2-2 and 3-2) in this context. In fact the proportion of praise used in this context out of the total use of praise is far greater in the case of men teachers 1: 3.3 (20 tallies out of 66) than in the case of women teachers out 1; 26: (1 tally out of 26 tallies).

When we move on to a study of the pattern of use of the category three (acceptance/use of students' ideas) again it is the men teachers who score a point over the women teachers. The sustained use of this category (cell 3-3) is 1.493 percent in the case of women teachers while it is 1.939 percent in the case of men teachers. Even going by the criterion of 'total

use' of this category (2.661 percent in the case of women teachers and 3.574 percent in the case of men teachers) it is the women teachers who are decisively bowled over by the men teachers.

Deliberate acceptance/use of students' ideas and resort to praise/encouragement immediately in the context of student talk will go a long way in reinforcing the learning and rewarding the learner. The men teachers again seem to have resorted to those two powerful means of reinforcement and reward in the context of teacher-controlled 'responsive' student talk (cells 8-3 and 8-2) to a greater extent—namely 1.474 percent (1.286 percent + 0.188 percent) than have the women teachers done—namely, 1.105 percent (1.006 percent + 0.099 percent).

It is noteworthy that women teachers could have 0.005 percent of praise/encouragement for students' self-initiated talk (cell 9-2) while the men teachers had practically no occasion to offer such praise/encouragement. Lending credence to this discovery is the revelation that the men teachers could 'use/accept' students' self-initiated ideas (cell 9-3) to a lesser extent (only 0.021 percent) than could the women teachers do (0.027 percent). This raises the question whether the men teachers are more impatient of students' self-initiated talk than their women counterparts, especially in view of the fact that the total self-initiated talk of the students (column nine) has been far greater in classes conducted by men teachers (0.418 percent) than in those by women teachers (0.321 percent). The point is that there having been more of such self-initiated student talk in men teachers' classes they could have given a better account of appreciation and acceptance thereof than the women teachers have done, had they (the men teachers) inclination to do so.

Also it turns out that the total self-initiated student talk in the context of teacher talk (column nine rows one to seven) is more (0.172 percent) in the case of women teachers than in

the case of men teachers (0.120 percent) indicating that men teachers were relatively apathetic towards students' self-initiated talk.

(e) *The Vicious Circle*: As the phrase suggests the occurrence of categories six and seven both in a sustained fashion and as shifts between them is undesirable and will have the effect of curbing the freedom and initiative of the students. Such restrictive behaviour on the part of the teachers as would make them patently authoritarian is termed as 'Extended Direct' behaviour. The relevant sequences are to be found within the *quadrangular* area—namely cells 6-6, 6-7, 7-6 and 7-7. The excessive preoccupation with these sequences points to the presence of problems of classroom management and control.

The total load in the four 'Extended Direct' cells is 1.570 percent in the case of women teachers and 2.033 percent in the case of men teachers.

It is interesting to note that in the case of women teachers the 'Vicious Circle' (Extended Direct) quantum is greater than the 'Constructive Integration (Extended Indirect)' (1.570 percent 1.534 percent) while it is happily the other way round in the case of men teachers (2.033 percent (2.126 percent)).

The proportion of the vicious circle component to the total use of orders/commands and criticism is more in the case of men teachers 0.62% (389 tallies out of 624 tallies) than in the case of women teachers 0.54% (348 tallies out of 639 tallies).

In the matter of resorting to orders/commands (total use and not the pattern of use) (column six) both the category of teachers are almost alike (2.318 percent by women teachers and 2.315 percent by men teachers). Resort to criticism (column seven) is far greater (0.945 percent) in the case of men teachers than in the case of women teachers (0.565 percent),

possibly further vindicating the relative impatience of men teachers that came out from earlier discussion.

Further the 'sustained' criticism (cell 7-7) is more pronounced in the case of men teachers (0.575 percent) than in the case of women teachers (0.225 percent), although in both the cases it is this 'sustained criticism' which is the highest cell load in the concerned column, namely column seven.

Another interesting thing about the resort to 'criticism' is that following criticism (cell 7-10) is 0.131 percent of silence etc. in the case of women teachers while the corresponding cell load in the case of men teachers is only 0.078 percent.

The relevant background information is that the total resort to criticism as has been mentioned earlier (column seven) has been far less in the case of women teachers (0.565 percent) than in the case of men teachers (0.945 percent). Hence viewed in the light of this fact that even with a relatively lesser degree of resort to criticism the women teachers could presumably stun the students into silence to a greater extent than the men teachers, the temptation to hazard a guess that they would have been far more vehement in their vocabulary of abuse and criticism or even extreme self-reference than the men teachers, seems to be irresistible.

As if to sustain this inference the women teachers as compared to men teachers not only have given 'nil' account of use of category one but also their total use of praise/encouragement (column two) is far less (0.119 percent) than that by the men teachers (0.344 percent). Further investigation yields supporting information as when we scan the occurrence of self-initiated talk by students (column nine) which is far more in the case of men teachers (0.418 percent) than in the case of the women teachers (0.321 percent). The overall evidence thus indicates a possibility of the women teachers compared to men teachers being less inclined to offer 'appreciation and praise' to students and more prone to pass vehement remarks of rebuke and criticism on them.

(f) *The Steady-State Cells:* The design of the square-matrix adopted is such that the occurrence of any event in a sustained fashion for spells of over three seconds each is all indicated on what is called the 'diagonal' from the left top to the right bottom of the matrix. There are ten such steady-state cells lying on this diagonal while all the other ninety cells of the matrix are transition cells which depict the shifts from one category to another in any two successive spells of three seconds each.

The combined total load in all the diagonal cells in the matrix relating to the women teachers is 77.399 percent while the corresponding figure in the case of men teachers is 78.617 percent. Thus the total shift from one category to another is slightly less in the case of men teachers ($100-78.617 = 21.383$ percent) than in the case of women teachers ($100-77.399 = 22.601$ percent).

The teacher talk segment of the steady-state cells is an indication to the relative degree of inflexibility to effect shift from one category to another, the part of the teachers. This segment is composed of the seven diagonal cells in columns one to seven. The combined load in this segment in the case of women teachers is 62.079 percent while in the case of men teachers the segment claims a total load of 69.403 percent.

Their respective total teacher talk amounts have been 75.183 and 82.142 percent. The relative degree of flexibility therefore works out to 13.104 percent (75.183 percent- 62.079 percent), for women teachers and 12.739 percent (82.142 percent- 69.403 percent) for men teachers leaving us the impression that the women teachers have been slightly 'more flexible' than the men teachers. A sizeable degree of flexibility on the part of the teachers might indicate that they have vast facility for pressing into service the different types of communication pattern in quick succession to one another as required by the situation, rather than persisting in one and the same category for long spells.

With both the sets of teachers, as can be normally expected, the cell 5-5 which stands for 'sustained information-giving' is the heaviest loaded cell in their respective matrices, while with men teachers however, the load is heavier (62.520 percent is greater than 54.485 percent). The second heaviest load (8.086 percent) is housed in the cell 10-10 followed by the third-heaviest load (7.153 percent) in the cell 8-8 in the matrix relating to the women teachers. In the case of men teachers the cell 8-8 (4.887 percent) comes as the second-heaviest cell, the cell 10-10 with a load of 4.107 percent taking the third rank in the order.

That 'sustained silence' should have been even more than 'sustained responsive talk of students' in the case of women teachers however provokes a sense of wonder. There has been only just half as much 'sustained silence' in the case of men teachers as there has been in the case of women teachers.

Hence sustained students' responsive talk (cell 8-8) is appreciably greater (7.153 percent) in the case of women teachers than (4.887 percent) in the case of men teachers. However a situation otherwise than this cannot be expected when the total of students' responsive talk as such is more in the case of women teachers (12.971 percent) than in the case of men teachers (10.071 percent).

As discussed earlier there has been more 'sustained self-initiated talk of students' (0.220 percent) in the case of the men teachers than in the case of (0.081 percent) women teachers.

The 'sustained criticism' (cell 7-7) too is well over twice as much with men teachers (0.575 percent) as with women teachers (0.225 percent). This relative position is however consistent with their relative position as regards the total of criticism employed (column seven) (0.945 percent for men teachers and 0.565 percent for women teachers).

As regards 'sustained orders/commands' despite the overall position (column six) being almost equal (2.315 percent for men and 2.318 percent for women) the cell 6-6 carries a load of

1.338 percent in the case of men teachers while the corresponding load is only 1.294 percent for women teachers.

It is noteworthy that only in the case of women teachers the 'sustained questioning', (cell 4-4) is 'significantly' loaded with 4.582 percent of tallies. While it is only 2.953 percent in the case of the men teachers, it is in the fitness of things therefore that for greater 'sustained questioning' there has been greater 'sustained responsive talk' by students in the case of women teachers than in the case of men teachers in whose case both have been at lower levels.

Again as has been discussed in another context, the 'sustained use/acceptance of students' ideas' by teachers is more in the case of men teachers (1.939 percent) than in the case of women teachers (1.493 percent). That there should have been no 'sustained praise/encouragement' whatsoever offered by women teachers is a shocking revelation.

Yet another disturbing discovery is that in the case of both the groups of teachers there has been no 'sustained feeling tone' (category one) for the obvious reason that while the category has never been employed at all by the women teachers, it was used on too limited a scale (two occasions only cell 3-1 and 10-1) by the men teachers.

In the case of women teachers 'sustained questioning' (cell 4-4 with 4.582 percent) is far more in excess of 'questioning following content delivery' (cell 5-4 with 2.625 percent) than it is in the case of men teachers (cell 4-4 with 2.953 percent and cell 5-4 with 2.660 percent).

With both the groups of teachers there has been sizeable amounts of 'students' response' in direct answer to questions (cell 4-8) which is next only to the 'sustained students' responsive talk (cell 8-8) in the concerned column. The difference is however more pronounced in the case of women teachers (7.153 percent-4.248 percent = 2.905 percent) than in the case of men teachers (4.887 percent - 3.753 percent = 1.134 percent).

That in the case of women teachers the 'sustained self-initiated talk of students' (cell 9-9 with 0.081 percent) should have been even less than such talk occurring after teacher questioning (cell 4-9 with 0.95 percent) should indeed cause concern.

In so far as the cells 3-3 and 9-9 represent the teachers' 'sustained constructive concern' for students' ideas' and the extent to which such students' ideas are displayed in a sustained fashion, a discussion of the relative loads in these two cells in the matrices under review would be worth candle. While in the case of women teachers the cells carry 1.493 percent and 0.081 percent of frequencies the corresponding cell-loads in the case of men teachers are 1.939 percent and 0.220 percent. The proportion of the cell 3-3 load to the cell 9-9 load is better in the case of men teachers 9:1 (371 tallies; 42 tallies) than in the case of women teachers 18:1 (331 tallies; 18 tallies). The implication is that the relative classroom climate was such that in the classes handled by men teachers the propensity for sustained self-initiated talk by students has been more with reference to the teachers' sustained use/acceptance of such ideas of students than has been the case in the classes controlled by women teachers. It is possible, as is always the case as well, that part of 3-3 load may be with reference to teacher-controlled students' responsive talk. However one cannot basically go wrong in assuming that there is a positive relationship between the cells 3-3 and 9-9. There should be a concerted effort towards a full and effective mobilisation of pupil initiative by suitably manouvering the 'indirect' techniques.

An identical feature in both the matrices is that it is the diagonal cells which are the heaviest loaded cells in their respective columns. As we scan horizontally for a similar analysis the following dissimilar features come up to our notice. In the matrix representing women teachers, in the row nine the steady-state cell load (9-9 with 0.081 percent) is excelled by

that in the cell 9-5 (0.122 percent). That signifies that category nine was followed more by category five than by itself.

In the case of the matrix relating to men teachers in two rows the respective steady-state cells forfeit the claim to 'being the heaviest loaded one in the concerned row'. In row two the steady-state cell 2-2 with a frequency of 0.078 percent is equalled by the cell 2-3 (0.078 percent) and is even excelled by the cell 2-5 (0.089 percent). That implies that rather than 'sustained praise/encouragement', 'praise/encouragement' was followed in an equal measure by 'use/acceptance of students' ideas and even more by content delivery. Again in row four the diagonal cell 4-4 (2.953 percent) is losing the claim to the transition cell 4-8 (3.753 percent) which is a recognised significantly loaded cell.

(g) *Content Cross*: What amount of concern there had been in the communication episode for subject matter as distinct from emotional and social aspects can be gauged from a perusal of the sum of column totals in columns four and five. The combined totals in the two matrices under review are 69.522 percent (10.824 percent + 58.698 percent) for women teachers and 74.953 percent (8.257 percent + 66.696 percent) for men teachers. Relatively therefore, the men teachers seem to have evinced greater concern for content and business on hand than the women teachers.

The concern for subject matter is not confined only to the two columns four and five but spills over to the columns three and six. The combined totals of the two columns (three and six) in the two matrices under study are 4.979 percent (2.661 percent + 2.318 percent) and 5.889 percent (3.574 percent + 2.315 percent) for women teachers and men teachers respectively.

While the sum of column four and five totals as also to some extent that of column three and six totals gives us an indication of the amount of concern displayed for content the pattern of distribution of tallies in all these four columns as also in rows

four and five is a pointer to the distinct patterns in which such concern has been shown in the communication episodes.

Short answer drill, a feature invariably common to all classroom situations, can easily be identified from this area. Such drill is normally characterised by the following communication sequences. The teacher asks questions which are answered by students (4-8). The answers are accepted (8-3 and 3-3) and the teacher repeats the question to another student (3-4) and so on. Also at times it happens that there is no acceptance following students' answer but the teacher by gestures repeats the same question to other students one after another, in which case the sequence is 4-8-4.....In the matrices under study the sum of cells 4-8 and 8-4 is 6.557 percent (4.248 percent + 2.309 percent) in the case of women teachers and 5.211 percent (3.753 percent + 1.458 percent) in the case of men teachers. This lead of women teachers is lost to the men teachers when the use/acceptance of students' ideas is considered. The sum of cells 8-3 and 3-3 is 2.499 percent (1.006 percent + 1.493 percent) in the case of women teachers while the figure is 3.225 percent (1.286 percent + 1.939 percent) for men teachers. On the whole, there seems to have been in classes under the women teachers slightly greater (9.055 percent) amount of short answer drill than in those under men teachers (8.436 percent) (sum of cells 4-8, 8-4, 8-3 and 3-3).

Another important fact is that the drill sequences occurring in a fast manner in actual classroom situations are invariably coded, rightly so, as 6's and 8's rather than 4's and 8's. These two cells namely 6-8 and 8-6 bear greater combined load in the case of women teachers (0.180 percent + 0.171 = 0.351 percent) than in the case of men teachers (0.099 percent + 0.162 percent = 0.261 percent).

It is significant that the two principal components of what is called the 'content cross'—namely category four (questioning) and category five (information-giving) belong to the 'Indirect' and 'Direct' types of teacher talk respectively.

Total 'information giving' by women teachers (column five) is 58.698 percent against a total of 66.696 percent by men teachers. In the case of women teachers 'questioning' (column four) is 10.824 percent which is decisively greater than 8.257 percent in the case of men teachers. This clearly is the reason why the I/D. ratio, as has been discussed earlier, is found to be greater (0.18) for women teachers than (0.15) for men teachers. A sizeable column four total coupled with comparatively less of column five total boosts up I/D ratio.

Next to using/accepting students' ideas the men teachers proceed to 'information giving' (cell 3-5) to a greater extent (0.497 percent) than do the women teachers (0.383 percent). Surprisingly enough, with neither category of teachers there has been any 'use/acceptance of students' ideas in the context of 'information-giving' (cell 5-3).

Some significance may be sought in the relative frequencies in the cell 7-5, in the two matrices.

The cell-load in the case of women teachers is just one-third (0.011 percent) of that (0.125 percent) in the case of men teachers. The men teachers thus have shown greater capacity for weaning themselves away from 'criticism' (category seven) through a switch to 'information giving'. As a matter of fact this has been the most often employed mode of retrieval by the men teachers whenever they found themselves having slipped into a boat of invectives against students (category seven) as is borne out by the fact that in row seven it is the cell 7-5 which is the heaviest loaded cell next only to the steady state cell (7-7).

Not only has there been less of 'criticism' by women teachers (0.565 percent) as compared to men teachers (0.945 percent) but also a different strategy is adopted by the former for terminating it. They resort to questioning following criticism (cell 7-4 with 0.054 percent is the highest in teacher talk category in the row, with the exception of the steady-state cell 7-7).

It is, of course, from that in the case of men teachers questions follow criticism (cell 7-4) to a greater extent (0.073 per cent) than in the case of women teachers.

In fact, on a perusal of the cell loads in the row seven in the matrix relating to women teachers we find that it is students' talk (category eight) that serves most often to terminate criticism (cell 7-8 with 0.68 per cent).

Following students' responsive talk there has been more of 'questioning' than 'information-giving' (cell 8-4 with 2.309 is greater than the cell 8-5 with 1.556 per cent) in the case of women teachers while the position is one of near-equality—(1.458 per cent and 1.463 per cent) in the case of men teachers.

There is twice as much criticism following 'information-giving' (cell 5-7 with 0.057 per cent) in the case of men teachers as there is with women teachers (0.028 per cent).

Students' response to teachers' questions (cell 4-8) is more in classes under women teachers (4.248 per cent) than in those under men teachers (3.753 per cent).

Again through 'questions' the women teachers have evoked students' unpredictable and hence relatively freer talk (cell 4-9 with 0.095 per cent) to twice as much an extent as the men teachers have done (0.047 per cent).

Both 'questioning' and 'information-giving' in the case of women teachers have been followed by spells of silence (cells 4-10 and 5-10) relatively to greater extents (0.997 per cent and 1.055 per cent respectively) than is the case with men teachers (0.810 per cent and 0.915 per cent).

It seems to be but natural that in the case of men teachers following 'criticism' and 'commands/orders' there is no self-initiated talk of students (cells 6-9 and 7-9) while the corresponding loads in the matrix relating to women teachers two are just not very sizeable (0.009 per cent and 0.005 per cent).

'Criticism' resorted to immediately following 'use and appreciation' of students' ideas might in all probability have

the deleterious effect of nullifying the gains of the latter. The shift therefore from category three to category seven (cell 3-7) is one of the most undesirable sequences that can ever occur in a classroom situation such a cell load is over five times heavier in the case of women teachers (0.027 percent) than it is in the case of men teachers (0.005 percent).

Use of the first three indirect tools (categories one to three) in the context of 'content-delivery' would have the effect of contributing to the reinforcement of content and affording a boost to the sense of ego of students. Through all this the teachers can hope to rope in more of student participation. Such a use of the 'indirect' categories has never occurred in the case of either group of teachers except that a little praise has been awarded by men teachers alone (cell 5-2 with 0.042 percent).

(h) *Use of Praise:* The pattern and effect of use of praise as a tool of 'constructive integration' can be studied by analysis of the relative distribution of cell loads in column two and row two. Unalloyed and direct praise/encouragement, prompting giving to a struggling student to come up with the answer and also deliberate repetition of the answer given by a student, with a view to securing reinforcement thereof in the minds of the students are all categorised as two.

All praise that comes concealed in teacher talk is to be found in column two rows one to seven. The sum of the seven cells is miserably limited in the case of women teachers (0.010 percent) and viewed against this standard the performance of men teachers (0.151 percent) is singularly praiseworthy.

Amount of praise or reinforcement through repetition of students' answer etc. (cell 8-2) is nearly twice as much (0.188 percent) in the case of men teachers as it is (0.099 percent) in the case of women teachers.

Women teachers praise self-initiated talk of students' to an extent of 0.005 percent (cell 9-2) while the account given by the men teachers is blank.

Spells of silence were broken by words of praise/encouragement (cell 10-2) to an equal extent (0.005 percent) in the case of both sets of teachers.

While there has been no 'sustained praise' (cell 2-2) at all in the case of women teachers the men teachers have as much as 0.078 percent to their credit.

Tips in the nature of prompting, offered immediately following questions (cell 4-2) are nearly equal in both the cases (0.005 percent).

'Jokes' cut in the context of 'information-giving' (cell 5-2) is 'nil' in the case of women teachers and 0.042 percent in the case of men teachers.

It is significant that there has been no use of category two immediately following 'commands/orders' or 'criticism' (cells 6-2 and 7-2) by either group of teachers.

Again, the women teachers never followed this category with category six or category seven (cells 2-6 and 2-7) while 'commands/orders' have been twice as much as 'criticism' following category two in the case of men teachers (0.010 percent and 0.005 percent).

While as much as 0.089 percent of content-giving has been performed by men teachers in the context of 'praise/encouragement' only just one-fourth of the said quantum—viz. 0.023 percent could take off from the launching pad of praise/encouragement in the case of women teachers (cell 2-5).

There have been nearly equal quantum of students' responsive talk preceded by category two (cell 2-8) in the case of both women teachers (0.046 percent) and men teachers (0.047 percent). The immediate effect of praise/encouragement in terms of student behaviour stops here since following 'praise/encouragement' in the case of both the groups there has been 'no' students' self-initiated talk (cell 2-9).

The contribution of category two of the 'Extended Indirect' component of teacher behaviour (sum of the five cells namely 2-1, 2-2, 2-3, 1-2, and 3-2) is woefully scant in the case of women teachers ($0.036 \text{ percent} + 0.005 \text{ percent} = 0.041 \text{ percent}$) while the men teachers give a far better account in this respect ($0.078 + 0.078 + 0.026 = 0.182 \text{ percent}$)

On the whole, the amount of praise/encouragement used (column two total) by the women teachers is only about one-third (0.119 percent) of that used by men teachers (0.344 percent). This raises the crucial question whether women teachers by nature are less generous in offering praise/encouragement in class communication, which can only be answered through further research.

(i) *The Provocation to Criticism*: Any teacher who wants to adopt constructive approach to teaching and encourage student participation has perforce to augment his repertoire of "indirect" aspects of behaviour. Alternatively he should attempt to discard as much of 'direct behaviour' as possible. Complete jettisoning of direct behaviour is simply inconceivable since there has to be some 'information-giving', some ordering and of course some limited and mild criticism too. The limited criticism may have to be used at least by way of a deterrent to the erring and potentially mischievous students in the class. The proposition therefore is that the teachers should to the extent possible, endeavour to disarm themselves of this harmful missile. Except when the provocation is high and irresistible course to 'criticism' should be eschewed. In other words, it should be used as a 'medicine and not as daily bread'.

It is interesting to compare and contrast the manner and extent to which the two groups of teachers have wielded this effective wand.

The total criticism (column seven) uttered by men teachers is more (0.945 percent) than that by the women teacher (0.565 percent).

On an examination of the distribution pattern of percentages in the different cells in column seven, in the matrix relating to the women teachers, we find how barring the 'steady-state' cell 7-7 with a load of 0.225 percent, the cell 10-7 with a load of 0.140 percent comes as the next heavy one. The provocation therefore seems to have been in the case of women teachers, the annoying 'silence' of students.

On the other hand, in the case of men teachers, barring the heaviest loaded cell which is the steady-state cell, the cell carrying the next heaviest load is 6-7 (0.094 percent). All this criticism therefore seems to have been cast in the context of 'commands/orders' even before the compliance by students. This shows that men teachers have been relatively more impatient and were more swayed by preconceived ideas than impelled by the need for 'wait and see' approach.

Both the groups of teachers have resorted to criticism even in the context of questioning (cell 4-7 with 0.054 percent and 0.042 percent respectively for women teachers and men teachers). This is an area where the resort to criticism is unjustifiable and could have better been eschewed.

Another fault committed by both the groups is to have allowed 'criticism' to follow 'use/acceptance' of students' ideas (cell 3-7). While, however, the droplet of criticism let in by men teachers is very negligible (0.005 percent) the avalanche of criticism by the women teachers (0.027 percent) is so sizeable as to warrant serious cognizance. The sequence, 3-7 makes a bad company in that all the 'constructiveness' of the former is 'wrecked' by the 'viciousness' of the latter. It is a jump — a bad one at that—from the sublime to the ridiculous.

There is seen to be twice as much 'criticism' following 'information-giving' (cell 5-7) by the men teachers (0.057 percent) as there is by women teachers (0.028 percent).

Once bagged into the state of hurling 'criticism' the men teachers have shown greater degree of vulnerability for being

dragged deeper into the quagmire (sustained state of criticism cell 7-7) than the women teachers (0.575 percent by men teachers and 0.225 percent by women teachers).

The total 'rejection' as expressed through 'Criticism' of all student talk (sum of cells 8-7 and 9-7) is nearly equal between the two groups of teachers, despite the fact that the women teachers never chose to reject the 'students' self-initiated 'ideas'. The men teachers' combined total is 0.078 percent (0.073 percent + 0.005 percent) while the corresponding figure is 0.072 percent (0.072 percent + 0) for women teachers.

(j) *Teachers' Reaction to Student Statements*: How the teachers have reacted to student statements, whether the reaction was one born out of sympathy, appreciation, praise and positive acknowledgement of the students' ideas or on the contrary, whether it was stemming from disregard and rejection are all mirrored in the rows eight and nine, columns one to seven.

The total response from teachers to student talk (sum of rows eight and nine and columns one to seven) is 5.412 percent for women teachers and in the case of men teachers it is 4.792 percent. So on the whole therefore the women teachers responded more to students than did the men teachers.

The teachers' sympathetic reaction to students' feeling and encouragement and acknowledgement of their ideas is exhibited in these two rows in columns one to three. Such 'constructive attitude' is exhibited more with regard to students' responsive (teacher-directed and teacher-controlled) talk rather than their self-initiated talk. On the whole, the men teachers have shown 'positive reaction' to students' responsive talk to a greater extent (0.188 percent + 1.286 percent = 1.474 percent) than have done the women teachers (0.099 percent + 1.006 percent = 1.105 percent) (cells 8-1, 8-2 and 8-3).

The scales are however tilted in favour of the women teachers in respect of students' self-initiated talk wherein the women

teachers' score is 0.032 percent (0.005 percent + 0.027 percent) and that of the men teachers is 0.021 percent (cells 9-1, 9-2 and 9-3).

Students' talk, in general has to a greater extent caused 'questions' to be put to them from women teachers than from men teachers.

The combined student talk has served to trigger 2.345 percent of questions from women teachers and 1.474 percent from men teachers (sum of cells 8-4 and 9-4).

As between the students' responsive and self-initiated types of talk it is the former which triggers off overwhelmingly more questions from either group of teachers than does the latter.

Students' responsive talk again has served as the launching pad for 'information-giving' to an extent of 1.556 percent in the case of women teachers and 1.458 percent in the case of men teachers. (cell 8-5 in both the matrices).

Resort to orders/commands immediately after students' responsive talk (8-6) accounts for 0.111 percent in the case of women teachers and 0.162 percent in the case of men teachers. More often than not a tally occurs in this cell when the teacher says 'sit down', 'stop', 'next' etc. In the context of a short answer drill or students' loud reading from the book this sequence occurs in plenty.

In the case of both the groups of teachers immediate and direct rejection of students' responsive talk (cell 8-7) occurs nearly to identical degrees, (0.072 percent in the case of women teachers and 0.073 percent in the case of men teachers) as has been detected in the course of analysis of 'provocation for criticism'.

It is heartening to note that such rejection has never been done by women teachers at all in respect of students' self-initiated talk while the men teachers have had the unenviable recourse, though on only one occasion, to such a direct repudiation of students' initiative. (cell 9-7 with 0.005 percent).

On the whole, as much as 7.2 percent of all teacher talk in respect of women teachers and 5.8 percent of all teacher talk in respect of men teachers has been in direct reaction to student talk, either in acceptance or in rejection thereof. (The total of tallies in rows eight and nine, columns one to seven with reference to the sum of column totals one to seven which are 1200 tallies out of 16,670 tallies in the case of women teachers and 917 tallies out of 15,717 tallies).

These are composed of teachers talk following students' responsive talk and that following their self-initiated talk. The ratio of the former to the latter is nearly 26:1 (1156:44) in the case of women teachers and 29:1 (886:31) in the case of men teachers.

(k) *The Prompt to Student Talk:* The extent to which students are enticed into wholehearted and conscious participation in classroom communication would largely be the decisive factor, in effective learning. In evolving an effective teaching strategy attention must be paid to devising ways and means of securing active and copious student verbal participation. To rely on an 'out and out' lecture method leaving the children in a position no better than that of passive spectators, glued to their seats, and then to hope for effective learning is a strategy basically faulty and functionally preposterous.

Again it is the teacher behaviour which is largely responsible for bringing about active student participation. A teacher, considerate, friendly and sympathetic in his approach is sure to rope in students for active participation in classroom communication. On the other hand, an authoritarian teacher with his frequent resort to threats, orders, and censure degenerates into a repulsive force.

The factors responsible for effective pupil participation can be identified by an analysis of the pattern of distribution of load in the different cells in columns eight and nine rows one to seven.

In all, students' responsive talk has occurred in more abundance (12.971 percent) in the classes handled by women teachers than (10.071 percent) in classes controlled by men teachers. The occurrence of students' self-initiated talk, very limited in either case, is slightly greater in the case of men teachers (0.418 percent) than in the case of women teachers (0.321 percent). On the whole, however, as has already been referred to, the combined student talk is decidedly more (13.292 percent) in the case of women teachers than (10.489 percent) in the case of men teachers. Thus in the case of both the groups of teachers the student talk falls far short of the normal expectations the range for which, as spelt out by Flanders, is 25 to 40 percent.

While as regards column eight it is the 'sustained' students' responsive talk, (cell 8-8) which is the heaviest loaded cell in the column in both the matrices, the load in the case of women teachers is significantly heavier (7.153 percent) than that in the case of men teachers (4.887 percent).

Leaving aside these sustained cells in column eight it is the cell 4-8 which comes up as the second-heaviest cell in the column in both the matrices. However, as with the sustained cell, so also with this transition cell representing the sequence of 'questions followed by students' responsive answer talk' it is the women teachers who have caused greater student response (4.248 percent) than the men teachers (3.753 percent).

As regards column nine, it is disquieting to note that in neither case there is any cell which is 'significantly' loaded. There are four cells lying vacant in this column in the matrix representing men teachers while the number of such vacant cells is only three in the matrix relating to women teachers. Despite this seemingly disadvantageous position the men teachers could raise more self-initiated talk (0.418 percent) than the women teachers (0.321 percent). A close examination of the distribution of load in the cells in this column reveals that this is largely due to the fact that 'sustained self-initiated talk by

students (cell 9-9) is carrying a load of 0.220 percent in the case of men teachers while the corresponding figure for women teachers is only 0.081 percent.

An interesting point of contextual significance is that this diminished load in the steady-state cell, of 0.081 percent in the case of women teachers is not the 'most heavily loaded' cell in the column either and it is relegated to the 'second' position only. Thus it forfeits the claim to the transition cell 4-9 which claims a load of 0.095 percent. However, in the case men teachers, the place of pride is retained by the steady-state cell which is followed 'next' not by cell 4-9 (0.047 percent) but by the cell 5-9 (0.068 percent).

Further scrutiny shows that the amount of such talk immediately following teacher questions (cell 4-9) is twice as much in the case of women teachers (0.095 percent) as in the case of men teachers (0.047 percent).

'Information-giving' has served as a fertile ground for the crop of self-initiated student talk (cell 5-9) to sprout in nearly identical measures in both the groups. The cell carries a load of 0.068 percent in the case of men teachers while the load is 0.063 percent in the case of women teachers.

Mention must be made of the two cells 6-9 and 7-9 having drawn blank in the case of men teachers possibly indicating a more congenial and harmonious social climate in their classrooms than in those of women teachers, wherein the two cells carry though very limited, loads of 0.009 percent and 0.005 percent respectively.

What might be overt resistance to and defiance of orders/commands and retaliation to 'criticism' from teachers was happily 'absent' in the classes handled by men teachers. Apparently the men teachers have kept in mind that 'a bad penny always turns up'.

To nearly equal degrees of occurrence in the case of both the groups of teachers, the students had chosen to dovetail their



'responsive' talk with their self-initiated' talk (cell 8-9). The extent of such healthy 'development' has been 0.026 per cent in the case of men teachers and 0.023 per cent in the case of women teachers.

The contribution of 'praise/encouragement' to students responsive talk is (cell 2-8) 0.047 per cent in the case of men teachers and 0.046 per cent in the case of women teachers. 'Use/acceptance' of students' ideas has however served to boost students' responsive talk (cell 3-8) by 0.454 per cent in the case of men teachers which is slightly higher than the figure in the case of women teachers (0.437 per cent).

Use/acceptance of students' ideas thus, has been a more effective bait than praise/encouragement for netting in 'student self-initiated' talk.

'Orders/commands' by teachers are followed by compliance in terms of students' responsive talk/answers to nearly twice as much an extent in the case of women teachers (0.180 per cent) as in the case of men teachers (0.099 per cent).

Students' controlled responsive talk occurring in the context of content—delivery (cell 5-8) in the case of women teachers is well over twice (0.176 per cent) that in the case of men teachers (0.073 per cent).

'Criticism' preceding students' controlled responsive talk (cell 7-8) is slightly more (0.068 per cent) in the case of women teachers than what is in the case of men teachers (0.063 per cent).

It is crystal-clear from the foregoing analysis that 'acceptance' rather than 'rejection' encourages student participation. The load in the cell 3-8 (0.437 per cent) bears a proportion of 6: 1 with that in the cell 7-8 (0.068 per cent) in the case of women teachers while the proportion is even better in the case of men teachers in whose case it is 7: 1 (0.454 per cent: 0.063 per cent).

On the whole, while in the case of women teachers as much as 40.1 percent (1143 tallies out of 2947 tallies) of all student talk immediately followed teacher talk (sum of columns eight and nine and rows one to seven with reference to the total student talk, *i.e.* sum of column totals eight and nine, to a slightly greater extent—namely 44 percent (882 tallies out of 2005 tallies) it did so in the case of men teachers.

(1) *The Flow of Communication*: Inasmuch as category ten stands for spells of silence or confusion or pause etc. the very occurrence of category ten following any other category does not ipso facto constitute an instance of discontinuity in the flow of communication. Proper interpretation should be based on an appreciation of the need felt sometimes for harbouring category ten deliberately by the speaker in order to make the statements more meaningful. Also it should be remembered that there is a groundrule advocating insertion of category ten by the observers, in 'certain' situations. Caution should be therefore counselled in the matter of analysing the use of category ten so that all use is not understood as being despicable and hence regrettable.

The total use of category ten (column ten) by women teachers (11.528 percent) is not only more than that by men teachers (7.274 percent) but also exceeds the maximum limit namely, 10 percent set for that category under normal conditions, by Flanders.

In the case of both groups of teachers the greatest contribution to the total occurrence comes from the respective steady-state cells which carry a load of 8.086 percent in the case of women teachers and 4.107 percent in the case of men teachers. It is this vast difference between the respective loads in the steady-state cells (8.086-4.107 percent = 3.979 percent) which apparently is largely responsible for inflating the overall difference to the extent of 4.254 percent (11.528 percent-7.274 percent).

The second biggest contribution to the total occurrence, in the case of both the groups is from the sequence 5-10 which carries a load of 1.055 percent in the case of women teachers and 0.915 percent in the case of men teachers. Women teachers' 'information-giving' thus seems to have been more discontinuous than that by men teachers.

Questions by teachers were followed by spells of silence (cell 4-10) in a greater measure in the case of women teachers (0.997 percent) than in the case of men teachers (0.810 percent). Contrary to what might appear to be the students' inability to respond to the questions as soon as they were put, largely the phenomenon was due to the teachers choosing 'to repeat or elongate' the question allowing spells of silence to creep in, while doing so. The evidence for this inference is that the cell 10-4 carries a load of 0.943 percent in the case of women teachers and 0.768 percent in the case of men teachers which shows that except on very few occasions when it was otherwise, all the ten's preceded by four's were followed by four's again. Added to this evidence is the fact that the prospects of those ten's (preceded by four's) being followed by prompts or encouragement have been very bleak as is clear from the load in the cell 10-2 which is 0.005 percent in the case of both the groups.

The load in the cell 10-7 is 0.140 percent for women teachers and 0.089 percent for men teachers, both of them not being so sizeable as to be comparable to the 4-10 cell loads.

The point is that had the significance of the ten's (preceded by fours) been the inability of the students to answer the questions the likelihood was that the teacher would have either 'prompted' or 'criticised' depending on whether the teacher was one having generally 'indirect' or 'direct' behaviour.

On the whole, 'silence' etc. following teacher talk (column ten rows one to seven) is 2.824 percent in the case of women teachers and is to a slightly lesser extent—namely 2.613 percent

in the case of men teachers. Likewise again, 'silence' etc. following student talk cell (8-10 + 9-10) is 0.618 percent under women teachers which is more than that under men teachers—namely 0.554 percent.

V. Summary of Significant Revelations

- (1) In classes conducted by women teachers communication is relatively faster.
- (2) Women teachers talk 75.183 percent and men teachers 82.142 percent.
- (3) Student talk under women teachers is 13.292 percent and that under men teachers is 10.489 percent.
- (4) Self-initiated student talk, however occurs more in men teachers' classes.
- (5) The I/D ratio for women teachers is 0.18 and 0.15 percent for men teachers
- (6) The i/d ratios for women teachers and men teachers are 0.5 and 0.55 percent respectively.
- (7) Sustained questioning is 'significant' in the case of women teachers.
- (8) Men teachers have been more 'pervasive' in the communication episodes than women teachers. The results of this 'pervasiveness' are reduced 'student talk' and diminished 'silence and pauses'.
- (9) Men teachers however do 'amends' by keeping the cells 3-3 and 9-9 more heavily loaded. Total emotional effect is more in the case of men teachers (3.928 percent) than in the case of women teachers (2.780 percent).
- (10) Emphasis on content is much higher in the case of men teachers (74.953 percent) than in the case of women teachers (69.522 percent).

- (11) Men teachers though blessed with favourable conditions, do not avail of the opportunities to bolster up emotional affect.
- (12) Women teachers keep in complete disuse category one.
- (13) The number of vacant cells in the matrix representing women teachers is 30 and it is 23 in the case of men teachers.
- (14) 'Extended Indirect' is 1.534 percent for women teachers and 2.126 for men teachers.
- (15) Men teachers appear to have been more insouciant of students' self-initiated talk as evidenced by their disinclination to use/accept such talk or even praise it.
- (16) Vicious circle quantum is greater in the case of men teachers (2.033 percent) than in the case of women teachers (1.570 percent).
- (17) Women teachers' vocabulary of invectives seems to have been far more vehement than that of men teachers.
- (18) Women teachers have shown slightly greater degree of flexibility for shift from one category to another, than men teachers.
- (19) The sustained students' responsive talk is more in the case of women teachers than in the case of men teachers, consistent with the picture of their relative totals of students' responsive talk.
- (20) Men teachers have resorted to more criticism than women teachers.
- (21) Students have shown more propensity for sustained self-initiated talk vis-a-vis the teachers sustained 'acceptance' of students' ideas, in the case of men teachers than in the case of women teachers,

- (22) Short answer drill, on the whole, is 9.056 percent in the case of women teachers and 8.436 percent in the case of men teachers, excluding the drill situation that might have occurred in a swift manner, which might have been coded as 6's and 8's.
- (23) In the case of women teachers due to heavier column four total and lighter column five total than in the case of men teachers the I/D ratio is more favourable for women teachers.
- (24) While women teachers have used 'questions' at the end of criticism, the men teachers have adopted 'information-giving' to make a retreat from criticism (heaviest teacher talk cell in row seven barring the concerned steady-state cell).
- (25) The load in the cell 3-7 is over five times heavier in the case of women teachers than in the case of men teachers.
- (26) Use of the first three indirect categories in the context of information-giving was never made by (cell 5-1, 5-2 and 5-3) either group of teachers except that the men teachers awarded a little praise following information-giving.
- (27) The total praise offered by women teachers is only about one-third of that offered by men teachers.
- (28) The total rejection of student talk (sum of cells 8-7 and 9-7) is nearly equal for both groups of teachers.
- (29) On the whole, the women teachers responded more to students than did the men teachers.
- (30) The men teachers have shown positive reaction to students' responsive talk to a greater extent than is the case in respect of women teachers (sum of cells 8-1, 8-2 and 8-3).

- (31) The position slightly turns in favour of women teachers, as regards such constructive attitude in reply to students' self-initiated talk (sum of cells 9-1, 9-2 and 9-3).
- (32) Students' responsive talk has served as a launching pad for questions and information-giving in a greater measure in the case of women teachers than in the case of men teachers (cells 8-4 and 8-5).
- (33) Student talk segment of communication events falls short of the norm spelt out by Flanders, with both the groups of teachers, though as between themselves, the women teachers have allowed more student talk than the men teachers.
- (34) Both the 'sustained' students' responsive talk as also answer to direct questions from teachers (cells 8-8 and 4-8) are occurring in a greater measure in classes handled by women teachers than in those controlled by men teachers.
- (35) Students' self-initiated talk occurs in a greater measure under men teachers despite their relative insouciance in the matter of acknowledging it, than under women teachers, due largely to the fact that the 'sustained' occurrence of such talk took place in a far-greater measure under men teachers as compared to women teachers.
- (36) The steady-state cell 9-9 is not the most-heavily loaded cell in the column, in the matrix relating to women teachers and the claim is forfeited to a transition cell 4-9.
- (37) The cells 6-9 and 7-9, happily draw blank in the case of men teachers.
- (38) In nearly identical measures, under both the groups of teachers, the students have chosen to dovetail their 'responsive talk' with self-initiated talk.

- (39) With both the groups use/acceptance of students' ideas has been a better bait than praise/encouragement for netting in students' self-initiated talk.
- (40) Students' response in compliance with orders/commands is nearly twice as much in the case of women teachers as in the case of men teachers and similarly students' responsive talk in the context of information-giving is well over twice as much in the case of women teachers as in the case of men teachers.
- (41) More of student talk followed immediately teacher talk, in the case of men teachers than in the case of women teachers.
- (42) The total occurrence of silence/pause in the case of women teachers is not only more than that occurring in classes under men teachers but also is in excess of the limit spelt out by Flanders, under normal conditions.
- (43) The difference between the respective cell loads in the steady-state cell *viz.* 10-10, in the two matrices is largely responsible for inflating the total use of the category ten by women teachers.
- (44) Women teachers' information-giving seems to have been more discontinuous than that by men teachers.
- (45) From an examination of the respective cell loads in cells 4-10, 10-4, 10-2 and 10-7 in the two matrices, there is evidence to suggest that the ten's following questions. in both the groups were mostly deliberate attempts on the part of the teachers to either 'elongate' or 'repeat' the question allowing spells of silence to creep in while doing so.

VI. Statistical Comparison of Matrices

Quoting Bales (1951), Flanders (1966) says that classified events of communication are interdependent. Each event

affects the probabilities that a particular event will follow. Hence, he concludes, it is inappropriate to test whether two distributions within the ten categories are significantly different by the use of Chi-square test.

The suggested alternative is the 'likelihood ratio criterion' developed by Darwin (1959).

When the two frequency matrices were subjected to statistical procedure for 'significance' according to the formula, the value of 'z' turned out to be 13.33. It has been stated that when 'z' is equal to or larger than 2.58, the null hypothesis is rejected at the 0.01 level of confidence. Since the value of 'z', as arrived at, is larger than 2.58 there is evidence to prove that the differences are 'significant'.

VII. Limitations

The observations were conducted by the observers in different classes handled by teachers of different age-groups. Also it is admitted that the particular cohort of students involved is an important variable affecting the patterns of teacher influence.

However, since the samples are not vast assumption that the other factors mentioned above would not appreciably affect the patterns is made. Also the study had not been designed so as to conform to all the rigours of a scientific investigation but was just undertaken as a spontaneous survey.

VIII. Conclusion

The exploratory study amply fulfills the chief objective for which it was undertaken. Interesting and important facts about the role of 'sex of the teacher' in the realm of 'teacher classroom behaviour' are uncovered.

The results of the study, though on account of the limited size of the sample could not be used to make generalisations, do serve to indicate the silhouette of the spectrum of differences in teacher influence patterns as between men and women teachers.

That incidentally underlines the need for further research along similar lines. In proper understanding of the influence of such bio-factors of teachers as 'sex' of the teacher upon teacher classroom behaviour lies the key to the evolution of an effective theory of instruction, which could be one of the more ultimate aims in studies in classroom interaction analysis.

APPENDIX A-
FREQUENCY MATRIX OF 19 WOMEN TEACHERS

	1	2	3	4	5	6	7	8	9	10	TOTAL
1	-	-	-	-	-	-	-	-	-	-	-
2	-	-	8	2	5	-	-	10	-	1	26
3	-	1	331	27	85	4	6	97	-	39	590
4	-	1	8	1016	148	31	12	942	21	1221	2400
5	-	-	-	582	12081	59	6	39	14	234	13015
6	-	-	-	32	47	287	4	40	2	102	514
7	-	-	2	12	9	7	50	15	1	29	125
8	-	22	223	512	345	38	16	1586	5	129	2876
9	-	1	6	6	27	2	-	1	18	8	71
10	-	1	12	209	268	86	31	146	10	1793	2556
TOTAL	-	26	590	2400	13015	514	125	2876	71	2556	22173

APPENDIX B
FREQUENCY MATRIX OF 17 MEN TEACHERS

	1	2	3	4	5	6	7	8	9	10	TOTAL
1	-	-	-	-	-	-	-	-	-	2	2
2	-	15	15	4	17	2	1	9	-	3	66
3	1	5	371	31	95	4	1	87	1	88	684
4	-	1	6	565	94	24	8	718	9	155	1580
5	-	8	-	509	11962	69	11	14	13	175	12761
6	-	-	2	28	58	256	18	19	-	62	443
7	-	-	1	14	24	5	110	12	-	15	181
8	-	36	246	279	280	31	14	933	5	101	1925
9	-	-	4	3	22	1	1	2	42	5	80
10	1	1	39	147	209	51	17	131	10	805	1411
TOTAL	2	66	684	1580	12761	443	181	1925	80	1411	19133

APPENDIX C
PERCENTAGE MATRIX OF 19 WOMEN TEACHERS

	1	2	3	4	5	6	7	8	9	10	TOTAL
1	-	-	-	-	-	-	-	-	-	-	-
2	-	-	036	009	023	-	-	046	-	005	0.119
3	-	005	1.493	122	383	018	.027	437	-	176	2.661
4	-	005	036	4.502	667	140	054	4.248	095	997	10.824
5	-	-	-	2.625	54.485	266	028	176	063	1.055	58.698
6	-	-	-	144	212	1.294	019	180	009	460	2.318
7	-	-	009	054	041	032	225	068	005	131	0.565
8	-	099	1.006	2.309	1.556	171	072	7.153	023	582	12.971
9	-	005	027	036	122	009	-	.005	081	036	0.321
10	-	005	054	943	1.209	388	140	658	045	8.086	11.528
TOTAL	-	0.119	2.661	10.824	58.698	2.318	0.565	12.971	0.321	11.528	100.000

APPENDIX D
PERCENTAGE MATRIX OF 17 MEN TEACHERS

	1	2	3	4	5	6	7	8	9	10	TOTAL
1	-	-	-	-	-	-	-	-	-	010	0 010
2	-	078	078	021	.089	010	005	047	-	016	0.344
3	005	025	1 939	162	497	021	005	454	.005	*460	3 574
4	-	005	031	2 953	491	125	042	3 753	047	810	8.257
5	-	042	-	2 660	62 520	361	057	073	068	915	66.696
6	-	-	010	.146	304	1 338	.094	099	-	324	2 315
7	-	-	005	073	125	026	575	063	-	.078	0 945
8	-	188	1 286	1 458	1 463	162	073	4 887	.026	.528	10.071
9	-	-	021	.016	.115	005	.005	010	220	026	0 418
10	.005	.005	204	768	1092	267	089	.685	052	4 107	7 274
TOTAL	010	0 344	3 574	8 257	66 696	2 315	0 945	10 071	0 418	7 274	99 904

APPENDIX E

COMBINED MATRIX OF 19 WOMEN AND 17 MEN TEACHERS (FREQUENCY)

	1	2	3	4	5	6	7	8	9	10	TOTAL
1	-	-	-	-	-	-	-	-	-	2	2
2	-	15	23	6	22	2	1	19	-	4	92
3	1	6	702	58	180	8	7	184	1	127	1274
4	-	2	14	1581	242	55	20	1660	30	376	3980
5	-	8	-	1091	24043	128	17	53	27	409	25776
6	-	-	2	60	105	543	22	59	2	164	257
7	-	-	3	26	33	12	160	27	1	44	306
8	-	58	469	791	625	69	30	2319	10	230	4801
9	-	1	10	11	49	3	1	3	60	13	131
10	1	2	81	356	477	137	48	277	20	2598	3967
TOTAL	2	92	1274	3980	25776	957	306	4801	151	3967	41306

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Editors' Comments

As is suggested by the title itself this is an exhaustive report, by the authors, of a study of Teacher Classroom Behaviour with a view to finding out the influence of "sex" of the teacher

on the patterns of teacher behaviour exhibited through verbal interaction in Social Studies Classrooms.

The observations which covered a sample of 17 men teachers and 19 women teachers were carried out by Research Fellows attached to the CASE and who are working in this area for their doctoral programmes.

Following usual procedures of observer training, establishing a high degree of inter-observer reliability, and relying on a set of well-discussed ground rules etc., the observers have collected the data which yielded 22173 tallies for women teachers and 19133 tallies for men teachers.

When analysed and interpreted through matrix technique, interesting revelations seem to emerge.

Some salient features as revealed by the analysis are:

- (i) That communication is relatively faster in classes conducted by women teachers.
- (ii) That men teachers talk more than their women counterparts.
- (iii) That student talk, as might be expected in the context of (ii) above, is less in classes under men teachers.
- (iv) That women teachers are more indirect than men teachers, on the whole.
- (v) That, however, men teachers score over the women teachers in the matter of manipulating the emotional climate favourably (i/d position).
- (vi) That emphasis on content is much higher with men teachers than with women teachers.
- (vii) That women teachers use more vehement words of stricture against students.
- (viii) That capacity for shift between categories is more in the case of women teachers.

- (ix) That women teachers were more stringent in the use of 'praise/encouragement'.
- (x) That women teachers, on the whole, responded more to students than did the men teachers.

The authors have subjected the data to a test for statistical significance, as suggested by Darwin's formula. The results indicate that there is evidence to prove that the differences are significant at 0.01 level of confidence.

A striking feature of this lengthy report is that it is extensively analytical and that evidently adds to its value. Though even this study, as in the case of another one reported elsewhere by the same authors, was not carried out in strict accordance with any research design, the utility of the study lies chiefly in its capacity to strike new grounds of analysis of classroom interaction. The report being fairly exhaustive, hardly has left out any significant point but has discussed the many differences, in all their shades and nuances.

The report, as also the one by the same authors appearing elsewhere in this volume, together, would be well received by both research workers and teachers alike since they represent the pioneering work going on in this area and are a precursor to other exhaustive studies that might be planned in the future.

A summary of significant revelations, included in the report, presents in a nutshell, the salient features.

Five matrices are appended to the report.

THE PATTERN OF CLASSROOM INFLUENCE BEHAVIOUR OF FIFTH GRADE TEACHERS OF DELHI¹

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Introduction

Historically, with the development of educational psychology the pupil got the focus of attention of educationists and psychologists. The text-books of psychology emphasized the need of paying attention to the pupil, in addition to the subject-matter. Such an emphasis continued for quite some time until some psychologists in the early 40s drew attention to the dynamics of classroom group of which the pupil was a part. The attention shifted from the pupil in isolation, and as an individual, to the pupil as a part of a dynamic group of which the peers and the teacher were also members. This shift has been historical for its implications for development of the child as well as for the teacher's behaviour and his methods of teaching.

Classroom in a school, as a unit of interaction amongst pupils, and between the teacher and pupils, plays an important part in the development of the child. Recently, attempts have been made to measure various dimensions of the classroom as a group. Since the teacher exerts a great deal of influence on the pupil, teacher's behaviour, as an important variable in the dynamics of the classroom, has attracted attention of

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psychologists and educationists. Several methods have been devised to study teacher behaviour in the classroom more systematically. The present paper reports a study of teacher's behaviour in Delhi schools.

The Rationale of the Study

There are some underlying assumptions which should be stated in the beginning before reporting the results of the investigation. These assumptions are as follows:—

- (1) The teacher has a great deal of influence on the pupils. It has been shown by several studies that a teacher is a father surrogate, and through the process of internalisation of the influence, pupil's behaviour is shaped, to a great extent, by the kind of influence the teacher exerts. (Amidon and Flanders, 1961; Anderson *et al*, 1946; Filson, 1957; Smith, 1955; Wispe, 1951).
- (2) Although it has always been recognised that the teacher exerts a great deal of influence on the pupils, only recently it has been shown that the most important aspects of teacher behaviour, as far as the influence on the pupils is concerned, is his classroom behaviour (Flanders, 1960, 1962). This is all the more important because classroom behaviour can be controlled, studied and changed.
- (3) The interaction or lack of interaction of the teacher with his pupils is an important variable producing changes in the pupils. The way the teacher interacts with the pupils (encourages them or reprimands them etc.), would have an important impact on the pupils (Flanders, 1960).
- (4) Verbal behaviour of the teacher is the basis of most of the interactions between the teacher and the pupils. Verbal behaviour is also an adequate sample of

teacher behaviour (Flanders, 1960), and therefore can be used for the analysis of teacher behaviour in general.

- (5) Classroom verbal behaviour of the teacher can be observed objectively. The observation can have high reliability and can be quantified for various purposes.
- (6) It is possible for a teacher to change his classroom behaviour through proper training based on his knowledge of the pattern of behaviour he mostly uses in the classroom usually called feedback (Flanders, 1963, 1963-a).

Interaction Analysis of Teacher Behaviour : a Brief Review

Anderson and his group are among the earliest to work in this direction. They were interested in the study of the reactions evoked by the type of contacts used by the teacher with the students in the classroom. Anderson *et al* (1939, 1945, 1946, 1946-a) proposed a typology of teacher behaviour in terms of 'integrative' and 'dominative' contacts. Their studies found that the dominative or the integrative behaviour of the teacher spreads in the classroom rapidly, persists for a long time in the classroom even in the absence of the teacher and is even transferred to other students coming after them. They found that pupils of teachers with more integrative contacts showed more spontaneity, initiative, voluntary social contribution, and acts of problem solving, and the pupils of teachers with dominative contacts were more easily distracted from school work and showed compliance to teacher's dominance.

Studies by Lippit and White (1943) on the effects of democratic and authoritarian leadership styles in the student groups are also historically significant in focussing attention on the dynamics of the instructional groups. Withall (1949) developed a category index designed to assess the social and emotional climate of the classroom. Bales (1950) was the

first to develop a system of categories to measure interactions in small groups. Later Flanders (1951) and Cogan (1956) (using inclusive, preclusive and conjunctive classification of behaviour) demonstrated the good effects of indirect, integrative, democratic or inclusive behaviour of teachers on their students. Inspired by Bales' method of interaction analysis, and Anderson's results, Flanders adopted Bales' method for use in the classroom to assess the spontaneous verbal behaviour of teachers.

Since Flanders' work on interaction analysis of classroom behaviour of teachers, several adaptations have been made of his technique. Ober (1968-a) has proposed Reciprocal Category System (RCS) which codes both student and teacher behaviour in the same categories as proposed by Flanders. The categories result in a matrix in which reciprocity is emphasized. Brown, Ober and Soar (1968) designed Florida Taxonomy of Cognitive Behaviour (FTCB) to consider and reflect the various levels of content and/or intellectual activities in a given classroom teaching-learning situation. Brown (1968) developed Teachers' Practices Observation Record (TPOR) for measuring the degree to which a teacher reflects John Dewey's point of view in his regular classroom practice.

Although some of the recent systems of interaction analysis claim an improvement on Flanders' system, the basic system proposed by Flanders has been demonstrated to be useful. Flanders' technique has been used in the present investigation.

Methodology

The Sample

The sample consisted of 50 male and female 5th Grade teachers of Delhi randomly drawn from the primary and middle schools governed by the Delhi Municipal Corporation and New Delhi Municipal Committee. All these schools are Hindi medium schools. Data were collected in the months of March and April, 1969.

The Technique

Interaction analysis technique developed by Flanders was used in the present investigation. Interaction analysis is an observational technique designed to observe and code classroom verbal behaviour of the teacher every 3 seconds, using a 10-category system. The observer sits in the classroom and observes what goes on, the interaction between the teacher and the pupils. At the end of each 3 second period he codes what has been going on, and makes a tally in the relevant category. The observations are in sequence. After the observations are completed for a given period, *e.g.*, half an hour, the observer tabulates his observations in the various categories.

Verbal behaviour of the teacher can be coded into 10-categories, of which 7 deal with teacher talk, two with student talk and one is for silence and/or confusion. The various categories and their explanations, as borrowed from Flanders, appear in Table 1. The most important element in this system is that of the type of influence the teacher uses in the classroom. As may be seen from Table 1, the influence is of two types: direct influence and indirect influence. Of the 7-categories dealing with teacher behaviour, the first 4 deal with indirect influence pattern, which is characterised by leaving more freedom of action for the students through accepting his feelings, facilitating his participation by praising and encouraging him, accepting his ideas, and stimulating him to talk by raising questions. Categories 5, 6 and 7 deal with direct influence pattern, in which there is little or no freedom of action to the students. When the teacher lectures continuously, or gives definite directions, and justifies his authority, or reprimands the students, he is using direct influence.

In this system each verbal act of behaviour is categorised and coded only once, and at every 3-second period the category number is noted. Whenever a statement can be classified under two categories, the category which has occurred less number of times is preferred.

TABLE 1

Categories for Interaction analysis*

TEACHER TALK	INDIRECT INFLUENCE	1. * Accepts Feeling: Accepts and clarifies the feeling tone of the students in a nonthreatening manner. Feelings may be positive or negative. Predicting or recalling feelings are included.
		2. * Praises or Encourages: Praises or encourages student action or behaviour. Jokes that release tension, not at the expense of another individual, nodding head or saying, "um hm?" or "go on" are included.
		3. * Accepts or Uses Ideas of Student: Clarifying, building or developing ideas suggested by a student. As a teacher brings more of his own ideas into play, shift to category five.
		4. * Asks Questions: Asking a question about content or procedure with the intent that a student answer.
TEACHER TALK	DIRECT INFLUENCE	5. * Lecturing: Giving facts or opinions about content or procedure; expressing his own ideas, asking rhetorical questions.
		6. * Giving Directions: Directions, commands, or orders to which a student is expected to comply.
		7. * Criticizing or Justifying Authority: Statements intended to change student behaviour from non-acceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.
STUDENT TALK		8. * Student Talk—Response: A student makes a predictable response to teacher. Teacher initiates the contact or solicits student statement and sets limits to what the student says.
		9. * Student Talk—Initiation: Talk by students which they initiate. Unpredictable statements in response to teacher. Shift from 8 to 9 as student introduces own ideas.
		10. * Silence or Confusion: Pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.

* From Flanders (1966, p. 7).

A manual, similar to that developed by Flanders (1966), was prepared for use of observers in the study.

Observer Training and Collection of Data

Eight young social scientists were trained for observation. The training lasted for a week and consisted of observation in schools followed by discussions and estimates of reliability of data. By the end of the training period the inter-observer reliability coefficients were calculated (Scott's Phi-coefficient was used for measuring reliability, as suggested by Flanders, 1966). The coefficients of reliability were fairly high, with a range of .38 to .88. 13 out of 16 coefficients were above .66,

The observers memorized the categories thoroughly, and were able to achieve the speed of coding upto 30 times a minute. At this stage the observers were sent to the field for observation. Each teacher was observed for 3 half-hour periods distributed over one or two-days. In these intervals the teachers usually taught either social studies or mathematics. The school teachers were found to be very cooperative and did not seem to be bothered, or affected by the presence of the observers. Data was collected for 50 teachers; one teacher was observed for only one half-an-hour and another for two half-hour periods. Thus, 147 sets of observation profiles were available for 50 teachers.

Internal Consistency of Observers

To establish the reliability of observations made by the observers, correlations were calculated for each observer between each pair of half-an-hour periods he observed. As each observer observed a teacher during 3 half-hour periods, there are three correlation coefficients obtainable for each teacher observed. Rank order correlations were calculated for the first seven categories, ranked on frequency basis. As the interest of the study is not on student talk, categories 8 and 9 (and also 10) were not taken into consideration. Reliability figures appear in Table 2. As may be seen from the table, in

TABLE 2

Frequency Distribution of the Reliability Coefficients
(Range .24 to 1.00)

<i>rho</i>	<i>Frequency</i>
.91 - 1.00	56
.81 - .90	49
.71 - .80	18
.61 - .70	4
.51 - .60	4
.24 - .50	14

about 72% cases the correlations are above .80, and in about 85% cases the correlations are above .70. These coefficients of correlation, besides reflecting the consistency among observers, also reflect, to some extent, the consistency of the behaviour exhibited by the teacher. The data reveal high reliability of the observers, as well as the consistency (reliability) of teacher behaviour.

Results and Discussion

Influence Pattern of 5th Grade Teachers

As has already been mentioned classroom verbal behaviour of 50 5th grade teachers was observed. Excepting in two cases, each teacher was observed for 3 half-hour periods. The total number of periods observed by 8 observers was 147. All the observations were coded and tabulated according to the method suggested by Flanders. The total number of behaviour acts was 84,087. The average number of behaviour acts observed in one half-hour period was 572. These behaviour acts were analysed in a number of ways to get an idea of the pattern of influence used by 5th grade teachers in Delhi Schools.

The overall pattern: Table 3 gives the frequency of behaviour acts falling under the various categories. The analysis has been done both for all the 10 categories as well as for the

TABLE 3

**Frequency of Behaviour Acts Falling under the
Various Categories**

<i>Categories</i>	<i>Raw frequency</i>	<i>Percentage For 10 categories</i>	<i>Frequency For 7 categories</i>
1	22	.026	.048
2	1,659	1.972	3.604
3	2,159	2.567	4.691
4	7,441	8.849	16.168
5	28,601	34.013	62.146
6	4,648	5.527	10.099
7	1,492	1.774	3.242
8	14,961	17.792	—
9	10,975	13.051	
10	12,129	14.424	
Total	84,087	99.995	99.998

7 categories concerned with teacher talk. It is significant to note that more than half of the behaviour acts, when only 7 teacher categories are taken into account, are accounted for by category 5, which is concerned with lecturing (about 62% of the time is spent by the teachers in lecturing). Category 1, accepting and clarifying the feeling tone of the students, is almost absent. Very little time, about 4% in each case, is spent in encouraging pupils and accepting their ideas. Next to lecturing is the activity of asking questions.

Table 3 also shows that teachers talk about 50% of the total available time. This figure is not bad compared with figure of 2/3 given by Flanders (1962). However, the more important question is what the teachers do during the time they are talking. As is clear from the table most of the time is spent in the act of lecturing, which contributes a great deal to producing direct influence pattern of the teachers.

The table also shows that about 14% of the time is wasted in confusion or silence. Students talk about 31% of the total available time. A significant observation in this connection is that out of the total amount of talk done by students, 58% is in response to teachers' asking questions, and 42% is self-initiated.

On the whole the amount of teacher talk in Delhi schools is not high when we compare it with 59% teacher talk in U.S. elementary schools and 83% in elementary schools of New Zealand (Flanders, 1962-a). The main concern is the content of the teacher talk and the use of various direct and indirect influence categories.

The pattern revealed in the periods observed: Teacher verbal behaviour was further analysed by taking 147 periods of observations into account. The percentage of tallies falling in each of the 7 "teacher talk" categories were calculated for each half-hour period. Thus percentage frequencies for 147 periods were available. Table 4 summarises the information about frequency distribution of the percentage in each category for the observed periods.

TABLE 4

Percentage Frequency Distribution of the 147 observed periods (of the Teachers' Classroom Verbal Behaviour) for each Interaction Category
Frequency (in percentage) of behaviour acts

Category	0	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
1	90	10									
2	17	71	10	1	1						
3	13	62	12	3	1	1		1			
4	1	29	38	18	8	3	1	1	1		
5	2	3	6	5	9	9	12	14	22	14	4
6	0	59	24	12	4	1					
7	7	17	71	9	3						

A critical look at Table 4 reveals that in 90% of the periods observed the teachers have not shown the behaviour of "accepting the feelings of the students" even once. And in only 10% of the periods observed the teachers have shown acceptance of the feelings, but the amount of this behaviour occurred is not more than 10%. This shows that very few primary school teachers, show a positive emotional tone in the classroom, inspite of the fact that they are dealing with children.

Praising and encouraging is observed in 83% of the periods observed and ranges from 1 to 40% of such behaviour acts. However, most of them exhibited very less percentage of such behaviour (1 to 10% in 71% of periods observed), and in 17% of the periods observed there was not a single verbal act of praise or encouragement.

In 87% of the periods observed teachers accepted or used the ideas of the students. However, in 13% of the periods there is a total absence of it. The percentage of this behaviour goes upto 70 in those who are showing this, though the number of those exhibiting such behaviour is very less (only 1%).

In 99% of the periods observed the teachers asked questions. The percentages of category 4 shows that some of the teachers spent even 80% of their total talk in asking questions, and most of them ask questions at one time or the other.

There is a wide scatter on the lecturing behaviour of the teachers, and in about 62% of the periods observed the teachers seem to spend 50 to 90% of their time in lecturing. This high amount of lecturing indicates a pattern of direct influence. And in all the observed periods the teachers were found to give directions to children at one time or the other. However, the range is comparatively less, and in 83% of the observed periods the directing behaviour ranged from 1 to 20% of their total talk.

In 83% of the periods observed the teachers criticized the

students or tried to justify their authority at least once. However, in 17% there was not a single act of criticism.

An overview of the table reveals that while the direct influence exhibited by the teachers is high, indirect influence is not completely absent, and has been used by some teachers at least at the acceptance level, though not at the feeling level.

The pattern revealed in the analysis of behaviour of individual teachers: In order to see the general pattern of influence behaviour in a teacher, the observations of each teacher during all the 3 periods were totalled. Table 5 gives frequency distri-

TABLE 5

**Frequency Distribution of Interaction Behaviour
(in 7 Categories) for 50 Teachers
Frequency in Percentage**

<i>Categories</i>	0	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
1	88	12									
2	6	84	8	2							
3	4	86	8	2							
4	0	26	40	24	8	2					
5	0	2	4	6	12	4	20	24	18	10	
6	0	58	30	8	4						
7	6	86	8								

bution of interaction behaviour of all the 50 teachers for 7 categories. As is evident from Table 5, of the indirect influence categories, the first 3 categories are almost absent. The most conspicuous category by its absence is the first category of the acceptance of feelings. Only 12% teachers have used this category below 10% of the time of their classroom behaviour. This finding is quite significant, as it reveals that the teachers use the classroom more for information giving and less for establishing rapport with the pupils. Encouraging pupils or

accepting their ideas is also rare. Only 2% teachers have done it a little less than 1/3rd of the time they interacted. The figures for both these categories are almost identical, and this suggests that both categories go together. The more frequently used category, among the indirect influence categories, is category no. 4, concerned with asking questions. It is rather encouraging to see that more teachers have used this category.

When we see the figures for direct influence categories it is puzzling to see that categories 6 and 7 have not been much used. 6% of the teachers have never criticised or justified authority, whereas 86% have done it less than 10% of the time. Although directions and commands have been given more frequently, only 12% have done it more than 20% (but less than 40%) of the time.

The most widely distributed category is that of lecturing. This category has been used most of the time by some teachers. About half of the teachers have used this category more than half of the time of their interaction in the classroom. About 88% of the teachers have lectured more than 1/3rd of the time of their interaction. The data in Table 4 suggest that one of the strongest sources of direct influence in the classrooms of Delhi Schools is lecturing by the teacher. This is a significant observation, as we shall show later in this paper, there is a high ratio of direct to indirect influence behaviour in the teachers.

Indirect/Direct influence behaviour

To determine the actual amount of indirect versus direct influence patterns exhibited by the teachers, Indirect/Direct behaviour ratios were calculated for each period observed. Two types of such ratios were calculated: I/D ratios, taking into consideration all the 7 categories of teacher behaviour and i/d ratios taking into account only 5 categories of active teacher behaviour.

I/D ratio is obtained by dividing total of frequencies in categories 1, 2, 3 and 4 by total of frequencies in categories

5, 6 and 7. In i/d ratio categories 4 and 5, which greatly depend on the subject matter being taught and cause much variance in the ratio, are not used; it is obtained by dividing total frequency of categories 1, 2 and 3 by the total frequency of categories 6 and 7. i/d ratio has the advantage of giving more attention to the social skills of the teacher, controlling the variable of subject matter. Table 6 gives the percentage of the observed periods in which teachers exhibited various I/D or i/d influence behaviour.

TABLE 6
Indirect/Direct Influence in Classroom
Behaviour of Teachers

$\frac{I}{D}$ ratio	Percentage frequency of the periods observed (N = 147)	$\frac{i}{d}$ ratio	Percentage frequency of the periods observed
0 - .50	67.34	0 - .50	49.62
.51 - 1.00	21.77	.51 - 1.00	27.90
1.01 - 1.50	6.12	1.01 - 1.50	9.52
1.51 - 2.00	2.72	1.51 - 2.00	4.76
2.01-18.50	2.04	2.01 - 8.15	8.16

From I/D ratios it is evident that in 67% of the periods observed, the teachers have shown double or more than double of direct influence to indirect influence. This is very much indicative of the authoritarian type of influence they use. Only in 11% of the observed periods, the indirect influence behaviour of teachers exceeds their direct influence behaviour.

The i/d ratios give slightly different picture of the influence patterns. In only about 50% of the periods the teachers have shown a proportionately less than half of indirect to direct influence behaviour. In 20% periods of observations indirect influence behaviour is high, though the range is not as much as in I/D pattern.

To clarify the picture further, the highest of the I/D and i/d ratios of each teacher were considered and the frequencies of the teachers under each I/D ratio category were counted. For this purpose 50 ratios (the highest for each teacher) were used. Table 7 gives the percentage of teachers showing various I/D or i/d ratios (when the highest of the three ratios is considered). This table shows results similar to those revealed in Table 6, with a few differences. An interesting observation is that 44% of the teachers showed more indirect influence (categories 1, 2 and 3) than direct influence, as revealed by i/d ratios. Considering the differences between percentage of I/D and i/d ratios, it may be noted that categories 4 and 5 are considerably influencing the ratios. However, the general trend among the teachers appears to be more for direct than indirect influence.

TABLE 7

**Percentage of the Teachers exhibiting Various Indirect/
Direct Influence ratios when only highest of their
ratios is considered**

$\frac{I}{D}$ ratio	Percentage of teachers	$\frac{i}{d}$ ratio	Percentage of teachers
0 - .50	48	0 - .50	20
.50 - 1.00	32	.51 - 1.00	36
1.01 - 1.50	8	1.01 - 1.50	14
1.51 - 2.00	6	1.51 - 2.00	10
2.01-18.5	6	2.01-18.5	20

Teacher student talk

So far the discussion has been about teacher behaviour. A related question is concerned with the ratio of teacher talk with student talk. Teacher-student talk ratios (T/S ratio), obtained by dividing the total frequencies in the first seven categories by the total frequencies in categories 8 and 9, for each period, were calculated. Table 8 gives the T/S ratios.

TABLE 8

Teacher-Student (T/S) Talk Ratios

$\frac{T}{S}$ ratios	Percentage of periods
.5 and below	6.12%
.51 to 1.0	14.96
1.1 to 2.0	31.29
2.1 to 10.0	38.10
10.1 and above	9.52

From Table 8 it is evident that only in 21% of the periods observed the teacher talk was less than (or equal, in a few cases, to) the student talk. In 31% of the periods observed the teacher talked more (but not more than twice) than the pupils. It is interesting to note that in 38% of the periods observed, the teachers talked twice to ten times the students did. And in about 10% of the periods observed, the teachers talked 10 times to 60 times the students talked.

A further analysis was made by calculating the percentage of teachers showing the T/S ratios when highest and lowest of the ratios of each teacher were calculated. These are presented in Table 9. The table reveals that when the highest

TABLE 9

Frequency of Teachers when highest and lowest of their T/S Ratios are concerned

$\frac{T}{S}$ ratio	Percentage when highest of the ratio is considered	Percentage of teachers when lowest of the ratio is considered
.5 and below	0	12
.51 to 1.00	8	22
1.1 to 2.0	22	42
2.1 to 10.0	48	24
10.1 and above	22	0

of their ratios are considered, 22% of the teachers talk more than 10 times, and 48% talk 2 to 10 times their pupils, and only 8% talk less than their pupils. When the lowest ratios were considered, 34% talk less (or equal to, in a few cases), than their pupils, and 66% talk more than their pupils (24% talk 2 to 10 times the pupils). The difference between the percentages when highest and lowest of the ratios were considered suggests that T/S ratios are flexible for the same teacher to some extent. However, the trend in the sample was that the teachers talked more than the pupils and some gave very little opportunity to their pupils to talk.

Relationship between teacher-student talk and teacher's indirect/direct influence behaviour

To determine if the amount of teachers' talk has anything to do with the type of influence he is exhibiting, a chi-square was computed between I/D ratios and T/S ratios. The chi-square was highly significant (as may be seen in Table 10).

TABLE 10

Chi-square between T/S Talk Ratios and I/D Ratios

		$\frac{T}{S}$ ratios			X ²
		High	Low	Total	
$\frac{I}{D}$ ratios	High	9	10	11	17.6 significant at .001 level
	Low	111	17	128	
	Total	120	27	147	

Ratios above 1 (including 1.04 etc.) were considered high and ratios below 1 were considered low.

A critical look at the table reveals that those teachers who talk more in the class than the pupils (high T/S ratios) exert more direct influence (low I/D ratios). However, the converse is not as much true, and it appears that those teachers who

talk less than the pupils do not necessarily use indirect influence, but may use more direct influence. The ϕ coefficient of .35 calculated from chi-square suggests some, though not high, relationship between the two.

Implications for Training

The main finding of the study can be summarized as the restricted teacher and student talk behaviour. The analysis reveals that the main "teacher talk" category is that of lecturing. Similarly, it is also clear that the main "student talk" category is that of responding to the teacher. This seems to be the general pattern in the influence behaviour of the fifth grade teachers in Delhi schools. The high ratio of direct influence behaviour to indirect influence behaviour can also be attributed to the lecturing as the main activity by the teacher.

There is a significant implication of the fact that the modal value of lecturing is so high, and, by implication, the teacher talk behaviour is so unvaried. This fact suggests that the training of these teachers should be in the area of expanding their talk behaviour to other categories. For example, the training should emphasize teachers' responding to the pupils at the feeling level, encouraging them to express themselves frankly, and accepting their ideas. This kind of training is not easy, and can certainly be not accomplished through the traditional methods of teacher training. The main emphasis in the traditional teacher training programmes on the skill of communicating subject matter information effectively to the pupils will not be able to achieve the objective of bringing about a change in the motivation of the teacher. His basic status need and the need to control seem to be so great that new methods of training will be necessary to release the teacher from the shackles of these needs (Lynton and Pareek 1967; Pareek, 1968). Such training should make effective use of feed back on behaviour to bring about change in behaviour (Flanders, 1962, Flanders, 1963, Flanders, 1965), should emphasize the skills of promoting interdependent relationship in the classroom

(Pareek, 1968), and should use methods of increasing the level of motivation for achievement (Mehta, 1969). This should also result in making the student talks more varied, and in helping the students take more initiative. An experimental programme of trying out training on these lines is being worked out at the National Institute of Health Administration and Education under a grant from the Indian Council of Medical Research.

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Editors' Comments

This is a paper, prepared to be read in the section of Psychology and Educational Science of the Indian Science Congress Session, at Kharagpur, January, 1970 (also it has since appeared in the "Indian Educational Review" January, 1970), conveying the findings of an explorative investigation undertaken in connection with the project "Motivation Training for Mental Health" under a grant from the Indian Council of Medical Research, to study the teacher classroom behaviour patterns of 50 male and female, 5th Grade teachers of Delhi, randomly drawn from the primary and middle Hindi medium schools under the Delhi Municipal Corporation and New Delhi Municipal Committee.

The first author, being one of the noted social scientists of the country, has carved out a permanent niche for himself in his field by winning the laurels in being elected 'fellow' of the N.T.L. Institute of Applied Behavioural Science, Washington, D.C., U.S.A. He is the first Behavioural Scientist from Asia to be elected to this honour. Much is expected by the readers from the paper and their expectations are not belied.

The paper puts the whole idea in its proper perspective as when the authors, in the course of a brief 'Introduction', trace its historical development. The rationale of the study, as explained, serves to prepare the mind of the readers for better appreciation of the oncoming scientific probe.

The brief review, in a vivid manner, of the successive attempts to develop suitable scales to measure teacher behaviour, beginning with those of Anderson and his group, will be found highly useful by the 'non-initiated' in understanding what may be called as the 'genealogy' of classroom interaction analysis of teacher behaviour.

Flanders' technique has been used in the investigation and

there is a brief description of the technique and the mode of observation.

A crucial factor in the validity of any observational data and hence, of the explorative study based thereon is the 'observer reliability'. One wonders whether all the eight observers, said to have collected the data, measured up to the expectations, in terms of Scott's Phi-Coefficient, as spelt out by Flanders (1966)—namely, 0.85 or higher. Although 13 out of 16 coefficients are stated to have been above '0.66' the range is said to have been between 0.38 and 0.88. One wishes the training had been continued, at least, in the cases falling short of the requirements, so that Flanders' specifications were reached, in respect of all of them. The authors state that the observers were able to achieve a speed of coding up to 30 times a minute and that they, at that stage, were sent to the field for observation.

Surprisingly, however, for these observers once in the field, the 'deus ex machina' of the rate of, about 19 codings per minute 'was possible of achievement (the average as worked out from the total of 84087 codings for 147 observations of 30 minutes' duration each).

Again the non-differentiating aspect of the scheme of observations, with regard to the subject taught (as between Social Studies and Mathematics), does not seem to be supported by any established theory or research finding. It is reasonable to suppose, until otherwise proved, that in the conceptual framework of classroom interaction, the 'subject' taught or, to be more precise, the 'task' going on in any given span of time, is as important a variable, affecting the patterns of teacher behaviour, as any other conceivable factor at play.

Especially as regards the two subjects observed the patterns are likely to be very much affected due to the variation of the subjects. Flanders, in his Manual (1966), has, in the end, given two master matrices, one each for Social Studies and

Mathematics. There, one can see how, teacher talk, by way of one instance, is 59 percent (30806 out of 51835) in the case of Social Studies and 70 percent (41069 out of 58614) in the case of Mathematics.

Again the statement that the observed teachers of Delhi Schools did not seem to be bothered, or affected by the presence of the observers, appears very much to be at variance with what one can normally come across. Although we should congratulate the observers on their 'good luck' in not having had any teacher, apparently 'bothered or affected' by their presence, it is not always safe to assume that there will be no 'novelty effect' on the part of the teachers, except possibly where the teachers, to be observed, are all so highly experienced as to remain unperturbed over the presence of an observer. It is not to say that almost all the teachers would be 'affected'. The point is that there would, at least, be 'some' who are 'affected'. What could be done about them? Although in other countries, particularly in the U.S., such facilities as 'sound-proof' observation booths and modern gadgets like tape-recorders, video-tapes etc. are being used to obviate this effect, in our country where we cannot afford such costly equipment with our limited resources, we can think of certain useful practices which can set at naught the 'novelty effect'. For example the observer may be asked to begin recording not until it is about 10 minutes since the commencement of the class. In the meantime, the teacher can be expected to reconcile himself to the observer's presence and to settle down with his 'natural patterns'. Securing the permission and promise of cooperation from the concerned teacher can also, of course, be there.

By computing 'internal consistency of observers', the authors have gone to the extent of discovering the 'consistency' of the teachers' behaviour patterns, too. This seems commendable.

Some of the revelations might raise one's eye-brows as for instance the one relating to the total occurrence of silence/confusion. It is of the order of a little over 14 percent (Table 3) which is far in excess of the limit—namely, 10 percent, spelt out by Flanders.

At least 3 teachers had never used praise/encouragement at all and two teachers, use/acceptance of students' ideas (Table 5).

As regard 'questioning' though, of course, all the teachers seem to have used this familiar technique of prompting pupil talk (Table 5) there was at least 1 percent of observed periods (which means at least 1 period) in which, practically, there was no recourse to questioning (category four) at all (Table 4). It would be amusing to know the concerned teacher's performance in the other two periods of observation. But that cannot be possible for the readers since the individual performances are not given, for obvious reasons, in the report.

Yet another point of surprise is in regard to the 2 percent of observed periods (which means 3 periods) when the concerned teacher/teachers drew blank in the matter of content-delivery (Table 4). Surprising though, as it appears to be, one is led to infer that in those periods all teaching, if there was any, would have been in 'socratic form' and nothing must have been there by way of straight supply of information. That, indeed, would have been rather interesting to observe.

A praise-worthy point for the teachers observed is that in 17 percent of the observed periods (Table 4) never was there any attempt, on the part of the teachers, to resort to criticism/extreme self-reference (category seven).

An overview suggests that the teachers, though predominantly 'direct' in behaviour, do exhibit 'indirect' influence also, in the case of some teachers at least, at the acceptance level, though not at the feeling level.

Other revelations include the following :

Teachers generally use classroom more for information-giving (category five) and less for establishing rapport (category one) with the pupils (Table 5).

A significant finding is that the most widely distributed category is that of lecturing (category five) and about 88 percent of the teachers have lectured more than $1/3$ of the time of their interaction (Table 5). From Table 4 it is clear that one of the strongest sources of direct influence in the classrooms of Delhi Schools is lecturing by the teacher.

Only in about 11 percent of the observed periods (Table 6) was the 'indirect' behaviour more than the 'direct' behaviour that is I/D ratio was more than 1.* Ignoring the emphasis on content—that is when i/d ratio is considered, there emerges a different picture—namely, that in about 22 percent of the periods observed, indirect influence behaviour is high (i/d is greater than 1). But the range in respect of i/d is shorter than that in respect of I/D (Table 6).

When the highest of the three I/D and i/d ratios in respect of every teacher were considered (Table 7) the data present a more interesting picture, though slightly different from that presented in Table 6. At least 44 percent of teachers showed more indirect influence than direct influence, as revealed by i/d ratios.

Yet another significant revelation is that in about 10 percent of the periods observed, the teachers talked 10 times to 60 times as much as the students talked (Table 8)† as evidenced by a very high T/S ratio.§

* I/D ratio is worked out by dividing total frequencies in categories 1, 2, 3 and 4 by the total frequencies in category 5, 6 and 7, while i/d ratio is obtained by dividing total frequencies of categories 1, 2 and 3 by the total frequency of categories 6 and 7.

† In the Table, however, the range is not clearly stated.

§ The T/S ratio is obtained by dividing the total teacher talk frequencies by the total student talk frequencies.

A very significant fact unearthed (Table 8) is that in, at least, 21 percent of the periods observed the teacher talk was either equal to or less than the student talk (T/S ratio is one or less than one).

Also it is discovered that T/S ratios are flexible to some extent for the same teacher.

The chief merit of the paper which in content, presentation and style is superb, one feels, is its attempt to establish significance, through computation of chi-square, between Teacher talk and the influence pattern he is exhibiting. For this purpose a chi-square is computed between I/D ratios and T/S ratios, which is highly significant. (Table 10).

It is revealed that 'those teachers who talk more in the classroom than the pupils (high T/S ratios) exert more direct influence (low I/D ratios)'. But the converse, however, is not as much true, and it appears that these teachers who talk less than the pupils do not necessarily use indirect influence but may use more direct influence.

The ϕ coefficient of 0.35, calculated from chi-square suggests some, though not high, relationship between the two.

Recognising the implications of the findings for teacher training programmes, the authors delineate, in a convincing manner, the areas of emphasis. With the modal value of lecturing being high and with the implication that the teacher talk behaviour is so unvaried, the training of these teachers should be, the paper says, in the area of expanding their talk behaviour to other categories.

The authors are sure to evoke concurrence from the readers when they categorically say that such training cannot be accomplished through the traditional methods of teacher training with its emphasis on the skill of communicating content. What is required is a change in the motivation of the teacher. 'The training should make effective use of feedback on behaviour to bring about change in behaviour, should underscore the

importance of skills of fostering interdependent relationship in the classroom (Pareek, 1968), and should use methods of increasing the level of motivation for achievement (Mehta, 1969), and should, at the same time, seek to 'make the student talk more varied such that the students take more initiative', the paper says.

It should be highly interesting to the readers to be told that an experimental programme of trying out training on these lines is on the anvil at the National Institute of Health Administration and Education under a grant from the Indian Council of Medical Research.

On the whole, it is ironical that the report which abounds in statistical calculations should present some insurmountable difficulties, to the readers in the matter of 'following' certain computations as, for instance, the chi-square between T/S talk ratios and I/D ratios obviously due to the (Table 10) non-supply of all the necessary basic data. It looks, as if the value and utility of the paper would have been substantially heightened if an additional table, presenting all the T/S ratios and I/D ratios and let us say, i/d ratios also, for each teacher observed, for I, II and III observation, had been appended.

A striking feature of the paper is that the matrix technique has played truant, despite the fact that in one of the earlier stages—namely, under 'Influence Patterns of 5th Grade Teachers', it is stated unequivocally that 'all the observations were coded and tabulated according to the method suggested by Flanders.

One of the chief merits of the Flanders system of classroom interaction is that it facilitates preservation and reconstruction to some extent, of the sequential nature of the events that occurred in an episode observed and coded.

Perhaps, for the type of analysis attempted in the paper, the matrix technique might not be necessary. But even so, one wonders whether the matrix technique which could prove

a treasure-house of revelations bearing on the sequential aspects of the communication observed, could not have been referred to, at least in the context of implications for training.

For evolving strategies of reorientation of the teachers, as envisaged in the concluding part of the paper, a matrix technique is highly indispensable for that would indicate, *inter alia*, the tactical possibilities in our efforts to achieve certain pre-determined goals in the realm of behavioural changes.

The paper treats the group of 50 (both male and female) teachers as a whole and does not accommodate the significance of the variable, 'sex' of the teacher. Possibly 'randomisation' might have been expected to offset the effects of sex differences. But the point we drive towards is that 'sex' as a 'significant' variable, in a study* conducted in Baroda, was found to affect the patterns of behaviour.

Other factors which are likely to be at play include the age-level, marital status and recency or otherwise of training, educational qualifications of teachers and last, but not least, the nature of composition of the class of pupils observed.

The report wherein the authors have marshalled the facts ably has a select and appropriate bibliography appended to it.

* The report is included elsewhere in this compilation.

INTERACTION ANALYSIS—SOME CONSIDERATIONS

N. K. JANGIRA*

The Challenge

The dull and dreary teaching in our classrooms is responsible for several negative effects on the child besides impeding realisation of the instructional goals. It swells wastage and stagnation on the one hand and handicaps full blossoming of the young personalities on the others, thereby depriving the nation of the potential human talent. Again, it results in adverse input and output ratio in education. The problem assumes tremendous magnitude in view of our commitment to provide universal education at the elementary stage and consequent expansion at subsequent stages of education. Optimum, if not maximum educational effectiveness is to be ensured to fulfil the obligations towards the national goals. This, to a large extent, depends upon *what goes on in the Classroom and how it goes on?* It is, therefore, imperative to cast a searching look at the transactions that feature our classrooms and streamline the same along desirable directions to make teaching effective. This is perhaps the greatest challenge that educational practitioners, and research workers face today.

Post Mortem

Have attempts been made to improve classroom teaching

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in recent times? If, yes, what are the attempts that have been made so far? Are these adequate? If not, what more needs to be done? What are the directions along which fresh attempts are to be channalised? These are some of the pertinent questions which need probing. Fearing digression from the main theme, I will just touch upon the answer to all but the last question, which will be considered in little detail.

During the last decade, concern of the educational planners and administrators for raising the quality of education alongwith quantitative expansion is discernible. Several programmes have been attempted for improving teaching. Improvement of the competence of teachers through raising their academic qualifications, expanding facilities of their pre-service education, enriching the training programmes, and instituting agencies for providing inservice education, developing improved instructional materials, curricula, curriculum guides, text-books, supplementary reading material, evaluative tools, teaching aids etc., initiating school improvement programme including programmes for instructional improvement through Extension Services and of examination reforms in the country, bear a testimony to this growing concern.

Coming back to our core question as to what is the impact of the developments enumerated above on the classroom teaching? With little hesitation, my answer is that the impact is insignificant. Why? Is the logical question emanating from the answer? Are these attempts irrelevant or are they inadequate? Probably nobody can belittle the importance of these programmes. As a matter of fact, they are not only relevant but indispensable as well for the improvement of classroom teaching. They are, of course, inadequate—inadequate because the classroom presents such a varied and complex phenomena to the teachers that despite their knowledge of pedagogical principles and the instructional materials at their disposal, they are bewildered. They find themselves in almost an alien world. We will have to agree with Smith's observation regarding the

limitation of the methods of teaching that are usually introduced to the teachers in our training colleges.

“From casual observation of teaching, we come to the conclusion that actual classroom teaching does not conform to the methods of teaching described in text-books. This conclusion has been sustained by subsequent observation. Actual teaching is so varied, so complex, so fluid as almost to defy any description whatsoever; and it certainly does not respond to the concepts of method set forth in treatises on the subject. When we speak of methods of teaching, we are not speaking of realities, but about the picture of teaching we have built up out of the ideas borrowed from Psychology and Philosophy”.

If we agree with Smith's view, which I do, we will have to review our teacher preparation in general and methods courses in particular. Probably strategies for the improvement of classroom teaching will also have to undergo a change. What kind of orientation is needed to accomplish this objective?

The Task Ahead

In order to prepare our teachers more effectively, it is desirable to orient them to something beyond the traditional concept of teaching derived from psychology and philosophy, the concept of teaching and its methodology based on actual classroom transactions. Attempts have been made and are still being made in advanced countries, particularly in USA, to evolve such a concept of teaching through the analysis of classroom activities, the transactions that feature the classrooms including interaction between teacher and student, student and student, teacher and the classroom, teacher and sub-groups in the classroom. The technique of interaction analysis so developed has not only proved useful in evolving the concept of teaching but in improving teacher preparation, both pre-service and in-service. It is high time for us here in this country to examine utility of interaction analysis for improving the quality of class-

room transactions, and plan comprehensive programme for the same.

Seeking Directions

Having accepted the urgent need to apply classroom interaction analysis to the improvement of teaching through modifying classroom behaviour of teachers, the following issues will have to be duly considered and decisions will have to be taken to prepare effective programmes in the area of classroom interaction analysis:

Shall we develop our own system(s) of classroom interaction analysis or adopt/adapt the systems that have been developed elsewhere?

Shall we use unidimensional system(s) of classroom Interaction analysis or use multidimensional systems?

Shall we cover ordinary classrooms in our programmes or shall we cover classrooms involving special problems or situations as well.

What kind of programmes should be planned in this area?

What systems of classroom interaction analysis shall we adopt/adapt for our programmes?

What will be the modus operandi for the collection of data in our programme?

What to expect from the teachers who are to be involved in the programmes, if we are to have any expectation at all?

These are some of the questions that come to my mind spontaneously. These are by no means exhaustive. It is hoped that the learned seminarians will supplement them by adding many more. In my opinion reflection on the issues so raised will be helpful for developing the necessary framework and guidelines for planning and operationalising the programmes involving classroom interaction analysis in this country. An attempt has been made in this section to point out some of the

possibilities in this regard, but the deliberations in the seminar, I am confident, will definitely sharpen the directions.

The desirability or otherwise of developing our own systems of classroom interaction analysis or adopting/adapting those developed elsewhere depend upon our policy regarding educational research and the position that we take about teaching. Does this policy permit fundamental research or does it limit our scope to applied research only? If we are open~~ly~~ invest in both, there is a scope for devising our own systems of classroom interaction analysis, contributing thereby, to the identification and description of the concepts relating to teaching, and in the ultimate analysis, towards the formulation of a theory of instruction. If we are committed only to the second proposition, of necessity, we will have to depend upon the systems that are available. A question can come from some quarter at this stage as to what is the scope of devising new systems of classroom interaction analysis? When enough work has already been done and a number of systems are available, why indulge in this costly exercise? Will the outcomes be commensurate with the human effort and the financial resources spent on it? So far as the scope and possibilities are concerned the very fact that when so many systems have already been developed and still more are in the process of development by way of improvements shows that the scope and possibilities will always remain open and present ever increasing challenge to us.

Another factor, probably of fundamental nature also guides our stand on this issue. The position that we take about teaching will determine our course of action. Is the concept of teaching universal in character, being the same everywhere or does it differ from place to place, from culture to culture? If we subscribe to the first proposition, there is a case for adopting/adapting the systems of classroom interaction analysis with minor modification in the categories dealing with the means of teaching. But if we subscribe to the second proposition, it becomes imperative for us to develop our own systems of

interaction analysis. Though my intention is to let the question remain open for you people to decide the stand, yet I fail to resist the temptation to state the position taken by Smith (2). He observes:

“ Our most general notion is that teaching is everywhere the same, that it is a natural social phenomenon and is fundamentally the same from one culture to another and from one time to another in the same culture ”.

Two broad types of systems of classroom interaction analysis, namely *Unidimensional* covering only one aspect of teaching such as Emotional Climate prevalent in the classroom (3, 4, 5) and *Multidimensional* covering more than one aspect of teaching such as Emotional Climate, Content Development, Classroom Organisation etc. (6, 7, 8, 9, 10) are in use. What will be our policy? Shall we concentrate on the first or second or on both?

The opinion in this case will have to be based more on *feasibility than on desirability*. The desirability of option in favour of the second is beyond question. But despite this, unidimensional systems are in frequent use in various programmes due to the ease with which the observation with high reliability can be obtained. Secondly, the number of categories being limited, it can be learnt and used by the teachers as well. Thirdly, it is held that pupil gains in various domains are improved with the improvement of classroom climate. To begin with probably we also will have to concentrate our attention on this alone. We may work with Flanders system of classroom interaction and try to enrich the programme simultaneously by developing knowledge and competence in utilising the multidimensional systems. But we must be very sure of the reasons for limiting our scope of operation, and always remain conscious about the need to launch programmes—involving the multidimensional systems as early as possible. Even at this stage, individual research workers may be encouraged to undertake work involving multidimensional systems.

The issue regarding the coverage of ordinary classrooms or including classrooms with special problems in our programmes is quite akin to the above with a little difference. Here the classification of researches and action programmes based on classroom interaction analysis have been conceived along another dimension. Some work has been accomplished with reference to the classrooms in general irrespective of the specific problems or situations marking them, while at the same time work has also been accomplished with reference to special classrooms such as classrooms with gifted boys (12), underachievers (13), deviant children (14). Again, systems with reference to particular subjects have been developed—Maths. (15), Biology (16) etc. What will be our policy with reference to the programmes here?

I will repeat my position in this respect as I had stated earlier. Considering desirability alongwith feasibility, let us, in the first instance, concentrate our attention on common classrooms. Individuals interested in special problems or situations may be encouraged to undertake work in their respective contexts.

What kind of programmes should be developed in the area of classroom interaction analysis? Shall we undertake research or depend upon the findings of researches done elsewhere? If we subscribe to the first proposition, what kind of researches should be undertaken? Shall we wait for research findings to be undertaken in India or shall we initiate some action programmes as well? If we have to initiate the action programmes what kind of programmes shall we concentrate upon? These are some of the vital questions with regard to the programmes that need consideration.

The researches and their findings are generally culturally biased and warrant caution for adoption or application. May be that some of the researches are replicated in addition to conducting more research in this area. Broadly speaking three types of programmes are envisaged. Firstly, fundamental research for evolving systems of interaction analysis with re-

ference to specific problems and subject areas through theoretical conceptualisation, try outs and establishing reliability and validity needs to be undertaken. Individual research workers or research scholars in the University Departments of Education may be involved in this task. Secondly, applied research in this area such as, "What are the different ways in which it can be used as a means of improving practice teaching in the training institutions? How to use it as a means of inservice education? How to make it an effective tool? What type of teachers are more responsive to the different ways of introducing this system? What is the effect of this type of teacher orientation on different personality types of children?" etc. will be required to maximise the utility of this technique in vitalising classroom instruction.

A word of caution for the planners of educational research in this area. We have seen a lot of sporadic research in education. The obvious result is that no threads can be discerned in different researches in any area and the contribution to theory and practice of education in this country is almost nil. Let us be conscious of this pitfall and in order to avoid the same concentrate on *programmatic research* in this area, so that after a few years we are in a position to evolve some principles through establishing relationship between the various variables, their cause and effect having been studied. A comprehensive programme of research based on a suitable model may be developed in the seminar. This will serve as a guide to the individuals, institutions and agencies interested to work in this area. A model prepared by Prof. Biddle (17) in context of teacher effectiveness and another by conceiving classroom as a social system may be considered in this context.

Besides the researches in this area undertaken by the individual research workers, research scholars in the universities, and agencies directly charged with the responsibility, educational research, action research type of activities should be planned by the extension departments under their programmes of instruc-

tional improvement. Even the experimental schools and other schools and teacher training institutions having initiative should be encouraged to undertake simple programmes on interaction analysis as applied to classroom teaching. They may not follow the rigours of research, but adopt the programmes as a developmental activity. Provision for the orientation of the educational practitioners will have to be made for this purpose. Probably, CASE would like to plan it in collaboration with NIE, Regional Colleges of Education, Extension Services Departments and S.I.E.'s.

What system(s) of classroom interaction analysis to adopt/adapt for our programmes?

Needless to say, selection of a particular system of classroom interaction analysis is to be determined by the purpose of the programme, the desirability and feasibility aspects discussed earlier. If the programme aims at studying and improving climate of classrooms, Withall's or Flanders system can be adopted. But if the programme includes coverage of curriculum areas alongwith classroom climate, other systems will have to be adopted. Besides we should not shirk even modifying the available systems of interaction analysis for our purpose if situation so demands.

What will be the *modus operandi* for collecting observational data on classroom interaction? Shall we use mechanical instruments or shall we use live observers in the classroom or both?

The *modus operandi* for the collection of observational data has again to be considered from the desirability and feasibility points of view. For methodological considerations such as reliability, replicability of the work etc., ideally, video-tapes should be used. But at this stage it appears beyond our resources. What are the alternatives then? Tape-recorders, observers, and tape-recorders supplemented by the observers can be employed for recording classroom behaviour

of teachers, students or of both. Keeping in view the novelty effect that the mechanical instruments are likely to have on our teachers who are least accustomed to it, their use may be avoided in the beginning. But as resources and other conditions permit increasing use of video-tapes may be adopted particularly in research studies.

Shall we expect anything from the teacher as a pre-requisite for involvement in the programmes? If so, what to expect?

Apart from willingness of the teachers their attitudes to cooperate in studies and concern for improving their competence, it is desirable to select teachers with certain level of mastery over the content to be taught, or develop the desirable level of mastery of content before initiating the work in this area. I believe that verbal communication in the process of teaching is controlled and facilitated to a great extent by this factor. The verbal interaction and its quality is likely to improve if the teachers have adequate mastery over the content to be taught. The technique may be more effective with such teachers. This is a mere hunch to be tested objectively. It will be interesting to study the effect of the content mastery on the part of the teacher on his verbal behaviour in the classroom particularly after undergoing training in interaction analysis.

I realise the manifold limitations of the paper which is more intuitive than scholarly. But I am confident that deliberations of the seminar will make its content more vivid and rich.

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Editors' Comments

This thought-provoking paper by Shri N. K. Jangira, discusses some pragmatic issues arising out of attempts to adopt classroom interaction analysis technique for toning up teaching, in their proper setting. It is raising more questions than it seems to solve, perhaps as it should be, being a paper presented to the seminar on 'Classroom Interaction Analysis and Teacher Behaviour' organised by the CASE in Baroda in January 1970, meant to be discussed further.

After putting the whole question of classroom interaction analysis technique as an urgent need for vitalising classroom teaching, in its proper perspective, he proceeds to reinforce his case by pointing out how the various measures taken in our country to tone up the quality of education along with quantitative expansion have been inadequate because of the varied and complex nature of actual classroom situations vis-a-vis the state, highly theoretical and non-real pedagogical principles developed from psychology and philosophy. Herein he quotes convincingly from Smith.

As regards the number of questions he poses like 'whether to develop our own system(s) of classroom interaction analysis or adopt/adapt the systems that have been developed elsewhere' and the like, he goes by the criteria of 'desirability' and 'feasibility' in the matter of seeking answers thereto.

The author feels that the systems already developed elsewhere can be used in our country also since, as he again quotes from Smith, in support of his suggestion, 'teaching is everywhere the same'.

He says that in the initial stages, uni-dimensional systems of classroom interaction analysis may be used and that our efforts may be first directed towards common classes, as distinct from those with special problems and situations.

As regards the kind of applied research programmes to be undertaken one cannot but agree with him when he says that caution is to be counselled against making 'sporadic' attempts and that research based on a suitable model should be the goal.

However on the question of 'Fundamental Research' one is at a loss to understand his ideas since he commends fundamental research evolving systems of interaction analysis with reference to specific problems and subject areas, while a little earlier, he feels that systems already developed elsewhere could be adopted here. After all, there are systems,

as he himself acknowledges (4.3.0.) developed and adopted with reference to special situations and particular subjects. What might be 'desirable' in the case of systems for ordinary classrooms might again be so in respect of 'special' classes as well.

In recommending 'Action Research type of activities' by Extension Departments, by way of their instructional improvement programmes, he is 'earth-earthly' and there can be no difference of opinion on this point.

As regards the modus operandi for collecting data one feels that using tape recorders too, (not to speak of video-tapes) might be beyond the possibility in Indian Conditions. But that need not deter our efforts, in this direction, and such mechanical gadgets can be brought in, as our resources position improves.

Again, one would find it difficult to agree with the author when he says that 'apart from willingness of the teachers, their attitude to co-operate in studies and concern for improving their competence, it is desirable to select teachers with certain level of mastery over the content to be taught, or develop the desirable level of mastery of content before initiating the work in this area'. Perhaps we are confusing the means with the end as classroom interaction analysis is a means to identify the patterns as exhibited so that feedback might help the teachers to modify their behaviour—all in the realm of methodology, as distinct from the mastery over content. Could it not be possible for a teacher with a relatively less degree of mastery over content to be reasonably democratic in his classroom management? Or is it, the other hand, to be taken for granted that a teacher with a relatively high degree of mastery over content could never be unduly authoritarian? The author, by implication, seems to be suggesting the latter when he says that 'the verbal interaction and its quality is likely to improve if the teachers have adequate mastery over the content to be taught and that the technique may be more effective with such teachers'. While there can be no gainsaying the fact that the content mastery

on the part of the teachers should be at a high level and that we should endeavour to bring it up if it is below the desired level, it seems difficult to accept the contention that high level of content mastery is to be pre-requisite for launching a scheme of observations of the classroom interaction. We are only labouring to distinguish between 'mastery of content' and 'methodology of delivery of content'.

To imply any incompatibility between integrative approach to teaching and relatively less degree of 'content mastery' on the part of the teacher will be rather presumptuous and possibly is contrary to fact as well.

We however concede, without any reservation, whatsoever, that a 'high level of content mastery', if found existing with 'highly integrative approach in teaching', should be all the more praiseworthy. But the basic point is that a relatively less degree of content mastery can, by all means, co-exist with a predominantly indirect behaviour.

The paper, on the whole, marked by a high sense of awareness of the realities of the situation and a scholarly analysis of 'all' the issues involved, makes interesting reading. At a time when we have not yet embarked upon any large scale programmes and projects in this vital area of research the paper with its treatment of the subject from a purely practical view point serves the great task of setting the ball in motion.

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