A STUDY OF THE APPLICATION OF INTERACTION ANALYSIS TO THE TRAINING OF PRESERVICE TEACHERS IN KENYA

By

Florida Amakobe Karani

B.A., University of East Africa, 1968

Dip. Ed., University of Nairobi, 1969

M.A., University of Nairobi, 1974

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University of Pittsburgh

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FACULTY ENDORSEMENT and
FINAL REVIEW COMMITTEE

Robert A. Cox, Chairman	Educational Communications	Education
Maritz C. Lindvall	Educational Research	Education
Catherine R. Cornbleth	Secondary Education	Education
Seth Spaulding	Educational Communications	Education

Date April 12, 1979

VITAE

Florida Amakobe Karani (neé Okwemba) was born on October 4, 1945, at Kima Mission, in Kenya. She received her primary school education (Standards 1 to 4) at Ebusiratsi Primary School from 1951 to 1953, and Butere Girls' School (Standards 5 to 8) from 1954 to 1957. She received her junior high school education (Forms 1 to 4) at Butere Girls' High School from 1958 to 1961, and did her senior high school studies (Forms 5 and 6) at Alliance Girls' High School from 1962 to 1963. From 1964 to 1968, she attended the University of East Africa (Nairobi campus) where she received a Bachelor of Arts Honours degree in History, Geography and English in 1968. In 1969, she received a Diploma in Education from the University of Nairobi. She taught at Alliance Girls' High School from June to September 1969. In September 1969, she was appointed lecturer at the University of Nairobi, Institute of Adult Studies and has taught at the University of Nairobi since. In the meantime, she enrolled for the Masters of Arts degree on a part time basis in 1971, and graduated in 1974. In 1975, she was promoted to Assistant Director at the Institute, and in the same year received a scholarship from the African American Institute to do doctoral studies in the United States. She was granted study-leave by the University of Nairobi and enrolled for the Doctor of Philosophy program, Educational Communication (major) and Educational Research Methodology (minor) at the University of Pittsburgh in

September 1975. Her field research for the doctoral program was done in Kenya from September 1977 to December 1978. She completed the Doctor of Philosophy program at the University of Pittsburgh in 1979.

provided by the dissertation committee. Dr. Robert Cox, the author's advisor and dissertation committee chairman generously devoted numerous hours of his time. His constructive suggestions during the development of the research problem, his comments on the rough version of the manuscript, and his advice and help relating to various technical details of the study, were indeed helpful. Dr. Mauritz Lindvall gave invaluable assistance in the statistical analysis of the data, and the organization and design of the study. Dr. Catherine Cornbleth gave extremely helpful and specialized suggestions relating to the field of teacher education. Dr. Seth Spaulding gave constructive suggestions relating to teacher education and with an international perspective. A special word of thanks is due to Lynn Cooper for typing the manuscript.

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PREFACE

Kenya is located in East Africa and borders the Indian Ocean between Somali and Tanzania. Its area is 582,646 square kilometers, and it has a population of approximately, 14 million people. Nairobi, the country's capital, has approximately 700,000 people. Kenya was a British protectorate from 1895 to 1920 and a colony from 1920 until 1963 when she attained independence. Western education was introduced into Kenya by the British, so that at independence the country inherited an educational system that was largely modeled after the British educational system. There were many inherited shortcomings in the educational system, such as limited educational opportunities, curricula that were not particularly relevant to the country's situation and needs, and inadequately trained teachers. Since independence, Kenya has done a great deal to expand the educational system and also to improve the quality of education. This study was concerned with teacher education. It investigated an alternative way in which the quality of education in Kenya can be improved.

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CHAPTER I

INTRODUCTION

A. Rationale

The quality of teacher training is one of the main concerns in the field of education in Kenya as well as in other countries of the world. This points to two important questions that must be considered seriously by trainers of school teachers, first: What constitutes effective teaching in a particular context? Secondly, how can teacher training programs prepare student teachers and equip them with skills that will enable them to become effective teachers?

Amidon and Hough give us a deeper insight into an important dimension of this problem when they say that:

> Teachers have never had an empirically verified instructional theory to serve as a basis for their classroom behavior. Yet perceptive teachers have sensed that the quality and quantity of teacher-pupil interaction is a critical dimension of effective classroom teaching. Without a theory, teachers have been unable to generalize principles of instruction from specific instances. Without a way of objectively describing the nature of classroom interaction, teachers in the past have had no way of capturing the elusive phenomenon of their instructional behavior, the climate that it creates in their classroom and the effect of this climate on student attitudes and achievement.[1]

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[1] Edmund Amidon and John B. Hough, eds. Interaction Analysis: Theory, Research, and Application (Reading, Massachusetts: Addison-Wesley, 1967), p. 2.

The view adopted in this study is that new insights into the questions posed above, can be gained through research that focuses on classroom processes. This view is widely supported. In their synthesis of studies on teaching, Dunkin and Biddle demonstrate that the most strategic way to answer questions relating to teaching effectiveness is through research on classroom processes.[1] This concern with the actual classroom processes has in the recent years encouraged the development of numerous observation systems designed to focus on various aspects of classroom interaction. Among such early instruments was that designed by Ned A. Flanders in 1957. Others of the early systems include those designed by Anderson in 1939,[2] Withall in 1949,[3] Medley and Mitzel in 1958,[4] Aschner in 1959,[5] Hughes et al in 1959,[6]

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[1]Michael J. Dunkin and Bruce J. Biddle, The Study of Teaching (New York: Holt, Rinehart, and Winston, Inc., 1974).

[2]Harold H. Anderson, "The Measurement of Domination and Socially Integrative Behavior in Teachers' Contacts with Children" Child Development 10 (1939):73-89.

[3]John Withall, "The Development of a Technique for the Measurement of Social-Emotional Climate in Classrooms," Journal of Experimental Education 17 (March 1949):347-361.

[4]Donald M. Medley and Harold E. Mitzel, "Technique for Measuring Classroom Behavior," Journal of Educational Psychology 49 (1958):86-92.

[5]Jane Mary Aschner, "The Analysis of Classroom Discourse: A Method and its Uses" (Doctoral dissertation, University of Illinois, Urbana, 1959).

[6]Marie Hughes, et al., Development of the Means for Assessment of the Quality of Teaching in the Elementary Schools (University of Utah, Salt Lake City, 1959).

Smith in 1960,[1] Amidon and Flanders in 1963,[2] Hough in 1966,[3] Honigman in 1966,[4] Amidon and Hunter in 1966,[5] and Simon and Agazarian in 1966.[6] By 1970, Simon and Boyer were able to provide an anthology of seventy-nine observation systems,[7] and in 1971 they added another thirteen.[8] More have been constructed since. Such a proliferation of classroom observational systems suggests their usefulness in providing objective data regarding actual classroom processes.

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[1]Bunnie O. Smith, "A Concept of Teaching," Teachers College Record 61 (1960):229-241.

[2]Edmund J. Amidon and Ned A. Flanders, The Role of the Teacher in the Classroom: A Manual for Understanding and Improving Teachers' Classroom Behavior (Minneapolis, Paul S. Amidon and Associates, Inc. 1963).

[3]John B. Hough, "An Observational System for the Analysis of Classroom Instruction," the Ohio State University, Columbus, 1966. (Mimeographed)

[4]Fred Honigman, "Testing a Three Dimensional System for Analyzing Teachers' Influence." (Doctoral dissertation, Temple University, Philadelphia, 1966.)

[5]Edmund J. Amidon, and Elizabeth Hunter, "Verbal Interaction in the Classroom: The Verbal Interaction Category System." Temple University, Philadelphia, 1966 (Mimeographed).

[6]Anita Simon, and Yvonne Agazarian, "Sequential Analysis of Verbal Interaction." Temple University, Philadelphia, 1966 (Mimeographed).

[7]Anita Simon, and Gil E. Boyer, eds. Mirrors for Behavior II: An Anthology of Observational Instruments. (Research for Better Schools, Inc. Philadelphia, Pennsylvania: Office of Education DHEW. Washington, D.C., Division of Educational Laboratories, 1970).

[8]Anita Simon and Gil E. Boyer, eds. Mirrors of Behavior: An Anthology of Classroom Observation Instruments, 1970 Supplement, Vols A and B. (Research for Better Schools Inc. Philadelphia, Pennsylvania - National Center for Educational Research and Development (DHEW/OE) Washington, D.C. Division of Educational Laboratories, 1970).

While classroom processes include both verbal and non-verbal behavior displayed by the teacher and the pupils during the teaching-learning process, this study was directly concerned with, and focused on the teacher, because the teacher is a central influence in what goes on in the classroom. The study focused on the teacher's verbal behavior, and dealt with pupils' verbal behavior only insofar as it was directly or indirectly related to the teacher's verbal behavior during the classroom interaction process. Non-verbal classroom behavior has its own characteristics and is an important area, but its investigation would have constituted another study.

Interaction analysis was an appropriate tool to use in this study because it is an observation system that captures the quantitative and qualitative dimensions of teacher verbal behavior in the classroom. Specifically the Flanders Interaction Analysis Categories system, hereafter abbreviated as FIAC, was utilized. The special features and characteristics of FIAC elaborated upon in the last section of this chapter, make it highly suitable for identifying and analyzing verbal behavior in the classroom. Data yielded by FIAC describes the type and classification of talk that is used during the teaching-learning process, also an analysis of the cause and effect of teacher-pupil interaction in the classroom can be made from the data.[1] Thus it is possible to

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[1]John B. Hough, "Classroom Interaction and the Facilitation of Learning: The Source of Instructional Theory," Interaction Analysis: Theory, Research, and Application. ed. by Edmund J. Amidon and John B. Hough, (Reading, Pennsylvania: Addison-Wesley, 1967), p. 376.

determine the effect of the teacher's verbal behavior in controlling total verbal behavior that goes on in the classroom. Secondly, FIAC's ability to yield objective[1] and reliable[2] information about classroom verbal interaction makes it possible for the student teacher to study his own verbal behavior in systematic and objective manner in order to gain personal insight into it and to make relevant and meaningful changes. These advantages and qualities probably explain why the instrument is used widely in the United States to train student teachers in classroom verbal behavior. As early as 1968 Johnson conducted a survey of 847 teacher education institutions and reported that all of them used interaction analysis to some extent to train student teachers in verbal behavior in the classroom.[3] All these points suggest that FIAC was the appropriate instrument to be utilized in the study.

A search of literature reveals that no experimental study on verbal interaction in the classroom has been conducted in Kenya, and hence the desirability for such a study

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[1]Edmund J. Amidon and Ned A. Flanders, Interaction Analysis as a Feedback System," Interaction Analysis: Theory, Research and Application. ed. by Edmund J. Amidon and John B. Hough (Reading, Pennsylvania: Addison-Wesley, 1967), pp. 121-140.

[2]Ned A. Flanders, "The Problems of Observer Training Reliability," Interaction Analysis: Theory, Research, and Application. ed. by Edmund J. Amidon and John B. Hough, (Reading Pennsylvania: Addison-Wesley, 1967), pp. 158-166.

[3]Glenn R. Johnson, Improving College Teaching via Microteaching and Interaction Analysis: A Handbook for Professors and Prospective Instructors (Glen R. and Associates, College Station, Texas, 1974).

to determine whether this procedure which has been found quite effective in the training of teachers in the United States is appropriate for, and may be effective in the training of teachers in Kenya. In this respect, this study is of historical significance to teacher education, and the development of instructional technology in Kenya.

B. Statement of the Problem

Kenya has two types of preservice teacher education programs. The first is a non-university program which prepares teachers for primary schools (standards one to seven).[1] The second is a university level program that prepares teachers for secondary schools (forms one to six).[2] Both programs cover five curriculum areas, namely: subject content, foundations and philosophy of education, psychology of learning, teaching methods theory, and teaching practice. The difference in the two types of programs is found in the level of difficulty and sophistication of the material, depth and coverage.

In Kenya at present, training student teachers in classroom processes is largely accomplished through courses of teaching methods' theory, and teaching practice. In teaching practice, the anecdotal records technique is used

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[1]Standards one to seven correspond to the United States' elementary grades one to seven.

[2]Forms one to six correspond to the United States' high school grades eight to twelve, plus the first year at college or university. After Form 6, successful students may proceed to the university.

to help student teachers change and improve their classroom instructional skills. The student teacher; teaching in a real classroom setting, is visited by the supervising teacher one to four times during the teaching practice period which may range from 7 to 12 weeks. The supervising teacher uses criteria set by the Teacher Education Institution he represents in observing the student teacher and writing a description of the behavior displayed by the student teacher. He makes a general assessment and provides the student teacher with some feedback. Presumably, the student teacher uses this information to improve his subsequent teaching. This procedure for evaluating a student's teaching and providing him with feedback has limitations. It is a subjective means of assessing classroom behavior and lacks the objective and reliable basis that is essential for helping the student teacher to make systematic, relevant, and meaningful change and improvement in classroom behavior. This condition undermines the efforts of Teacher Education Institutions to provide student teachers with quality training in practical teaching.

As early as 1969, the then Permanent Secretary, Ministry of Education in Kenya expressed concern over the problem of the quality of teacher education in Kenya when he said

> ...it becomes necessary...to raise the quality of teachers at all levels so that they will not only subscribe to the accepted educational goals, but also possess skills to make them a reality. Whether they succeed in translating these objectives into day to day classroom teaching will

> depend very largely on the nature and quality of their training....I believe...educational development will only be possible if...better and improved practices are introduced, and if the system is conducive to maintaining the best and ablest in the profession...In order to improve practices, it will be necessary to try out constantly new ideas and innovations...[1]

It is believed that this goal can be attained if teacher education programs utilize knowledge gained from new research, and from innovations that are compatible with the educational needs in the country. It is this need which motivated the writer to conduct this study which dealt with a university level program and focused on the teaching practice portion of the curriculum. The major question that this study investigated was: How effective is FIAC in training student teachers to change teacher-pupil verbal interaction in the classroom to attain indirect verbal teaching behavior.[2] The study was concerned with systematic methods of self evaluation and obtaining feedback via FIAC applied during teaching practice.

The FIAC method has several advantages over the anecdotal records method of evaluation and providing feedback. In the latter method, any well meaning supervising teacher will find it difficult to be consistent in assigning equivalent grades to similar classroom behaviors. In contrast, the FIAC procedure provides valid and more objective data that

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[1] New Directions in Teacher Education (East African Publishing House, Nairobi, Kenya, 1969), pp. vii-viii.

[2] For a description and discussion of indirect verbal behavior in the classroom, as the acceptable effective classroom verbal behavior for this study, see p. 17-22.

reflect the verbal behavior that actually occurs in the classroom during the teaching-learning process.

Secondly, it is possible that different supervising teachers may observe different behaviors, so that assessment subsequently arrived at may constitute the measurement of different behaviors of student teachers. In contrast the FIAC procedure is a technique that involves the identification and categorization of specific verbal behaviors displayed during the teaching-learning process. The observer looks for these specific behaviors and codes them according to standardized procedure. The data collected are analyzed and on this basis an assessment is arrived at. Assessment arrived at in the latter procedure holds more promise for consistency, stability, and dependability and will therefore provide reliable information about the student teacher's verbal behavior in the classroom that will enable him to make systematic, relevant, and meaningful changes.

Thirdly, the current procedure is dependent entirely on the supervising teacher who has to observe the student teacher and to advise him accordingly. This is very limiting considering that student teachers do their teaching practice in different parts of the country, and there are only a limited number of supervising teachers who can travel from one place to another to get to see the students. In the circumstances, a student teacher may be observed only once, or up to four times if he is in a more accessible area during the teaching practice period. A procedure whereby a student

can work towards mastering a set of objectives that describe required effective classroom verbal behavior by evaluating himself and making changes and improvements, without waiting for the supervising teacher is more efficient and desirable. The FIAC technique provides the means of doing this. The student teachers can be trained in the use of FIAC, they can evaluate themselves and make the necessary changes and progress on their own. The supervising teacher can thus be set free to play the more important and practical role as the student's consultant and guide. For example, by using the FIAC instrument, the student teacher can identify specific desirable and undesirable classroom verbal behaviors, and then he may discuss these with the supervising teacher who may suggest specific strategies for development and improvement. The supervising teacher can also use the student teacher's FIAC self evaluation data as a basis for giving guidance pertinent to the particular classroom verbal communication pattern, style and techniques.

In light of the foregoing discussion, and in accordance with the expressed need to continually improve the quality of teacher education, it was anticipated that the use of FIAC as a training procedure in classroom behavior offered opportunity for such improvement.

C. Objective of the Study

Since independence in 1963, Kenya has done a great deal to improve the quality of teachers and ipso facto teaching through such programs as inservice teachers' courses and

correspondence courses that aim to raise the academic level of teachers. Quality teaching can also be attained directly through improving methods of training student teachers. An important component of teacher training in Kenya is practical teaching during which student teachers presumably acquire instructional techniques. That classroom verbal behavior is a central element of classroom instructional processes, is a position supported by scholars elsewhere. For example, Flanders makes the assertion that "the verbal behavior of an individual is an adequate sample of his total behavior."[1] Research which can suggest ways in which effective classroom verbal behavior can be attained will offer an important addition to the training of student teachers in Kenya.

This study was primarily concerned with testing the feasibility and effectiveness of the use by student teachers of the FIAC method of analyzing teacher-pupil verbal interaction and obtaining feedback to change and/or attain indirect verbal teaching behavior.[2]

It was expected that the experimental group, who in addition to conventional training and the anecdotal records feedback[3] also received intensive training in the FIAC

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[1]Edmund J. Amidon and Ned A. Flanders, The Role of the Teacher in the Classroom: A Manual for Understanding and Improving Teachers' Classroom Behavior, (Minneapolis, Paul S. Amidon and Associates, Inc., 1963), p. 5.

[2]A description and discussion of indirect verbal behavior in the classroom, as the acceptable effective verbal behavior for this study is found on p. 17-22.

[3]For a description of conventional training, see p.14.

procedure (categorizing, analyzing and interpreting teacher-pupil verbal interaction and obtaining feedback and used the technique to evaluate themselves and obtain feedback), would change their verbal behavior during teaching practice and use more indirect verbal behavior than would the control group who depended entirely on conventional training and anecdotal records feedback and neither received FIAC training nor utilized the technique for self evaluation and obtaining feedback.

A general objective of this study was, that its findings would suggest possible effective strategies and procedures of training preservice teachers in effective classroom verbal behavior.

D. Null Hypotheses

From the foregoing discussion of the rationale, statement of the problem, and the objective of the study, a number of important questions which this study seeks to investigate emerge. These are stated in the null hypotheses form as follows:

There will be no significant difference between the experimental group who received the FIAC training (in addition to the conventional training) and used the FIAC technique for self evaluation and feedback during teaching practice (in addition to the anecdotal records feedback), and the control group who trained via the conventional method, and depended entirely on the anecdotal records feedback during teaching practice in:

1. Accepting and/or clarifying positive and negative feeling tone of the pupils;

2. Praising and encouraging pupil action and behavior;

3. Accepting and using pupils' ideas, by clarifying building, and developing these ideas;

4. Asking questions about content and procedures;

5. Encouraging pupils to initiate ideas and soliciting specific pupil responses;

6. Encouraging pupil initiated talk by inviting them to respond to broad questions or comments which they initiate;

7. The overall amount of pupil talk allowed;

8. The overall use of indirect verbal behavior as opposed to direct verbal behavior;

9. Lecturing, i.e., giving facts or opinions about content or procedures, and expressing own ideas, and asking rhetorical questions;

10. Giving of directions, commands or orders;

11. Criticizing pupils, and justifying the teacher's authority;

12. The amount of silence and confusion occurring in the classroom;

13. The overall amount of teacher talk.

E. Constructs

Introduction

In this section, a description of independent and dependent variables of the study is given. It must be noted that the FIAC system played a triple role in this study: first as an independent variable which formed an essential component of the treatment which was administered to the experimental group; second as a dependent variable whose selected verbal dimensions were subjected to treatment and observed for

variation; and third as the instrument which was used to measure classroom verbal behavior of both experimental and control groups as pre- and posttests.

Independent Variables

1. Training in FIAC and its use for self evaluation and feedback. The experimental treatment consisted of 26¼ hours of intensive FIAC training, combined with the use of the FIAC technique for self evaluation and feedback during the seven weeks teaching practice period. Detailed explanation of these processes appears in Chapter III in the section on "treatment procedure."

2. Conventional method of training student teachers in verbal behaviors in the classroom used at Kenyatta University College. In accordance with the normal College practice, both the experimental and control groups first received instruction in general and special methods theory and principles for one semester. This was followed by a seven week practical teaching period during which each student teacher, teaching in a real classroom setting, was visited and observed by the supervising teacher one to four times. The supervising teacher evaluated the student teacher on the basis of criteria set by the College.[1] The supervisor described and recorded the behavior displayed by the student while teaching and gave an assessment. On this basis, he

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[1]Appendices A and B are representative samples of evaluation criteria, and report form respectively used at Kenyatta University College.

provided the student teacher with feedback and suggested ways of improving. The student teacher was expected to incorporate the feedback into his new plans and improve his subsequent teaching.

Dependent Variables

Dependent variables of this study include thirteen selected dimensions of verbal categories and clusters obtained from the FIAC system. These verbal categories and clusters are enumerated below under the section on "Effective classroom verbal behavior."

Definitions of Other Related Terms

1. Interaction analysis. Interaction analysis refers to the use of objective observational instruments to code relevant aspects of classroom behavior according to predefined categories. Interaction analysis provides a systematic structure for gathering information about behaviors that occur during a period of observation. The data gathered can then be transferred to a matrix and treated by appropriate statistical or empirical procedures to analyze classroom behaviors.

2. Flanders Interaction Analysis Categories (FIAC). The Flanders Interaction Analysis Categories[1] refer to the verbal categories developed by Ned Flanders in 1957. All

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[1]Edmund J. Amidon and Ned Flanders, The Role of the Teacher in the Classroom: A Manual for Understanding and Improving Teachers' Classroom Behavior (Minneapolis, Paul S. Amidon and Associates, Inc., 1963), p. 12.

verbal statements made in the classroom are placed in one of three categories namely: teacher talk, student talk, and silence or confusion. These are further subdivided into ten categories as illustrated in the chart below:

Figure I

The Flanders Interaction Analysis Categories

TEACHER TALK:	Indirect Influence:	1.	Accepts and clarifies feelings
		2.	Praises and encourages
		3.	Accepts and uses ideas of students
		4.	Asks questions
	Direct Influence:	5.	Lecturing
		6.	Giving directions, commands or orders
		7.	Criticizing or justifying authority
STUDENT TALK		8.	Student talk: response
		9.	Student talk: divergent
		10.	Silence or confusion

From the description (or figure) above, it can be seen that in the FIAC system all teacher statements are classified first as either indirect or direct - a classification which gives central attention to the amount of freedom the teacher grants to the pupil. In a given situation, the teacher has a choice; he can be direct and by so doing minimize the freedom of the pupil to respond, or he can be indirect and by so doing maximize the freedom of the pupil to respond. The system also provides for the pupil talk - responding to the teacher or initiating talk. A third major category - silence

or confusion - is included in order to account for the time spent in behavior other than that which can be classified as either teacher or pupil talk. The categories are mutually exclusive, yet totally inclusive of all verbal interaction occurring in the classroom.

3. Classroom verbal behavior. This refers to words, phrases, sentences, and other expressive verbal sounds, e.g., 'um! uh!' et cetera, that originate from the teacher and pupils in the classroom.

4. Effective classroom verbal behavior. In this study, effective classroom verbal behavior refers to indirect verbal behavior displayed during the teaching-learning process. In this context, indirect verbal behavior includes Flanders' thirteen verbal categories described below as follows:[1]

a. more acceptance and/or clarification of positive and negative feeling tone of pupils;

b. more praise and encouragement of pupils' action and behavior;

c. more acceptance and use of pupils' ideas, by clarifying, building, and developing these ideas;

d. more asking of questions about content or procedures;

e. encouraging pupils to initiate ideas and soliciting specific pupil responses;

f. encouraging pupil initiated talk by inviting them to respond to broad questions or comments which they initiate;

g. more overall pupil talk;

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[1] Ibid.

h. more overall use of indirect verbal behavior as opposed to direct verbal behavior;

i. less lecturing, i.e., giving facts or opinions about content or procedures, and expressing own ideas, and asking rhetorical questions;

j. less giving directions, commands or orders;

k. less criticism or justification of the teacher's authority;

l. less silence and confusion;

m. less overall teacher talk.

It is not being implied that the indirect teaching approach is the universal teaching style. Various learning situations, pupils, and subject matter may call for different teaching behavior. Regarding the FIAC number categories, Hansen and Anderson explain that

> "There is no scale implied by the numbers. Each number is a classification, it designates a particular kind of communication event. To write these numbers down during observation is to enumerate, not to judge a position on a scale."[1]

While there is argument whether direct or indirect behavior is more desirable, different studies support either approach. Studies done by Withall and Cogan respectively support the hypothesis that a teaching style that is indirect and flexible is asscciated with higher achievement and positive attitudes towards school.[2] On the same subject, Amidon and

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[1]John H. Hansen and Robert A. Anderson, Trainer's Manual: Interaction Analysis (Northwest Regional Educational Laboratory, 500 Lindsay Building, 710 S.W. Second Avenue, Portland, Oregon 97204. December 1969), p. 22.

[2]John Withall, op. cit.; Morris L. Cogan, "Theory and Design of a Study of Teacher-Pupil Interaction," The Harvard Educational Review 26 (1956):315-342.

Flanders found that

> ...certain types of students learn more working with direct teachers, and othertypes of students learn more working with indirect teachers....all types of students learn more working with more indirect teachers than with more direct teachers....students in mathematics...learn more working with a more direct teacher, and students in social studies learn more working with a more indirect teacher...[1]

Results of another study conducted by Flanders on the same subject indicated that a direct teaching style or dominance in the teacher's behavior was disliked by pupils, and reduced their ability to recall materials they had studied.[2] He further reported findings of two studies which indicated a relationship between the attitudes of pupils, and the type of verbal behavior a teacher normally employed. He found that elementary school teachers who were rated high on different kinds of affective measures utilized a more indirect verbal behavior in their teaching. He also reported that seventh grade social studies and eighth grade mathematics pupils whose teachers utilized more indirect verbal teaching patterns performed higher on achievement tests than pupils of teachers who employed more direct verbal teaching patterns.[3]

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[1]Edmund J. Amidon and Ned A. Flanders, The Role of the Teacher in the Classroom: A Manual for Understanding and Improving Teachers' Classroom Behavior (Minneapolis, Paul S. Amidon and Associates, Inc., 1963), pp. 56-57.

[2]Ned A. Flanders, "Personal - Social Anxiety as a Factor in Experimental Learning Situations," Journal of Educational Research 45 (October 1951):100-110.

[3]Ned A. Flanders, Teacher Influence, Pupil Attitudes, and Achievement, Cooperative Research Monograph No. 12 (Washington, D.C.: U.S. Government Printing Office, 1965).

Nelson found similar results in a study on pupil linguistic performance.[1] LaShier also found similar results in a study with science students.[2] Soar studied sixteen 3rd, 4th, 5th, and 6th grade classes and found that vocabulary and reading growth were greater for indirect groups.[3] A review by Gage of the results of several studies on the correlation between indirect vis-a-vis direct teaching approach and the level of achievement revealed that indirect teaching was associated with higher achievement in upper grades, whereas the direct teaching approach was associated with higher achievement in lower grades.[4] In their study on verbal behavior of superior elementary teachers, Amidon and Giammatteo found that indirect teachers were rated as superior, and their classes showed higher levels of achievement.[5]

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[1]Lois N. Nelson, "The Effect of Classroom Interaction on Pupil Linguistic Performance," Dissertation Abstracts 25 1964. 1789.

[2]William S. LaShier, Jr., "An Analysis of Certain Aspects of the Verbal Behavior of Student Teachers of Eighth Grade Students Participating in a BSCS Laboratory Block." (Unpublished dissertation, University of Texas, 1965).

[3]Robert S. Soar, "Pupil Needs and Teacher-Pupil Relationships: Experience Needed for Comprehending Reading," Interaction Analysis: Theory, Research, and Application. ed. by Edmund J. Amidon and John B. Hough, (Reading, Pennsylvania: Addison-Wesley, 1967), pp. 243-250.

[4]Nathaniel Lees Gage, The Scientific Basis of the Art of Teaching, (Teachers College Press, Teachers College, Columbia University, New York and London, 1978), pp. 96-111.

[5]Edmund J. Amidon, and Michael Giammatteo, "The Verbal Behavior of Superior Elementary Teachers," Interaction Analysis: Theory, Research, and Application. ed. by Edmund J. Amidon and John B. Hough, (Reading, Pennsylvania: Addison-Wesley, 1967), pp. 186-188.

This review of findings on the effectiveness and merits of the indirect versus the direct teaching approaches suggests that each approach has its own advantages and merits in particular learning settings, but comparatively, more studies indicate and demonstrate that indirect teaching behavior is effective in more learning situations than the direct teaching approach.

In light of this evidence, it was concluded that indirect verbal teaching behavior was the acceptable effective verbal teaching behavior for this study for the following reasons: first, the geography subject which was used in the experiment is partially a social science discipline, and the available evidence suggests that this discipline can be taught more effectively via the indirect verbal behavior. Secondly, the geography content which was handled by the student teachers during teaching practice was in the form of 'new' and 'old' information to be presented to the pupils, and this provided opportunity for the utilization of indirect verbal approach. Thirdly, the pupils whom the student teachers taught during teaching practice were secondary school, young adults, and the available evidence suggests that older pupils learn more under indirect instructional influence. Fourthly, it was established that conventional training in learning theory and principles at Kenyatta University College seek to help student teachers acquire and use an indirect and flexible teaching approach when dealing with subject content that requires verbal presentation. Thus, the objectives of

conventional training in teaching methods and learning theory at Kenyatta University College, and those of this study were consistent.[1] This reinforced the need to investigate the possibility and advantages of an alternative procedure, such as FIAC might yield, in helping student teachers to acquire indirect teaching behaviors.

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[1]For an appraisal of the similarity between the objectives of this study, and those of the conventional training at Kenyatta University College, see p. 52.

CHAPTER II

REVIEW OF LITERATURE

A. Introduction

The present chapter reviews the literature related to interaction analysis and its role in changing classroom verbal behavior of teachers. Most of the studies reviewed, were conducted in the United States beginning in the late 1930's when research on socio-emotional climate in the classroom first started. Initially, literature relating to the historical development of interaction analysis is reviewed. This is followed by a discussion of literature which deals with changes in classroom verbal behavior resulting from the use of interaction analysis procedures in both preservice and inservice teacher training. Thirdly, literature relating to the effects of preservice and inservice training in interaction analysis on subsequent teaching behavior in schools is reviewed. Lastly, literature which show negative effects resulting from the use of interaction analysis in the training of teachers is reviewed.

B. Research Relating to the Historical Development of Interaction Analysis

Studies carried out prior to 1957 which focus on socio-emotional climate in the classroom are the fore-runners

of interaction analysis concepts. It is to such studies that the developmental background of interaction analysis can be traced.

One of the first studies in this area is Anderson's classic study of the integrative and dominative behavior of teachers in their contacts with children reported in 1939.[1] The purpose of the study was to develop a reliable measure of recording incidences of integrative and dominative behavior occurring in the contacts between three teachers and their respective kindergarten classes. Interrater reliability was established based on seventy-three pairs of consecutive and simultaneous records of five minutes each made by two independent observers. This demonstrated that overt classroom behavior could be measured reliably. Interrater reliability is an important requirement in the interaction analysis procedure, because it ensures that data collected is a correct reflection of actual classroom verbal behavior.

At about the same time, Lewin, Lippit, and White reported a series of experimental studies of the effects of three types of leadership behaviors - autocratic, democratic or laissez faire - on ten year old children's groups organized into clubs on a voluntary basis, and engaged in different kinds of productive activities.[2] The context of

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[1]Harold H. Anderson, "The Measurement of Domination and Socially Integrative Behavior in Teachers' Contacts with Children," Child Development 10 (1939):73-89.

[2]Kurt Lewin, Ronald Lippit, and Ralph K. White, "Patterns of Aggressive Behavior in Experimentally Created Social Climates," Journal of Social Psychology 10 (May 1939): 271-299.

these studies were removed from the formal classroom situation, but the findings are significant and relevant to classroom settings. The results of the studies showed, that the determinant factor producing climatological differences among groups was the type of leadership rather than the characteristics of the participants. Second, that different types of leadership produced different types of social climates and behaviors among groups. Third, that autocratic leadership either produced apathetic submissive behavior, or aggressive rebellious behavior, whereas laissez faire leadership produced easy going behavior. Fourth, that conversational categories more adequately identified leadership behavior than social behavior. These studies demonstrated that in a structured setting, overt behavior could be manipulated to produce different kinds of effects.

The earliest systematic studies of spontaneous pupil and teacher behavior in the classroom were conducted by Harold Anderson and his colleagues.[1] The settings of these studies were kindergarten and elementary school classes involving five different teachers and extending over several

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[1]Harold H. Anderson and Helen M. Brewer, Studies of Teachers' Classroom Personalities, I: Dominative and Socially Integrative Behavior of Kindergarten Teachers (Stanford University Press, Stanford, California, 1945); Harold H. Anderson and J. E. Brewer, Studies of Teachers' Classroom Personalities, II: Effects of Dominative and Integrative Contacts on Children's Classroom Behavior (Stanford University Press, Stanford, California, 1946); Harold H. Anderson, J. E. Brewer and Mary F. Reed, Studies of Teacher' Classroom Personalities, III: Follow up of the Effects of Dominative and Integrative Contacts on Children's Behavior (Stanford University Press, Stanford, California, 1946).

years. The objective of the studies was to determine the effects of dominative and integrative teacher behavior on children's classroom behavior. Taken altogether, these studies produced a series of significant findings. First, it was concluded that the main direction of influence in the classroom was from the teacher to the pupils, and that the level of integrative or dominative behavior a teacher displayed determined the type and amount of pupil overt behavior. Second, that a higher proportion of integrative teacher contacts with pupils, produced spontaneous and initiative pupil behavior, whereas a higher proportion of dominative teacher behavior either produced submissive or rebellious pupil behavior. Third, that the pattern of classroom behavior a teacher developed in one year was likely to be continued by him in the following year with different pupils.

John Withall was the first among early researchers of classroom climate to measure classroom interaction by means of a seven category system that classified teacher statements. Seven verbal categories that encompassed all types of statements utilized by teachers in the classroom were identified. These included learner-supportive, acceptance and clarifying, problem structuring, neutral, directive, deprecating, and teacher self-supporting statements. Procedures were developed for the application of this category system to classroom data. Objectivity of the instrument was ascertained by having four trained judges use the instrument to categorize three typescripts comprising sixty-eight, seventy-one and forty-five teacher statements respectively. The judges'

ratings were in general agreement. The instrument's objectivity was further tested and ascertained by computing tetrachoric correlations between the categorization of each of the judges on the three typescripts. To establish reliability, successive blocs of fifty statements drawn at random from typescripts of several sessions of one class were added to each other and the flactuation in the pattern of statements falling into the seven categories was noted. It was concluded that two hundred statements offered an adequate sample of a given teacher's statements. Secondly, that there was no significant difference in the pattern of a teacher's statements from day to day. To validate the instrument "Harold Anderson's Teacher Behavior Categories"[1] was used as a criterion instrument by applying it to the same data. Secondly, results of judges' ratings were compared to predicted results. Thirdly, classroom climate as perceived by pupils (obtained via pupils' recorded comments and feelings) was compared to that obtained by the application of Withall's instrument to the teacher's statements. Agreement was to some extent established in all three cases. The major conclusions of this study reported in 1949 were, that several individuals may be trained to use a category system and achieve an adequate measure of reliability. Secondly, that individual teachers are consistent in their pattern of verbal

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[1]Harold H. Anderson and Helen M. Brewer, Studies of Teachers' Classroom Personalities, I: Dominative and Socially Integrative Behavior of Kindergarten Teachers (Stanford University Press, Stanford California, 1945), pp. 22-26.

behavior from day to day, and that such patterns of behavior can be identified for various teachers. Thirdly, that positive verbal behavior of the teacher produces positive feelings in the pupils, and negative verbal behavior of the teacher produces negative feelings.[1] This study demonstrated that classroom verbal behavior could be measured and described by means of a category system. Withall's system is significant in that its verbal categories and measurement procedures are in some respects similar to those developed by Flanders in the FIAC system later.

Bales and Strodtbeck worked with small groups engaged in problem solving tasks. They used the "Interaction Process Analysis" developed by Bales[2] to determine the relationship between the behavior of group members and the productivity of the group. Results of this study reported in 1951 showed that group problem solving process tended to progress through three phases - orientation, evaluation, and control - and that frequencies of both negative and positive reactions also increased with these transitions.[3] These findings facilitated the understanding of the functioning of group processes under various conditions and their effects on the motivation,

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[1]John Withall, "The Development of a Technique for the Measurement of Social-Emotional Climate in Classrooms," Journal of Experimental Education 17 (March 1949):347-361.

[2]Robert Bales, Interaction Process Analysis (Cambridge Massachusetts: Addison-Wesley, 1950).

[3]Robert Bales and Fred Strodtbeck, "Phases in Group Problem Solving," Journal of Abnormal Social Psychology 46 (1951):458-496.

satisfaction and performance of the participants.

At about the same time Perkins utilized Withall's seven category system to determine the amount of learning accomplished by groups of teachers, led by integrative and dominative types of leaders in learning about child growth and development. He reported that greater learning occurred in groups led by an integrative type of leader than in those led by a dominative type of leader.[1]

Flanders created laboratory situations in which one pupil at a time was exposed to dominative and integrative teacher behaviors.[2] Results of the study reported in 1951 showed that sustained dominative teacher behavior was disliked by pupils and reduced their ability to recall materials they had studied, it also produced disruptive anxiety as indicated by galvanic skin responses and changes in heartbeat rates. Reversed trends were observed when pupils were subjected to sustained, integrative, teacher behavior.

Cogan's exploratory study investigated the relationship between teachers' classroom behaviors and the productive behaviors of their pupils. The results of the study indicated that there was a relationship between pupils' scores on both self-initiated and required work, and their perception

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[1]Hugh V. Perkins, "Climate Influences Group Learning," Journal of Educational Research 45 (October 1951):115-119.

[2]Ned A. Flanders, "Personal-Social Anxiety as a Factor in Experimental Learning Situations," Journal of Educational Research 45 (October 1951): 100-110.

of the teacher.[1]

The studies reviewed in this section which relate to the historical development of interaction analysis, helped to isolate and determine the characteristics of some of the FIAC variables, and in this way provided a conceptual framework for its construction.

C. Research Relating to the Effects of the Use of Interaction Analysis on Teaching Behavior

Bowers and Soar conducted one of the earliest studies of the effects of human relations training on inservice teachers. The study was carried out in a laboratory setting and involved fifty-four elementary school teachers - twenty-five in the experimental group and twenty-nine in the control group. The experimental group received three weeks training in theory, skill development, and group discussion techniques. The purpose of the training was to increase the subjects' sensitivity to their own behavior, to the factors underlying pupil behavior, and to their own level of self-direction. The "OScAR instrument" developed by Medley and Mitzel[2] was used for the observation of classroom interaction. The control group on the other hand underwent instruction in learning theory. It was anticipated that each subject from the experimental and control groups would achieve his own

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[1]Morris L. Cogan, "Theory and Design of a Study of Teacher-Pupil Interaction," The Harvard Educational Review 26 (Fall 1956):315-342.

[2]Donald M. Medley and Harold E. Mitzel, "A Technique for Measuring Classroom Behavior," Journal of Educational Psychology 49 (1949):86-92.

preferred degree of democratic classroom management. The results of the study showed that the experimental group demonstrated a larger amount of gain from the program than the control group.[1]

In 1962, Flanders reported a study in which he utilized experimental and control groups consisting of twenty-five subjects each, all of whom were junior high school teachers. The subjects' spontaneous verbal classroom behavior was field sampled and a number of attitude scales were used to measure the pupils' attitudes toward their teachers (subjects). The experimental group received interaction analysis training, but the control group did not undergo such training. A post treatment field sampling of all subjects' spontaneous classroom behavior was conducted, and data on pupils' attitudes toward the teachers was collected. The results of the study showed that the experimental group displayed more spontaneous indirect verbal influence than the control group, and pupils of the experimental group showed more positive attitudes toward their teachers than those of the control group.[2]

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[1]Norman D. Bowers and Robert S. Soar, Studies in Human Relations in the Teaching Learning Process V, Final Report, Cooperative Research Project No. 469 (Chapel Hill, North Carolina: University of North Carolina, 1961).

[2]Ned A. Flanders, "Using Interaction Analysis in the Inservice Training of Teachers," Journal of Experimental Education 30 (June 1962):313-316.

In 1963, Flanders reported a similar study which involved fifty-one junior high school teachers who participated in an inservice program whose purpose was to increase their use of flexible teaching behavior which encouraged pupils to participate in classroom learning activities. It was hypothesized that a teacher would gain most from inservice training which was compatible with his own preferred style of teaching. Initially, each subject explored different patterns of influence in his own classroom, and then he either opted to utilize the interaction analysis training program to change his classroom behavior, or he worked with a team of other colleagues who observed each others' teaching and provided feedback, or he simply taped his own teaching and analyzed it himself (not using interaction analysis procedures). The results of the study concluded that the interaction analysis program was more effective in helping subjects to acquire flexible teaching behavior. Second, the teachers who were most active made the most change in their classroom behavior. Third, that matching training methods with the teacher's own preferred style of teaching, enhanced progress made by the teacher.[1]

Bough and Amidon worked with undergraduate secondary school student teachers at Temple University in their Study of the effects of FIAC training in the classroom behavior of student teachers. The experimental group received FIAC

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[1]Ned A. Flanders, "Teacher Behavior and Inservice Programs," Educational Leadership 21 (October 1963):25-29.

training, and both the experimental and control groups were taught learning theory. Hough and Amidon reported that the experimental group with FIAC training were rated higher by college supervisors at the end of the teaching practice than the control group.[1]

Furst's research reported in 1965 was a follow-up study to the Hough and Amidon experiment discussed above. She worked with three groups of ten student teachers each. Experimental group A received training in FIAC prior to doing their teaching practice. Experimental group B received training in FIAC at the same time as they did their teaching practice. Control group C did not receive FIAC training, but was instructed in learning theory. The results of the study showed that experimental groups A and B used more indirect verbal behavior and they displayed more positive attitudes towards teaching than control group C. There was also more pupil participation in the classes of the experimental groups than those of the control group. The timing of the FIAC training had no effect on the behavior differences.[2]

Reporting on the effects of interaction analysis training for a period of five semesters at Temple University,

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[1]John Hough and Edmund J. Amidon, Behavioral Change in Preservice Teacher Preparation (Temple University, Philadelphia College of Education, 1964).

[2]Norma Furst, "The Effects of Training in Interaction Analysis on the Behavior of Student Teachers in Secondary Schools." Paper read at the Annual Meeting of the American Educational Research Association, Chicago, Illinois, February, 1965.

Amidon showed that data consistently indicated that preservice secondary school student teachers trained in interaction analysis used more indirect verbal behavior, and elicited more student initiated ideas than the student teachers trained in learning theory only.[1]

In 1966, Amidon and Powell reported a study in which they worked with four groups of fifteen student teachers each, to test the hypothesis that those who received training in interaction analysis would use more indirect teacher talk at the end of student teaching than those taught learning theory. The results of the study showed that student teachers trained in interaction analysis used more indirect teacher talk that is - they accepted pupils' feelings, they used pupils' ideas and encouraged them, they asked questions, they lectured less, they were more indirect in the use of motivating and controlling behaviors, and they used more extended and indirect influence - than the control group.[2]

Simon and Agazarian used experimental and control groups which consisted of twenty-two student teachers each. The experimental group underwent ninenty hours of observation and behavior training in FIAC. The control group received instruction in learning theory. The FIAC system was also

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[1]Edmund J. Amidon, "Using Interaction Analysis at Temple University." Paper read at the Conference on the Implications of Recent Research on Teaching for Teacher Education, sponsored by the National Association for Student Teaching and the University of Rochester, Rochester, New York, January 1966.

[2]Edmund J. Amidon and Evan Powell, Interaction Analysis as a Feedback System in Teacher Preparation (Washington, D.C., 1966).

used to evaluate each student teacher in the study, once at the beginning and once at the end of the teaching experience. The results of the study reported in 1966 showed that student teachers trained in FIAC were more accepting, less critical, less directive, and there was more pupil initiated talk and less silence and confusion in their classes than student teachers trained in learning theory alone.[1]

At about the same time, Simon investigated the effects of interaction analysis training on the teaching pattern of student teachers in favored and non-favored classes. She found that student teachers who received training in interaction analysis were more indirect in both their favored and non-favored classes than those who only received instruction in learning theory.[2]

In his study on the classroom verbal behavior of selected secondary school teachers, Matthews sought to determine the effects of the verbal behaviors of the teacher on the pupils' verbal behavior and vice versa. The FIAC system was used. The pupils' behavioral changes may be summarized as follows: teacher talk became more restrictive of student behavior when it was devoted to facts and teacher opinion, secondly, as the frequency and the length of pupil response to the teacher's questions decreased, the length of pupil

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[1]Anita Simon and Yvonne Agazarian, "Sequential Analysis of Verbal Interaction." Temple University, 1966 (Mimeographed).

[2]Anita Simon, "The Effects of Training in Interaction Analysis on the Teaching Patterns of Student Teachers in Favored and Non-Favored Classes." Doctoral dissertation, Temple University, 1966.

initiated comments increased.[1]

Amidon's study reported in 1967 involved an experimental group which received training in interaction analysis, and a control group which was instructed in learning theory. The results of the study showed that the experimental group were more accepting and supportive in working with pupils than the control group. Evidence was also identified which indicated that pupils perceived the indirectness of student teachers trained in interaction analysis.[2]

The research reported by Hough and Ober in 1967, was the culmination of a two year course that involved revision and evaluation of the introductory professional course for the preparation of preservice secondary school student teachers at the Ohio State University. The purpose of the project was to help student teachers acquire flexible indirect teaching behavior that is - accepting, clarifying, and encouraging (that was associated with positive pupil attitudes and greater pupil achievement) rather than directive, critical, rejecting behavior. Hough and Ober employed five treatment groups of eighty-four subjects each. Two of the groups received training in interaction analysis and in various skills in

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[1]Charles C. Matthews, The Classroom Verbal Behavior of Selected Secondary School Science Student Teachers and their Cooperating Teachers (Cornell University, Ithaca, New York, 1966.

[2]Edmund J. Amidon, The Effect Upon the Behavior and Attitudes of Student Teachers of Training Cooperating Teachers and Student Teachers in the Use of Interaction Analysis as a Classroom Observational Technique (Temple University Philadelphia, College of Education. Sponsoring Agency: Office of Education DHEW, Washington D.C., Bureau of Research, 1967).

human relations. Three groups did not receive interaction analysis training, but received instruction in human relation skills and held discussions of verbal teaching behavior. The results of the study showed that the treatment groups who were taught interaction analysis used more indirect verbal behavior associated with positive pupil attitudes and greater achievement, than those not so taught.[1]

In 1967, Moskowitz reported a study in which she compared the effects of interaction analysis on student teachers and their cooperating teachers. She worked with forty-four secondary education student teachers from Temple University and their cooperating teachers during a fifteen week spring semester. Subjects were assigned to one of the four possible combinations of training or no training in interaction analysis. Results showed that student teachers and their cooperating teachers trained in interaction analysis used significantly more indirect teaching patterns than student teachers and their cooperating teachers who did not receive such training. Secondly, that student teachers trained in interaction analysis used significantly more indirect patterns of teaching than their cooperating teachers who did not receive such training. Thirdly, that there were no significant differences between the teaching patterns of student teachers not trained in interaction analysis and

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[1]John Hough and Richard Ober, "The Effect of Training in Interaction Analysis on the Verbal Behavior of Preservice Teachers," Interaction Analysis: Theory, Research and Application, ed. Edmund J. Amidon and John B. Hough, (Reading, Massachusetts: Addison-Wesley, 1967), pp. 329-345.

their cooperating teachers who were trained in interaction analysis.[1]

McLeon's study reported at about the same time, is in some respects similar to that of Moskowitz. He sought to determine whether student teachers tended to adopt teaching patterns of their cooperating teachers, and whether student teachers with interaction analysis training displayed indirect teaching behavior during their student teaching. He found that the experimental group with training in interaction analysis utilized more indirect influence and were more sensitive to the teaching patterns of their cooperating teachers than the control group.[2]

In their study of the effects of preservice training in interaction analysis on the verbal behavior of student teachers, Lohman, Ober, and Hough worked with sixty sixth grade student teachers, thirty of whom had been trained in interaction analysis four to twelve months prior to student teaching, and thirty of whom had not been so trained. Observers who used a thirteen category modification of the Flanders system found that the two groups of student teachers differed significantly in their use of verbal behaviors.

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[1]Gertrude Moskowitz, "The Attitudes and Teaching Patterns of Cooperating Teachers and Student Teachers Trained in Interaction Analysis," Interaction Analysis: Theory, Research and Application, ed. by Edmund J. Amidon and John B. Hough (Reading, Massachusetts: Addison-Wesley, 1967), pp. 271-281.

[2]Richard J. McLeon, "Changes in the Verbal Patterns of Student Teachers Who Have Had Training in Interaction Analysis and the Relationships of These Changes to the Patterns of their Cooperating Teachers." Paper read at the 40th Annual Meeting of the National Association for Research in Science Teaching, Chicago, Illinois, 1967.

Student teachers who had been taught interaction analysis were found to use more indirect and less direct teacher behavior than those not so taught. There was also more pupil initiated talk in the classes of the experimental group who had been trained in interaction analysis than those of the control group.[1]

Zahn worked with ninety-two elementary education student teachers in a study of the use of interaction analysis in supervising student teachers. He found that student teachers instructed in and supervised by means of interaction analysis showed more positive teaching attitudes after student teaching than those instructed in and supervised with the use of conventional methods. Secondly, student teachers instructed in and supervised by means of interaction analysis tended to modify their teaching attitudes more positively regardless of the attitude of the cooperating teacher than the student teachers instructed in and supervised with the use of conventional methods.[2]

Kirk investigated the effects of interaction analysis training on the verbal behavior of elementary student teachers. He concluded that there was a relationship between

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[1]Ernest Lohman, Richard Ober and John Hough, "A Study of the Effect of Preservice Training in Interaction Analysis on the Verbal Behavior of Student Teachers," Interaction Analysis: Theory, Research and Application, ed. Edmund J. Amidon and John Hough, (Reading, Massachusetts: Addison-Wesley, 1967), pp. 346-359.

[2]Richard D. Zahn, "The Use of Interaction Analysis in Supervising Student Teachers," Interaction Analysis: Theory Research and Application, ed. Edmund J. Amidon and John Hough, (Reading, Massachusetts: Addison-Wesley, 1967), pp. 295-298.

training in interaction analysis and indirect student teaching. Student teachers with interaction analysis training were "more aware of what they did and of what is possible... they achieved a relaxed, conversational, and content centered atmosphere without being ordered to do so." Student teachers without interaction analysis training "individually achieved the same results through the graciousness of their own proclivities, but those who learned interaction analysis became indirect through positive reactions to the objective instrument, changing as a group..."[1]

Wood investigated the effects of training in verbal interaction analysis on teacher behavior in English and Mathematics classes. The experimental group of ten English and ten Mathematics teachers constructed and utilized an instrument for coding teacher student verbal behavior in their classrooms. Experimental and control classroom sessions were taped and coded; also the teachers responded to attitude inventories. The results of the study showed that the experimental group were more accepting, less critical, less directive, and they had more pupil initiated talk, and less silence and confusion in their classes than the control group.[2]

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[1]Jeffery Kirk, "Elementary School Student Teachers and Interaction Analysis," Interaction Analysis: Theory, Research and Application, ed. Edmund J. Amidon and John Hough, (Reading, Massachusetts: Addison-Wesley, 1967), pp. 299-306.

[2]Nolan Earl Wood, "The Effects of an Inservice Training Program in Verbal Interaction Analysis on Teacher Behavior in the Classroom." Doctoral dissertation, University of Houston, 1968.

Jeffs trained an experimental group of four mathematics and social science student teachers to use the Flanders instrument for self evaluation and feedback during student teaching. A control group did not receive any training. The results of the study showed that the experimental group increased their use of accepting ideas of pupils, and promoted a greater frequency of pupil initiated talk.[1]

The study reported by Bondi in 1969 investigated the effects of interaction analysis feedback on the verbal behavior of student teachers. The experimental group consisted of forty randomly selected, senior elementary education student teachers who were observed by means of the FIAC instrument for eight, weekly, fifteen minute periods during student teaching and were provided with feedback to help them change their classroom verbal behavior. A control group did not receive treatment. The results of the study showed that the experimental group used more indirect teaching behavior than the control group.[2]

Strawitz developed a "Science Interaction System" which was used by supervising teachers to train and supervise an experimental group of thirteen preservice secondary school science student teachers. A control group of thirteen

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[1]George A. Jeffs, The Effects of Training in Interaction Analysis on the Verbal Behavior of Teachers (Bethseda, Maryland: ERIC Document Reproduction Service, ED 023 621, 1968).

[2]Joseph C. Bondi, Feedback in the Form of Printed Interaction Analysis Matrices as a Technique for Training Student Teachers (Bethseda, Maryland: ERIC Document Reproduction Service, ED 028 995, 1969).

student teachers relied on feedback for studying audiotapes of their own classes. The results of the study showed that the experimental group used more flexible and indirect verbal behavior than the control group.[1]

In 1971, Traill reported a study in which he investigated the use of interaction analysis by student teachers or by supervisors to evaluate classroom verbal behavior of student teachers. He concluded that interaction analysis was an effective teacher training procedure and could be utilized by both student teachers and supervisors.[2]

The purpose of the study reported by Olmo in 1973, was to use interaction analysis techniques to help intern teachers to utilize higher levels of learning in their teaching behavior than those reported in studies of experienced teachers. Each of the twenty interns used interaction analysis instruments to observe, evaluate, obtain feedback, and plan a micro unit lesson which he taught to four different laboratory school classes. Results showed that the goal was achieved.[3]

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[1]Barbara Marie Strawitz, "The Development and Evaluation of Verbal Behavior of Secondary Science Student Teachers." Ph.D. dissertation, University of Texas, Austin, 1970.

[2]R. D. Traill, "The Effects of Using Interaction Analysis as a Means of Assisting Student Teachers to Analyze Teaching Behavior." Australian Journal of Education 15 (October 1971):295-304.

[3]Barbara Olmo, Interaction Analysis for Teacher Preparation, Bethseda, Maryland: ERIC Document Reproduction Service, ED 087 758, 1973).

Literature reviewed in this section shows that the use of interaction analysis in preservice and inservice teacher training does have an effect in shaping and modifying classroom verbal behavior of teachers, and can be used to help preservice and inservice teachers to change teacher-pupil verbal interaction of their classes to acquire indirect teaching behavior.

D. Research Which Relates to the Effects of Training in Interaction Analysis on Subsequent Teaching Behavior in Schools

Little research has been done on the effects of interaction analysis training on subsequent teaching behavior in schools.

Smith's study reported in 1976 is one of the few research studies done in this area.[1] Smith investigated the effects of preservice training in interaction analysis on subsequent teaching behavior in schools. He compared an experimental group of teachers with preservice training in FIAC and a comparison group of teachers without pre- or post service training in FIAC. Findings indicated a positive relationship between preservice instruction in FIAC and indirect verbal interaction behavior in subsequent teaching in schools. The experimental group exhibited more indirect teacher behavior than the control group.

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[1]Eldon C. Smith, "A Latitudinal Study of Preservice Instruction in Flanders Interaction Analysis Categories." Doctoral dissertation, Arizona State University, 1976.

E. Research Which Show Negative Effects of the Use of Interaction Analysis in the Training of Teachers

Comparatively few studies have found the use of interaction analysis ineffective in helping preservice and inservice teachers to change their classroom teaching behavior.

One of the few studies in this area was reported by Yulo in 1967. Yulo worked with fourteen candidates for the "master of arts in teaching" degree who in addition to receiving the usual supervision during student teaching, were also observed six times for the recording of classroom behavior with the use of the FIAC instrument. Seven of the candidates who constituted the experimental group were provided with FIAC feedback, but the control group which also consisted of seven candidates was not provided with FIAC feedback. The results of the study showed that there was no significant difference in the teaching behavior of the experimental and control groups; but there was indication that FIAC data can be used by interns to study their teaching behavior and become more aware of the dynamics of classroom interaction. In this respect, it was concluded that FIAC can be a useful device as one component of a comprehensive approach to training in verbal behavior in the classroom.[1]

The findings of Williams' study reported in 1972, are in some respects similar to Yulo's. Williams investigated whether FIAC was capable of modifying teacher verbal behavior

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[1]R. J. Yulo, An Exploration of the Flanders System of Interaction Analysis as a Supervisory Device with Science Interns (Harvard University, Cambridge, Massachusetts, 1967).

characterized as direct teacher influence. He used two control and one experimental groups. Group I (control) consisted of three teachers whose teaching patterns was indirect. Group II (control) consisted of four teachers whose teaching pattern was direct. Group III (experimental) consisted of five teachers whose teaching pattern was direct. Group III were observed three times for recording of classroom behavior with the FIAC instrument, and were provided with feedback. Groups I and II were not subjected to such treatment. Results showed that there was no significant difference in the teaching behavior of Groups II and III, and that Group III failed to reach the point of indirectedness of Group I.[1]

F. Summary

From the foregoing review of literature on the historical development of interaction analysis and its role in changing classroom teacher-pupil behavior, it is evident that its development filled an important gap in the field of instructional measurement. With its introduction it became possible for the first time to measure, classify and analyze the instructional language of the classroom empirically and statistically.

Beginning in the late 1930's there developed a variety of observation systems for coding classroom language. Literature shows that most of these observation systems focus on

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[1]Willie Elbert Williams, A Study of a Process to Modify Verbal Interaction Patterns of High School Geometry Teachers (Ann Arbor, Michigan, 1972).

behaviors of pupils and teachers in the teaching-learning process, and have functioned either as research tools for reinforcing the already working principles, or for discovering new ones, and unearthing new knowledge, all of which have served to strengthen the scientific basis of interaction analysis, or as classroom observation instruments to provide a preservice or inservice teacher with a perspective of his own instructional behavior to help him change.

The literature of the research relating to the role of interaction analysis in changing classroom teacher-pupil behavior is consistent, and shows that interaction analysis can yield reliable and objective data about classroom behavior and can be used as a feedback mechanism in preservice and inservice training to help teachers change their verbal behavior and improve. Comparatively, only a few studies show that interaction analysis training is ineffective in helping preservice and inservice teachers change classroom behavior.

The search of literature reveals that little research has been undertaken on the effects of interaction analysis training on subsequent teaching behavior in schools. There is need for intensified research in this important area, especially considering that the ultimate goal for investing in teacher training is to attain higher quality teaching in schools.

The research reported in the present study investigated the extent to which FIAC training and its use for self evaluation and feedback produced change in thirteen verbal

behaviors (enumerated in Chapter I under "Effective classroom verbal behavior") of preservice secondary school student teachers. The results of the study showed that the experimental group became more indirect in some of the verbal behaviors than the control group which did not undergo such treatment. These results are to some extent consistent with some of those of the research studies reviewed in this chapter. In this respect, this study contributes toward building confidence on the conclusions reached.

CHAPTER III

DESIGN OF THE STUDY

A. Setting

This experimental study was conducted in Kenya between September 1977 and November 1978. Initially, the Ministry of Education, Kenya Government approved and gave clearance for the study. Secondly, Kenyatta University College administration granted permission for the College to be utilized as the setting for the study. Accordingly, Kenyatta University College and some thirty-eight secondary schools in Nairobi and environs, where student teachers in the study underwent seven weeks of teaching practice, provided the setting for the study. Kenyatta University College is located on the outskirts of Nairobi, the country's capital, about thirty kilometers from the city center. Until 1978, University level teachers for secondary schools throughout the country were trained at the University of Nairobi and Kenyatta University College which is a constituent college of the University of Nairobi. In September 1978, the two programs were amalgamated; Kenyatta University College is currently the only institution in the country which prepares University level teachers for secondary schools. Although other teacher training programs operate in Kenya, the choice of Kenyatta

University College as the setting for this study was appropriate because it provided a realistic field setting and relevant background for a study of this type.

B. Population

Kenyatta University College offers various types of teacher education programs, but the one which was most relevant for this study is the three-year Bachelor of Education degree in the social science subjects. A candidate has to possess a higher school certificate with a minimum B grade average to be admitted to the program, and is required to take courses in at least two school subjects which he will teach after graduation. The other components of the curriculum in this program include the foundations and philosophy of education, psychology of learning, educational administration and planning, general and special methods theory, microteaching, and teaching practice. This study was concerned with the teaching practice component of the curriculum as this is the primary experience wherein the student teachers learn in a practical way about classroom instructional techniques which include verbal behavior. The study experimented with one subject field in the social sciences area - geography. In accordance with this type of study, the College administration in consultation with the Departments of Geography and Educational Communications and Technology identified forty-nine second year Bachelor of Education student teachers, with geography as one of their teaching majors, as an appropriate population for the study.

C. Sample

The population of forty-nine student teachers described above was randomly assigned to two groups - the experimental and control groups. The experimental group consisted of twenty-five student teachers, nineteen of whom were males and six of whom were females. The control group consisted of twenty-four student teachers, seventeen of whom were males and seven of whom were females. The approximate age range of the subjects was twenty to twenty-five years. The sample data are summarized in Table 3.1.

TABLE 3.1

SAMPLE DATA

	Groups	
Sex	Experimental	Control
Males	19	17
Females	6	7
Total	25	24

D. Preparations

Conference

Formal introduction of the research task to the various groups and individuals of Kenyatta University College whose schedules were affected by the research was accomplished through a Conference. Those in attendance included the forty-nine student teachers, faculty members of the Educational

Communications and Technology and Geography Departments, a research assistant who was also a member of the faculty, a member of the administration, and a technician who assisted with the technical chores of the research.

Three important items of importance to the research were discussed and accomplished at this Conference. First, the background to and the purpose of the study were explained. It was explained that the study was a partial fulfillment of the researcher's Doctor of Philosophy program at the University of Pittsburgh, but more important was the fact that the study was an attempt to investigate and suggest improved strategies and practices of training teachers in instructional technology. This latter objective expressed one of the College's aims to encourage research that contributed to better and improved practices of training teachers. Secondly, a brief explanation of the function of the interaction analysis technique in helping teachers to improve classroom teacher-pupil interaction was given. All the subjects received a handout describing the FIAC verbal system,[1] in this way, the control group was exposed to the specific verbal categories which the experimental group dealt with. It was observed that in teaching some subjects, particularly social sciences the content of which is suited to verbal presentation, it is necessary to encourage pupils to participate in the classroom talk. Various studies which deal

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[1]A description of the FIAC verbal categories is found in Appendix C.

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with this dimension of classroom instruction indicate that an indirect, flexible teaching approach which solicits pupil participation through questions, and encourages them through praising, developing, and using their ideas is more effective than a direct approach.[1] It was noted that the conventional method used at the College to train student teachers in classroom instructional techniques sought to help them acquire and use indirect and flexible teaching behavior when dealing with content for which verbal presentation was appropriate. It was concluded that the objective of conventional training in this respect was similar to that of the FIAC study,[2] "Student teachers shall use indirect verbal teaching approach when dealing with content which was suited to verbal presentation."

Finally, it was agreed that FIAC training would take place once a week on Fridays from 4 P.M. to 5:15 P.M. and that the training would run from November 1977 through April 1978 (except for the vacation period from December 17, 1977 to January 7, 1978). This amounted to twenty-one meetings (1¼ hours in length) for a total of 26¼ hours. This is close to the thirty to forty hours suggested by Hansen and Anderson.[3]

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[1]For further information on effectiveness of indirect verbal behavior in teaching, see p. 17-22.

[2]A description of the objectives of this study is found on p. 10-12.

[3]John H. Hansen and Robert A. Anderson, Teachers' Manual: Interaction Analysis (Northwest Regional Educational Laboratory, Portland, Oregon, December 1969).

Preparation of Training Materials

In order to develop materials for training, ten high school geography classes were either video- or audio-taped. The classes which were video-taped included:

one Form 5 boys' class

two Form 3 co-education classes, and

two Form 2 co-education classes.

The classes which were audio-taped included:

one Form 3 girls' class

one Form 3 co-education class

one Form 2 co-education class

one Form 1 boys' class, and

one Form 1 co-education class.

Forms 4 and 6 classes were not available for taping because they were preparing for the National examination at that time of year (October/November). With this exception, the classes listed above were representative of the typical Kenyan high school classes with respect to the range of Forms, the subject, sex, and age which ranged from twelve years in the junior Forms to nineteen years in the senior Forms.[1]

The teachers who were video-taped included:

- one male teacher (one video-tape)
- two female teachers (two video-tapes each with different classes and different subject content)

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[1] In Kenya, Forms 1 to 4 are classified as Junior High School and correspond to the United States grades 8 to 12; and Forms 5 and 6 are classified as Senior High School and correspond to the United States grades 13 and 14 or the first two years of college.

Teachers who were audio-taped included:

- one male teacher (one audio-tape)
- three female teachers (one of whom was audio-taped twice with different classes and different subject content)

These teachers were representative of the typical Kenyan high school teacher with respect to sex, level of education and training (university level). It was concluded that the materials collected were relevant and appropriate for the purpose of FIAC training. Altogether, five video- and five audio-tapes were produced. Two of the videos including the Form 5 class with a male teacher teaching "Soil Erosion in Tropical Regions" and a Form 3 class with a female teacher teaching "the Relief Features of the British Isles" were transcripted, and samples of the three FIAC analysis steps described under "Instrumentation" below were prepared to be used for demonstration during the FIAC training. This concluded the preparation stage.

E. Treatment Procedure

The experimental treatment consisted of 26¼ hours of FIAC training for approximately 1½ semesters (November 1977 through April 1978) and the use of FIAC for self-evaluation and feedback during the seven weeks teaching practice period (June 12, 1978 to July 31, 1978). The FIAC training, self-evaluation, and feedback procedures are discussed below.

The FIAC Training[1]

Objectives of the FIAC Training. The FIAC training for the experimental group was conducted by the researcher with the aid of a research assistant and a technician. The immediate objectives of the training were to enable the subjects to learn the FIAC categories to the level of automatic response, to master the three FIAC analysis steps described later under "Instrumentation" and to use the steps to analyze a lesson and to infer the verbal behavior therein correctly. The long term objectives of the training were that a student teacher would be able to use the FIAC technique to analyze and infer the teacher-pupil verbal behavior of at least two of his own audio-taped geography lessons during teaching practice, secondly, that he would be able to use this information as feedback to vary, limit, or expand verbal behavior of his class to acquire indirect verbal teaching behavior.

Learning Activities. The textbook used for this training was "The Role of the Teacher in the Classroom" by Amidon and Flanders.[2] This text contains several guidelines on the theory and application of the Flanders category system. Initial sessions dealt with the theory and application of interaction analysis, and its role in the training of teachers in classroom teacher-pupil interaction. Subjects

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[1]A sample of the time-table which was used for training is found in Appendix G.

[2]Edmund J. Amidon and Ned A. Flanders, The Role of the Teacher in the Classroom: A Manual for Understanding and Improving Teachers' Classroom Behavior (Minneapolis, Paul S. Amidon and Associates, Inc. 1963).

were then given drills in memorizing the FIAC categories. This was followed by exercises demonstrating the three FIAC analysis steps presented on video-tapes, and samples of the three respective steps which had been prepared for the purpose. In the subsequent sessions, subjects practiced the FIAC analysis steps one at a time, first, in one large group to expedite discussion of problems encountered during the initial trials, and then in five small groups ranging in size from four to six persons. The video- and audio-tapes, which were produced during the preparation period, were used for the practice.

Determining Interrater Reliability. To determine whether the immediate objectives of training were achieved, and as the final stage in training, paired subjects in the various groups analyzed tapes using the FIAC method independently, and interrater reliability tests were administered to determine the degree of agreement between subjects.

Interrater reliability between each independent member of the pair was determined using Scott's coefficient 'π' - a method which has been suggested and described by Flanders. The advantages of this method according to Flanders are, that it is not affected by low frequencies, is adaptable to percentage figures, and is more sensitive at higher levels of reliability.[1] The 'π' coefficients for pairs of independ-

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[1]Ned A. Flanders, "The Problems of Observer Training and Reliability," Interaction Analysis: Theory, Research, and Application, ed. Edmund J. Amidon and John B. Hough (Reading, Massachusetts: Addison-Wesley, 1967), p. 162.

ent subjects ranged from .9 to .97, and the average of thirteen such 'π' coefficients was .94. It was concluded that this was sufficient for the purpose of the study. The 'π' coefficients indicated that the results of analysis arrived at independently by the different subjects were very close in agreement. It was therefore concluded that subjects had mastered the FIAC technique, and results obtained independently by them were reliable. It was expected that during teaching practice, subjects would use the technique reliably for self evaluation and feedback to attain indirect verbal behavior in teaching geography.

In addition to the FIAC training, the experimental group along with the control group attended the regular conventional classes in instructional theory.

Use of FIAC for Self Evaluation and Feedback during Teaching Practice. Teaching practice took place from June 12th to July 31st 1978. Subjects of the study, the experimental and control groups, along with the rest of the B.Ed. II student teachers were posted to Secondary Schools in Nairobi and environs (within a radius of approximately 95 kilometers). Subjects of the study were distributed in some thirty-eight secondary schools in this area. There were one to two subjects from either group at each of the schools. Subjects taught one other subject in addition to geography, and taught about two to three, forty-five minute geography lessons per week, to one or more classes.

Only 20 subjects in the experimental group received cassette recorders and were able to use the FIAC self evaluation and feedback technique during teaching practice. There were not enough tape-recorders for all the twenty-five subjects in the experimental group who had received FIAC training. Each of the twenty subjects who received sets were also furnished with two empty ninety minute cassettes, batteries, tally sheets, and matrices. Each subject taped at least two of his geography lessons once a week, or once every two weeks, and processed the data with the use of the FIAC technique. He identified the teacher-pupil verbal behavioral pattern of his class and used the information obtained to change classroom verbal behavior of the subsequent geography classes he taught. For example, after processing the data, if the subject found that there was more teacher directedness, that is he had utilized the direct categories 5, 6, and 7 more than the indirect categories 1, 2, 3, and 4, he attempted to limit and restrict the use of direct categories and to expand the use of indirect categories in his subsequent geography lessons. Similarly, if he found that there was little pupil participation, he made more use of the relevant indirect categories, such as questioning in the subsequent geography lessons, to solicit pupil response and participation.

In accordance with the research requirements, each of the twenty subjects preserved the cassettes and self evaluation data. These were collected at the end of the teaching practice period. Such an arrangement provided a way of determining that the subjects did their task. The

cassettes and data were also checked to ensure that classes had been taped, and data processed properly.

In addition to using the FIAC method of self evaluation and feedback, the experimental group along with the control group and the rest of the second year Bachelor of Education student teachers were, in accordance with the normal college requirements, observed by supervising teachers who used the conventional anecdotal records technique to evaluate the student's teaching and to provide him with feedback.

During this phase of the study, the researcher and assistant visited most of the subject's geography classes. Sometimes the visits coincided with subject's taping of classes for self evaluation and feedback. These visits were useful in that subjects were able to discuss with the researcher and assistant their experiences with the technique, problems encountered and the pros and cons of the method. Implications of some of the questions which were raised by the subjects are discussed in Chapter V.

F. Instrumentation

Instrument

The Flanders Interaction Analysis Categories constituted the instrument used to classify, tabulate, and analyze classroom verbal behavior of the subjects. Appendix C presents a summary of the verbal categories and brief definitions. The three steps of the FIAC analysis process are described below.

The FIAC Analysis Process

First Step: Classification of Verbal Behavior onto Tally Sheet. To classify classroom verbal behavior, a tally sheet, a sample of which is contained in Appendix D, was used.[1] Thorough knowledge of the verbal categories to the level of automatic response was an important prerequisite. Classification of teacher-pupil verbal interaction was done either from a live class or tape. Observing a live lesson, or listening to a taped lesson of the subject, the researcher or research assistant, wrote down the category number of verbal interactions which occurred every three seconds. Efforts were made to record accurately and to keep the tempo. This procedure was repeated until all verbal teacher-pupil interactions in a lesson were recorded. Category number 10 was entered as the first and last number because in accordance with the ground rules of this method, it is assumed that each record generally begins and ends with silence or confusion. At the end of this step, the tally sheet concisted of several long columns of numbers.[2]

Second Step: Transferring Data into a 10-row by 10-column Matrix. In the second step, data from the tally sheet was entered into a 10-row by 10-column matrix. Tabulation

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[1]The tally sheet format was developed by Flanders. More information on this is found in Edmund J. Amidon and Ned A. Flanders, The Role of the Teacher in the Classroom: A Manual for Understanding and Improving Teachers' Classroom Behavior (Minneapolis, Paul S. Amidon and Associates, Inc., 1963), pp. 25-29.

[2]This step is illustrated in Appendix D which is a sample of one of the classes used for training.

was made from the sequence in the tally sheet columns with each pair of numbers overlapping with the previous pair, so that each number except the first and the last was used twice. This may be illustrated by referring to Appendices D and E. Rows are always taken first, and columns are taken second, thus the first pair of numbers in the Appendix D classified tally sheet is 10 and 5. This is shown on the 10-row by 10-column matrix (Appendix E) by a tally in the cell formed by row 10 and column 5. The second pair 5 and 5 is shown in the cell formed by row 5 and column 5. The third pair also 5 and 5 is entered into the cell formed by row 5 and column 5, and so on. The process is repeated until all the pairs of numbers are entered into the matrix. The frequencies are then added up and the sum recorded.[1] Because of the pairing system, the 10-row by 10-column matrix is one frequency less than the sum entered in the classification tally sheet. For example, in Appendix D the total sum of number frequencies is 362, and in Appendix E the sum is 361.

The generalized sequence of the teacher-pupil interaction could be readily examined in the matrix. Cells with heavy build-up of tallies indicated that the specific type of verbal behavior represented by those cells was used more than the verbal behaviors represented by cells in which there were only a few or no tallies. For example, Appendix E shows a concentration of frequencies in cell 5-5, an area which is

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[1]This step is illustrated in Appendix E which is a sample of one of the classes used for training.

sometimes referred to as the content area. This indicates that the verbal category 5, that is lecturing, was used more than the verbal categories represented by cells 1-1 or 7-4, etc. where there are no tallies.

Third Step: Computing and Inferring Verbal Behavior Types. The third step involved computing data from the 10-row by 10-column matrix and inferring the way the respective verbal categories and clusters of categories were used. The verbal categories and clusters which this study dealt with included the verbal categories numbered one through ten, overall teacher talk, overall pupil talk, indirect versus direct teacher talk, and the Indirect/Direct (I/D) ratio.[1] To compute the percentage of each verbal category, one through ten, each of the column totals was divided by the sum of frequencies in the matrix. To find the proportion of overall teacher talk, the total number of frequencies in columns one through seven was divided by the sum of frequencies in the matrix. To find the proportion of overall pupil talk, the sum of frequencies in columns one through four was divided by the sum of frequencies in columns one through seven. To compute the proportion of direct teacher talk, the sum of frequencies in columns five through seven was divided by the sum of frequencies in columns one through seven. Indirect direct (I/D) was computed by dividing the sum of frequencies in columns one through four by the sum of frequencies in columns five through seven. The information obtained was

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[1]A summary of the verbal categories and clusters is found in Appendix C.

then examined to infer the way the respective verbal categories and clusters were used.[1]

G. Constraints

This section discusses limitations of the study, their implications and effects. There were three major sources of limitations in this study, namely: financial, logistical, and time constraints.

While the writer is greatly indebted to the United States Agency for International Development and the African American Institute for funding this study, it is considered essential to identify ways in which financial constraints affected the study because this will facilitate the understanding of some aspects of research findings and implications. Two important adjustments were made due to limited funds. The money available was sufficient for only twelve casette recorders, and Kenyatta University College loaned an additional eight sets so that twenty cassette recorders were available for teaching practice. This meant that only twenty subjects of the experimental group could use the FIAC self evaluation and feedback technique during teaching practice instead of the twenty-five that had received training. In this respect, financial constraints contributed to the mortality factor. Secondly, the working budget allowed for only one research assistant and one technician instead of five research assistants as originally planned. This meant the entire task

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[1]This step is illustrated in Appendix F.

of processing training materials and the pretest and posttest data was done by two individuals - the researcher and a research assistant. It turned out to be a time consuming process which delayed the completion of this phase of the study.

Other sources of difficulty , which also contributed to the mortality factor, were the following: lack of easy access to schools where five of the subjects from the control group did their teaching practice; scheduling difficulties prevented the participation of one subject from each group; and absenteeism also took a toll of one subject from each group. Thus, by the end of the posttest, the study had a total of thirty-five subjects out of the original forty-nine.

A technical problem posed another limitation to the study. Due to a shortage of trained personnel and electronic editing equipment, it was not possible to prepare the training tapes in the ideal, structured sequence of illustrations of direct and indirect verbal behaviors.

Another area of concern relates to the degree to which the equipment used for video and audio taping training materials and the collection of pre- and posttest data affected classroom behavior. Most classes, especially on first visits, were sensitive to the fact that they were being recorded. In most cases, pupils showed a keen interest in the class; other times participation was not so spontaneous, however, such climates are sometimes ordinarily observed in classes so this should not be considered completely atypical.

Logistical and time constraints were two other limitations and affected the study in several ways. Training and field activities had to be accommodated within the regular schedule of the College. Instead of a one week intensive (25 hours) training in January 1978 as originally planned, training activities spread over a twenty-one week period from November 1977 through April 1978 with classes held once a week on Fridays (4 P.M.-5:15 P.M.) for a total of 26¼ hours. This was the most convenient arrangement for the Geography and Educational Communications and Technology Departments which were involved in the study. This affected the study in three ways. First, FIAC training was, for the experimental group, an additional chore to the regular course work and preparation for the B.Ed. II examination, which was only a few weeks away. It is possible that with an already pressing schedule, the added pressure was probably unwelcome by some of the subjects. The cooperation and assistance extended by the Departments concerned and the moral support shown by the College administration probably contributed to the fact that most subjects were cooperative and exhibited a keen interest. Secondly, although the extended training period provided an opportunity for greater quantitative and qualitative impact due to long term effects, it is possible, in this course of time, that individuals from the control group had access to some of the FIAC materials during routine interaction with subjects on academic and other matters. This suggests that possibly some of the subjects from the control group were

exposed to more FIAC features than was intended.[1] In this way, it is probable that inter-treatment contamination was introduced into the study. Thirdly, the seven weeks teaching practice period (June 12th to July 31st) was so short and rushed that probably the full impact of FIAC self evaluation and feedback could not be completely realized.

Interpretation of the results of this study should take these limitations into account, because they probably had some influence on the effects of the treatment and ipso facto the study results. It is therefore suggested that similar future studies should avoid the constraints and limitations encountered in the present study, because this will facilitate the efficiency and effectiveness of the treatment and will enhance the quality of the results.

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[1]For information of the FIAC features, which the control group was exposed to, see p. 51.

CHAPTER IV

MEASUREMENT PROCEDURE AND ANALYSIS OF DATA

This chapter describes how the data of the study was gathered and analyzed. It also reports the results obtained in testing the thirteen hypotheses of the study. The Flanders system of interaction analysis described in the preceding chapter, constituted the tool used to gather data concerning subjects of both experimental and control groups. The data was first subjected to the empirical FIAC analysis process after which the values obtained, with respect to the different verbal categories and clusters, were subjected to statistical tests.[1]

A. Measurement Procedure

The Pretest

Teaching practice took place between June 12 to July 31, 1978. During the first week of teaching practice, subjects in the study, both the experimental and control groups, were visited and one geography class of each subject was taped. The procedure called for the researcher or assistant to sit in the class so that classification of verbal behavior

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[1]The University of Pittsburgh computer system - DEC - 10 model 1099 was used to run the statistical tests.

using the FIAC tally sheet (first step in the FIAC analysis process) was in most cases done at the same time as the taping. It was necessary to revisit some of the classes due to scheduling problems. The twenty subjects in the experimental group who had been issued cassette recorders were visited and taped. Nineteen subjects in the control group were visited and taped. Five of the subjects in the control group were not taped due to scheduling problems or lack of access to the schools where they were teaching. The data gathered was first analyzed using the FIAC technique, so that for each subject taped percentages of each verbal category were computed; also, appropriate computations were carried out for teacher talk, pupil talk, indirect teacher talk, direct teacher talk, and Indirect/Direct (I/D) ratio. This constituted the pretest.[1]

The Posttest

Similarly, during the final week of teaching practice, all thirty-nine subjects were visited and one geography lesson of each subject was taped. Two subjects from the experimental group and one from the control group were not available for the second taping which left seventeen subjects from the experimental group and eighteen subjects from the control group. As in the pretest, the data gathered were analyzed using the FIAC technique, and computations for the respective verbal

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[1]Pretest FIAC percentage and ratio computations for the experimental and control groups, respectively, are found in Appendices H and I.

categories and clusters were carried out.[1] This constituted the posttest.

B. Data Analysis

At the time the pretest was conducted, the experimental group had already received training concerning the use of FIAC, but had not been subjected to the experimental treatment of using FIAC self evaluation and feedback. A first analysis was undertaken to determine whether the two groups were different as a result of the experimental group having undergone FIAC training prior to teaching practice, before proceeding with the testing of the thirteen hypotheses developed to establish differences brought about as a result of the use of FIAC for self eavluation and feedback during teaching practice by the experimental group.

To accomplish this first analysis, an independent 2-samples t-test was used to test the difference between the means of the pretest values for the experimental and control groups at the significance level $\alpha=.01$ in the following verbal behaviors:

Indirect teacher talk,

overall teacher talk,

overall student talk,

silence or confusion.

It was not necessary at this point to do tests for all thirteen verbal behaviors separately because the four verbal

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[1]Posttest FIAC percentage and ratio computation for the experimental and control groups, respectively, are found in Appendices J and K.

clusters enumerated above, are specific combinations of the thirteen separate verbal behaviors and the results of the verbal combinations to some extent reflect the position of the respective verbal behaviors. Secondly, detailed information relating to each verbal category and cluster is more relevant at the hypotheses testing stage than here. Results of that analysis are presented in Table 4.1.

The foregoing analysis reveals that the means of the respective verbal behaviors do not differ significantly, thus indicating that the experimental group was not different from the control group at the beginning of teaching practice in the four verbal behaviors, regardless of the fact that they had received FIAC training.

This suggests that FIAC training, per se, does not necessarily change the teacher's classroom verbal behavior, and, further, that FIAC training must be followed up by actual use of FIAC self evaluation and feedback technique in a real classroom setting.

It is thus proper to state that any differences identified in testing hypotheses of the study were largely accounted for by the fact that the experimental group used FIAC self evaluation and feedback technique during teaching practice.

To test hypotheses one through thirteen, the independent 2-samples t-test was used to test the differences in gains from the pre- to posttest values between the experimental and control groups, in the following verbal behaviors at the significance level $\alpha=.01$.

TABLE 4.1

TESTS OF SIGNIFICANCE FOR DIFFERENCES BETWEEN MEANS FOR EXPERIMENTAL AND CONTROL GROUPS ON FOUR MEASURES OF VERBAL BEHAVIOR PRIOR TO IMPLEMENTATION OF EXPERIMENTAL TREATMENT

	Mean		
Measure	Control Group(N=19)	Experimental Group(N=20)	t-ratios
Indirect teacher talk	45.09	38.56	1.577
Overall teacher talk	78.54	78.12	.188
Overall pupil talk	15.17	14.06	.711
Silence or confusion	6.25	7.82	.649

[1]None of the four t-ratios are significant at the .05 level.

1. acceptance and/or clarification of positive and negative feeling tone of pupils
2. praise and encouragement of pupils' action and behavior;
3. acceptance and use of pupils' ideas, by clarifying, building, and developing these ideas;
4. asking of questions about content or procedures;
5. encouraging pupils to initiate ideas and soliciting specific pupil responses;
6. encouraging pupil divergent talk, by inviting them to respond to broad questions or comments which they initiate;
7. overall pupil talk;
8. indirect teacher talk as opposed to direct teacher talk;
9. lecturing, i.e., giving facts or opinions about content or procedures, and expressing own ideas, and asking rhetorical questions;
10. giving directions, commands or orders;
11. criticism and justification of authority;
12. silence or confusion;
13. overall teacher talk.

The results of the analysis are presented in Table 4.2.

Table 4.2 results indicate that student teachers from the experimental group who received FIAC training and used FIAC self evaluation and feedback technique, (in addition to conventional training and anecdotal records feedback) differed from the control group who trained via the conventional method and relied entirely on the anecdotal records for feedback during teaching practice. They differed in the following verbal behaviors:

The experimental group showed greater change in:

1. The asking of questions,
2. lecturing,
3. encouraging pupils to initiate ideas, and soliciting pupil responses,
4. using indirect teacher talk as opposed to direct teacher talk,
5. the amount of pupil talk occurring in their classes.

However, the two groups did not exhibit significant change in the following behaviors:

1. Acceptance and clarification of positive or negative feeling tone of the pupils. This verbal category was not used at all by either group.
2. Praise and encouragement given to pupils' action and behavior,
3. Acceptance and use of ideas of pupils,
4. Directions, commands and orders given,
5. Criticism of pupils and justification of the teacher's authority,
6. Encouragement given to the pupils to respond to broad questions and comments,
7. Confusion or silence occurring in the class,
8. Teacher talk. There was a decrease in the amount of teacher talk for both groups, but the change was not significant.

For presentation of the results relating to Indirect/Direct (I/D) ratio, reference will be made to empirical FIAC data summarized in Table 4.3. Statistical tests could not be performed meaningfully on data which is in the form of ratios.

The I/D continuum relates to the verbal categories which enhance or curtail the pupils' participation; thus, the teacher can choose to be indirect by maximizing the freedom

TABLE 4.3

MEAN INDIRECT/DIRECT (I/D) RATIOS FOR EXPERIMENTAL AND CONTROL GROUPS

Group	Mean I/D Ratio		
	Pretest	Postest	Gain
Experimental group	.78	1.1	.32
Control group	.86	.98	.12

of the pupils to respond, or he can choose to be direct by minimizing the freedom of the pupils to respond.

The data presented in Table 4.3 reveals that the mean I/D ratio for the experimental group increased from .78 in the pretest to 1.1 in the posttest showing a gain value of .32, whereas that of the control group .86 on the pretest - slightly higher than that of the experimental group - but showed only a slight increase to .98 on the posttest - a gain value of .12. These results indicate that by the end of the teaching practice period, the experimental group of student teachers were more indirect and maximized the freedom of the pupils to respond, but those from the control group were more direct and to this extent curtailed the pupils' freedom to participate.

The conclusions to be drawn from these data analyses are discussed in the next chapter.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

A. Summary of the Results

This study was primarily concerned with testing the effectiveness of the use by student teachers of the FIAC method of analyzing teacher-pupil verbal interaction and obtaining feedback in order to change and attain indirect verbal teaching behavior. The thirteen null hypotheses of the study were as follows:

There will be no significant difference in the gains between the experimental and control groups in the following verbal behaviors:

1. Accepting and/or clarifying positive and negative feeling tone of pupils,
2. Praising and encouraging pupil action and behavior,
3. Accepting and using pupils' ideas, by clarifying, building, and developing these ideas,
4. Asking questions about content and procedures,
5. Encouraging pupils to initiate ideas and soliciting specific pupil responses,
6. Encouraging pupil initiated talk by inviting them to respond to broad questions or comments which they may initiate,
7. The overall amount of pupil talk,
8. The overall use of indirect verbal behavior as opposed to direct verbal behavior,

9. Lecturing, that is giving facts or opinions about content or procedures, and expressing own ideas, and asking rhetorical questions,

10. Giving directions, commands or orders,

11. Criticizing pupils and justifying the teacher's authority,

12. Silence and confusion occurring in the classroom,

13. The overall amount of teacher talk.

It was learned in the preceding chapter that five null hypotheses of the study were rejected and eight were accepted. The results of the study may be summarized as follows. The experimental group evidenced change and improvement in questioning, initiating, and soliciting pupil responses. They lectured less, there was more pupil talk in their classes, and they used more indirect verbal behavior as opposed to direct verbal behavior than the control group. However, the experimental group did not evidence change in eight verbal behaviors. There was a decrease in the overall teacher talk by both groups, though the difference was not significant. The experimental group did not accept pupils' feelings, or praise and encourage them, or accept and use pupils' ideas more than the control group. There was not much difference between the two groups in the amount of directions and commands given, in their criticism of pupils and justification of the teachers authority, and in the amount of confusion or silence occurring in the class.

From the summary of the results given above, it can be seen that the experimental group did attain indirect

teaching behavior in several verbal behaviors. This suggests that the FIAC system can be used to help student teachers change their classroom verbal behavior, and further, that the FIAC system can provide a stable and predictable basis on which the student teacher can make deliberate change to acquire desired classroom verbal behavior. It was also learned that the experimental group did not attain indirectedness in several verbal behaviors. The view held by this study is, that some of the constraints and limitations discussed in Chapter Three had direct or indirect influence upon the study results, and largely accounted for the lack of change in the verbal behaviors enumerated above. The most serious of these constraints relates to the time factor. It was observed in Chapter Three that the teaching practice period was short and rushed. This meant that the full impact of the FIAC self evaluation and feedback technique could not be completely realized; which suggests that the results would be more pronounced over a longer teaching practice period, during which the student teachers would have ample time to use the technique and to modify their behavior. A second explanation to the lack of change in these verbal behaviors could be that some behaviors are more resistant to change than others.

Although this study was conducted in Kenya with a population and circumstances that are different from those of most of the studies reviewed in the literature, its results are in some respects consistent with those of most of these studies. This is important in two respects. First,

it serves to build confidence in the conclusions reached about the utilization of interaction analysis in teacher training; that is, interaction analysis training does have an effect on shaping and modifying classroom verbal behavior of student teachers, and it can be used to help them to attain indirect teaching behavior. Secondly, coupled with the fact that this study met the randomization requirement, it suggests that these results may be generalized to similar, even though non-equivalent, populations and situations. This is valuable recommendation for the international market of teacher education. Although FIAC (along with several other interaction analysis systems) was originally developed and used in the United States - an English speaking country - it is, as are other techniques in teacher education and other fields, infiltrating the international market of countries which may not speak English. For example, the FIAC system was one of the techniques discussed and recommended for use in other countries at a seminar on the "Use of Recording Devices for Behavioral Observation and Analysis in Teacher Training" organized by the United Nations Educational Scientific, and Cultural Organization (UNESCO). The conference was held in Turin Italy in 1972, and attended by scholars from eighteen African, European, and Arab countries.[1] This points to the importance of modifying techniques to suit particular local needs and situations.

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[1]"Seminar on the Use of Recording Devices for Behavioral Observation and Analysis in Teacher Training." UNESCO, Paris, December 1972, pp. 63-76.

B. Conclusions Relating to the Advantages of Using the FIAC System for Training Student Teachers

Evidence has been presented in the preceding chapters which demonstrate that the FIAC system has several advantages over the conventional anecdotal records system in providing feedback on classroom verbal behavior. It offers the student teacher a means of gathering objective data about teacher-pupil interaction, and, ipso facto, a rational and empirical basis for assessing and analyzing his verbal behavior in the classroom. The conventional method on the other hand is restricted in that it depends entirely on the supervising teacher who has to observe the student teacher in order to provide subjective feedback about the student's verbal behavior in the classroom. The FIAC procedure is much more dependable because of its empirical basis, and is capable of providing reliable information about the student teacher's verbal behavior in the classroom which will enable him to make relevant, systematic and meaningful change. The FIAC system offers a viable alternative for the evaluation of verbal teaching performance. Reliable evaluation of classroom teaching behavior is a key factor in suggesting what needs to be rectified in order to achieve effective classroom teaching. In this respect, interaction analysis has potential for dealing with this aspect of teacher education and should therefore be considered seriously by teacher trainers.

In this study, FIAC was used by the student teachers for self evaluation and feedback, but the research litera-

literature reviewed in Chapter Two indicates that FIAC can also be used, and usually is, as a supervisory tool.[1] In this capacity, FIAC enables the supervising teacher to provide the student teacher with objective feedback about his classroom verbal behavior. It appears that combined use of these two FIAC utilization strategies in teacher training programs - as a self evaluational tool by the student teachers and as a supervisory tool by the supervising teacher - offers a more efficient and effective means of helping student teachers acquire desired instructional verbal behaviors that are considered essential for effective teaching.

The teacher is the architect of the teaching-learning situation. Because of his influence and responsibility, it is important that he learn as much as he can about the methods, processes and strategies he employs to influence his pupils. This study has demonstrated that FIAC can be used by the student teacher as a self-evaluational mechanism, and as a feedback device. This enables him to analyze his own instructional verbal behavior in the classroom, to examine and study what he actually does and to incorporate the information into his new plan in order to improve his subsequent teaching. In this way FIAC provides the means of making the student teacher sensitive to his own verbal behavior and aware of its effect on the pupils. With this

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[1]Richard D. Zahn, "The Use of Interaction Analysis in Supervising Student Teachers," Interaction Analysis: Theory, Research and Application, ed. Edmund J. Amidon and John B. Hough (Reading, Massachusetts: Addison-Wesley, 1967), pp. 295-298.

knowledge, he can make more valid judgments and take decisions to change and improve his verbal behavior to achieve desired and intended effects in the classroom.

Most studies available on interaction analysis such as those reviewed in the professional literature indicate that the process has largely been used by research scholars and educators, to prepare and evaluate student teachers or in-service teachers, to provide them with feedback about their verbal and/or non-verbal behavior in the classroom, and to study socio-emotional climate and verbal and non-verbal classroom processes. In some cases independent raters have been used. There are not many instances where the procedure has been deliberately or totally entrusted to the trainee to apply it on himself, obtain feedback, and to change his classroom verbal behavior, as was the case in this study. This strategy may be capable of promoting more intensified use of interaction analysis by student teachers. Such use of interaction analysis would appear to be a highly commendable technique with which to equip teacher trainees for continued self improvement as inservice teachers.

A long term implication of FIAC training and utilization is that once the technique is mastered during preservice training, it can be utilized regularly by student teachers after they graduate and begin to teach in secondary schools in different parts of the country. They may assess, analyze, and adjust their classroom teacher-pupil interaction to attain verbal behaviors desired for particular learning

situations. In this respect, the FIAC system equips an in-service teacher with the appropriate training to gather empirical evidence about his instructional verbal behavior, to identify problem areas, to generate instructional principles about his teaching behavior which can serve as a guide for improvement of his subsequent teaching, and as a source of valuable teaching experience. In this way, FIAC represents a special tool for the prospective or inserve teacher in the form of self-diagnosis and subsequent improvement. But sustained utilization of interaction analysis concepts and skills by serving teachers (with undergraduate or graduate training in interaction analysis) will probably require motivation and reinforcement, which may best be provided through regular in-service courses organized as follow-up measures to preservice training in the procedure.

C. Other Applications for Interaction Analysis

Advantages associated with FIAC training and its utilization for self evaluation and feedback discussed above, make it a tool worth considering for application in similar teacher education programs. It was noted earlier that the Government of Kenya operates non-university level teacher education programs which prepare teachers for the primary schools. A reflective question to pose at this juncture pertains to the applicability of FIAC to comparable but non-equivalent situations. The FIAC data analysis process is fairly complex, time consuming, and can be quite tedious. The experience with the FIAC system in this study demonstrates that

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university level teacher trainees can handle the tool correctly and with the speed required to accomplish the ultimate goal-that is changing verbal behavior in the practice teaching classroom. It is possible that less qualified teacher trainees might find the process difficult. This problem might be dealth with in the following ways: first, where the interaction analysis instrument is manipulated by student teachers themselves for self evaluation and feedback, as in this study, a simplified form of the instrument is desirable for non-university teacher training programs. Utilization of a modified form of FIAC has also been found expedient and economical for university level teacher training. Appendix L presents an example of a simplified and expedient form of the FIAC instrument used at the University of Pittsburgh to train undergraduate secondary school teacher trainees in classroom verbal behavior. In using this tool, complete verbal communication utterances occurring either as one work, or as a phrase, or as a sentence during the teaching process are recorded under the appropriate verbal categories, then an analysis is done to find how frequently each verbal category was used, and to determine whether the way in which these verbal communication utterances were used is acceptable and effective for the particular classroom situation. Secondly, independent trained observers can be used to analyze the data and provide the student teachers with feedback. Thirdly, improved technology in processing interaction analysis data using a computer, will not only provide an alternative solution to a problem such as this, but will also facilitate the intensified use of interaction analysis in both university

and non-university level teacher education programs.

D. Other Findings

An observation commonly made by most of the subjects of the experimental group regarding their experience in using the FIAC technique, was that an encounter with one's own verbal teaching behavior by means of audio play-back during the FIAC self evaluation and feedback process was, in some respects, a provocative experience. Such self encounters with one's verbal behavior not only created intimate awareness of his classroom language, but also probably prompted personal change of voice characteristics. This factor has direct relevance to self-confrontation - an experience that is largely associated with the student teachers' training with microteaching - a component of the curriculum which falls outside the scope of this study. But this factor is significant in the present context in two ways. First, it reveals the kind of overlap that generally pervades instructional skills and behaviors that are sometimes taught by different methods in teacher education programs. Secondly, it points to the importance of a carefully planned and well coordinated teacher training program in which the series of training activities can be planned to complement each other. This study was concerned only with the FIAC training procedures which focus on verbal behavior. But it is also possible that the effectiveness of FIAC could be further enhanced by a well coordinated teacher education program which utilizes other techniques, such as microteaching, and incorporates such instructional

strategies as self-confrontation. This may help to improve other behaviors such as voice characteristics which is also an important dimension of classroom verbal behavior. This serves to explain why the best results in utilizing interaction analysis may ultimately depend on how well it is integrated into a carefully planned and well coordinated teacher training program. It is very probable that no single training technique can hope to accomplish all the theoretical and practical goals that a teacher education program ultimately seeks to attain.

E. Technical Questions Raised by the Study

This study raises two technical questions regarding the use of FIAC. The first relates to the silence or confusion category which Flanders explains, accounts for the time spent in behavior other than that which can be classified as teacher or pupil talk.[1] Teacher trainers and other educators using interaction analysis in their teacher training programs are also concerned with other dimensions of classroom processes such as the non-verbal behavior. In this context, confusion is a disruptive and undesirable classroom behavior, whereas silence can be used constructively in a deliberate and planned fashion as part of the teacher's repertoire to produce certain effects in the classroom. The trainer who may want to use the FIAC system to improve verbal instructional skills

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[1]Edmund J. Amidon and Ned A. Flanders, The Role of the Teacher in the Classroom (Minneapolis, Paul S. Amidon and Associates, Inc., 1963), p. 6.

of trainees, will find it more efficient and time saving to be able to use available information regarding such aspects of classroom behavior as these two. It is therefore necessary to separate the two, so that specific information about each behavior can be obtained separately and can be used when needed.

A second question relates to the acceptance and clarification of positive or negative feeling tone of pupils' verbal behavior (category one) - a category which was hardly used by either the experimental or control group. This is explained by the fact that this category is concerned with the emotions of pupils in the class, and many teachers see the class as a place for dealing with ideas not feelings. On this point, Amidon and Flanders state that

> ...statements belonging in category one are used very rarely in any teaching style, the average time appearing to be less than .5% of the total time. Little difference in the use of category one is found between direct and indirect teachers. Indirect teachers may use up to .5%, while direct teachers usually use less than .1%. Not much use then is made of clarifying emotion of students in the classroom. This category is maintained because of the significance of such behavior when it does occur.[1]

The use of this category, therefore, may largely depend upon the teacher's personal assessment of the pros and cons of utilizing the category in a given classroom situation, or with specific types of learners. The matter has cultural dimen-

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[1]Edmund J. Amidon and Ned A. Flanders, "Interaction Analysis as a Feedback System," Interaction Analysis: Theory Research and Application, ed. Edmund J. Amidon and John B. Hough, (Reading, Massachusetts: Addison-Wesley, 1967), pp. 137-138.

sions which will vary from country to country, and for which there is no single solution.

F. Questions for Further Research

This study raises five questions which require further investigation. The first question relates to the teacher's rate of speech in the classroom. This question may be more pronounced in a situation where the language of instruction is a second language and not well mastered by the teacher and/or the pupils. Depending on the achievement level and age of the pupils, the teacher's speaking rate and the clarity with which he talks can facilitate or hinder learning. It is therefore important to be able to identify this dimension of verbal behavior in the classroom in order to adjust the rate when necessary. Based on subjective observations of this aspect of verbal behavior with several subjects in the study, the researcher concluded that the verbal communication of some student teachers was spontaneous, well paced, and stimulating; a few student teachers were slow and not always clear in their speech. This could be attributed to the fact that English is a second language in Kenya, which introduces a problem in the use of the FIAC technique. The FIAC computations do not reflect the rate of speech, but there is need to identify this dimension of classroom verbal behavior and to modify it where necessary. A well organized and fast speaking teacher will probably accomplish more than a slow but less clear teacher. Amidon and Flanders have suggested that at the same time as classifying verbal categories, the observer can

make marginal notes which will help explain what is happening in the class.[1] This offers a plausible alternative that can be used to deal with the problem, but a more efficient device is desireable. This suggests an area for further research.

The next three questions are related and are therefore discussed together. In a teaching-learning situation and with a subject content where indirect verbal instructional approach is considered appropriate, it is anticipated that the pupils learn more by participating in the discussion. This raises the question, to what extent does the teacher interact with each individual pupil during the course of the lesson to ensure that each one has an opportunity to participate and to learn? The FIAC instrument does not provide for the observation or collection of this kind of information, yet this may be a key factor in the question of the effectiveness of interaction analysis where indirect verbal behavior is involved, and suggests an area for further research. This leads to a related question; what is a reasonable number of pupils a teacher should have in a class in order to be able to interact effectively with all or most of them in an indirect verbal approach? In other words how many pupils constitute a workable teacher load in a given classroom situation. Anderson states that teachers respond at a fairly constant

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[1]Edmund J. Amidon and Ned A. Flanders, The Role of the Teacher in the Classroom (Minneapolis, Paul S. Amidon and Associates, Inc., 1963), p. 13.

rate regardless of the numbers of children before them.[1] This suggests that it is essential to identify optimal class size and length of lesson time that are appropriate for given teaching situations and teaching strategies. The classes observed in this study were about forty to forty-five minutes long, and the numbers of pupils in each class ranged from twenty-five to forty. It is difficult to establish how class size and length of lesson time facilitated or hindered effective indirect verbal interaction. This suggests an area for further research.

A final area suggested for further research refers to a factor which was discussed in the review of literature. It was learned that little research has been undertaken on the effects of interaction analysis training on subsequent teaching behavior in schools. There is need for intensified research in this important area, especially considering that the ultimate goal for investing in teacher training is to attain higher quality teaching in schools.

G. Final Comment

This study investigated the effects of FIAC training and its use for self evaluation and feedback on the classroom verbal behavior of preservice student teachers. Evidence has been presented in the preceding chapters which show that utilization of interaction analysis in teacher training, does

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[1] Harold H. Anderson, "The Measurement of Domination and of Socially Integrative Bheavior in Teachers' Contacts with Children," Interaction Analysis: Theory, Research, and Application ed. Edmund J. Amidon and John B. Hough, (Reading, Massachusetts: Addison-Wesley, 1967), p. 16.

have an effect on shaping and modifying classroom verbal behavior of student teachers. Analysis of the data obtained revealed that the experimental group which received the FIAC training and utilized FIAC self evaluation and feedback technique during teaching practice, became more indirect in some of their classroom verbal behavior than the control group which did not under such treatment. This suggests that interaction analysis can be used effectively to help student teachers acquire indirect instructional verbal behavior, which is perceived to constitute effective teaching in many classroom contexts. It therefore is a skill which can help produce flexible teachers who can handle classes effectively by adapting to their needs.

APPENDICES

APPENDIX A

GUIDELINES FOR LESSON ASSESSMENT

Comments should be made on each of the main headings and sub-heading as appropriate for the subject discipline.

Preparation:

(a) Objectives: Were the lesson objectives clearly defined in terms of specific and attainable pupil behaviours to be acquired and standards of performance expected?

(b) Lesson Materials: Was the subject content and the material appropriate as regards: amount, quality, organization and relevance to subject discipline, pupils, and learning situation?

(c) Teaching Aids: Did the teacher prepare (select) suitable teaching aids — number, quality, relevance — and plan their effective use?

(d) Lesson Plan: Did the lesson plan indicate thorough planning in the effective use of time, pupil activities, teacher activities, subject matter and teaching aids to achieve the instructional objectives?

Performance

(a) Competence in Lesson Development:
Was the lesson suitably organised, unified and paced?
Did the teacher's introductory step realistically link the new work with previous pupil experience, focus the pupils' attention, and motivate them to engage in the learning task(s)?
Did the steps of the body of the lesson involve the pupils in a sequence of activities that developed and evaluated the types of pupil competence specified in the objectives?
Did the concluding step serve to unify the lesson, evaluate and consolidate its achievements in terms of performances specified in the objectives.
Was there adequate provision for sustained motivation and individual differences: use of groups, individual differences: use of groups, individual assignments, and individual assistance.

(b) Competence in Appropriate Teaching Procedures and Techniques
To what extent were the procedures and techniques used appropriate to the subject discipline, the specific objectives, pupil readiness, and the teaching situation?
In his presentation and exposition of information how effective was the teacher in his techniques of communication — in delivery and using pupil feedback; explanation via the use of examples and illustrations and planned repetition; and demonstration.
In his assignment and control of tasks to be performed by pupils how effective were the teacher's techniques of giving directions, supervising task performance, correcting errors, and crystallising gains in performance?
Was the teacher skilful in questioning techniques: wording, routine of asking, distribution and dealing with pupil questions or responses to his questions?
Did the teacher effectively use the types of questions and types of reactions to pupil answers appropriate to the kind of teaching strategy (method) being used?

(c) Competence in the Use of Teaching Aids and Materials
Was the chalkboard used effectively: quality of writing, setting out extent of use, provision for student recording and use of materials?
Were other audio-visual aids well presented and well used to promote communication, interest, understanding, discussion, or thinking ability
Were the lesson materials and equipment employed in pupil task performance effectively organised and used?

(d) Competence in Classroom Management & Control:
To what extent did the teacher have the class with him throughout the lesson (teacher-pupil rapport)?
Did the teacher maintain good contact with class members, recognise changes in their attending behaviour, and adapt his own behaviours to maintain effective pupil participation?
Was interest maintained by the use of lesson material which was real and meaningful to the pupils?
Did the teacher take prompt, firm, unobtrusive action to check breaches of discipline and correct undesirable behaviour
Were consistent and effective routines of classroom organization and work procedures in evidence that contributed to orderly pupil behaviour

3 Personal Factors.

(a) Appearance: Was the teacher's appearance in accordance with school expectations for the type of teaching situation

(b) Image: Was the image he presented to the class — bearing, posture, mode of address — likely to inspire the respect and confidence of the pupils

(c) Manner: Did the teacher's manner — confidence, sympathy, pleasantness, firmness — promote effective teacher-pupil relationships and interaction

(d) Communication: Was there clarity and adequacy of communication arising from the appropriate use of the teacher's voice (audibility, tempo, pitch and inflection), and language (fluency and suitability to audience, situation and subject matter).

(e) Innovation: Did the teacher adopt novel approaches, show inventiveness and innitiative, and adaptation to circumstances

APPENDIX B

KENYATTA UNIVERSITY COLLEGE

TEACHING PRACTICE OBSERVATION REPORT

School: _____ Student: _____ Ref. No:

Form: _____ Course: _____

Subject: _____ Supervisor: _____
(Capitals)

Date: _____

Preparation

Performance

Personal factors

Lesson Assessment	Distinction	Credit	Pass	Fail
	10 9	8 7 6	5 4 3	2 1

Sipervisor _____

TEACHER PERFORMANCE PROFILE

Variable	1	2	3	4	5	6	7	8	9	10
O: Objective of Lesson										
L: Student Learning										
P: Student Participation										
S: Mastery of Subject matter										
I: Intregration with Prior Knowledge										
M: Method										
A: Teaching Aids Apparatus										
R: Relatedness to Students										
C: Communication with Students										
E: Student Teacher Self-Evaluation										

REMARKS AND SUGGESTIONS

APPENDIX C

CATEGORIES FOR INTERACTION ANALYSIS[1]

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 behavior. Jokes that release tension, but not at the expense of another individual; nodding head, or saying "um hm?" or "go on" are included.
		3.*	ACCEPTS OR USES IDEAS OF STUDENTS: Clarifying, building or developing ideas suggested by a student. As 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.
	DIRECT INFLUENCE	5.*	LECTURING: Giving facts or opinions about content or procedures; 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 behavior from nonacceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.
STUDENT TALK		8.*	STUDENT TALK--LIMITED. Talk by students within the limits set by the teacher. Teacher initiates the idea or solicits specific student response.
		9.*	STUDENT TALK--DIVERGENT: Talk by student in response to broad questions or comments which they initiate.
		10.*	SILENCE OR CONFUSION: Pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.

*There is NO scale implied by these numbers. Each number is a classification; it designates a particular kind of communication event. To write these numbers down during observation is to enumerate, not to judge a position on a scale.

[1]Adapted from Amidon, Edmund J. and John B. Hough. Interaction Analysis: Theory, Research and Application. Reading Massachusetts: Addison Wessley, 1967, p. 125.

APPENDIX D

CLASSIFICATION OF VERBAL CATEGORIES ONTO A TALLY SHEET
(Lenana School, Form 5 Arts, Geography)

10	4	2	5	5	5	2	5	2	4	8	5	5	4	9	3	5	5	6
5	6	4	5	5	4	4	5	3	4	5	5	5	6	3	3	10	5	10
5	8	6	10	5	8	8	4	3	6	4	10	5	6	9	3	5	5	
5	6	8	5	5	3	4	6	3	9	8	5	5	6	4	4	4	5	
5	8	3	10	5	4	6	8	6	4	4	5	5	5	9	8	5	5	
5	2	3	5	4	6	8	2	8	4	10	5	5	6	4	4	6	5	
5	3	3	10	6	8	2	3	4	8	6	5	5	6	8	6	9	5	
5	3	10	5	8	5	3	4	8	5	8	5	5	6	4	9	3	10	
5	10	5	5	3	5	5	8	2	5	4	5	5	6	6	4	3	4	
5	5	4	4	2	5	5	5	3	4	8	5	5	6	9	9	5	5	
5	5	4	4	3	5	4	4	5	6	3	4	5	8	2	4	5	6	
5	5	6	6	5	5	4	8	5	8	8	8	5	6	3	8	7	6	
5	5	6	8	6	5	8	5	3	4	2	5	5	4	3	4	10	6	
5	10	8	6	8	10	5	4	10	8	8	5	5	8	5	10	4	6	
5	5	4	8	3	4	5	8	9	8	3	5	5	4	5	6	6	6	
5	5	8	2	2	4	5	4	6	2	3	5	5	8	5	9	9	6	
5	4	2	3	3	4	4	6	9	3	4	5	6	4	3	3	9	6	
10	4	8	5	5	6	8	8	4	3	6	5	8	3	4	3	9	6	
5	6	3	5	3	8	4	4	4	5	8	5	2	4	9	5	4	6	
4	8	5	5	5	2	8	8	10	4	3	5	3	6	3	5	8	10	

Summary of Categories

	1	2	3	4	5	6	7	8	9	10	
Total	0	16	40	60	121	45	1	46	14	17	N=362

APPENDIX E

A 10-ROW BY 10-COLUMN MATRIX FOR ENTERING FREQUENCIES (OR TALLIES) OF VERBAL CATEGORIES (Lenana School, Form 5 Arts, Geography)

COLUMNS (Always taken SECOND)

ROWS (Always taken FIRST)

	1	2	3	4	5	6	7	8	9	10	Matrix Total
1								//			
2		/	卌 卌 /			/		//	/	//	
3		//	卌 卌 ///	卌 ///	卌 卌 //	卌 卌 //// 卌		卌 卌 卌 卌 ////	///	///	
4			/	卌 卌	//	卌	/			卌 ////	
5			///	卌 卌 卌 /	卌 卌 卌 卌 卌 卌	卌 卌 ////		卌 卌 卌 //	卌 //	///	
6				/	////					/	
7											
8		卌 卌 //	卌 ///	卌 卌 ///	卌 卌	///		/			
9		/	////	卌 /		/			//		
10				卌	卌 卌 /	//			/		
Column Totals	0	16	40	60	121	45	1	46	14	18	361

↑

Additional tallies for 5/5 above:

卌 卌 卌 卌
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APPENDIX F

INTERPRETATION MATRIX TABLE
(for inferring types of verbal interaction between teacher and pupils)
(Lenana School, Form 5 Arts, Geography)

COLUMNS

	1	2	3	4	5	6	7	8	9	10	Matrix Total
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
Column Totals	0	15	40	60	121	45	1	46	14	18	361
Column	0	4.43	11.08	16.62	33.52	12.47	0.28	12.47	3.88	4.99	

Teacher tals% = Columns $\frac{1 \text{ to } 7 \text{ total}}{\text{Matrix total}}$ = 78%

Pupil talk % = Columns $\frac{8 \text{ to } 9 \text{ total}}{\text{Matrix total}}$ = 17%

Teacher Indirect % = $\frac{\text{Columns } 1 \text{ to } 4}{\text{Columns } 1 \text{ to } 7}$ = 41%

Teacher Direct % = $\frac{\text{Columns } 5 \text{ to } 7}{\text{Columns } 1 \text{ to } 7}$ = 59%

Indirect/Direct (I/D Ration = $\frac{\text{Columns } 1 \text{ to } 4}{\text{Columns } 5 \text{ to } 7}$ = 69%

APPENDIX F

INTERPRETATION MATRIX TABLE
(For inferring types of verbal interaction between teacher and pupils)
(Lenana School, Form 5 Arts, Geography)

COLUMNS

	1	2	3	4	5	6	7	8	9	10	Matrix Total
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
Column Totals	0	16	40	60	121	45	1	46	14	18	361
Column	0	4.43	11.08	16.62	33.52	12.47	0.28	12.47	3.88	4.99	

Teacher tals% = Columns $\frac{1 \text{ to } 7 \text{ total}}{\text{Matrix total}}$ = 78%

Pupil talk % = Columns $\frac{8 \text{ to } 9 \text{ total}}{\text{Matrix total}}$ = 17%

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Teacher Direct % = $\frac{\text{Columns } 5 \text{ to } 7}{\text{Columns } 1 \text{ to } 7}$ = 59%

Indirect/Direct (I/D Ration = $\frac{\text{Columns } 1 \text{ to } 4}{\text{Columns } 5 \text{ to } 7}$ = 69%

APPENDIX G

TIME-TABLE FOR TRAINING IN FLANDERS INTERACTION ANALYSIS CATEGORIES TECHNIQUE

TRAINING November 1977 - April 1978

(Meetings weekly on Fridays from 4 p.m. to 5 p.m. except during the vacation period 17th Dec. 1977 to 7th January 1978).

11th Nov 1977	Introduction (Discussion of teacher/ student behaviors in the classroom) Interaction Analysis Theory and its role in teacher training. Materials: Overhead projector, transparencies, handout - Introductory notes on Interaction Analysis.
18th Nov 1977	Introduction to Flander's Interaction Analysis categories (Students to memorize and be tested). Materials: Overhead projector, transparencies, three handouts: 'Categories for Flanders Interations Analysis', Description of Flanders Interaction Analysis Categories', 'Research Constructs'.
25th Nov 1977	Experiencing video tape of a typical Kenyan Secondary level Geography lesson and the Flander's Interaction Analysis data collection process: Viewing while following the video-taped transcript, of Lenana Secondary School lesson - teacher - Mr. Isinya. Materials: T.V. and transcript (30).
2nd Dec 1977	Experiencing the FIAC data collection process - Lenana Secondary School lesson (continuation of 25th Nov. task) Study, explain and discuss samples of tally sheets, interaction Matrix sheets and Matrix analyses sheets. Materials: T.V., sample sheets - 30 copies each.
9th Dec 1977	Second experience of the FIAC data collection process: Viewing while following video taped transcript of Aga Khan High School lesson - Form 2P, topic: British Isles Relief, teacher Mrs. Wambugu. Materials: T.V. and 30 copies of transcript.

16th Dec 197?	Experiencing the FIAC data collection process - Aga Khan High School lesson (continuation of 9th Dec. task). Study, explain and discuss samples of tally sheets, Interaction Matrix sheets, and Matrix analysis sheets. Materials: T.V. and sample sheets 30 copies each.
	JAN 1978 to APRIL 1978: GROUP WORK (5 Groups) Practicing tallying, tabulating and data analysis and interpretation, each group using a different video or audio lesson each round.
13th Jan 1978	First Round practice tallying (Classification of verbal categories onto a tally sheet).
20th Jan 1978	Practice transferring the sequence of numbers from the tally sheet columns to a 10-row by 10-column matrix table, (entering frequencies into cells).
27th Jan 1978	Practice completing "Interpretation Matrix Table": (infer types of verbal interaction between teacher and pupils).
3rd Feb 1978	Determine Inter-rater reliability. Discuss teacher verbal behavior inferred.
10th Feb 1978	Second Round practice tallying (classification of verbal categories onto a tally sheet).
17th Feb 1978	Practice transferring the sequence of numbers from the tally sheet columns to a 10-row by 10-column matrix table (entering frequencies into cells).
24th Feb 1978	Practice completing "Interaction Matrix Table": (infer types of verbal interaction between teacher and pupils).
3rd March 1978	Determine Inter-rater reliability. Discuss teacher verbal behavior inferred.
10th March 1978	Third Round practice tallying (Classification of verbal categories onto a tally sheet).

17th March 1978	Parctice transferring the sequence of numbers from the tally sheet columns to a 10-row by 10-column matrix table, (entering frequencies into cells).
31st March 1978	Practice completing "Interaction Matrix Table": (infer types of verbal interaction between teacher and pupils).
7th April 1978	Determine Inter-rater reliability. Discuss teacher verbal behavior.
14th April 1978	Practice how to tape own lesson, and run through the interaction analysis data processing step, just practiced.
21st April 1978	Continuation of 14th April task.
28th April 1978	Complete 14th task and Wrap up.

APPENDIX H

Subject	TEACHER TALK: Indirect Influence 1	2	3	4	Ind. %	Direct Influence 5	6	7	Di- rect %	Teacher Talk %	Student Talk 8	9	Student Talk %	10	Ind. Direct I/D Ratio
1	0	7.2	9.2	23.6	55.3	29.7	2.6	0	44.7	72.3	23.9	1.7	25.7	2.1	1.2
2	0	7.6	7.6	21	45.3	36.6	6.3	.9	54.7	79.9	16.5	.3	17	3.1	.8
3	0	.5	4.4	15.2	37.6	26	7.4	0	62.4	53.4	5.4	.5	5.9	40.7	.6
4	.2	5.9	7.6	27.3	58	17.1	7.3	5.7	42	71	23.1	1.6	25	4.1	1.4
5	0	3.1	9.6	20.5	39.2	48.9	2.6	0	60.8	84.7	12.2	0	12.2	3.1	.6
6	0	.3	11.8	20.6	42.1	42.9	1.8	0	57.6	77.6	14.7	3.3	18	4.6	.7
7	0	3.3	7.7	20.1	39.5	41.7	5.9	0	60.5	78.7	11.8	0	11.8	9.5	.7
8	0	7	8.8	23.8	52.6	32.1	3.1	.5	47.4	75.3	18.3	1.1	19.4	5.4	1.1
9	0	4.4	6.5	22.4	46.8	31.1	6.5	.2	53.2	71	9.1	.3	9.4	19.6	.9
10	0	7	8.5	6.4	26.3	47.5	11.3	2.6	73.7	83.3	12.5	0	12.5	4.2	.4
11	0	.4	10.4	22.3	43.3	40.8	2.5	0	56.7	76.3	15	.8	15.8	7.9	.8
12	0	8.3	15.7	21.1	54.9	28.5	8.2	.4	45.1	82.4	17.1	0	17.1	.5	1.3
13	0	1.4	6.1	27.3	46.3	38.3	1.4	.6	53.7	74.9	14.3	0	14.3	10.7	.9
14	0	2.7	13.4	20.9	46	40.1	3.2	0	54	80.2	13.9	0	13.9	5.9	.9
15	0	2.7	6.2	23.3	42.7	38.1	5	0	57.3	75.2	18.9	.3	19.2	5.6	.8
16	0	2.7	11.5	26.7	52.3	35.5	1.1	.7	47.7	78.3	17.4	.2	17.6	4.1	1.1
17	.2	1.4	1.2	6.2	10.8	70.6	3.1	1.4	89.2	84.2	4.8	8.8	13.6	2.1	.1
18	0	2.8	9.8	15.7	36.7	41.1	6.3	1.4	63.3	77	18.1	2.4	20.6	2.4	.6
19	0	3.7	9	15.6	33.3	54.2	2.3	0	66.7	84.7	11.3	0	11.3	4	.5
20	0	.9	1.5	8.5	12.2	76.9	1.2	.3	87.8	89.4	4.9	2.1	7	3.6	.1

APPENDIX I

CONTROL GROUP: PRE-TEST FIAC PERCENTAGE AND RATIO COMPUTATIONS

	TEACHER TALK														
	Indirect Influence				Ind.	Direct Influence			Di-	Teach-	Student Talk		Stu-		Ind. Direct
	1	2	3	4	%	5	6	7	rect %	er Talk %	8	9	sent Talk %	10	I/D Ratio
Subject															
1	0	0	1.7	20.1	29	51	2	.2	71	75	9.5	0	9.5	15.5	.4
2	0	5.5	19.2	24.9	58.7	31.1	2.7	0	41.3	86.8	8.9	1.2	10.4	2.7	1.4
3	0	6.8	6.4	19.9	42.2	44.7	.6	.2	57.8	78.5	10.1	.6	10.7	10.8	.7
4	0	2.7	8.5	24	48.2	33.7	2.4	1.7	51.8	72.9	16.9	3.6	20.6	6.5	.9
5	0	7.5	8.4	16.1	38.2	40.3	11.3	0	61.8	83.6	10.4	2.4	12.8	3.6	.6
6	0	10.4	8.1	25	59	26	3.9	.3	41	74.1	22.7	1.3	24	1.9	1.5
7	0	.5	16.8	25.7	60.8	25.7	2	0	39.2	70.8	23.3	0	23.3	5.9	1.6
8	0	.8	8.6	17.8	32.1	51.3	6.3	0	67.9	84.8	11.5	.6	12.1	3.1	.5
9	0	0	1.6	5.8	8.4	80.2	0	.8	91.6	88.3	.8	1.2	2	9.7	.1
10	0	9.5	13.2	19.5	55.4	20.9	11.4	1.8	44.6	76.4	18.6	.9	19.5	4.1	1.2
11	0	0	12	24	44.8	39.6	4.7	0	55.2	80	15.1	.5	15.6	4.2	.8
12	0	6.5	6	18.1	38.4	37.9	11.2	0	61.6	79.7	10.8	2.6	13.4	6.9	.6
13	0	.4	7.3	25	42.9	39.4	4.1	0	57.1	76.2	19.1	.4	19.5	4.3	.8
14	0	7.6	11.5	21.9	50.9	29	8.8	1.8	49.1	80.6	16.6	.2	16.8	2.5	1
15	0	2.8	11.6	24	51.2	32.6	4	0	48.8	75	15.9	.3	16.2	8.8	1.1
16	.3	1.9	5.5	20.5	34.4	50.4	3.3	0	65.6	81.9	10.7	.5	11.2	6.8	.5
17	0	2.7	0	10.7	15.4	68.1	5.7	0	84.6	87.2	4.7	2	6.7	6.1	.2
18	0	1.7	9	30.6	54.1	23.6	8.7	2.7	45.9	76.3	12.2	0	12.2	11.4	1.2
19	0	5.5	11.9	24	55.9	26.6	8.6	.4	44.1	74	18.4	.2	18.6	7.4	1.3

APPENDIX J

EXPERIMENTAL GROUP: POST-TEST FIAC PERCENTAGE AND RATIO COMPUTATIONS

	TEACHER TALK													
	Indirect Influence				Ind.	Direct Influence			Di-	Teach-	Student	Student		Ind./ Direct
	1	2	3	4	%	5	6	7	rect %	er Talk %	Talk 8	Talk % 9	10	(I/D) Ratio
Subject														
1	0	3.8	4.6	24.9	48.7	33.9	1.2	0	51.3	68.4	25.5	.6	26.1	5.5	1
2	0	4.5	9.2	27.9	57.6	23.1	4.7	2.7	42.4	72.1	15.4	.7	9.5	11.7	1.4
3	0	.8	3.8	16	27.7	47.1	2.9	3.8	72.3	74.4	13.9	3.4	17.2	8.4	.4
4	0	.7	2	31.6	55.3	25	2.6	0	44.7	61.8	18.4	3.3	21.7	16.4	1.2
5	0	4.6	3.4	25.4	52	24.9	5.1	.7	48	64	18.6	.2	6.8	17.1	1.1
6	0	6.4	8.6	24.7	51.7	31.3	4.5	1.3	48.3	76.7	15.8	3.6	19.4	3.9	1.1
7	0	4.9	6.3	26.4	50	37	0	.7	50	75.4	10.2	1.8	11.9	12.7	1
8	0	8.3	5.7	34.6	56	35.8	2.3	0	44	86.7	9.4	1.8	11.2	2.1	1.3
9	0	0	11.9	28.1	54.3	31.5	1.5	.7	45.7	73.7	18.5	.7	19.3	7	1.2
10	0	3.9	8.6	24.8	55.3	29.8	.3	0	44.7	67.3	28.2	1	29.1	3.6	1.2
11	0	.4	2.7	33.1	54.5	27.6	1.8	.9	45.5	66.4	20.2	.9	21.1	12.4	1.2
12	0	4.2	6	26.5	50.6	32.9	3	0	49.4	72.7	23.3	3.4	26.7	.6	1
13	0	2	6.8	29.1	60.9	22.3	2	0	39.1	62.1	26.9	1.3	28.2	9.6	1.6
14	0	2.1	3.4	17.4	31.3	47.6	2.3	.5	68.8	73.2	15.6	7.1	22.7	4.1	.5
15	0	1.9	12.2	18.6	46.7	36.1	.4	.6	53.3	69.7	24.7	2.5	27.2	3.1	.9
16	0	5.3	12.6	24.6	59.7	28.6	0	0	40.3	71.1	23.1	2.8	25.9	3	1.5
17	0	1.7	5	22.9	40.9	42.7	0	0	59.1	72.3	22.1	1.1	23.2	4.5	.7

APPENDIX J

CONTROL GROUP: POST-TEST FIAC PERCENTAGE AND RATIO COMPUTATIONS

	TEACHER TALK									STUDENT TALK				
	Indirect Influence				Ind.	Direct Influence			Direct	Teacher			Stu-	Ind./ Direct
	1	2	3	4	%	5	6	7	%	Talk %	8	9	dent Talk %	10	I/D Ratio
Subject															
1	0	0	2	14.9	19.1	69.3	2	0	80.9	88.1	4	0	4	7.9	.2
2	0	3.9	8.4	13.8	34.4	46.3	3.4	0	65.6	75.8	12.6	.6	13.2	11	.5
3	0	3.1	2.5	18.9	30.9	51.1	2.1	1.5	69.1	79.2	9	6.7	15.7	5.2	.5
4	0	4.7	13.4	25.6	62.8	22.8	1.2	1.9	37.2	69.5	22.5	.2	22.8	7.7	1.7
5	0	7.9	11.1	20.1	49.3	35.8	4.3	0	50.7	79.2	13.6	0	13.6	7.2	.9
6	0	5.4	7.3	18.3	39.4	47.6	0	0	60.6	78.6	16.1	1.2	17.3	4.2	.7
7	0	6.3	13	13	38.3	47.4	4.2	.5	61.7	84.3	14.1	0	14.1	1.6	.6
8	0	6.3	10.3	16.6	39.1	50.9	.9	0	60.9	84.9	11	.4	11.4	3.7	.6
9	0	6.7	12.4	19	54.1	29.5	1.7	1.2	45.9	70.5	18.6	0	18.6	11	1.2
10	0	0	17.3	29.6	66.2	21.4	2.6	0	33.8	70.9	18.9	2.6	21.4	7.7	2.0
11	0	2.8	6.7	13.2	27.2	58.9	1.8	.3	72.8	83.7	9.6	1.6	11.1	5.2	.4
12	0	.5	6.1	17.6	30.6	52.1	2.6	.3	69.4	79.2	10.8	1.6	12.4	8.4	.4
13	0	7.2	7.5	15.7	36	44.5	8.2	1.2	64	84.3	10.6	1.7	12.4	3.3	.6
14	0	5.4	8.8	31.4	62.3	25.5	1.9	2	37.7	73.2	15.9	0	15.9	10.8	1.7
15	0	6.2	11.7	30.2	64.6	20.7	4.1	1.6	35.4	74.6	23.1	0	23.1	2.2	1.8
16	0	7.8	5.2	22.4	44.2	42.4	2.4	0	55.8	80.2	14.8	2.2	17	2.8	.8
17	0	1	11.4	25.8	52.7	32.6	1.3	.5	47.3	72	19.9	0	19.9	7.5	1.1
18	0	9	8.6	16.1	42.7	34.4	10.8	0	57.3	78.9	15.8	0	15.8	5.4	.8

APPENDIX L

MODIFIED FLANDERS INTERACTION ANALYSIS CATEGORIES FORM (USED WITH SECONDARY EDUCATION UNDERGRADUATE STUDENT TEACHERS AT UNIVERSITY OF PITTSBURGH)

1. Accepting Feelings

2. Praising or Encouraging

3. Accepting or Using Students' Ideas

4. Asking Questions:
   Memory ---------- Convergent ----------
   Divergent ---------- Evaluative ----------
   Other ----------

   ____ % Indirect

5. Lecturing

6. Giving Directions

7. Criticizing or Justifying Authority

   ____ % Direct

8. Responding ____ % Total T

9. Initiating:
   Question ---------- Comment ----------

   ____ % Total S

10. Silence or Confusion ____ %

Summary Impressions: ----------

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