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ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

ANALYSIS OF GEOGRAPHY INSTRUCTION ON THE BASIS OF FLANDERS INTERACTION ANALYSIS CATEGORIES (FIAC) IN SENIOR SECONDARY SCHOOLS OF SIDAMA ZONE

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Analysis of Geography Instruction on The Basis of Flanders Interaction Analysis Categories (FIAC) in Senior Secondary Schools of Sidama Zone

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Ambaye Tsehaye	
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ABSTRACT

The purpose of this study was to make an investigation into the nature of classroom verbal interaction in ninth grade geography classes. On the basis of Flanders' model, attempts were made to identify the prevailing behaviors in the teaching-learning process. Whether or not the teaching behaviors of teachers were related to teachers experience and qualification was also one of the major purposes of this study.

Data regarding classroom verbal interactions were obtained from six Sidama Zone senior secondary schools that were selected using purposive sampling technique. The study included all ninth grade geography teachers in these schools systematic observation was the instrument of data collection. The data gathered through consecutive observations were analysed using percentage, t-test, Spearman's rank order and point biserial correlation coefficients.

The findings have indicated that,on average teachers consumed about 85.42% of the class time for talking (mainly for lecturing), while students used only about 5.40%. All geography teachers were found using direct influences in teaching. Geography classes were characterized by low teachers use of questions, high teachers' initiation, teachers high emphasis on the presentation of the subject matter and low students self introduced ideas. The findings have also shown that total years of teaching have significant direct relationship with the proportion of teachers' talk and teachers' use of lectures. But experience was found to have no significant relationship with the type of influence teachers used in teaching. Moreover, qualification too was found to have no significant relationship with the above variable. Thus, it was concluded that geography classes were teacher dominated and students were mainly left to the position of passive audience.

Based on the findings and conclusions, it was recommended that measures regarding upgrading the previous training of teachers and re-examination of the methodology courses be taken to improve classroom interaction. It was also recommended that teachers should vary their talk so as to include such categories as accepting students' feelings, praising them, using students ideas, etc instead of delivering lectures for a very long period of time.

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

In every social system as long as at least two individuals participate in it, there is interaction. This interaction can be either face-to-face or it could be communication from a distance. With regard to the above fact, Feldman (1986:132) remarked that without interaction it is impossible to imagine any social functioning. He also noted that in interaction, the participants influence each other. That is, they react to each other, attend to the behavior of others and respond to the expressed behavior of other participants.

The above fact also applies to the teaching-learning process in which teacher and pupils interact with each other. Hence, scholars like Flanders (1970), Moore (1995), Stolurow and Pahel (in Amidon and Hunter, 1966) and many others defined teaching from the perspective of interaction.

For Stolurow and Pahol (in Amidon and Hunter, 1966:2) teaching is fundamentally a social process involving communication and interaction between at least two people-a teacher and a student. It is a kind of dialect in which both serve as teacher and student at different times and at different levels. That is, the teacher does not only instruct a student,

but also learns about that student and using this knowledge he makes decisions about what to do next in the course of his teaching. Similarly, the student is not only learning, but also providing information to the teacher, which in turn, guides the teacher in the ongoing interaction.

Moore (1995:34-35) further indicated that teaching is not just a matter of teacher's talking and students listening. Effective teaching involves interactive communication patterns that are skilfully directed. But sometimes, as noted by Chauhan (1979:140), when teaching becomes one way traffic, it blocks the process of communication and hampers the real spirit of teaching.

The above conceptions imply that teaching is a form of influence where the teacher and the learners participate in a reciprocal manner. It occurs in a system of relations among them. In this relation students work cooperatively with their teacher and in doing so they learn what is intended for them.

Though the explicit objective of classroom interaction is to add knowledge and skills to students, the influence through interaction may also determine other aspects of behavior. In relation to this Gammage (1971:32) says that:

> The interaction of the teacher and the pupil is one of the most important aspects of the educative process and possibly one of the most neglected. To some extent the type and quality of interaction will determine not only the effectiveness of the learning situation but the attitudes, interests and in part even the personality of the pupil.

This implies that the teacher's interaction mechanism with students determines what the students learn, how they feel about learning and other aspects.

To make a safe passage into the heart of the study under way, interaction forms are identified as they are seen in Moore (1995) and Hunter (1972). Subsequently, Moore (1995:34-35), based on communication pattern, identified four possible interaction styles. These are:

- teacher-group interaction-as when the teacher gives a lecture or when questions are asked or directed during the course of the lecture to the group.
- teacher-student interaction-as when the teacher addresses or questions a specific student.
- student-student interaction-is when, for instance, a teacher wishes to redirect a student question to another student for a response or clarification.
- student-group interaction-is the possible style when the teacher wants to transfer the leadership of a lesson to one of his students.

On the other hand, based on the type of communication, Hunter (1972:67) classified classroom interaction as verbal and non-verbal. Verbal here includes talk and its components such as asking, explaining, comparing, contrasting, etc, while non-verbal interaction covers tonal variation of voices, expressive movements and facial expressions covering a range of feelings

from enthusiastic support through inattention to outright disapproval.

In both verbal and non-verbal interactions teacher and students must communicate, that is, transmit symbols with a shared meaning in such a way that the behavior of each is in part a response to the behavior of the other (Curzon, 1990:110).

However, many scholars like Amidon and Hunter (1966), Flanders (1970), Good and Brophy (in Borich, 1988), Hargreaves (1972), Morrison and McInter (1973) and Parsons (in Ehman et. al. 1974) recognized the importance of talk in the teaching-learning process and they believed that teaching behavior is principally verbal. Particularly Flanders (1970) strongly defended the assumption that verbal behavior is an adequate sample of the total teaching behavior in the classroom.

In relation to the above idea, Chauhan (1979:143) noted that though classroom interaction cannot be understood as only verbal, yet most of the functions associated with teaching are implemented by verbal communication. Non-verbal communications occur less frequently.

On the other hand, employing verbal communication in instructional process like other aspects of teaching, requires appropriate skills. As it has been revealed by Hunter (1972:67), in order to select appropriate verbal behavior for each situation, teachers will always need to be acutely conscious of their own talk and that of their pupil. In other words, in order to teach as effectively as possible, teachers will always need to

act on the basis of intelligent choice rather than haphazard or routine ways.

Regarding research practices in the area under discussion, one may say that efforts to analyse verbal interaction in the teaching-learning process in Ethiopia are limited to the works of few individuals. Among these Abdukadir (1983) Mccaul (1994) and Tassew (1992) analyzed teacher-pupil interaction in English, mathematics and science classes, respectively. Except these, classroom interaction as a determinant factor in the teaching-learning process of other school subjects like geography is an untouched area.

Thus, it seems essential to investigate and analyse classroom verbal communication in the instruction of geography through classroom research if improvement is sought in the existing practice of the teaching-learning process of the subject.

1.2 Statement of the Problem

Though our schools are not beneficiaries in terms of being scrutinized scientifically, currently there are many systems for studying and analysing verbal behavior of teachers and students. One of the best known and most widely used of these systems is closely associated with the name of Ned Flanders (Chauhan, 1979:142).

Flanders (1970:34), in his work entitled "Analysing Teaching Behaviour" intensively dealt with the technique for observing and

analysing classroom communication. In his system he divided classroom verbal communication into ten categories which are again grouped into three major sections: teacher talk, student talk and silence or confusion. Categories 1-7 are grouped under teacher talk and consist acceptance of feelings, praise or encouragement, acceptance of pupils ideas, questions, lecture, giving directions and criticism. His eighth and ninth categories are for pupil's talk and are labelled pupil response and pupil initiation. The tenth category is for confusion or silence (see the detail explanation of each category in chapter 2).

On the basis of this category systems many scholars have undertaken studies on teacher-pupils interaction in the classroom settings. For instance, Callahan and Clark (1988:486), based on this system, guard teachers against talking too much and over dominating classroom activities. According to theses scholars, without an optimum amount of teacher pupil interaction, classes tend to become stifling.

Although in any particular lesson, the lesson objectives, design of the lesson and other factors determine the type of interaction, Clark and Starr (1986:199) also listed the following criteria to be applicable to most lessons in general.

- students should be actively participating at least half of the time. If the teacher finds himself to be talking more than half of the time, he should check his procedures.

- as far as possible, every student should participate in some way. Classes that are dominated by only few students are hardly satisfactory.
- a good share of the class time should be given to thoughtful, creative activity rather than to mere recitation of information by either teacher or students.

Flanders (1970:100-107), based on studies of several years gave normative expectations for such elements as proportion of "teacher's talk", "students talk" and "silence or confusion", the rate of interchange in communication, the extent of questioning, etc. For instance, the normative expectations for "teacher's talk", "students talk" and "silence or confusion" are 68%, 20% and 12% of the class time, respectively. Of the above two suggestions, however, Flanders' normative expectations which are based on studies of several years are widely applied in studies of classroom Verbal communication. Hence the writer used the Flanders' normative expectations throughout this study.

On the basis of the above framework, some research hypotheses were formulated on the analysis of ninth grade geography instruction in senior secondary schools of Sidama Zone. Hence basic questions which are found to be relevant to guide the study are raised as follows.

- Are classes of geography instruction teacher-centered or student-centered?

- Which type of teachers' talk and students' talk categories are more dominant in geography instruction?
- What type of teachers' influence/direct or indirect/ is dominant in geography instruction?
- Are geography classes consistent with the norms in:
  a) using questions while presenting the subject matter?
  b) the degree to which teachers react to students ideas and feelings?
  c) students participation in initiating classroom discussion or expressing views?
  d) giving appropriate balance to the content and motivation aspects in teaching?
  e) the rate of interchange in communication between teachers and students?
- Do the degree of teachers' qualification and their experience have any significant relationship with teachers' classroom behavior?

1.3 Significance of the Study

Since the ultimate purpose of this study is analysing geography instruction on the basis of FIAC, the study may be expected to provide the following contributions.

- It may give insights into the nature of classroom communication in geography classes and helps our

teachers in modifying their verbal behavior. That is, the study provides geography teachers with the opportunities to practice new ways of interaction geared to involve pupils actively in the teaching-learning process..

- The results of the study may also encourage trainers and concerned officials to re-examine the practice our teachers are employing in the classroom.
- The study may also help as a spring board for those who are interested to conduct further research in the related area of study.

1.4 Delimitation of the Study

Since all teaching-learning behaviors are not equally or suitably amenable to observation, the researcher is confined only to the analysis of verbal interaction in the teaching-learning process of geography in senior secondary schools of Sidama Zone. The study is also delimited to grade 9. As grade nine is the beginning of senior secondary school, what the students learn, the manner on which the subject matter is imparted and the interaction dynamism employed at this level is felt to influence the learning scenario of other grades of senior secondary schools. That is, grade 9 can be seen as a basis for the other levels of senior secondary schools. Due to this important

reason, the writer selected the mentioned grade level for conducting this research.

On the other hand, it would have been the pleasure of the writer, if it was possible to include all the available senior secondary schools in Ethiopia in this study. But for the main reason that the study is conducted using continuous and intensive observations, the writer is obliged to take only selected senior secondary schools of the Sidama. Therefore, the findings and conclusions to be made are in terms of verbal interactions in the instruction of geography and would serve only the above mentioned grade level and zone.

Moreover, the writer selected Sidama Zone for some important reasons. First, the previous Awasa teachers training institute is now operating as a teachers training institute (TTI) and a college.currently in this institute, there are as ample experts as needed for conducting systematic observations in senior secondary schools. Secondly, many of the senior secondary schools in this zone are proximate to the institute. Therefore, these factors enable one to properly use the experts and ease the task of data gathering through observations.

1.5 Limitation of the Study

This study has a limitation for it is only concerned with the description of what is going on in geography classes. Hence before widely using the system under discussion, it seems

important to undertake intensive study on the effect of Flanders' model on students' learning in Ethiopian context.

Adequate materials concerning the study in Ethiopia in general were also scarce. This was notably true with regard to classroom interaction in geography teaching. Similarly, the information concerning the issue either in books or journals was not of recent works and at the same time scant. Nevertheless, it has been attempted to include the available recent publications related to the area.

Lastly, lack of research fund and delaying its release were also other problems encountered in conducting this research. Nevertheless, the writer has attempted to bridge the gap by searching for other source of fund.

In all cases, despite the challenges and limitations, the writer has made the utmost effort in gathering the accessible relevant data from the sources.

1.6 Definition of Key Terms

Classroom Interaction -refers to purposeful the chain of events which occur one after the other, each occupying only a small segment of time.

Classroom Interaction Analysis - is a system for coding spontaneous verbal communication, arranging the data into a useful display and then analysing the results in order to study patterns of teaching and learning.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

As indicated in the first chapter, many educators Amidon and Hunter, 1966, Chanan, 1973, Chauhan, 1979, Dunkin and Biddle, 1974, Flanders, 1970, Stones and Morris, 1973, Wragg, 1973, and many others) gave an important place to teacher-student verbal interaction in the teaching-learning process. In their works, these scholars gave much attention to the analysis of verbal communication and its effects on students role, achievement, attitude and the like. This review, thus, addresses some of the issues in some detail. The chapter, therefore, incorporates the historical development and description of the FIAC system, the concept and role of classroom talk in the teaching-learning process, direct and indirect teaching behaviors, teachers experience in classroom instruction, studies related to geography instruction and local research findings that focuses on teacher-student verbal interaction in Ethiopian Schools.

2.1 Classroom Interaction Analysis

2.1.1 Historical Perspectives

Classroom interaction analysis was recognized in educational literature quite long ago. For instance, as early as 1930s, Kurt Lewin and his associates conducted a research on the impact of autocratic, democratic and laissez-faire styles of teacher behavior upon a group of boys in the university of Iowa (Dunkin and Biddle, 1974:95).

However, systematic observation of classroom phenomena began with works of H.H Anderson in the late 1930s. Anderson's approach to direct observation was to deal with contacts between teachers and children or among the children themselves, and he divided these into dominative (use of force, commands, threats, blame, etc) and integrative (sharing, asking, playing, co-operating, etc) (Wragg, 1973:89).

Following are Anderson's categories grouped under "Domination" and "Integration".

Table 1

Anderson's Categories for Analysing Classroom Interaction*

	Domination		Integration
1	Determines Detail or acts for the child in carrying out a detail	1	Approval
2	Direct refusal	2	Accepts differences
3	Relocating, repeating or placing children in different relations to each other or to property	3	Extends invitations to activities
4	Postponding, slowing up the child	4	Question or statement regarding child's expressed interest or activity
5	Disapproval, blame or obstruction	5	Builds up (helps) child to better definition or solution without giving final answer
6	Warning, threats or conditional promises	6	Participates in joint activity with children
7	Rations material	7	Gives permission
8	Lecture method (defining a problem or anticipating a question)		
9	Questions: lecture method (one-answer questions) recitation		
10	Perfunctory questions as statements (indifference)		

*Source: M.J. Dunkin and B.J.Biddle, 1974 P.98

The next major development, according to Wragg (1973:90),is to be found in the works of Withall in 1945 who constructed a seven category system for describing the social/emotional climate in the classrooms. Withall's system analyzed teachers' verbal statements and consisted of three learner-centered categories, three teacher-centered categories and one neutral category. Statements intended to show his categories are shown in table 2.

with both the teacher and the pupils whereas 15 look at the teacher's and 8 look at the pupils' verbal behaviors.

Of the systems that look at both teacher's and the pupils' verbal behaviors, the pioneering work was done by Ned A Flanders as part of a research into teacher influence and pupil attitudes and achievement in the early 1960s (Chauhan, 1979: 142). In doing so Flanders, as indicated by Wragg (1973:90), used the previous works of Withall and others.

2.1.2. Flanders Classroom Interaction Analysis System

As mentioned earlier, in his system Flanders (1963:2-5) selected ten kinds of verbal behaviors which he thought would give insight into the nature of the teaching-learning process. He divided these ten behaviors (categories) into three major sections: "teacher talk", "student talk" and "silence or confusion". The first section (teacher talk) comprises the first seven categories which are again grouped under "indirect teacher influence" and "direct teacher influence". The indirect teacher influence includes "acceptance of feelings", "praise or encouragement", "acceptance of pupil's ideas" and "questions". Direct talk, on the other hand, includes "lecturing", "giving directions" and "criticizing or justifying authority". Of the above categories of teacher's talk, Flanders (1970:34) considered the first three (1-3) as teacher's response while the last three (5-7) are taken to be initiation. Flanders' eighth and ninth categories are for pupil's talk and are labelled pupil talk-

response and pupil talk-initiation, respectively. The tenth category is for the moment of silence or confusion. These ten categories, with Flanders' own description of them, are given in table 3.

Table 3

Categories in the Flanders' System of Interaction Analysis*

Teacher Talk	Indirect Influence	Response	1. Accepts feelings: accepts and clarifies the feeling tone of students in a non-threatening manner. Feelings may be positive or negative. predicting and recalling feelings are included.
			2. praises or encourages: Praises or encourages student action or behaviour. Jokes that release tension, not at the expense of anther individual, nodding head or saying "um hm?" or "go on" are included.
			3. Accepts or uses ideas of student: clarifying-building or developing ideas or suggestions by a students. As teacher brings more of his won ideas into paly. shift to category five
			4. Ask questions: asking a question about content or procedure with the intent that a student answer
	Direct Influence	Initiation	5. Lecturing: giving facts or opinions about content or procedures; expressing his own ideas, giving his own explanation, or citing and authority other than a pupil.
			6. Giving directions: directions, commands, or orders with which a student is expected to comply
			7. Criticizes or justifies authority: statements intended to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing, extreme self-reference.
Pupil Talk		Response	8. Pupil talk-response: talk by students in response to teacher. Teacher initiates the contact or solicits student statement
		Initiation	9. Pupil talk-initiation: talk by pupils which they initiate. Expressing own, ideas; initiating a new topic freedom to develop opinions and a line of though, like asking thoughtful questions; going beyond the existing
Silence or Confusion			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 classificatory; 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.

*Source: Ned A Flanders, 1970 P.34.

When one sees this system against the previously discussed Anderson's categories, it is possible to say that Flanders categories grouped under indirect influence (1-4) roughly correspond to Anderson's "Integrative" while categories 5,6 and 7 where to some extent the teacher is limiting the verbal activity of the learners correspond approximately to Anderson's concept of "Domination."

2.1.2.1 Basic Assumption of Flanders in Devising FIAC

Some basic assumptions are milestone in the system of Flanders interaction analysis. These are listed by Chauhan (1979) as follows.

- Acts of influence are expressed primarily as verbal statements. Non-verbal interactions which occur in the classroom are not suitably recorded. According to Chauhan, this assumption is acceptable due to the fact that verbal behavior of the teacher is consistent with his non-verbal acts. For instance, teacher's "nodding of head" is associated with saying "go on".
- Interaction analysis is concerned primarily with recording, and analysing verbal behaviors because of the higher reliability in observing them than most non-verbal behaviors. Stones and Morris (1973) also assert that only verbal behaviors are analyzed because of the difficulty in reliably categorizing non-verbal behaviors.

- The teacher is the influential authority in the classroom.

The student's verbal behavior is to a large extent determined by the teacher's behavior. Hargreaves (1972:137) confirms this fact as follows:

> Whilst it is true that the pupil's behavior is influenced more by many other factors than the teacher's behavior and whilst it may be that the teacher adopts his behavior in response to the special characteristics of the pupils in his class, we would expect the pupils to adapt to the teacher to a much greater degree than the teacher to the pupil.

This indicates that there is a power differential between the teacher and his pupils. The former is the influential authority in the classroom. It is, thus, safe to say that it is due to this fact that Flanders gave only two categories for student talk.

The last basic assumption emphasizes the possibility of changing classroom behavior. Teachers can control their verbal participation (amount of time to talk) in the classroom and use it as a psychological force in classroom management (Chauhan 1979:144).

In short, it is on the basis of these assumptions that FIAC has been devised to observe and analyse classroom communication systematically.

verbal behaviors (Chauhan, 1979:156-157) and fails to specifically identify the particular student reacting (for instance, responding to teacher's question) in the instructional process (Wragg in Wragg, 1973:99).

Despite these limitations, the system has widely been used and found to be relevant to numerous studies of classroom interaction across the world. For instance, according to Perrott (1982:186) an important aspect of Flanders' interaction analysis system is that it helps to analyse the balance of initiation and response between the teacher and his students in the classroom. Moore (195:34) stressed that the system enables one to analyse whether a class is teacher dominated or pupil dominated, whether it is open or repressive and whether the teaching style is direct or indirect. In discussing the same issue Cronbach and Snow (in Anderson and Burns, 1989:229) also indicated the importance of studying classroom interaction using FIAC. According to them, research works undertaken using FIAC represent a movement away from the more traditional "teaching method" studies and toward studies that investigate issues like the impact of teaching behaviors on students' learning, the relationship between aptitude and interaction. For instance, scholars like Dobson et.al (1972) and Measel and Wood (1972) have successfully employed FIAC to investigate the relationship between modes of teacher verbal influence and the sophistication of pupils' thinking and to study the nature of custodial and humanistic teachers and their influences, respectively.

Moreover, FIAC has been serving as a basis for many of the systems later developed by other scholars. For example, those systems developed by Amidon and Hunter (1966) and Hough (in Bondi, 1970) either include many features of the ten categories of Flanders or they are simple modifications of them. That is, the verbal interaction category system (VICS) of Amidon and Hunter was developed by subscribing Flanders original categories so as to make distinctions between "narrow" and "broader" teacher questions, and divisions were also made within the categories of accepting student idea and criticizing or justifying authority to gather information concerning the type of pupil behavior accepted or rejected. Hough's system, on the other hand, is a simple modification that adds two more categories ("answer student questions" "and corrective feedback") to "teacher talk" and changed "student talk" categories of Flanders into "teacher -initiated student talk", "student question" and "student-initiated student talk".

In all cases FIAC is one of the most utilized category system to study classroom verbal communication (Chauhan, 1979).

2.1.2.3 Description of Data Collection, organization and Processing Using FIAC

In using FIAC, scholars like Chauhan (1979), Flanders (1970), Shukla (1978), Stones and Morris (1973) and Wragg (1979) have described the procedures and tasks involved in collecting, systematizing, and processing classroom interaction data.

Collecting interaction data is done by noting every three seconds the type of interaction that takes place. The interaction is recorded by writing down the number of the category to which it belongs. In this process of recording, the observer notes the verbal events in sequence and if one kind of interaction persists he writes down the number repeatedly until there is a change (Flanders, 1970 and Stones and Morris, 1973).

After the collection of data is completed, the next step is entering the numbers into a 100 cell, two-dimensional display known as Flanders Matrix (Wragg, 1979). This, according to Chauhan (1979), enables one to get a picture of not only the number of interactions falling in each category but also the way in which the categories tended to follow each other or helps to know the patterns of behavior.

Once the data are systematized in a matrix, it is possible to carry out various types of analysis. For instance, percentage of tallies in each of the categories, percentages of total teacher talk and students' talk, the relative emphasis of

2.2.1 "Teacher's Talk" in the Instructional Process

"Teacher's talk" is the amount of time which the teacher speaks or the number of lines or words spoken by the teacher in a given amount of time. It sets the type and context of student behavior (Gage and Berliner, 1988:542). According to Flanders' (1970:39) classification, as discussed earlier, the teacher's talk includes accepting feelings, praising or encouraging, accepting or using ideas of students, asking questions, lecturing, giving directions and criticizing or justifying authority (see the details of these categories on page 21).

Findings of those studies focused on teacher's talk revealed that in most cases classroom talk was dominated by the teacher. For instance, Buch and Santhanam (in Shukla 1978:128) found that on an average, about 60-65 percent of total interaction time was in the form of "teacher's talk", 20-25 percent in form of "students' talk" and 10-15 percent was occupied by "Silence and confusion". Flanders and Perrott (in Perrott, 1982:19) also indicated that in primary and secondary classrooms, the average teacher does 70 percent of the talking. The percentage, according to them, is probably higher in higher education.

Based on the eight-year research program, Flanders (1963:253) explained the share of "teacher's talk" in the teaching-learning process by his "law of two-thirds". According to this law, two third of the time teacher and students spend in

Research findings reviewed by Dunkin and Biddle (1974:135) indicated that teacher questions, on the average, represent one tenth to one sixth of all classroom interaction time. These findings also pointed out that higher grade level (which specific grade this represents is not indicated) is associated with less teachers use of questions.

On the other hand, Bellon et. al. (1992:315-3160) advised teachers to use different types of questions (lower level questions and higher level questions) depending on such factors as objectives of the instruction, nature of the learners, etc. Because different kinds of questions stimulate different kinds of thinking, teachers must be conscious of their purpose when using certain questions (Perrott, 1982:41). But, by analysing tape recordings of a small number of lessons in the first year of comprehensive secondary schools, Barnes (in Delamont, 1983:125) found out that in all subjects, but science, factual questions predominated.

Moreover, Dunkin and Biddle (1974:142) summarized research findings on the effect of questioning on students achievement and attitude. Accordingly, many studies found no significant relationships between the above variables. That means, students achievement and their attitude towards learning are not only the outcomes of the amount of questioning, but also of such factors as the content of questions, the forms of questions and the occasions upon which these questions are asked.

Nevertheless, the high correspondence between the amount of questioning and students engagement in the teaching-learning process cannot be a contentious issue.

Praising or Encouraging

According to Bellon et. al. (1992:100) praise is one of the most important means for motivating and engaging students in the learning process. "praise', said Perrott (1982:19), "not only changes behavior, it also develops confidence and a positive self-image."

However, many studies pointed out that the use of praise or encouragement occupies relatively little class time of most teachers. For instance, Dunkin and Biddle (1974: 121) reported that the amount of time teachers use for praising accounts for no more than six percent of the total interaction time, on the average. Similarly, Wragg and Wood (in Borich, 1988: 224) indicated that only two percent of a teacher's day is devoted to any kind of praise. Ornestein (in Bellon et. al. 1992: 100) was concerned with the amount of praise at different levels. He found that praise was used less than five time per hour in elementary classrooms and considerably less in secondary classes Moreover, findings by Flanders and others (in Dunkin and Biddle, 1974:122) indicated that higher teacher praise is associated with greater pupil achievement.

On the other hand, although praise is a strategy that is always available to the teacher, it is only effective when

In all cases what is acceptable by all educators/researchers is that accepting or using students idea has both affective and cognitive components. Hence increasing its amount usually increases the degree of students participation.

Criticizing or Justifying Authority

According to Dunkin and Biddle (1974:126) teacher's praise and teacher's acceptance of students ideas are good things while criticism is bad thing. Criticism in the form of punishment has long effect on the pupil. It does not necessarily eradicate undesirable behavior and may even generate other problems like anxiety, hate, fear which result in pupils' refusal to participate in the teaching learning process (Perrott, 1982: 101-102).

On the other hand, it is impossible to always negatively relate criticism with students achievement and motivation. When occurs within a general context of warmth and interest in student, it can increase learning and motivation. Hence, it must match the situation and communicate what behavior is expected. Through it, learning can be promoted up to a certain point. Beyond that point students' progress is hindered (Bellon et. al. 1992:102).

Several research findings also indicated that criticism is mostly negatively related to students learning. For example, Gage and Berliner (1988:556) reported that out of sixteen studies concerned with investigating the relationship between teachers'

use of criticism and disapproval and students achievement, thirteen yielded a negative relationship and three yielded a positive relationship. A similar result was also reported by First (in Perrott, 1982: 172). According to him teachers who use large amount of criticism usually have classes that achieve less in most subject areas.

Fortunately, the use of criticism in classroom interaction has not been found to be a frequent practice. Dunkin and Biddle (1974:125) reported that teachers use of criticism accounts for less than 6 percent of the total time on the average. Brophy (in Gage and Berliner; 1988:556) also found a low rate (from 0.26 to 2.19 times per teacher per hour) of criticism of poor answers, poor work and poor conducts in six studies.

Hence, one can safely conclude that criticism, particularly excessive criticism, should not be used in teaching. By using excessive criticism, it is hardly possible to expect gains under all circumstances.

Other categories under "teacher talk", "accepting feeling" and "giving directions", have not generated substantial findings that relate them with students attitude, achievement, motivation or learning in general. For instance, the intensive reviews of research findings by Dunkin and Biddle (1974) and Rosenshine and Furst (1971) have not mentioned about the effect of these teachers behavior upon students learning.

2.2.2 "Student Talk" in the Instruction process

"Student talk", according to Flanders classification, includes "student talk-response" and "student talk-initiation" (see the explanation on page 15). Studies regarding student talk reflected almost the previously indicated results, that is, domination of classroom talk by teachers. For instance, Wragg (in Delamont, 1983:119) found that pupils' share of classroom talk fell throughout secondary school from 32 percent in the first year to 23 percent in the fifth year. According to him, pupil talk appears to decline as one goes up the grade level ladder. The findings reported by Dunkin and Biddle (1974:140) also indicated almost similar situation. According to them, pupil talk occupies one-fifth to one third of all classroom interaction time.

When one sees each of the two categories under "pupils' talk" with respect to the amount of time they are given, "pupil talk-response" seems to surpass the "pupil talk-initiation". For example, according to the findings of Dahlof and Lungdren (in Dunkin and Biddle, 1974:140) of all classroom interaction time 20 percent is occupied by "pupil talk-response" while "pupil talk-initiation" accounted only for less than 10 percent of the interaction time.

Furthermore, studies reviewed by Dunkin and Biddle indicated that the amount of pupil talk is unrelated to pupil achievement. That is, giving more opportunity for students to talk does not

necessarily imply or indicate higher learning. Because other factors like the content of talk, occasions of `pupils' talk', etc are important. But talk, if the above aspects are on the credit side, can obviously lead to active participation and in turn maximize students learning.

2.2.3Direct and Indirect Teaching Behaviors

As indicated earlier, Flanders (1963), making ingenious use of his system, classified teaching behaviors into direct and indirect influences. According to him, direct teaching behaviors refer to actions taken by the teacher which restrict student participation. Expressing one's own views through lecture, giving directions and criticising with the expectation of compliance tend to restrict participation. In Flanders system this is defined operationally by noting the percentage of teacher statements falling into categories 5, 6 and 7.

The indirect teaching behaviors, on the hand, refer to the actions taken by the teacher to encourage and support students' participation. "Accepting feelings", "praising or encouraging" "accepting or using students ideas" and questioning tend to support participation. Operationally, this is designated by noting the percentage of teacher's talk falling into categories 1,2,3 and 4.

Several studies have attempted to summarize the categories under "teacher talk" under the above main sections and relate them to many aspects (achievement, student attitude, and participation) of the teaching-learning process. In relation to this, for instance, Anderson (cited by Wragg, 1973:89), using his key words "dominative" and "integrative", found out that when the teacher's integrative contacts increased, the students showed more initiative and greater problem solving ability. Contrary to this, when teachers dominative contacts increased, the pupil could more easily be distracted from what they were doing. Delamont (1983:18) also stressed the positive aspects of indirectness in learning. According to him, the more indirect influences the teacher uses, the more favourable are the pupils' attitude to school work and the more they learn. Still Stones and Morris (1973:119) indicated that indirect teaching is found to produce higher pupil creativity scores than direct teaching.

But the findings reviewed by Dunkin and Biddle (1974:113-116) are very contradictory and difficult to explain. Teachers indirectness was found to be "unrelated" and "highly correlated" with the amount of pupils response, attitude and achievement. Some other findings, on the other hand, indicated "higher correlation" between indirectness and the total amount of pupil talk (both initiation and response). In any case, none of the studies reviewed by these scholars reported negative relationship between indirectness of teachers and students' attitude and achievement.

Furthermore, Hargreaves (1972:136) examined the effect of students condition upon the teaching behavior of teachers and indicated the possibility of reverse condition. According to him, teachers with better pupils (higher attainment and attitude scores) might have adopted an indirect teaching style in response to their superior learners, while teachers with more difficult students (lower attainment and attitude scores) are forced to be more direct in their behavior.

In short, many of the findings point in the direction of indirect teacher influence. They associate this teaching style with various measures of effectiveness and request teachers to take more indirect role. For instance, according to Amidon and Flanders (in Stones and Morris, 1973:118), indirect teachers take more time to accept and use students' idea, encourage a greater amount of pupil-initiated talk, use less criticism and use less direction. But this does not mean that direct teacher influence is unimportant. Regarding this issue, Flanders (in Perrott 1982:187) stressed that both direct and indirect behaviors are necessary in good teaching. According to him, there are times when teachers are forced to be direct, for instance, to introduce new idea and to give directions. But this has to be used to provide opportunities for indirect teacher's behavior. For instance, by giving directions (direct influence), the teacher can praise (indirect influence) the learners for their efforts and successes in accomplishing his directions.

2.3 Teachers' Experience in Classroom Instruction

According to Dunkin and Biddle (1974:39), teachers experience can be classified into formative and training experiences. Formative includes every experiences encountered prior to teacher training while teacher's training experience includes experiences during practice teaching, course taken at college or university, in-service and post graduate education. These two forms of experiences, according to these scholars, cannot affect the teachers classroom performance unless he/she retains traces of these experiences in his/her behavior.

On the other hand, Borich (1988:2-3), while discussing teacher's experience, focused on the experience that comes directly from teaching and related elements. For him, teaching experience includes years of teaching experience, experience in the subject taught, experience in grade level taught, work shops attended, graduate courses taken, degrees held and professional papers written. Similarly Nemser (in Bellon et. al., 1992:450) indicated that the daily work of teaching shapes teachers notions about how one becomes a good teacher. But of all experiences, teacher's experience with specific type of curriculum, grade level or learner may be more relevant to a teacher's performance

than the typical experience data such as total years of teaching experience, credits earned, hours of in-service training etc.

Research findings that relate teachers experience with their verbal interaction are very scarce. Nevertheless Dunkin and Biddle (1974:140) indicated that teachers decrease the amount of their talking as they gain experience (of the above forms of experiences which this represents is not explicitly indicated). But longer practice teaching experience is associated with greater teacher's use of lecturing. That means, the greater the experience of the teacher, the more time he/she spends in lecturing than in other categories of teacher's talk.

In all cases, one can safely say that experience, be it total teaching years, experience in specific curriculum or grade level or teaching practices in college or university, enables teachers to practice different teaching skills and integrate new knowledge and skills with current practice. It enables them to learn from interacting with students and their colleagues. Hence, it is difficult to expect a complete success from training or qualification alone. Rather what is learned in college or university can be effectively utilized, if and only if it is exercised over a long period of time. On the other hand, it is impossible to overlook the fact that experience alone is not enough unless one learns from it. That means, long experience can guarantee the acquisition of the issues mentioned above only when one can benefit (learn) through it.

2.4 Studies Related to Geography Instruction

Educationalists observe that, as in the case of all other subject areas, in the teaching of social studies, in which geography forms one major component, there is no one best approach that fits all instructional objectives, content, students, etc. An effective teacher utilizes a variety of approaches that suit the elements specified above (Savage and Armstrong, 1987:114).

Nevertheless, teaching techniques in geography can be seen from two angles. Some of the techniques rely on the pupils direct observation of what can be seen (example, observation of the topography) while other techniques require students to use second hand materials like maps, photographs, charts, etc. Of these, direct observation is more recommended in geography teaching. But because of the practical reasons like difficulty of covering large geographical areas, lack of important

facilities, etc. geography teaching must necessarily rely on second hand materials (UNESCO, 1965: 36-37). Though these are the methods to be used, the model applied in this research dictates the researcher to consider only verbal communication in geography classes.

On the other hand, geography teaching must start from the principle of pupil involvement. Since passive students are negation to this principle, the teacher must employ various methods like discussion than simply resorting to lecturing

(AAMSS, 1967:59). Similarly UNESCO (1965:75) contended that geography instruction would fail to cultivate pupil with right spirit if it became a bookish study. Even when it is difficult to teach the subject outside the classroom, teachers must involve students to find out as much information for themselves from materials rather than learning from direct instruction, that is, from lecture.

In geography instruction, like in other school subjects, effective teaching methods are also seen from the view points of students interest and motivation. In relation to this UNESCO (1965:75) stated that:

> There is no doubt the key to effective teaching is the creation in the child of genuine interest and the desire to know more. Inspired teaching generates wonder, wonder promotes interest and interest creates thirst for knowledge. With the world and its people, the geography master fails completely if he is unable to stimulate such a chain process in the child, for only this leads to real education.

This implies that interested and motivated students are attentive and eager to be engaged in the teaching-learning process. Moreover, in geography instruction, effective verbal communication is very crucial. Particularly debate can stimulate students to think critically and to express their ideas logically (Estville, 1988:2). In support of the same idea Bale (1987:107-108) also stated that in modern secondary school geography teaching there must be more talking, not by the teacher but by the learners.

However, the research finding (Stephenen in Bale, 1987:108) on the involvement of students in classroom talk during geography instruction shows minimum participation. Stephenen indicated that in primary school children spent 57.7 percent of the school day listening to the teacher's talk. The effect of this, according to Bale (1987:108), is that many children start fidgeting after a few minutes of monologue. There is, therefore, the need to break up monologue and replace it with dialogue, in which students get more opportunity to talk.

Moreover, geography teaching requires well qualified teachers. The idea of considering geography, as a subject that can be taught by someone with no special qualification or training must be avoided. Because of the complexity of the subject matter and because of special techniques involved in teaching (interpretation of data, cartography, etc) geography teaching requires qualified teachers (UNESCO, 1967:199).

In general in geography instruction, teachers must realize the extent to which students are learning. For this, they need to specifically pay attention to the use of various methods, and techniques (lecturing, discussion, demonstration, project method, etc) and also consider the issues of students interest, motivation and involvement in the instructional process.

2.5 Classroom Interaction Analysis in Ethiopian Schools

Studies related to teacher-pupil verbal interaction in Ethiopia are very much limited and do not allow to establish a complete profile for all grade levels and all school subjects. An attempt to investigate this issue using systematic classroom observation has been non-existing until recent years. Particularly, the relationship between teachers' verbal behavior and their experience or qualification has remained unexplored by the Ethiopian researchers.

Nevertheless as indicated earlier, Tassew (1992) has dealt with classroom verbal behavior of teacher trainers in Ethiopia in relation to their intelligence, self-concept and attitude towards teaching. Abdulkadir (1983) and Mccaul (1994) also investigated teacher-student interaction in English and mathematics classes, respectively.

The findings of these studies are, therefore, summarized in table 4.

All the local studies summarized above, regardless of the differences in grade level and subjects they treated and the sample size they have taken, invariably noted:

- the dominance of teacher talk by direct influence
- teachers' high preference for lecturing
- low students' participation in classroom communication, etc.

And all these researchers, like the previously reviewed ones, also showed high preference for indirect teacher influence which is associated with high students involvement.

In this study, therefore, an attempt was made to see verbal interactions in geography instruction. Whether or not the findings of this study are consistent with the findings discussed so far are important elements to give attention to.

greater the precision and the accuracy of the data it provides. Hence all of the teachers in these schools were included in this study. This size of sample population makes up about 67% of the total ninth grade geography teachers in the zone.

In all cases using schools near Awasa town as data gathering centers and limiting the number of sample size to about two-third of the population enabled the researcher to properly use the trained observers without jeopardizing their main duties.

3.4 Data Gathering Instrument

This research was designed to undertake the analysis of geography instruction on the basis of Flanders' Interaction Analysis Categories (FIAC). To apply this model in the schools under discussion, structured observation was used as data gathering instrument. This system enables observers to code verbal behaviors with high reliability (Bennett and McNamara 1979).

To carry out this systematic observation, the following steps were taken. Firstly, based on Flanders' model and using the ninth grade geography textbook, a training manual was prepared in order to acquaint and train the observers before gathering the data for the main study (see the training manual in Appendix A).

Secondly, two observers, who were knowledgeable about pedagogical science, were trained for coding classroom teaching

behavior for three days. Since training was very crucial to increase observers' agreement, the researcher concentrated on:

- orienting the observers about classroom interaction and the FIAC system.
- giving exercises to the observers and following them up
  a) whether or not they memorize the ten code symbols associated with each category,
  b) whether they can record classroom verbal communication using the code symbols,
  c) whether they attain appropriate speed in using these ten code symbols.

Thirdly, inter-observers' agreement in coding teaching behavior using the ten code symbols was calculated using the formula suggested by Scott (in Chauhan 1979:148). Applying this formula, the agreement between the two observers and the researcher was found to be significantly high (above 0.80). This enabled the researcher to confidently use the two trained observers for data gathering for the main study.

The following table indicates Scott's coefficient of agreement between the two observers and the researcher.

Table 6

Bio-Data of Observed Teachers

Total years of teaching experience	No	%	Qualification	No	%	Responsibilities	No	%
5-10	5	50	B.A	8	80	Teaching only	7	70
11-15	3	30	Diploma	2	20	Dept.Head	1	10
16-20	1	10				Director	1	10
21-25	1	10				Club Coordinator	1	10
Total	10	100					10	100

The above table indicates that almost all the teachers involved in this study have considerable teaching experience. Half of them have a teaching experience that ranges from 11 to 25 years. Those with a teaching experience between 5-10 years are also 50% of the sample population.

Qualification wise 8 out of 10 teachers (80%) have a B.A. degree, while 2 teachers (20%) are diploma holders in geography. It was also revealed that few teachers (30%) have some other responsibilities (head of school, head of department and club coordinator) besides their teaching task. Since one of the intents of this study is to investigate the relationship between teachers' behavior and their experience and qualification, these two aspects of the bio-data (experience and qualification) will be used towards the last part of this chapter.

4.2 Comparison of Teaching Behavior of Teachers Based on Individual Matrices

4.2.1 Proportion of Teachers' Talk, Student Talk and Silence or Confusion in Geography Instruction

In Flanders model "teacher talk", "student talk" and "silence or confusion" represent the time each of these elements occupy in classroom verbal communication. To find the rate of distribution of these elements, Flanders, using his 10 by 10 matrix, adds the totals of columns 1 to 7 and divides this sum by matrix total for proportion of teachers' talk, adds totals of columns 8 and 9 and divides this by matrix total for student talk, and divides total of column 10 by matrix total for silence or confusion and multiply each of them by 100 to get the percent of tallies that lies in columns of "teachers' talk", "students' talk" and "silence or confusion".

Applying these method of calculation, the following table has been developed for geography teachers.

Table 7

Proportion of Teachers' Talk, Students' Talk and Silence or Confusion

	CLASSES											
Variables	A	B	C	D	E	F	G	H	I	J	NE	average
TT	87.50	86.08	86.04	79.90	84.25	84.01	92.56	86.21	84.21	83.53	68	85.42
ST	3.83	5.73	4.40	10.33	4.18	6.13	0.55	5.13	6.21	6.35	20	5.30
SC	8.68	8.19	9.56	9.77	11.57	9.86	6.89	8.66	9.58	10.12	12	9.28

category was also calculated from the individual matrices. This was mainly intended to clearly show the frequency of each category in each of the classes (Table 8).

Table 8

Frequency of Each Category in Each of the Classes (A-J)

Categories	A	B	C	D	E	F	G	H	I	J
1	-	-	-	-	0.04	-	-	-	-	0.05
2	0.31	-	0.32	1.48	0.29	0.27	-	1.17	0.40	0.67
3	2.27	4.63	3.60	6.14	2.75	2.72	0.06	3.07	4.64	3.44
4	4.10	6.37	5.61	12.52	3.87	6.15	0.51	5.06	6.08	6.18
5	80.59	74.16	75.87	58.18	76.09	74.86	91.99	75.98	71.75	72.60
6	0.07	0.89	0.52	0.78	1.19	-	-	0.59	0.99	0.33
7	0.16	0.02	0.12	0.78	0.02	-	-	0.35	0.30	0.26
8	3.76	5.48	4.33	10.14	3.61	6.10	0.5[illegible]	4.75	5.98	6.13
9	0.07	0.26	0.07	0.20	0.57	0.04	-	0.37	0.25	0.22
10	8.67	8.19	9.56	9.78	11.57	9.86	6.89	8.66	9.61	10.12

The percentage of the frequency of each category has been calculated from the individual matrices (see appendix E). The results indicated that teachers in classes A-D and F-I had not totally accepted and clarified the feeling or the attitudes of the learners (category 1) in geography instruction. And those in classes E and J also gave little time (0.04% and 0.05%, respectively) to this category. From the data in table 8, it was also observable that teachers' praise (category 2), teachers' direction (category 6), teachers' criticism (category 7) and students' talk initiation (category 9) were extremely low in

classes A,C, D, E, F, H, I and J. when compared with other categories Similarly categories 6, 7 and 9 accounted for little percentages in class B and the teacher in this class even took no time for praising or encouraging the learners (category 2). The distribution of figures for these categories, further showed a very extreme condition in class G. The teacher in this class did not praise or encourage, give direction and criticize students. Students in the same class were not also found initiating classroom talk.

A closer scrutiny into the data also showed that the percentages for accepting or using students ideas (category 3) were very close to each other in classes A, B, C, E, F, H, I and J. The range of distribution for the data in this category in these classes was only 2.37%. Nevertheless, the highest tallies for accepting or using students ideas (category 3) were recorded in class D(6.14%) while the lowest were in class G (0.06%).

Moreover, the data in table 8 revealed that comparatively, the teacher in class D used more praises or encouragements (1.48%), asked more questions (category 4=12.52%) than other teachers. In this class the frequency of occurrence of pupil talk response (category 8) was also the highest (10.14%) when seen against the percentages of this category in other classes. Particularly the frequency of this category and category 4 (questioning) were very low in class G(0.55% and 0.51%, respectively).

On the other hand, the distribution of data for category 5 (lecturing) indicated that the time teachers used for lecturing was very high in all classes, above 75% on average. This implied that of the time the teacher and students interacted during geography instruction, on average three fourth was spent for giving lecture. Further assessment, however, revealed that domination by teachers' lecture was not equal or uniform in all classes. For instance, in class G lecturing accounted for the highest percentage (91.99%) while this was as low as 58.18% in class D.

On the whole, comparing the conditions in each of the classes, the teacher in class D seemed in a better position (as the frequency indicated) in using praise or encouragements, in accepting and using students ideas, in asking more questions, in minimizing the time for lecturing and in initiating students' response. But the teacher in class G seemed to have high dominative character. Because he was observed using more than 90% of the class time for lectures and gave little or no time for the other categories of classroom communication.

4.2.2 The Type of Teachers' Influence In Geography Instruction

As discussed in chapter two, to clearly show the notion of freedom and control in classroom communication, Flanders used the terms "direct influence" and "indirect influence." To find out whether the teachers' teaching behavior is direct or indirect, he proposed the following formula.

$$^{I}/_{D} = {}^{1+2+3+4}/_{5+6+7}$$

According to Flanders, this formula is particularly useful when applied to matrices with well over 1000 tallies. Here, if the ratio is large, the numerator becomes larger compared with the denominator and the ratio coming in value greater than one indicates more indirectness. For instance, the $^{I}/_{D}$ ratio of 0.5 means that for every two direct statements, there was only one indirect statement.

To focus on the type of teachers' influence without the presence of categories 4 & 5 (questioning and lecturing) or the most content laden categories, Flanders also suggested another formula.

$$^{i}/_{D} \text{ (small } ^{i}/_{d}) = {}^{1+2+3}/_{6+7}$$

Hence following the same method of calculation, the following table has been developed to indicate these two ratios for each of the sample population

Table 9

The Type of Teachers' Influence In Teaching Geography

CLASSES										
Ratio	A	B	C	D	E	F	G	H	I	J
I/D	0.08	0.15	0.12	0.34	0.09	0.12	0.01	0.12	0.15	0.14
i/d	11.6	5.05	6.15	4.91	2.91	-	-	4.53	2.10	7.00

The above table summarized the indirect-direct ratios calculated from the individual matrices (see appendix E). The results indicated that the I/D ratios for all teachers were well below one. This implied that geography teachers employed direct influence in teaching the subject. That is, all teachers involved in this study gave less freedom to the learners.

But when compared with each other, the teacher in class G seemed to impose more direct influences (I/D=0.01) while the one in D appeared to use more indirect influences (I/D=0.34) than the others. In the rest of the classes, it was really difficult to say that this or that teacher was more direct or indirect than others. Because the distribution of the figures indicated almost a similar condition in many of the classes and the numbers were very close to each other. For instance, in classes B, I and J the I/D ratios were 0.15, 0.15 and 0.14, respectively. Classes C, F and H had also identical I/D ratio, that is, 0.12. In classes A and E the ratios were 0.08 and 0.09, respectively. Thus, this implied not only directness of geography teachers but

also showed that the extent to which most of the teachers employed direct influences was quite similar.

When seen against the findings of previous researches the present study showed a very high teachers' use of direct influences. For instance, Abdulkadir's (1983) finding indicated the I/D ratio that ranged between 0.47-1.00 for English teachers. Of course, the higher ratios for English teachers may be due to the nature of the subject. But still it seemed that geography teachers lacked concern for student oriented categories. Furthermore, what geography teachers did also contrasts with the arguments of Delamont (1983). According to her observation, using more indirect influences develops a favourable pupils attitude to school work and this in turn leads to higher learning.

However, when the effects of categories 4 and 5 were eliminated or when small i/d was considered, the ratios became very high in some classes. For instance this ratio went as high as 11.6, 5.05, 6.15 and 7.00 in classes A, B,C and J, respectively. In classes D, E,H and I the values of i/d ratios were 4.91, 2.91, 4.53 and 2.10, respectively. Since the denominators were zero in classes G and F (see appendix E), it is impossible to apply Flanders formula for small i/d in these two classes.

In all cases, the i/d ratio together with what has been discussed above can tell us two important facts about the teaching behavior of geography teachers. First, the small number

of tallies in columns 6 and 7 in eight classes (A-E and H-J) and their complete absence in the two classes (G and F) implied that teachers were less concerned with giving direction and control. Secondly, the content laden categories had been emphasized in geography teaching. To put differently, teachers directness in geography teaching was mainly due to devotion of much time to lecturing and also questioning. Hence, the high emphasis teachers gave to the presentation of the subject matter and their lack of concern to motivation and control resulted in contrasting figures for the I/D and small i/d ratios.

In general, on the basis of this discussion, it is possible to say that students were taught by dominative teachers. Though scholars like Flanders (1970), Stones and Morris (1973), Delamont (1983) and many others advised teachers to be more indirect than direct in their approach, geography teachers were observed using predominantly direct influences in the teaching-learning process.

Other than this direct-indirect ratio, many other ratios have been proposed by Flanders to investigate the actual performances of teachers and students in classroom communication. Of these ratios, those which enabled the writer to get the proper answers for the questions raised previously were summarized in table 10 below and discussed one by one. So the discussion from pages 71 to 79 was with reference to this table.

4.2.3Ratios for Teachers Use of Questioning and Other Verbal Behaviors

Table 10

Teachers' Question Ratio and Other Matrices Ratios in Geography Classes (A-J)

Ratios	A	B	C	D	E	F	G	H	I	J	NE
TQR	4.86	8.64	8.65	17.71	4.84	7.59	0.55	6.24	7.81	7.84	26
TRR	92.06	83.47	86.01	83.07	71.79	100	100	81.90	89.61	87.50	42
PIR	1.74	4.40	1.60	1.93	13.68	0.62	0.00	7.31	4.15	3.37	34
CCR	90.57	86.63	81.22	80.12	86.07	88.95	95.26	88.01	86.64	86.62	55
SSR	82.94	79.04	77.91	64.84	81.97	76.51	94.03	76.89	79.97	74.79	50

4.2.3.1 Teacher Question Ratio (TQR)

In Flanders, model, teacher's question ratio is an index used to indicate the tendency of teachers to use question when guiding the more content oriented part of the class discussion. Mathematically this is given as the percentage of all category 4 and 5 statements which are classified in category 4. That is,

$$TQR = {}^{\text{totals in column 4x100}}/_{\text{total in column 4+totals in column 5}}$$

According to Flanders, one could normally expect average teachers' questions to be close to 26%. But the findings of this study revealed almost unusual low number of questions asked in geography teaching. That is, except in class D in all other classes the teachers' question ratios were below 10%.

Particularly the teacher's question ratios for teachers in classes A and E were even less than 5% (4.86% and 4.54%, respectively) and it was only about 1% in class G. But the teacher's question ratio of class D (17.7%) was exceptionally closer to Flanders 26%. The data in table 10, thus, indicated not only the teacher question ratios which were well below the average but also signified the differences in using questions while teaching.

Similar study undertaken by Abdulkadir (1983) on English teaching reported the teachers' question ratios that ranged between 29.70% to 41.10% for English teachers. When seen against this finding, the present study indicated a very low emphasis on questioning.

In short, geography teachers seemed to give less emphasis to the issue of encouraging students participation and getting them to interact with them and with each other through questioning. The high emphasis they gave to lecturing appeared to lead to the absence of balance between teachers' question and teachers' lecture.

4.2.3.2 Teacher Response Ratio (TRR)

Flanders defined teacher response ratio as an index which corresponds to the teacher's tendency to react to the ideas and feelings of the pupil. It is obtained by applying the formula,

$$TRR = {}^{1+2+3x100}/_{1+2+3+6+7}$$

The normative expectation for this index, according to Flanders, is 42%.

Using this formula, which excludes one category of teacher initiation (category 5), it has been found that the highest teacher response ratios were in classes F (100%) and G(100%), while the lowest was in class E (71.79%). The teacher response ratios in all other classes ranged between 81.90% to 92.06%. That means, the figures for this index went extremely above the average. Particularly the figures in classes F and G showed the highest possible limit (100%). This condition was, of course, due to the absence of teachers' direction and criticism in these two classes (see Appendix E). And the results with these very high percentages for this index in all classes did not necessarily show high teachers responsiveness in classroom communication. Because, as discussed earlier (under table 8), categories 1,2 and 3 (teacher response categories) occupied a negligible time in almost all classes. What brought these high ratios were the very low or complete absence of teachers' direction and criticism in the observed geography classes and the exclusion of category 5 in calculating the value of teacher response ratio. Hence on a comparative base what one could understand from values of teacher response ratios given in table 10 was that teachers used more categories of teachers' response (particularly categories 2 and 3) rather than categories 6 and 7. To put differently, teachers had a tendency of praising and

accepting or using students idea than criticizing and giving directions.

To make things more clear, the writer also calculated the proportion of teacher response categories (1,2 and 3) and the proportion of teacher statements intended to initiate classroom discussion, that is, categories 5, 6 and 7 (see Appendix E). The results indicated that, except in class D, in which the teacher initiation categories accounted for 74.78%, in all other classes, the teacher initiation categories accounted for more than 85% of the teacher's talk. Particularly in class G, these categories occupied 99.38% of teacher's discourse.

On the other hand, responses which teachers gave to pupils comments or ideas accounted for very low percentages in all classes. That is, the proportion of teacher response categories was less than 10% in the observed classes. Of course, the highest proportion (9.54%) was recorded in class D, while the lowest was in class G (0.07%). In all other classes the percentages for teacher response categories were below 6% of the total teachers' talk.

Thus, these proportions of teacher response and initiation categories together with what has been discussed so far, implied that ninth grade geography teaching in schools under discussion was associated with high teachers' use of initiation categories, particularly lecturing rather than accepting feelings, praising and using students' ideas.

4.2.3.3 Pupil Initiation Ratio (PIR)

According to Flanders, this ratio indicates the proportion of pupils talk which is judged by the observer to be an act of initiation. The formula for this is given as,

$$PIR = {}^{9 \times 100}/_{8+9}$$

Based on studies of several years, Flanders also pointed out an average pupil initiation ratio to be close to 34%. The results obtained in the present study almost showed quite a contrast to this average. As indicated in table 10, class E, with the highest pupil initiation ratio, had about 14% while class G with the lowest pupil initiation ratio had not any talk initiated by the students. Classes A, C and D, had similar figures for this index (about 2%). In classes B and I the ratios were also almost alike (about 4%). In the rest of the classes, i.e. classes F, H and J the pupil initiation ratios accounted for 0.62%, 7.31%, 3.37%, respectively.

Thus, this indicated that as far as pupil initiation ratios were concerned, in the present study student-initiated classroom talk was way below the average. Comparing the classes with each other, one could safely say that pupils were taking much more initiative in class E and no pupil initiation in class G.

Moreover, the present results for this index were not also in line with Abdulkadir's (1983) findings. In his study, Abdulkadir reported the highest pupil initiation ratio to be

experience increased teachers' use of indirect influences showed slight decrease.

Using the aforementioned statistical tools, high coefficients of correlation were found for the relationships between proportion of teachers' talk and experiences (0.80) and for teachers' use of lecturing and experience (0.86). These results indicated that the longer the years of teaching experiences of teachers, the more they talked and also the more they resorted to the use of lecturing. Similar findings were also reported by Dunkin and Biddle (1974) for the association between teachers use of lectures and their years of experience.

To substantiate the above results, test of significance was computed using a t-test. The results indicated that the relationship between the I/D ratio and teachers' experience was statistically non significant. Because the magnitude of the calculated t (-0.89) was less than the critical t-value ($t_{8;05}$=2.31). But statistical test showed that the correlations between the proportion of teachers' talk and the use of lecturing, on the one hand, and teachers' experience on the other, were significant. This is evidenced by the fact that the calculated t values, 3.77 (for teachers' talk and experience) and 4.77 (for teachers' use of lecturing and experience) were greater than the critical t value (t=2.31, df=8, α=0.05). This means, as far as the correlation between teachers experience and the amount of their talk and their use of lecturing was considered,

5.3.1 In the present world, the idea of considering students as passive receivers is a dead issue among open-hearted educators. But the investigation revealed that geography classes under discussion were highly dominated by teachers. This may be, among other things, due to lack of appropriate training. Therefore, it seems important to support the previous training of teachers by updating programs such as workshops, seminars and the like.

5.3.2 From the investigation it seemed that ninth grade geography teachers of Sidama Zone had no idea about classroom interaction. Therefore, it is important to re-examine whether or not methodology courses have a section that deals with classroom interaction in general and with verbal communication in particular.

5.3.3 It is clear that emphasizing the content alone may not necessarily bring about learning. In addition to the presentation of the subject matter through lecturing, using questions, increasing students' initiation, being flexible in communication and reacting to students' ideas and feelings can obviously enable teachers to focus on students' attention. These also keep students alert and help teachers to emphasize the lesson and extend students' thinking. Therefore, it is advisable that ninth grade geography teachers should vary their classroom talk to include such

variables as accepting feelings, encouraging, accepting students' ideas, teachers' direction, etc.

5.3.4 Lastly, teachers and students at different levels of schools (elementary, junior secondary and senior secondary) may have different character in classroom interaction. And the previous exposure may have direct impact upon teacher-students classroom interaction in the later stages. Hence it seems useful to undertake comparative study of classroom interaction in the three levels of schooling.

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Appendix - A

Training Material

General Description About the Training Material

This training material has three parts. First it consists of explanations and examples to enable the trainees identify the ten categories of FIAC. Secondly, there are exercises to be done before undertaking observation of actual teaching -learning process. Lastly it consists of practical exercises that enable the trainee to practice recording verbal communication in the classroom.

In all case the trainees are expected to:

- memorize the ten categories and their code symbols.
- do all exercises before observation of the live situation.
- exercise recording classroom talk in live situation for several hours before gathering data for the main study.

Part I

Explanations and Examples

In order to be familiar with each of the categories try to digest and memorize the 10 code symbols associated with each category given below. Then, read and also note the examples given under each category.

Category 1: Acceptance of Feeling.

- the teacher accepts feelings when he says he understands how the pupils feel, that the y have the right to have these feelings and that he will not punish the pupils for their feelings.
- also included in this category are statements that recall past feeling, refer to enjoyable or uncomfortable feelings that are present or predict happy or sad events that will occur in the future.

Examples:

1 T Oh! You students seem frustrated!

1,4 T Alemayeha, you look, Sorrowful! What happened to you ?"

These statements that indicate teachers acceptance of students feeling are relatively, in frequent. ("T" stands for teacher's statement and "S" for students' statement.)

Category 2: Praising or Encouraging

Included in this category are jokes that release tension, but not those that threaten pupils or are made at the expense of individual pupils. Often praise is a single word such as "good","okay","alright",etc.Sometimes, the teacher simply says I like what you are doing, "I appreciate you," etc.

Examples

4 T- What is the location of rainforest region?

8 S- It is found between 6^0 N and 6^0 S.

2,4 T- "Good boy" can Alemayehu tell us one specific area

8 S- Yes, Zaire basin in Africa.

2,4 T- "Good for you, Tadelech will add one more?

8 S- Yes, Amazon basin.

2 T- You also gave a correct answer.

Category 3:Accepting or Using Students Ideas.

This category is quite similar to category 1, however, it includes only acceptance of student idea not acceptance of expressed emotion (feeling). When a student makes a suggestion, the teacher may paraphrase the student's statement, restate the idea more simply or summarize what the students have said. Statements belonging to this category can be identified by asking the question;"Is the idea that the teacher is now stating the pupil's or is it the teacher's?" If it is pupil's idea, then this category is used.

Examples:

9 S- Sahara desert, due to its scanty rainfall, is unsuitable for agriculture.

3 T- Tadelech, thinks that agricultural activities require sufficient rainfall.

9 S- The lee ward sides of Drakensberg mountains are deserts.

2,3 T- Right you are, the lee ward sides of these mountains have very little rainfall and little vegetation.

Category 4:Asking Question

This category includes only questions to which the teacher expects an answer from the pupil. That means, not all questions are classified in this category. If a teacher asks a question and then follows it immediately with a statement of opinion, or if he begins lecturing, obviously the question was not meant to be answered.

Examples

6 T- Alemitu, would you clean the blackboard?

4 T- What was the point of discussion in our last period?

8 S- It was about the formation of deserts.

7,7 T- No, did not you attend the class last time? Or were you day dreaming during that time?

4 T- Who can recall the last discussion?

8 S- It was about economic activities of deserts

Category 5:Lecturing

Lecture is the form of verbal interaction that is used to give information, facts, opinions or ideas to children. Whenever, the teacher is explaining, discussing, giving opinion or giving facts or information, category 5 is used. This category is the one most frequently used in classroom observation.Rhetorical questions are also included in this category.

Examples

5 T- Last time we have discussed the location of hot deserts.

5 T- We have said that they are found between 35^0N and S.

5 T- Our today's topic is about "Major hot deserts".

5 T- The major hot deserts are Atakama, Sahara, Kalahari and Arabia

5 T- Of these, Sahara is the largest.

5 T- It covers large area in Africa.

Category 6:Giving Directions

The decision on whether or not to classify the statement as a direction or command must be based on the degree of freedom that the pupil has in response to teacher direction. If the statement is merely an announcement, code it 5. If there is compliance, code it 6.

Examples

6 T- Will you stand up and stretch?

6 T- Alemitn, I want you to participate in teaching - learning process.

5 T- The "film show" will begin next Monday.

5 T- So, all of you are invited to take part.

6 T- Abebe, go to the blackboard and write your name.

Category7:Criticising or Justifying Authority

A statement of criticism is one that is designed to change student behavior form non-acceptable to acceptable. Statements of self justification or defence and statements of extreme self-reference or those in which a teacher is constantly asking the learners to do something as a special favor to the teacher.

Examples

7 T- I do not like what you are doing. Do something else.

7 T- One of your troubles is that you forgot to follow directions.

Category 8: Pupil Talk - response

This category is used when the teacher has initiated the contact or solicited pupil statement, when the pupil answers a question asked by the teacher or when he responds verbally to a direction the teacher has given. Any thing that the pupil says that is clearly in response to initiation by the teacher belongs to this category.

Example

4 T- How can we calculate a mean monthly T^0 of one station?

8 S- By summing up the T^0 in all days of a month and dividing it by the number of days.

4 T- Tell me the rainy seasons in S.E highlands of Ethiopia.

8 S- The Autumn and Spring months.

6 T- Alemu, clean the blackboard.

8 S- Sir, the duster is stolen by students of section A.

Category 9:Pupil Talk-initiation

In general if the pupil raises his hand to make a statement or to ask question when he has not been prompted to do so by the teacher, the appropriate category is "9". Predicting the general kind of answer that the student will give in response to a question from the teacher is important to make distinction between category 8 and 9. If a student, after answering teacher's question adds, his idea or different opinion, the last part of his suggestion (idea) will be coded 9.

Examples

4 T- Alemu, can you tell us one example of desert animal?

8,9 S- Yes, Camel is a desert animal. It can go without water for long time.

9 S- For what purposes do Camels use their hump?

Category 10:Silence or Confusion

This category includes anything not included in other categories.Periods of confusion incommunication (when it is difficult to determine who is talking) are classified in this category.

Part II

Exercises before Observation of the Actual Teaching - Learning Process.

Exercise 1:Trainees will, through discussion, give complete answers for the following questions.

1. What is classroom interaction?
2. What are the two major categories of classroom interaction?
3. Identify the two groups who verbally interact in the classroom.
4. What is Flanders interaction Analysis categories?
5. How many categories of FIAC stands (refers) to teacher talk?
6. How many " " " " " for students talk?
7. How " " " " " " for confusion or silence?

Exercise 2:Define (explain) each of the categories of FIAC

Exercise 3:What code numbers are given for each of the following key words in the FIAC (Write the numbers on spaces give on left side).

_____Accepting feelings or attitude _____giving direction

_____Encouraging or praising _____ lecturing

_____Accepting students ideas _____ justifying authority

_____ Asking questions _____ crificising students.

_____ using students ideas _____pupil talk - response.

_____pupil talk imitation _____silence or confusion

Exercise 4:What category of classroom talk, can be represented by each of the following numbers (don't refer to the previous exercise).

9._____8. _____7._____3._____10._____5._____

2._____1._____4._____6._____

Exercise 5:Answer the following questions without referring to Flanders' classification of classroom talk.

1. When the teacher is talking your select a code number from _____ to _____.
2. When a pupil is talking, you select either _____ or _____.

3. When the teacher statements respond to feelings or attitudes, encourage or make use of pupil ideas, the code numbers you select are _____.
4. When the teacher statements initiate, the cods numbers you use are_____.
5. Pupil statements in response to the teacher are coded by the number_____.
6. Pupil statements showing initiation are coded with number _____.

Exercise 6:After you complete exercise 5 , attempt, the following questions, again without referring to the FIAC.

1.When the teacher clarifies an attitude of the pupil you write number _____
2.Jokes that release tension and which are not at the expense of others are coded__
3. Saying "go on", "alright" and the like are coded _____.
4. When student verbally responds to teacher's direction the code number to to used is _____.
5.Comparing students ideas or developing should be coded using number___
6. When the teacher expresses his own idea or gives his own explanation you use number___
7. When student gives an answer for teacher's question you use number_____.
8. When the teacher criticizes students for incorrect answers you select number__.
9. When student expresses his own idea you select number _____.
10. When teacher's statement is designed to change students' behavior from non-acceptable to acceptable you select number _____.

Exercise 7:How do you classify the following statements of teachers and students (Use the code numbers).

_____T- Abebe, have you brought your geography book?
_____S- No, I forgot it at my home.
_____T- Bring and show me next time.
_____T- Today we will learn about the equatorial rain forest region.
_____T- Adanech, do you know what equatorial rain forest region is?
_____S- Yes, equatorial rain forest is an area of high rain fall and high temperature.
_____T-Right she is;Alemu,do you tell us the amount of rainfall and temperature?
_____S- I do not know sir.
_____T- You are in a problem, because you do not read your book!

_____T- Have you ever seen such a beautiful work of Solomon?

Part 3

Practical Exercise in Live Situation

The following tasks are intended to help the observer to exercise recording verbal communication in the classroom. Since exercising makes you so skilled and reliable in recording classroom talk, do all the exercises in order of their sequence. (In all cases don't forget sitting in a best position where you can see and hear the participants. But without distracting the attention of he class).

Task 1:First Observation

Tally each statements of teacher and pupil talks as "TT" (T and P should be written after the teacher and pupils complete the sentence, respectively).

Example,if the teacher says - "Stop writing. Listen to me, write TT.Excellent boy=T

If a student says " Teacher, I did not understand what climate is ", write P.

Task 2:Second Observation

Now, using the tally mark indicate a simple form of interaction analysis as follows. The tally mark indicates (stands for) a single statement.

T=1111 P=111

Task 3:After you finish the above observation periods, now try to record (tally) the talk at the interval of 3 seconds using the following simplified version of Flanders.

	Category	Tallies
Teacher Talk	1. Accepts feelings 2. Praises of encourages 3. Accepts or uses ideas of students. 4. Asks questions 5. Lectures 6. Gives directions 7. Criticizes or justifies authority.	
Student Talk	8. Student response 9. Student initiation	
	10. Silence or confusion	

Appendix B

Inter Observers Agreement Between the Researcher and the Trained Observers

Inter Observers Agreement Between the Research (A) and Observer B

Category	A	B	%A	%B	% difference	(Average %²)
1	-	-	-	-	-	-
2	-	-	-	-	-	-
3	13	13	2.41	2.37	0.04	0.06
4	26	39	4.82	7.13	2.31	0.36
5	406	413	75.32	75.51	0.19	56.87
6	5	7	0.93	1.28	0.35	0.01
7	-	-	-	-	-	-
8	26	19	4.83	3.47	1.36	0.17
9	2	2	0.37	0.37	0	0
10	61	54	11.32	9.87	1.45	1.12
Total	**539**	**547**	**100**	**100**	**5.70**	**58.59**

$$p_1 = \frac{P_o - P_e}{100 - P_e} = \frac{(100-5.70)-58.59}{100-58.59} = 0.86$$

Where , P_1 = reliablity, P_o =agreement between observers and P_e =agreement between observers that occurs simply by chance.

Appendix C

Inter Observers Agreement Between the Researcher (A) and Observer B

Category	A	B	%A	%B	% difference	(Average %)
1	-	-	-	-	-	-
2	-	-	-	-	-	-
3	13	18	2.41	3.30	0.89	0.16
4	26	30	4.82	5.49	0.67	0.27
5	406	399	75.32	73.08	2.24	55.06
6	5	7	0.93	1.28	0.17	0.01
7	-	-	-	-	-	-
8	26	32	4.83	5.86	1.03	0.29
9	2	2	0.37	0.37	0	0
10	61	58	11.32	10.62	0.7	1.20
Total	539	546	100	100	5.88	56.99

$$p_1 = \frac{P_o - P_e}{100 - P_e} = \frac{(100-5.88)-56.99}{100-56.99} = 0.863$$

Appendix E (1-10)

Individual matrices of each sample population consisting percentage each category and various indices calculated the formulas given in Caper 4.

1. Master Matrix of Class A

Categories	1	2	3	4	5	6	7	8	9	10	Total	%
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	1	-	10	-	-	-	-	3	14	0.31
3	-	-	25	12	62	-	-	2	-	1	102	2.27
4	-	-	-	27	-	-	-	109	-	49	185	4.10
5	-	-	-	101	3417	3	-	-	3	100	3624	80.59
6	-	-	-	-	-	-	-	-	-	3	3	0.07
7	-	-	-	-	7	-	-	-	-	-	7	0.16
8	-	14	73	6	34	-	7	31	-	4	169	3.76
9	-	-	3	-	-	-	-	-	-	-	3	0.07
10	-	-	-	39	94	-	-	27	-	230	390	8.67
Total	-	14	102	185	3624	3	7	169	3	390	4497	100

TT = 87.50, ST = 3.83, SC = 8.67, TRR = 92.06, TQR = 4.86, TIR = 1.74, I/D = 0.083
i/d − 11.6, CCR − 90.57, SSR − 82.94, PTIC − 92.35 PTRC − 2.95

PTIC means the proportion of teachers' initiation categories and PTRC represents proportion of teachers' response categories.

4. Master Matrix of Class D

Categories	1	2	3	4	5	6	7	8	9	10	Total	%
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	19	26	12	2	1	-	6	-	16	82	1.48
3	-	9	71	105	83	1	1	33	1	35	339	6.14
4	-	2	-	161	12	4	-	381	-	132	692	12.52
5	-	-	-	169	2981	7	-	4	6	47	3214	58.18
6	-	-	-	3	5	22	2	3	-	8	45	0.78
7	-	-	-	21	1	-	1	13	-	7	43	0.78
8	-	46	233	105	52	2	37	57	2	26	560	10.14
9	-	1	7	1	-	-	-	-	2	-	11	0.20
10	-	5	2	115	78	6	2	63	-	269	540	9.78
Total	-	82	339	692	3214	43	43	560	11	540	5524	100

TT = 79.90 ST = 10.33 SC = 9.77 TRR = 83.07 TQR = 17.71
PIR = 1.93 = I/D = 0.34 i/d = 4.91 CCR = 83.07 SSR = 64.84
PTIC = 74.78 PTRC = 9.54

6. Master Matrix of Class F

Categories	1	2	3	4	5	6	7	8	9	10	Total	%
1	–	–	–	–	–	–	–	–	–	–	–	–
2	–	7	–	1	5	–	–	1	–	–	14	0.27
3	–	1	15	38	59	–	–	14	–	16	143	2.72
4	–	1	2	22	10	–	–	241	–	18	324	6.15
5	–	–	1	169	3648	–	–	5	1	118	3942	74.86
6	–	–	–	–	–	–	–	–	–	–	–	–
7	–	–	–	–	–	–	–	–	–	–	–	–
8	–	5	123	60	80	–	–	26	–	27	321	6.10
9	–	–	2	–	–	–	–	–	–	–	2	0/04
10	–	–	–	34	140	–	–	34	1	310	519	9.86
Total	–	14	143	324	3942	–	–	321	2	519	5265	100

TT = 84.01 ST = 6.13 SC = 9.86 TRR = 100 TQR = 7.59 PIR = 0.62
I/D = 0.12 CCR = 88.95 SSR = 76.51 PTIC = 89.13 PTRC = 3.55

7. Matrix of Class G

Categories	1	2	3	4	5	6	7	8	9	10	Total	%
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	3	-	-	-	-	-	3	0.6
4	-	-	-	1	-	-	-	21	-	1	23	0.51
5	-	-	-	13	4073	-	-	-	-	104	4190	91.99
6	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	3	9	5	-	-	4	-	4	25	0.55
9	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	109	-	-	-	-	205	314	6.89
Total	-	-	3	23	4190	-	-	25	-	314	4555	100

TT = 92.56 ST = 0.55 SC = 6.89 TRR = 100 TQR = 0.55
PIR = 0.00 I/D = 0.01 CCR = 95.26 SSR = 94.03 PTIC = 99.38
PTRC = 0.07

10. Master Matrix of Class J

Categories	1	2	3	4	5	6	7	8	9	10	Total	%
1	-	2	-	-	-	-	-	-	-	-	2	0.05
2	2	10	9	2	3	-	-	2	-	-	28	0.67
3	-	8	28	16	51	-	-	32	6	4	145	3.44
4	-	-	-	37	16	-	-	155	-	52	260	6.18
5	-	-	-	137	2795	14	5	-	1	103	3055	72.60
6	-	-	-	-	8	-	-	-	-	6	14	0.33
7	-	-	-	-	11	-	-	-	-	-	11	0.26
8	-	8	99	29	64	-	6	34	-	18	258	6.13
9	-	-	9	-	-	-	-	-	-	-	9	0.22
10	-	-	-	39	107	-	-	35	2	243	426	10.12
Total	2	28	145	260	3055	14	11	258	9	426	4208	100

TT = 83.53 ST = 6.35 SC = 10.12 TQR = 7.84 TRR = 87.5 PIR =3.37
I/D = 0.14 i/d = 7.00 CCR = 86.62 SSR = 74.79 PTIC = 87.62
PIRC =4.98

2. Spearman's Coefficient of correlation (P) between Proportion of teachers talk and their experience

Teacher	TT	R_1	Experience	R_2	d	d^2
1	79.90	1	11	6.5	-5.5	30.25
2	84.53	2	12	8	-6	36
3	84.01	3	11	6.5	3.5	12.25
4	84.21	4	10	5	-1	1
5	84.25	5	16	9	-4	16
6	86.04	6	8	2	4	16
7	86.08	7	7	1	6	36
8	86.21	8	9	3.5	4.5	20.25
9	87.50	9	8	3.5	5.50	30.25
10	92.56	10	23	10	0	0

$$\sum d^2=198$$

$$\rho=1-\frac{6\sum d^2}{N(N^2-1)}=1-\frac{198}{10(10^2-1)}=0.80$$

$$t=p\sqrt{\frac{N-2}{1-p^2}}=0.8\sqrt{\frac{10-2}{1-(-0.8)^2}}=3.77$$

3. Spearman's correlation coefficients between teachers'' use of lecture (TL) and their experience.

TL	R_1	Years of Experience	R_2	d	d^2
58.18	1	11	6.5	5.5	30.25
71.15	2	10	5	-3	9
72.60	3	12	8	-5	25
74.16	4	7	1	3	9
74.86	5	11	6.5	-1.5	2.25
75.87	6	8	2	4	16
75.98	7	9	3.5	3.5	12.25
76.09	8	16	9	-1	1.00
80.59	9	9	3.5	5.5	30.25
91.99	10	23	10	0	0

$$\sum d^2=135$$

$$\rho=1-\frac{6\sum d^2}{N(N^2-1)}=1-\frac{135}{10(10^2-1)}=0.86$$

$$t=\rho\sqrt{\frac{N-2}{1-\rho^2}}=0.86\sqrt{\frac{10-2}{1-(0.86)^2}}=4.77$$

5.Point Biserial Correlation between Proportion of Teachers talk (TT) and their qualification.

Teacher	Teacher's Talk (X)	Qualification	$(X-\bar{X})^2$
1	79.90	1	30.57
2	83.53	1	0.53
3	84.01	1	2.01
4	84.21	1	1.49
5	84.25	0	1.39
6	86.04	1	0.37
7	86.08	1	0.42
8	86.21	1	0.61
9	87.50	1	4.29
10	92.56	0	50.85
	$\bar{X}$=85.429		$\sum (X-\bar{X})^2$=92.53

Standard deviation = 3.04 (S_x)
Mean score of TT for B.A. teachers = 84.685
Mean of TT for Diploma teachers=88.405
Proportion of B.A teachers (p)=0.80
Proportion of Diploma teachers (q) =0.2

$$\Gamma=\frac{\bar{X}_p-\bar{X}_q}{S_x}\sqrt{pq}=\frac{84.685-88.405}{3.04}\sqrt{0.80x0.20}=-0.49$$

$$t=\tau\sqrt{\frac{N-2}{1-\tau^2}}=-0.49\sqrt{\frac{10-2}{1-(-0.49)^2}}=-1.59$$

6.Point Biserial Correlation between Teachers' use of Lecture (TL) and Qualification .

Teacher	Teacher's Talk (X)	Qualification	$(X-\bar{X})^2$
1	58.18	1	288.66
2	71.75	1	11.70
3	72.60	1	6.60
4	74.16	1	1.02
5	74.48	1	0.48
6	75.87	1	0.49
7	75.98	1	0.66
8	76.09	0	0.85
9	80.59	1	29.38
10	91.99	0	282.91
	$\bar{X}$=75.17		$\sum (X-\bar{X})^2$=622.75

Standard deviation (S_x) = 7.89
Mean of TL for B.A. teachers = 72.95
Mean of TL for Diploma teachers=84.04
Proportion of B.A teachers (p)=0.80
Proportion of Diploma teachers (q) =0.2

$$\Gamma=\frac{\overline{X}_p-\overline{X}_q}{S_x}\sqrt{pq}=\frac{72.95-84.04}{7.89}\sqrt{0.80x0.20}=-0.56$$

$$t=\tau\sqrt{\frac{N-2}{1-\tau^2}}=-0.56\sqrt{\frac{8}{1-(-0.56)^2}}=-1.91$$

DECLARATION

I, the undersigned, declare that this thesis is my work and that all sources of materials used for the thesis have been duly acknowledged.

Name: Abdulaziz Hussien

Signature: 

Place and Date of Submission
Addis Ababa University
June, 1997