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UNIVERSITY TEACHING:
THE IMPACT OF AN IN-SERVICE PROGRAM FOR TEACHING FELLOWS IN CHEMISTRY

by
Nevart Yaghlian

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Education)
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Doctoral Committee:

Professor Robert S. Fox, Co-Chairman
Professor Allen Menlo, Co-Chairman
Associate Professor Betty Morrison
Professor Alvin Zander

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CHAPTER I

INTRODUCTION

> Change does not necessarily assure progress, but progress implacably requires change.[1]
>
> . . . . . .
>
> There is more to the business of producing beneficial change than passion and provocation, frustration and fury.[2] Yet, even when one knows where There is, the hardest human problem is getting from Here to There. (Maguire, 1971, p.91)

NATURE OF THE STUDY

The growing concern with the teaching function of universities is expressed in the recent literature on higher education, through experimental courses in various subject fields on many campuses, and positions

---

[1] H.S. Commager, "Change in History", Freedom and Order: A commentary on the American Political Scene. (New York: Braziller,1966), p.244

[2] E.D.Etherington, President's Matriculation Address,Wesleyan University, September 15,1968.

opening on some campuses to provide consultative services in innovative ways to teach.

This study addresses itself to the development, implementation and evaluation of an in-service program for teaching fellows in the department of chemistry at The University of Michigan during the academic year 1971-72.

The development and the implementation of the program include the problems of

1) entry into the system [this refers to "the attachment of a new person to an existing social system" (Glidewell,1961, p.653)] including clarification of the relationship between the consultant (change agent) and the department (system);

2) identification and utilization of available resources on campus (including the department);

3) the choice of content and method of delivery of the in-service program.

The evaluation of the program assesses the following:

1) change in each teaching fellow, who participated in the program , with regard to

a. attitude toward teaching as a career

b. job satisfaction

c. interpersonal style

2) change in satisfaction of students with teaching fellows who participated in the program;

3) differences between participant and non-participant teaching fellows with regard to

a. attitude toward teaching as a career

b. interpersonal style

c. satisfaction of students with teaching fellows;

4) feedback from teaching fellows pertaining to the program:

a. after each workshop session

b. at the end of the program;

5) consequences of the program for the chemistry department.

STRATEGIES OF PLANNED CHANGE

The impact of concerns with the teaching function of universities presupposes necessary changes in systems - departments, teachers, students - that constitute the university. Since the present study

reports such a change effort, strategies of change will be discussed in this section.

In a review of a number of articles from the literature on change strategies (in different environmental and technological settings) Bennis et al (1969, p.315-317) state that "change is an alteration of an existing field of forces", and that "most of the change strategies are based on this idea". The authors list the assumptions underlying this idea:

1) effective change is bringing about an alteration . . . in forces so as to reduce tension and gain commitment to ("ownership" to) the change.

2) The effective change agent and [those in line power] accomplish this by understanding the total array of forces operating on a particular equilibrium and reach consensus on a change strategy.

3) Consensus is built through obtaining as much participation and commitment as possible in the diagnosis and manipulation of the relevant forces.

4) Organizational cultures must be changed

to re-enforce and maintain changes achieved by individuals.

The main strategies of planned change fall into three categories: 1) empirical-rational, 2) normative-re-educative, 3) power-coercive. (Chin and Benne,1969, p. 58-59). The empirical- rational strategy of planned change assumes that "man is rational" and that "men will follow their rational self-interest once this is revealed to them". According to Chin and Benne (1969)

> The general strategy of encouraging. basic knowledge building and of depending on general education to diffuse the results of research into the minds and thinking of man is still by far the most appealing strategy of change to most academic men of knowledge. (p.35)

The authors also refer to the view that superstition carried from "generation to generation through the agency of unclear and mythical language" is the "foe of rational change", and that clarification of language is one medium of bringing about rational change. Strategies of change associated with clarification of language overlap with the next group of strategies.

The normative-re-educative strategies of planned

change are built on the assumption that "patterns of action and practice are supported by socio-cultural norms and by committments on the part of individuals to these norms". Changes will occur only as the persons involved are

> brought to change their normative orientations to old patterns and develop commitments to new ones. . . . changes in normative orientations involve attitudes, values, skills and significant relationships, not just in knowledge, information, or intellectual rationales for action and practice (Chin and Benne, 1969,p.34)

The power-coercive group of strategies is based on the application of power in some form - political, moral, or otherwise . The authors state that "those committed to the advancement of normative-re-educative strategies of changing must take account of present actual concentrations of power wherever they work".

The strategy model for inducing change is related to the questions mentioned by Bennis and Schien (1969): 1)How are the change agents selected? and 2) How do they achieve their goals? (p.339)

There are those who maintain that the outside-the-system change agents are more effective, while others advocate the opposite. This gives the impression that in bringing about change consultants are either external-to-the-system or internal-to-the- sytem.

According to a statement by Bennis and Schein (1969) it seems increasingly clear "that combinations and proper sequencing of . . . approaches [to change] may prove to be more useful". They continue to say

> from certain trends we now see developing, new models for implementing organization change will be used that rely on external and internal change agents in combination, using line and expert power (p.339). What this implies is a team effort involving a diverse set of skills, status, and roles in order to induce the organizational change. We believe that this will prove to be the most useful strategy in the future (p.340).

The in-service program under discussion in this study was the result of a change strategy combining the efforts of external resources with those of internal resources. This becomes particularly necessary in educational settings where the change project involves issues of both content and method of instruction. In

order for this strategy to be functional, it was necessary to have a language common to the internal and the external resource persons.

The language of educational psychology was carefully translated into the language of logic, assuming that logic is an area common to both the physical and the social sciences. For instance, in discussing the importance of the interpersonal aspects of teaching in a training program, the issue was presented in terms of necessary and sufficient conditions for teaching competencies. This helped clarify the view that teaching has at least two antecedent components: competence in subject matter and competence in human relations skills. Each of the competencies is a necessary condition for teaching, yet none is a sufficient condition in-and-of itself.

The change model for the in-service program as a change project, both for individual teaching fellows and the department as a system, was the normative-re-educative strategy using a team effort. The team combined the resources of persons from chemistry and educational psychology.

ENTRY STAGE OF THE IN-SERVICE PROJECT

The long standing interest of the department of chemistry in its teaching function been reflected in a number of ways such as, an orientation program for new teaching fellows; a position of co-ordinator for general chemistry teaching fellows; the involvement of senior faculty in the orientation program; a questionnaire for the use of teaching fellows who wish to be evaluated by their students; provision for a combined degree in chemistry and education; the use of various resources on campus for the enhancement of teaching effectiveness; experimental courses, and an award for outstanding teaching fellows.

The department has a graduate council whose members include students and the chairman of the department as ex-officio. The 1971-72 graduate council had discussed the need for a training program to augment the existing orientation program. The main concern of those interested was the learning of skills for giving help to students to think scientifically and in deciding when, and how to

give help during laboratory sessions.

The consultant, a teaching fellow from the department of educational psychology with background in science as well as experience and interest in college teaching, volunteered to explore the possibilities of an in-service program for general chemistry teaching fellows (see Appendix A). The understanding was that in case the program was approved by the administration and the faculty, and then implemented, the data collected would be utilized for a dissertation study.

Through a series of meetings with the co-ordinator of general chemistry teaching fellows, members of the graduate council, the policies committee, the general chemistry cluster (faculty members) and the chairman of the department (see Appendix B), the volunteer consultant-trainer clarified her relationship with the department as follows:

1) the in-service program would serve as a basis for the department to consider the conduct of its own program, subsequently using resources within the department (such as third year teaching fellows)

and on campus (such as the Educational Media Center).

2) There would be a liaison person in the department with whom the consultant-trainer would work in deciding the details of the administration of the program.

3) The consultant-trainer would give feedback to the department about her findings while there would be no expectation for information of a confidential nature about any teaching fellow by any person or group within the department.

4) The consultant-trainer would attend the general chemistry lectures.

5) Participation of teaching fellows in the program would be on a voluntary basis.

6) Faculty members would be welcome to attend the workshop sessions.

In a meeting of the entire faculty, the proposal of an in-service program was considered (see Appendix B). The vote of the faculty expressed ' best wishes ' to the graduate council in their project for a training program. There was skepticism on the part of some regarding the extent to which the program would do any good, while others seemed to have the assurance

that the trainer would, at least, do no harm to the existing equilibrium within the department.

It was understood that the teaching experience and the science background of the consultant-trainer had a bearing on the decision of the administration and the faculty to use or not use her services. Other factors leading to the decision included the interest of the graduate students in increasing the role of the graduate council in policy making,as well as demonstrating that teaching competency needs training the same as research does. This last factor seems to have been particularly important to those working toward a combined degree in chemistry and education, since the 'cultural' norm in universities holds a (chemistry) research degree in highest esteem.

Although the study began open-mindedly, the previous educational experience of the consultant as a college teacher, and more recently as a doctoral student, prompted her to explore certain concerns she had about teaching effectiveness.

There was the realization from the beginning

that the development of an in-service program needed a conceptual frame of reference based on theory and research. Therefore, the literature was searched with this requirement in mind. The results of that search are described in the next chapter.

CHAPTER II

REVIEW OF LITERATURE

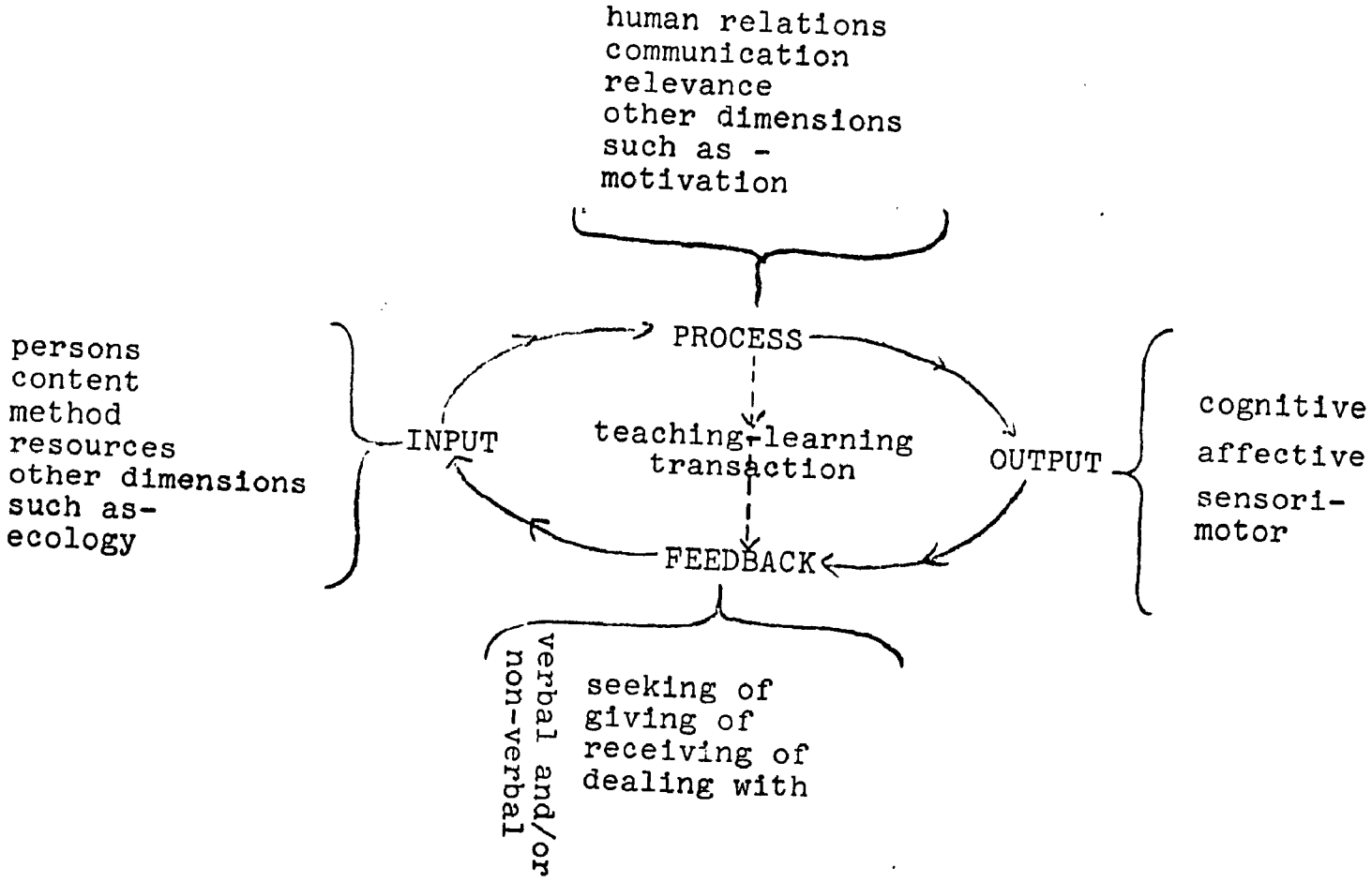
The literature reviewed in this chapter relates to the concerns of this study. They are: 1) teaching and learning on the college level; 2) the state-of-the-art of preparing for college teaching; and, 3) teaching effectiveness.

TEACHING AND LEARNING ON THE COLLEGE LEVEL

The teaching-learning transaction within a college course, as on all levels of formal education, is a complex phenomenon. The originator of the expression "teaching-learning transaction" is L. P. Bradford (1968) who discusses that transaction in terms of input, process, outcome and feedback. Based on his concept, my scheme (see figure 1) specifies certain of the dimensions of what constitutes the teaching-learning transaction. This scheme guided my consideration of the literature.

figure 1

The Teaching-learning Transaction



The input into the course (see left side of figure 1) includes persons- students and teacher(s) - each of whom brings his values, attitudes, skills, perceptions, aspirations, knowledge, patterns of generating stimuli, and patterns of selection and rejection of stimuli from the environment. In short, they bring into the class a variety of life-styles through their teaching styles or learning styles.

The types of students that Mann et al (1970) have isolated in their study, The College Classroom, seem to be useful for understanding and responding to students as complex individuals. For purposes of this study, it will suffice to mention the labels of the eight categories:

1. The Compliant Student
2. The Anxious Dependent Student
3. The Discouraged Student
4. The Independents
5. The Heroes
6. The Snipers
7. The Attention Seekers
8. The Silent Students

Despite the differences between students, "most students start a course with certain common questions."

1. Does the teacher care?
2 Is the teacher fair?
3. Does the teacher know subject matter?
4. How is the course relevant? (Ericksen, 1970)

Teaching styles may be viewed as the emphases or the combination of task strategies through which teachers interact with students in the classroom, lecture hall, or the laboratory. Much of the literature reporting efforts to construct teacher task strategies (such as Adelson, 1962; Trow, 1960; Isaacson et al, 1964; McKeachie, 1965) overlaps with or can be translated in terms of the "teacher-as typology" in the study by Mann et al (1970).

This "typology is but one possible way of carving up the diverse intentions, behaviors, and perceptions that constitute the teacher-student relationship." The six typologies describe the "set of. . .identities" that have "emerged" as the authors "have observed teachers in action, talked with them after class, and reflected on [their] own experiences." (p. 2.)

This typology of teaching "functions" may be considered a medium of clarification of "two of the most important processes affecting the college classroom: 1) the teacher's efforts to define and act on his priorities and 2) the coming together of the teacher's priorities with those of students." (p. 12)

> The process of deciding who one shall be or shall try not to be as a teacher, who one must regretfully give up trying to be, and who one will energetically try not to be. This process is a complex and often difficult one. (p. 13)

Teachers who are in search of a style, may make use of the following statement by the Committee on Undergraduate Teaching (1968):

> . . .there is, of course, no one right style in teaching any more than in painting or writing, and, therefore, it is unfair and unrealistic to set forth for oneself or for another a model distant from what is consonant with one's distinctive being. (p. 54)

Furthermore, the Committee presents its view that "teaching is a personal but not a private act, and somehow, the teacher's immediate public will provide him with clues for indicated revisions of his performance." (p. 55)

Teachers and students, through their teaching and learning styles contribute to the classroom process (refer to top of figure 1). Some of the issues involved in studying this process concern human relations (both intra-personal and inter-personal), communication, and the problem of relevance.

In his volume, University Teaching, Henderson (1969) states:

> Whether the teacher admits it or not, he cannot escape being the center of an important system of personal feelings within his classroom. This is because the processes of teaching and learning, however various the subject content and method of instruction may be, represent a common exercise in human relationships. (p. 26)

He further states that "learning is based on social and emotional contexts and is influenced by a matrix of personal and psychological factors." (p. 26)

One of the implications of the above statement is that teaching becomes active while learning is occurring or when it has occurred. "Teaching is, in a sense, the mediation of experience, or of the result of experience, to those who are learning." (Pullias, 1963, p. 43)

The acts of teaching and learning are interdependent, just as the actors-students and teachers are interdependent. The nature of this interdependence is influenced by certain aspects of the input, especially the teaching style and learning style.

In view of the above, one of the tasks of the teacher "is to establish satisfactory human relations with class members by showing an active interest in them as persons, by showing a concern for their problems, and by believing in their potentialities for creative action." (Bond, 1963, p. 75)

In order to establish satisfactory interpersonal relations, it becomes vital for teachers to have "some honest searching of themselves for better self-understanding" (Henderson, 1969), p. 29) and to become aware that "in deepest essence, a teacher can be no greater as a teacher than he is as a person." (Pullias, 1963, p. 44)

In selecting and promoting college and university teachers "there is a growing conviction that . . .their qualities as persons amongst other persons be considered as well as their scholarship and other academic achievements." (Henderson, 1969, p. 27)

Another of the aspects of the teaching-learning transaction is the phenomenon of communication which "perhaps is the chief problem we encounter in human relating." (Bond, 1963, p. 74) It is possible to view the classroom as a 'communicational system ' which can be analyzed in terms of "the direction of communication, the patterns of communication, and the depth at which communication occurs." (Gibb, 1968, p. 54) Commenting on problems of communication, Gibb (1968) states:

> In a basic sense, the problem of poor communication is simply a symptom of all the other basic problems that people have in relating to one another. A person's motivations and perceptions are the basic stuff out of which his interpersonal behavior is made. The manifestations of his perceptions and motivations occur in verbal and non-verbal communication with other individuals. (pp. 54-55)

He continues to say:

> . . .communications that a person initiates in a group are determined by his motivations to communicate. These communications are perceived in some way by the receiver. How the person communicates, his tone of voice, his facial expression, his choice of words, the amount and kind of his talk will all determine, in part, how the receiver perceives the communication. The receiver's perception will be determined not only by these factors but by the perceptual and motivational state of his organism. He will see things partly as they are and partly as he is. (p. 55) [Emphasis mine]

Closely related to communication is the problem of relevance. Bruner (1971) refers to relevance as "that thumb-worn symbol in the modern debate about the relation of education to man and society."

He states that the word has two senses:

> . . .the first is that what is taught should have some bearing on the grievous problems facing the world, the solutions of which may affect our survival as a species. This is social relevance. Then there is personal relevance. What is taught should be self-rewarding by some existential criterion of being 'real' or 'exciting' or 'meaningful.' The two kinds of relevance are not necessarily the same, alas. (p. 114)

Considering the uniqueness of personal relevance, due to individual differences, and the uncertainty of social relevance, due to rapid social change and the knowledge explosion, I think that a quest for relevance will require ambiguity-tolerance and uncertainty-tolerance in both teacher and student.

The issue of relevance is related to the question of human meaning, both social and personal. According to the Committee on Undergraduate Teaching, "the earnest quest for relevance will produce efforts to bring scholarship and human meaning closer together." (1968, p. 21.)

The concern with relevance existent in the literature (such as Combs, 1972; Axelrod et al, 1969; Morris, 1970; Pullias, 1963; and Larder, 1967) is expressed by Bruner (1971) in his statement:

> . . .relevance, in either of its senses, depends upon what you know that permits you to move toward goals you care about. It is this kind of 'means-end' knowledge that brings into a single focus the two kinds of relevance, personal and social. (p. 115)

The nature of knowing is viewed by Rogers (1963) as a threefold process of <u>subjective</u>, <u>objective</u> and <u>interpersonal</u> knowing; while Bruner (1971) makes the distinction between 'knowledge about' and 'knowledge how to' (or knowledge of). The former (knowledge about) refers to the acquisition of facts through memory, and, the latter refers to the processing of facts, to the acquisition of skills, to a mode of thought. According to him "when one learns [chemistry] one is learning ways of dealing with givens, connecting things, processing unrelated things so as to give them a decent order. It is a way of connecting what one observes and encounters so as. . .to get from the surface

of the observed to its underlying structure of regularity." In this sense, knowing chemistry is a "constant exercise in problem formulating and problem solving."

The outcomes (to the right of figure 1) in any given course are the result, in part, of both purposive and incidental learning. Many discoveries happen because of incidental learning, of serendipidity.

The outcomes of both kinds of learning may be conceptualized in terms of educational objectives in a broad sense. In the cognitive domain the categories are knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956). While in the affective domain, the categories are receiving (attending), responding, valuing, organization, characterization by a value or value complex (Krathwohl, 1964).

Regarding the area of educational objectives, Combs (1972) in his Educational Accountability: Beyond Behavioral Objectives, states that "the perceptual view of learning holds that the process always has two aspects (a) the provision of new information or experience, and

(b) personal discovery by the learner of its personal meaning for him."

He clarifies the emphasis he places upon "personal meaning" by stating that this "stress. . .is by no means anti-intellectual or anti-cognitive. Quite the contrary, the point is that no information of whatever variety will affect behavior until the individual has discovered its personal meaning for him." (p. 21)

"Modern education must produce far more than persons with cognitive skills" says Combs (1972) and asserts that the "primary goal of education" is "self-actualization." Referring to studies through which "social scientists in recent years have given increasing thought to the problem of self-actualization," he states that:

> . . .four basic qualities seem to be central to the dynamics of [self-actualizing] personalities. Self-actualizing persons are: 1) well informed; 2) possessed of positive self-concepts; 3) open to experience; and, 4) possessed of deep feelings of identification with others. (p. 23)

The assessment of educational outcomes,whatever the form, are fed back to the persons involved in the teaching-learning transaction.

Feedback (refer to figure 1) refers to any information given to an individual concerning the outcome of his behavior. It includes evaluation, self-testing, and checking out one's behavior with other persons capable of giving an opinion. (Lindgren, 1969)

In a dissertation study dealing with feedback from students to college instructors which has been conducted concurrently with the present one, the following recommendation for further research is made:

> It appears that informing instructors of students' evaluations is not sufficient. What instructors need more, in this investigator's opinion, is skill in the use of feedback. Therefore, in addition to feedback from students to their instructors, the latter should be given the tools for implementing change or acting upon information received. They should be helped in developing skills to make better use of feedback. (Pambookian, 1972, p. 88)

This recommendation may also be conceptualized in terms of computers. The computer needs to have a program to make sense of a particular input, otherwise feeding data will result in the comment "invalid command." Thus, the issues involved in feedback go beyond giving and receiving of feedback to seeking of feedback and to developing a scheme which provides for dealing with the information about the assessment. This information concerns both the impact of the teaching-learning transaction upon the persons involved and the educational outcomes of that transaction.

THE STATE OF THE ART

The problem of training college teachers is recognized in the literature. Several extensive studies (Clark, 1966; McCalland Harlan, 1961; McGrath, 1961) reported that there is a concern on the part of both college administrators and new instructors about the relative lack of skill in undergraduate teaching. Berelson (1960) reports that college administrators see the task of the graduate school as two-fold, research competence and preparation for college teaching.

One of the comprehensive studies about the subject has been undertaken by Koen (1967) who states:

> The published literature presents little precise information on methods currently being used to attract and to prepare young scholars for the college teaching career. A large majority of graduate students do serve as teaching assistants at some period during their graduate education, but there has been little detailed information on the extent and nature of pedagogical training they receive. (p. 46)

Two factors noted by the respondents[1] included in the above study act to inhibit the development of training programs:

> The first one was the lack of a broad based faculty interest in the training-supervision role; the second, the shortage of available staff time for carrying out the demanding task of developing competent teachers from the graduate student body. (p. 48)

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[1]Data were collected by mail and/or campus visit from 71 humanities, 14 social science, and 51 natural science departments, plus 10 professional schools and 26 administrative officers above the departmental level, representing a total of 42 institutions.

The literature reveals, then, that teaching fellows do not benefit fully from the experience because they "begin their instructional duties . . .without much formal consideration of their teaching potential or competence" (Koen, 1967, p. 48).

Another aspect of the problem is expressed by Eisenberg (1969), a departmental chairman on a large university campus, who urges "an attitude of responsible laissez-faire at every level of instruction. Certainly, a major reason that the work of teaching fellows is so often attacked is that they are too frequently forced to twist their knowledge and perceptions at every turn into a watertight scheme prescribed by a senior member of the faculty." (p. 12)

The implication of the above is that there is a need of an atmosphere conducive to the growth of teaching fellows both as persons and as teachers. I prefer to use the term 'laissez-devenir' signifying the explicit distinction between <u>let-become</u> and <u>let-do</u>.

In the AACTE Study Series, Improvement of Instruction in Higher Education (1962) it is stated that the in- service approach to improvement of college teaching has spread, and that in-service education seems to be the "key which has unclicked and opened a new vista in higher education." It is observed that the most popular in-service programs seem to be the seminar and the workshop. (p. 7)

Referring to the forces functional in the movement toward improved teaching, Committee on Undergraduate Teaching (1969) remarks that "with many undeniable exceptions the movement. . .in its many facets comes principally from the younger faculty, especially those emerging into positions of influence. Recognizing the tensions and resistances in faculty relations, they are still convinced that the system is open enough for individual initiatives." (p. 21)

Another factor noted in the same study is the "undeniably increasing concern of students themselves for good teaching, manifested through their own evaluation." (p. 19) According to the above committee, there has been response to the concern on the part of administrators, faculty, and students for the improvement of undergraduate

teaching.

> More than fifteen universities have asked the Danforth Foundation whether it could provide financial assistance calculated to transform the usual teaching assistantship into a more substantial internship. [It is acknowledged] that the interest of graduate faculty members is not uniform but that a substantial and influential part of the graduate faculties of these universities have a new recognition for improved teaching. (p. 19)

The proceedings of the ninth annual meeting of the Council of Graduate Schools in the United States (1969) includes the following proposal:

> The Committee on the Preparation of College Teachers of Graduate Schools in the United States recommends the establishment of graduate programs leading to the degree of Doctor of Arts to prepare graduate students for a lifetime of effective teaching at the college level.
>
> To insure adequate preparation of college teachers, the Doctor of Arts program should provide for the following:

(1) The formal course work in the Doctor of Arts program will deal preponderantly with subject matter to be taught by the prospective teacher. . . .

(2) Prospective college teachers should take an appropriate amount of formal course work and seminars in such areas as the psychology of learning, the history and sociology of higher education, and the responsibilities of faculty members within an institutional setting.

(3) The development of teaching competence requires a structured exposure to college teaching at the undergraduate level. . . .The teaching internship should include substantial and direct classroom experience in regular courses, preferably in more than one kind of course. It should, moreover, be supervised, criticized, and evaluated by experienced faculty members and reinforced by relevant course work in teaching methods.

. . . . . .

(4) The development of the capacity and habit of reading, understanding, and interpreting the results of new research and pedagogical development appearing in the literature of the field should be encouraged.

(5) The development of the ability to apply new significant research and pedagogical developments in the field for the benefit of college teaching.

(6) The Doctor of Arts program must include the satisfactory completion of a project of individual study demonstrating an acceptable combination of scholarly, analytical, creative, and expository skills. The project may focus upon the teaching of a subject as well as upon a contribution to original knowledge. . . . (pp. 125-128)

Similar concern related to college teaching seems to prevail overseas. According to Henderson (1970) "apparently the Russians do not believe university lecturers are born teachers and are taking the bold step of doing something about it. Some universities in British and American communities meet these problems by giving courses in the techniques of university teaching for beginning staff and arranging conferences and demonstrations for older members." (p. 9)

He continues to say that "method is. . . .the means of blending the components of living subject-matter, enquiring attitudes and lively interests in such a way

that it makes for creative teaching in a university, and does not allow the dull job of getting a degree to become an end in itself." (p. 10)

Concerns related to the state-of-the-art of college teaching includes the need to move further toward theories of teaching. While rooted in the concerns related to the preparation for college teaching, there is the need for the development of meta-theories of teaching.

TEACHING EFFECTIVENESS

Teaching embraces "far too many kinds of processes and of activity, to be the proper subject of a single theory. We must not be misled by one word, teaching, into searching for one theory to explain it." (Gage, 1964)

Considering the variety of task strategies of the teacher, I view teaching effectiveness to have at least two antecedent components, namely, competence in

1) <u>subject-matter</u> (including research skills) and
2) <u>human relations skills</u>.

This does not mean that there is or can be a single, universal model for teaching effectiveness considering that effectiveness in teaching is not a unitary concept (McKeachie, Lin and Mann, 1971) and that there is no such person as the universally effective teacher.

Referring to the same phenomenon, the Committee on Undergraduate Teaching (1968) states:

> In the last analysis, teaching as well as learning must be individualized.
>
> A person's peculiar teaching style is in a large measure a function of his temperament and personality. Some teachers have a flair for vivid phrasing, while others are slow, painstaking, and analytic. Some are highly systematic, while others are impulsive and spontaneous. Some are lighthearted, while others are consistently serious. Some are almost always the same. . . .while others are mercurial. (p. 54)

The slow progress made in research on teaching is indicated by this statement of McKeachie (1964):

> Undoubtedly there are social psychological variables which have uniform effects upon all sorts of people, but our progress

> in extending a list of these has been frustratingly slow, and I suspect that one reason for this is that dimensions keyed to differences between roles and individuals may be both more numerous and more powerful in predicting behavior in many social situations. (p. 31)

The progress seems to continue at the same slow rate. By their choice of the first word of their titles, Smith (1967) and McKeachie (1969) indicate the nebulous nature of the conceptualization of teaching, Toward a Theory of Teaching and Toward an Educational Psychology of Higher Education.

Mention was made, earlier in the chapter, of teaching becoming active while learning is occurring. Like any other activity, learning occurs under certain conditions, both internal and external. One aspect of the external conditions of learning is the teacher and his ability to create conditions for learning.

According to Carl Rogers (1967) there are three attitudes on the part of the teacher that will enhance significant learning:

1. Realness in the sense that "the teacher is a person to his students. . .not a sterile tube through which knowledge is passed from one generation to the next."

2. Acceptance of the learner on the part of the teacher "as an operational expression of his essential confidence in the capacity of the human organism."

3. Empathic understanding which refers to the teacher's "ability to understand the student's reactions from the inside, to have a sensitive awareness of how the process of education appears to the student."

What Rogers offers as conditions for significant learning reminds me of a poem "on teaching" in Gibran's The Prophet (1923). The poet says:

> The teacher who works in the
> shadow of the temple,
> among his followers, gives
> not of his wisdom, but rather
> of his faith and his lovingness.
>
> If he is indeed wise, he does
> not bid you enter the house of
> his wisdom, but rather leads
> you to the threshold of your
> own mind. (p. 62)

A similar quest is expressed in an article, Frank Lloyd Wright on College Teaching:

> The 'good men' will collect
> their students around them
> and will know, first of all,
> that the good teacher desires
> no greater recompense than to
> form students who surpass him-
> self, and with whom words such
> as art, love, purity, and
> passion need no longer hide
> their faces for fear of ridicule.
> (de Nevi, 1967, p. 49)

Therapist, poet, and architect, all three join educators Axelrod and the co-authors of Search for Relevance: The Campus in Crisis (1969) when they talk of acceptance, understanding and love (the

equivalent of 'agape). The latter present their view:

> . . .the ideals, 'know thyself' and ;love thy neighbor as thyself' are infinitely profound, each age, sensitive to its own experience, reinterpreting these ideals in ways that set relevant goals. . . .

They continue to say:

> It is not surprising that when ideals are translated into psychological terms, they embody what we meant in this book, when we have spoken of the fullest possible development of the individual.

When "know thyself" and "love thy neighbor as thyself" are put into psychological terms:

> . . .these two ideals are closely related; in order to love another person well, one must love oneself well. Self-respect is basic to love of another person, for if one is to know others well, he must first know himself. The major sources of misapprehensions of other people come from a failure to admit into one's consciousness aspects of himself - as authoritarianism, for example, which is marked by lack of love for one's neighbor and failure to know oneself. (p. 211)

A consideration of De Chardin's viewpoint on human relationships as discussed in his Activation of Energy (1970) my help further refine our concept of teaching effectiveness.

He states that "in its most general form, and, from the point of view of physics, love is the internal, affectively apprehended, aspect of the affinity which links and draws together the elements of the world, centre to centre" (p.70).

According to De Chardin, "once this definition has been accepted, it gives rise to a series of important consequences " (p. 70). One of the consequences mentioned is "the growth of personality that can any day be observed in the particular case of a great human affection" (p. 71).

It may be said that one of the dimensions of teaching effectiveness, or teaching for that matter, is the creation and/or enhancement of conditions for effective learning. It is the belief of the writer that these conditions should also function in

facilitating the interdependence of affective and cognitive learning, of personal and social relevance.

In summary, based upon this review of the literature and the writer's experiences over the past three years as both teacher and student, the following postulates concerning teaching have been derived:

1) Teaching effectiveness is a function of conditions, created by the teacher's influence style (cognitive and affective), activating energy within the student to move toward educational goals (behavioral objectives and self-actualization), within a frame of personal and social relevance.

2) Teaching effectiveness is a function of the teacher's awareness of (his) influence styles; his willingness to re-examine these; his ability to move toward competence in knowledge of subject matter and in human relations skills; and toward self-actualization.

The implications of these postulates for the in-service program will be expored in the next chapters.

CHAPTER III

DESIGN OF THE STUDY

The development, implementation and assessment of an in-service program (refer to Appendix I for schedule of activities) for teaching fellows in chemistry has been the goal of this study. One of its concerns is to examine the impact of the program on teaching fellows, their students, and the department.

SAMPLE

The sample of the study includes a group of teaching fellows from the department of chemistry at The University of Michigan, and students enrolled in their classes during the fall and winter terms, 1971-72. The program was developed primarily for general chemistry teaching fellows. During the fall term there were 54 teaching fellows whose assignment involved teaching general chemistry. (A teaching fellow has the responsibilities similar to those of a junior faculty member and has the status of a graduate student).

Participation in the program was on a voluntary basis. If, for any reason, participation in the total program was not possible, teaching fellows were not excluded from any part of the program. Therefore, some came to all the workshops, others to a few; some responded to all instruments and others to particular ones; some asked for the use of the questionnare (see Appendix D) to receive feedback from students just for their own use, while others made the student feedback available to the consultant (this investigator); some came only for consultation. Thus , a total of 21 teaching fellows from a universe of 54 teaching general chemistry availed themselves of different amounts of the services offered through the program.

Fifteen of the teaching fellows constitute the sample of this study. Of these eight participated in all aspects of the program and are referred to as the participant group. The seven teaching fellows,who attended some workshops, responded to instruments at the beginning of the academic year and made available student evaluations for the fall term, are referred to as the non-participant group.

The number of students who responded to the student

feedback instrument during the fall term was 304, with 167 students enrolled in classes of the participant group and 137 students enrolled in classes of non-participants.

Participant teaching fellows were also evaluated by their students during the winter term. $Test_2$ (refer to figure 2) was administered during the fourth week of the term with 167 students responding, while $Test_3$ was administered during the twelfth week with 142 students responding. The total number of students enrolled in the classes of the participants during the winter term was 194. Students present during the period the instrument was administered constitute the student sample for the winter term.

The age range of the participant teaching fellows was 21 to 28 years, with only two over 25. There were four men and four women. Of the eight, one was married and one had been married. Two of the teaching fellows had one year of teaching experience, three had no teaching experience and three had two years of teaching experience.

Participant TFs were teaching one or two sections of recitation and laboratory in general chemistry during the fall term 1971. During the winter term 1972, three were involved in teaching one laboratory section each in organic chemistry, three were teaching recitation and laboratory sections of general chemistry and two were assigned to a general chemistry course which was being taught on an experimental basis by the Keller plan for individualized system of instruction (Brintzinger et al, 1972).

The seven non-participant teaching fellows were all teaching general chemistry during the fall term. Three were women and four were men. There were three with no teaching experience, two with one year and two with more than one year teaching experience. None came to the workshop at which dealing with evaluative feedback was considered.

STATEMENT OF PROCEDURE

The 'two-cell study model' (McGrath,1970) also referred to as the 'one-group pretest-posttest design' (Campbell and Stanley,1963) is the basis for the procedure of this study.

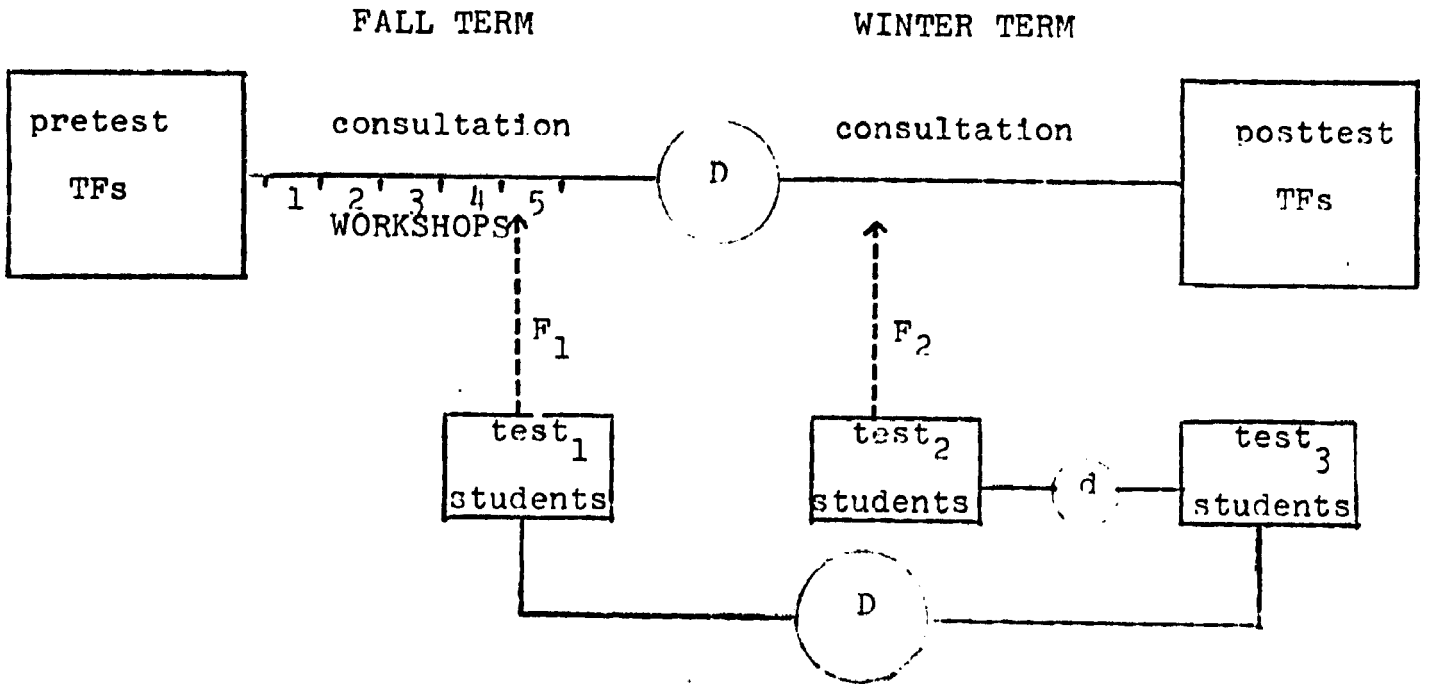
The procedure of the present study is an application of the two-cell study model with certain modifications (refer to figure 2). These modifications were necessary in order to deal with such characteristics of the study as the voluntary nature of program participation.

The factors acting as constraints on the internal validity of this study include 1) history signifying the many other change-producing events, that may have occurred between the pretest and the posttest, along with the in-service program; 2) maturation referring to biological and psychological processes which vary with the passage of time, independent of specific external events ; 3) effects of testing including the possibility that the respondents may present themselves as they wish on the posttest; and 4) bias of the sample because of self-selectivity (Campbell and Stanley, 1963, pp.178-179).

The external validity of the study is subject to the same limitation as any other study, since "generalization always turns out to involve extrapolation into a realm not represented in one's sample" (Campbell and Stanley,1963,p.187).

figure 2

Procedure of The In-service Program,1971-72



F_1 refers to feedback from students to TFs for workshop DEALING WITH EVALUATIVE FEEDBACK

F_2 refers to feedback from students to TFs through individual consultation hr.

D refers to the in-service program (workshops, consultations, feedback from students) over a period of eight months of the academic year.

d refers to course experiences of students over eight weeks during Winter Term

VARIABLES

The development and the implementation of the program is discussed in the next chapter, The assessment of the program considers certain variables within the frame of a "generalized schema for reseach on teacher effectiveness." (Gage, 1963,p.119; Mitzel,1960)

This schema is comprised of four types of variables. Type I -prediction sources; Type II - contingency factors; Type III - classroom behavior; Type IV - criteria of effectiveness. The assessment of the program of this study is limited to three type I variables: attitude toward teaching as a career; satisfaction with teaching; interpersonal style of teacher; and to one variable of type IV: satisfaction of student with teacher.

INSTRUMENTS

The instruments used in the assessment of the program included 1) Attitudes Toward Teaching as a Career; 2) Job Satisfaction Blank; 3) Interpersonal Check List; 4) Student Satisfaction Scale.

Statements about the development, validity, reliability and scoring of instruments are included in appendices. This section will be devoted to a brief discussion of the conceptual bases of the instruments and the variables they propose to measure.

The instrument, Attitudes Toward Teaching as a Career (Appendix E), is based on the theoretical orientation that "favorable attitudes are said to result from perceptions that the attitude-object facilitates need satisfaction, while unfavorable attitudes result from perceptions that attitude-objects block or hinder need-satisfaction." (Merwin and Di Vesta, 1959, p. 302) In developing the instrument, the originators selected "four needs related to teaching" - achievement, affiliation, dominance, exhibition.

The term 'attitude' varies widely with use and definition. Nevertheless, the existing definitions of the term agree upon one common characteristic:

> Attitude entails an existing predisposition to respond to social objects which, in interaction with situational

> and other dispositional variables, guides and directs the overt behavior of the individual .. (Shaw and Wright, 1967,p.2).

The other key concept in this instrument is career which relates to occupational choice. According to Super's (1958) theory, occupational choice is "a process which takes place over a period of time and which is best explained by a combination of determinants which themselves interact, are modified and thus develop with time".

'Combination of determinants' refers to cultural variables , intra- and inter-personal variables, vocational developmental tasks, vocational developmental opportunities.

The Job Dimensions Blank (Appendix F) is a job satisfaction scale. Robinson et al (1969) state that

> . . .it is unlikely that worker attitudes will be predicted by a general theory dealing with abilities, background, or

> motivation in any more accurate manner than worker performance has been predicted on the basis of reported job satisfaction. (p. 212)

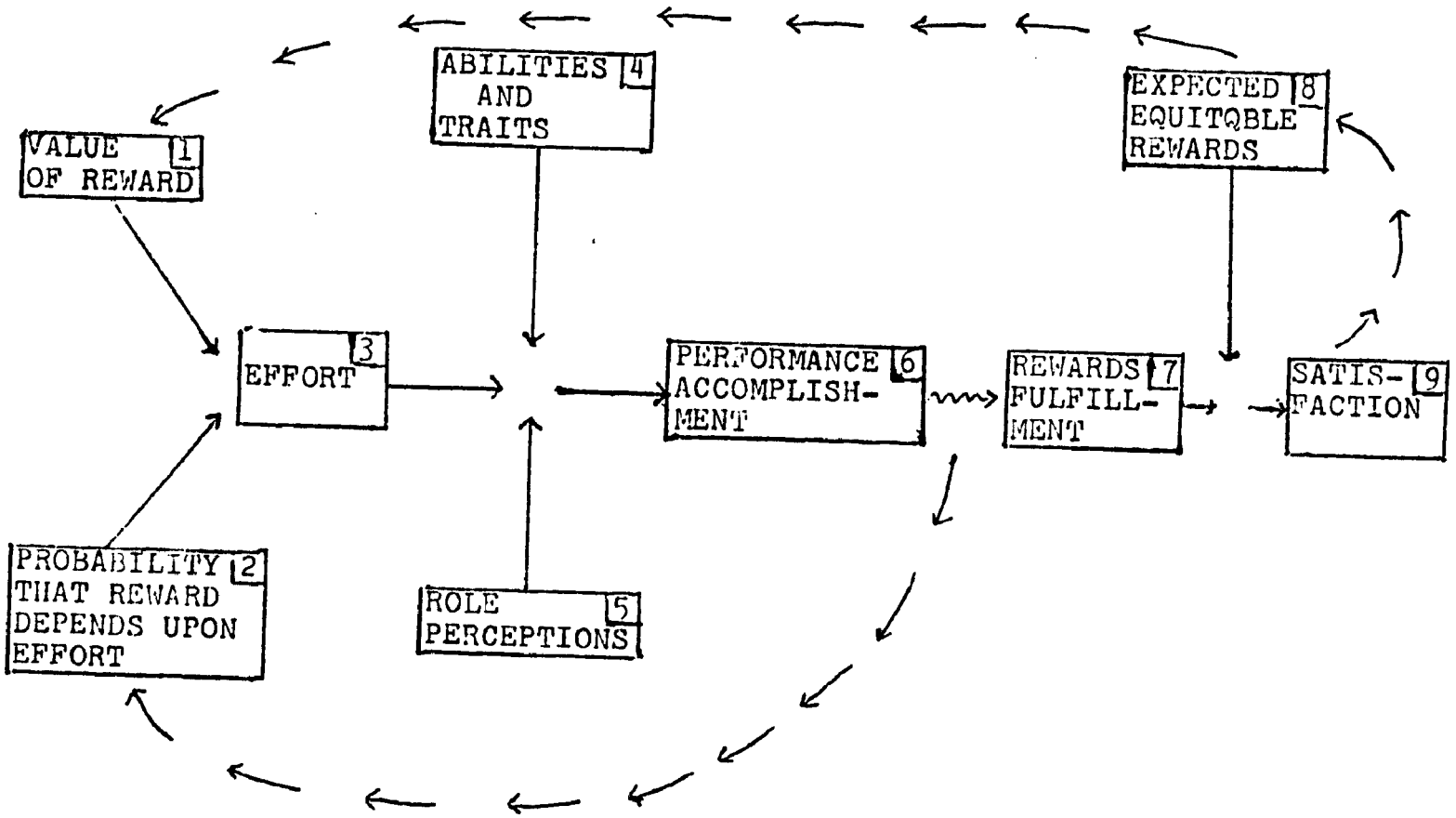
In spite of the above view, an attempt to construct a model summarizing the psychological factors likely to affect job satisfaction is reported by Athanasiou (1969) in a review of the literature.

The tentative scheme of such a model, offered by Porter and Lawler at the 1966 meetings of the American Psychological Association, is presented in Figure III. The reviewer states that "while the Porter and Lawler model is admittedly still in the exploratory stage, it offers a creative synthesis of the factors affecting satisfaction that will undoubtedly advance future research." (p. 91)

The Interpersonal Check List (Appendix G) has been developed by a group of psychiatrists and clinical psychologists who were attempting to build a model of personality focusing upon modes of social interaction. (Leary, 1957)

Figure 3

Tentative Theoretical Model Proposed by Porter and Lawler[1]



[1] John P. Robinson, R. Anasthasiou and K.B. Head. Measures of Occupational Attitudes and Occupational Characteristics. (Ann Arbor, The University of Michigan,1969), p.92

The construct of personality according to this model is characterized as "the multilevel pattern of interpersonal responses (overt, conscious or private) expressed by the individual." Leary and his associates have specified five levels of personality (Leary, 1957):

Level I, Public Communication - consists of "the overt behavior of the individual as rated by others."

Level II, Conscious Descriptions - includes "the verbal content of all the statements that the subject makes about the interpersonal behavior of himself and 'others'."

Level III, Private Symbolization - consists of projective, indirect fantasy materials.

Level IV, the Unexpressed Unconscious - is defined "by interpersonal themes which are systematically and compulsively avoided by the subject at all the other levels of personality."

Level V, Values - consists of the "data which reflect the subject's system of moral judgements, his ego ideal.

The Interpersonal Check List used in this study aims at assessing interpersonal response patterns at Level II of this personality system. The criterion mentioned by originators of the theory and the instrument for determining Level II data is the "conscious verbal report of the subject." Everything the person says about himself becomes Level II "self" and everything that is said about people in his interpersonal world becomes Level II "other." The accuracy, the immediate purpose behind these responses, is disregarded. "Their direct surface meaning is the essence of the Level II classification."

The unit with which "the language of conscious description" is measured is referred to as "interpersonal trait." The interpersonal trait of Level II is formally defined as the interpersonal motive attributed by the subject to himself or another in his conscious reports.

The themes or categories employed are derived from the circular continuum of interpersonal variables. The general nature of these traits is suggested by the words listed for the outer ring of Figure 4 , namely, (AP) managerial-autocratic, (BC) competitive-exploitative, (DE) blunt-aggressive, (FG) skeptical-distrustful , (HI) modest-self-effacing, (JK) docile-dependent, (LM) cooperative-overconventional, (NO) responsible-overgenerous.

The "traits represented nearer the center are considered to be of normal, moderate,or appropriate intensity, while those at the circumference are considered to [have]. . . .an [inappropriate] intensity of the same trait." (Leary, 1959)

The checklist is "comprehensive and may have general usefulness in research independent of the use of the theory." (Laforge and Suczek, 1955, p. 97)

The Student Satisfaction Scale (Appendix H), was constructed for this research. There was an existing form in the chemistry department being used by those teaching fellows who wished to be informed of the

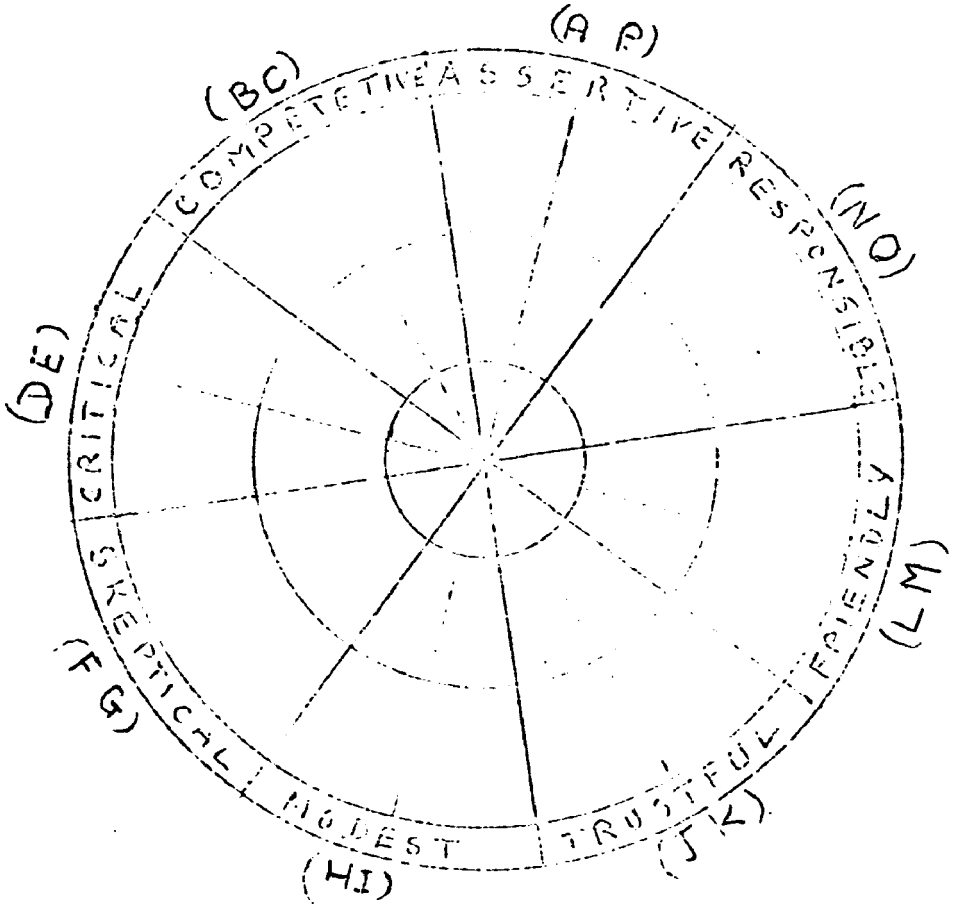


Figure 4: Circular Continuum
of Interpersonal Variables

reaction of their students. This form served as a starting point for the construction of the instrument.

After interviews with two faculty members in the Department of Chemistry and a number of teaching fellows, I drew up a list of items related to broad objectives of the courses. The items were examined, modified, and reduced in number in consultation with two of the members of the dissertation committee.

A second series of interviews took place with other teaching fellows and graduate students, also with another faculty member in chemistry. This resulted in further modification of the items of the scale. (Appendix D)

Finally, the scale was subjected to the critique of two School of Education faculty members, one in the area of educational psychology and the other in the area of psychometrics.

The test was designed to get feedback from students as to their satisfaction with the teacher.

According to Gage (1963), p. 116), student satisfaction with teacher is high on "the continuum of ultimacy of criteria of teacher effectiveness." Also, "the concept of criterion of teacher effectiveness connotes educational or social values of some kind" and "teacher effectiveness" usually means the teacher's effect on the realization of some value."

The value in this case was related to some of the educational objectives of the faculty and the teaching fellows responsible for the courses : help students think scientifically and grow in their ability to work on their own.

CHAPTER IV

THE PROGRAM

The theme underlying the in-service program was the interpersonal aspects of teaching. The pre-established goals of the program for teaching fellows were:

1)awareness of the existence of skills for teaching

2)realization of the relationship between one's possession of skills and his satisfaction with teaching

3)raising one's level of awareness of the relevance of already developed interpersonal competencies to teaching

4)discovery of one's style of teaching and the potential to change if he wishes

5)motivation to gain (more) skills

6)learning of skills related to teaching

ASSUMPTIONS

The choice of content and method of delivery of the workshops were governed by certain underlying assumptions:

1) the content area of educational psychology is so wide that any decision about the selection of topics for particular workshops becomes arbitrary. The workshops exist for the participants to meet their need for improvement in certain areas of teaching competence. The primary consideration in choice of content was its value to the participants in terms of personal relevance.

2) teaching is very much a personal activity. Therefore, improving teaching becomes equivalent to improving a personal activity. The primary consideration in choice of method was the improvement and acquisition of skills for teaching.

As a result of the above assumptions, detailed plans for the workshops were not developed in advance, but were developed throughout the semester. The content of the first workshop was decided upon on the basis of the consultant's meetings with teaching fellows and members of the faculty during the entry stage of the in-service project as well as during the departmental orientation program.

The content of the last workshop was decided

upon as a result of discussions I had with the coordinator of general chemistry teaching fellows. Consideration was given to the possible uses of the existing procedure for student evaluation of teaching fellows and my conceptualization, as mentioned in the second chapter of this study, of the need for skills in processing feedback from students.

The content of the other workshops grew out of the comments and requests of the participants. These expressed needs of the participants were translated into topics. This translation was done with the help of a repertoire of topics related to teaching on the basis of existing literature, discussion with colleagues, and on my own experience in college teaching.

RESOURCES

The development and implementation of an in-service program such as this requires broad ranging resources. Therefore, an extended effort was made to identify a range of resources from the University campus which could be drawn upon as needed to enhance the workshops.

Resources come in many forms. They may be available as print materials, people and products. One of the purposes for acquisition of resources is "awareness" of what is "new" and available. Awareness provides images of solutions but not details. (Havelock, 1970)

Efforts related to the acquisition of resources began with the initial contact with the Department of Chemistry in March, 1971.

My program advisor, who had conducted a number of workshops for faculty in various departments on The University of Michigan campus, informed me of the existence of some trigger films developed for purposes of improving instruction in the School of Dentistry. The trigger film is "a simulation device that is designed primarily to generate data within the viewer." Some of the episodes include these situations: feedback seminar, referral, and interruptions.

Upon contacting the designer of the films, I received a pre-publication copy of an article, The Trigger Film Technique (I am informed that it has been

accepted for publication in Improving College and University Teaching, Autumn, 1972) and a description of fourteen completed and seven partially completed episodes.

Arrangements were made with the Media Center of the School of Education for the use of video-tape equipment needed to review the films. The review session proved useful for an exchange of my assessment of potential use in the in-service program and the experiences of the designer in workshops he had conducted with the help of the films. The discussion ended with the agreement that he would serve as co-trainer for one of the sessions. Also, a list of films for possible use was agreed upon.

A former teaching fellow in educational psychology, who is now an elementary school principal, contributed to the clarification of some of the issues involved in black-white relations. As a black person, he shared his insights about cross-ethnic relations in the classroom. An undergraduate black student agreed to be the resource person at one of the workshops, and a graduate student in educational psychology and former counselor

was involved in a session as role-player and resource person.

Other human resources include the members of my dissertation committee who in various ways contributed to all phases of the program. A number of the faculty of the Chemistry Department attending the workshops contributed to discussions when a detailed knowledge of chemistry was required.

The libraries and publications of the Institute of Social Research and the Center of Research for Teaching and Learning at The University of Michigan were drawn upon for printed resource materials.

THE METHOD

The method chosen for the workshops was the laboratory training model as it applies to human relations skills. The laboratory approach to learning about human factors assumes:

> . . .when faced with a dilemma, a person experiments; he invents, devises and tests out ideas and

> methods on himself; he gets feedback; and he generalizes, leading to new and different ways of reacting. Translated into operations, then, the purpose of the laboratory in human relations training is to create dilemmas that lead to the intention-feedback-generalization cycle outlined above. (Mouton and Blake, 1968, p. 91)

One of the inventors of this type of training is L. P. Bradford. Some of the goals for human relations training have been stated by Bradford (1964).

1. To increase self-insight.
2. To become sensitive to the behavior and feelings of others.
3. To understand group process.
4. To develop action skills.
5. To learn how to learn.

Some other goals have been delineated by Buchanan and Dunnette (1968) in a review of literature on human relations training.

1. To develop a spirit of inquiry and willingness to experiment with one's role in the world.

2. To expand interpersonal consciousness or gain an increased awareness of more things about more people.

3. To increase authenticity in interpersonal relations or simply feel more free to be oneself and not feel compelled to play a role.

4. To increase the ability to act in a collaborative, inter-dependent manner with peers, supervisors, and subordinates rather than in authoritative or hierarchical terms.

5. To develop the ability to resolve conflict situations through problem-solving rather than through "horse trading," coercion, or power manipulation.

The choice of method was due primarily to my belief that this method lends itself to the potentiality of knowledge "how to" and the premise that together with competence in subject matter, human relations skill is an antecedent component of teaching effectiveness.

THE WORKSHOPS

There were five workshops during the Fall term, 1971. The topics, goal(s), activities, and feedback from participants will be described for each workshop. The

number of participants ranged from 15 to 10; while the duration of workshops ranged from 4 hours to 2 1/2 hours.

Workshop #1 - COMMUNICATION (Participants 15; duration 3hrs.)

The goals of this workshop were to increase awareness of the importance of listening, of checking out whether the intended message was understood by the receiver, of the accuracy of one's coding of messages sent; to become aware of the non-verbal aspects of communication; to experience oneself as receiver and sender of messages.

Activities

Trigger Film: Expectation

In the film, a professor is informing his students on what he expects from them in the course (e. g., attendance, participation, reading). What he says about student-instructor dialogue and his approach to teaching seem positive, yet, his manner of communication and restrictions seem negative.

The episode is designed to generate discussion on open versus restrictive classroom environments, verbal and non-verbal communications of feelings, the generation of feelings within students.

Total group discussion was led by the designer of the film and brought about the expression of commonly shared questions which are summarized below.

1. We are here to teach chemistry. If the level of maturity of students interfered with doing that, do we deal with the things that are interfering? If so, what can we do?

2. What the professor said in the film is acceptable. But, the way he said it creates a distance between himself and the students. How can we, as teaching fellows, express ourselves in such a way as to minimize distance between ourselves and our students?

3. Should we give time to students who do not come to class?

Listening Exercise

Participants were asked to get in groups of three, and keeping certain ground rules for communication, discuss the following questions: 1) What keeps us from understanding each other? 2) What can teachers do to facilitate communication? (Pfeiffer,Vol.I,1970,p.31)

At the end of the exercise, the triads shared their learnings among themselves and then shared their findings with each other. The learnings expressed by the participants related to the importance of listening, thinking through carefully what it is "I intend to communicate," effort to overcome thinking of an answer while another is still in the process of articulating his communication, awareness of possible emotional interference as a message is coded and/or decoded.

Trigger Film: Lecture

"An instructor is mixing aids into his lecture very well - slides, models, handouts, etc. He seems to be illustrating and communicating his points very well until camera pans across the audience. Many students

are reading, sleeping, talking, etc. The episode is designed to illustrate innovative use of teaching aids as well as to generate discussion on how aids can be used effectively, how to cope with non-attentive students, etc."

Total group discussion was led jointly by the designer of film and the consultant. Common concerns were expressed around the following comment by one of the chemistry faculty present.

> The interest of students during a lecture fluctuates and some seem 'out of it.' Those who are 'out' need to be brought 'in.' This can be done by keeping the element of mystery alive during the lecture.

The discussion that followed, revolved around the questions: 1) How can we convey that chemistry is beautiful without using chemical terminology? 2) Timing and sequence of use of visual aids and explanation deserves careful consideration by teacher. 3) Teacher must be thoroughly prepared for class and laboratory sessions.

Feedback from Participants

At the end of the session, the participants gave their written comments. An important aspect of the session was seen to be the opportunity to share ideas and mutual problems. These were the remarks:

"disagreements were discouraged"

"more questions have been raised than answered"

The general tone was that the session was valuable for "highlighting difficulties that we have experienced but might not have thought about."

Workshop #2 - CLASSROOM CLIMATE (Participants 15; duration 2hrs. 30 min.)

The goals of this workshop session were to develop an awareness of the impact of friendly and unfriendly forces in the classroom group upon the behavior of the individual (students and teacher), and of non-verbal aspects of communication, as these relate to interpersonal relations.

Activities

Acceptance-Rejection Exercise

The first activity was a structured experience with focus on the impact of the perception of friendly and unfriendly forces in the environment, upon behavior. (The University of Michigan, Department of Community and Adult Education,1953)

This activity is based upon a conceptualization which may be represented in the form of a ratio:

$$\text{BEHAVIOR} \longleftarrow \text{level of security} = \frac{\text{person's perception of own value} + \text{his perception of friendly forces}}{\text{his perception of unfriendly forces}}$$

The conceptualization was part of the input of the workshop, as well as Gibb's (1968) findings that within a supportive climate there is willingness for shared problem solving in the classroom.

Following the structured experience, participants shared their learnings.One finding was the insight that it is necessary to consider changes in one's own behavior in relationship with others before effecting change in behavior of others.

One-way, Two-way Communication

The focus of this activity was the combination of verbal and non-verbal modes of communication. (For complete description see Pfieffer, Vol. I,1970,p.13).

The total group discussion brought out shared learnings about the importance of eye-to-eye contact, of seeing and hearing at the same time, of the importance of using similar language codes in order to facilitate understanding between persons.

Feedback from Participants

Comments by participants indicated that this session was viewed as a medium for becoming aware of their own teaching style. For instance, one remarked that the session "pinned down some of the reasons why I had been feeling bad about the job I had been doing . . . ."

The group seemed to come away with the belief that they could use non-verbal communications skills to improve their teaching. Some wanted more practice in this area.

Workshop #3 - INFLUENCE STYLES (Participants 12; duration 3hrs.)

The goals of this workshop were an examination of different influence styles: awareness of one's own styles, and skill practice in asking questions as cognitive aspects of teaching style.

Activities

Styles of influence

There was a brief description of three styles of influence from which emerge the hypothetical types - the Tough Battler, the Friendly Helper, and the Logical Thinker.

With the help of a chart (see Appendix J), the characteristic emotions, goals, standards of evaluation, and techniques of influence of each type were discussed.

The participants were asked to form groups of four and given the following instructions, item by item:

1. Using these three categories, rank yourself in descending order of power.

2. Likewise, rank each of the other members of the group.

3. After you have completed all rankings, exchange them, so that each person will have all rankings for self.

4. After each person looks at rankings, you may wish to share reasons for rankings of self and others the way you did.

Feelings and thoughts were shared during the total group discussion. Responding to the request of those present, the trainer and one of the participants engaged in a dialogue. This served as a demonstration about the possibility of shifting from one style of influence to the other, as well as combining the three mentioned above.

Classroom Questions

The focus of this activity was exploration into the function of questions as a medium to arouse interest, to motivate, instruct and evaluate. The group was asked to form dyads with the following instructions:

1. Decide upon a discussion session specifying the objectives of the session.

2. Make believe you are in the classroom. Think of leading questions (those that require memory in order to be answered). Write down questions on newsprint (1-3 questions) and put up newsprint.

3. Formulate search questions which have the potential of engaging the student in thought processes, such as interpretation, application, analysis, synthesis, evaluation .[1]

[1]These are some of the educational objectives mentioned in Chapter II.

Write down questions on news-
print and put them up.

During the course of the discussion, which was led jointly by the chemistry faculty present at the session and myself, some of the leading questions were transformed to search questions.

Someone posed the following question : "What do you do with a response that is scientifically wrong?" The discussion (at one point debate) that followed highlighted the possible use of questions by the teacher in guiding students to discover the sources of 1) misinformation and/or faulty thinking and 2) information and both divergent and convergent thinking.

Feedback from Participants

The comments expressed the views of some that "demonstration of teaching skills or approaches are useful for [own] style of presentation. A better understanding of how to teach was gained through group

discussion," guided by the resource person (this referred to the trainer).

Some remarked that they were able to study their own teaching methods and get "constructive criticism from each other."

Two contrasting comments were: "I don't ask questions. The students ask and I answer ", and "the use of classroom questions was helpful in changing the habit of just giving the right answer to the students."

Workshop #4 - CROSS-ETHNIC RELATIONS (Participants 0; duration 4hrs.)

The goal of this session was the development of authentic relationships between white teachers and black students through "acceptance and recognition of differences and appreciation of these differences as sources of mutual learning " (Lee, 1969) . The activity was based on the source just cited.

Activity

There was a short lecturette on cultural differences and stereotypes. The participants (including a black student who agreed to be a resource person) were asked to make a list of: 1) assumptions white teachers make of black students and 2) assumptions black students make of white teachers. This was done in groups of three each.

The lists of assumptions were written on newsprint and put up for everyone to see. The participants were asked to reflect on the following question: "How does this information make me feel?"

During the general discussion, there was sharing of experiences, and feelings, and of realizations of own attitudes and the meaning of these in white teacher perception of black students.

The black student made it clear that she was talking for herself and not for all blacks. The general comment was that this was the first time that the teaching fellows had the opportunity to engage in an open exchange with a black student and had received feedback from

a black student about her feelings and perceptions.

Feedback from Participants

The dominant reaction of the participants to this session was a realization that each one has his own attitudes and that these attitudes influence teaching.

Not all were satisfied with their attitudes once they discovered what those attitudes were. There was an expression of awareness for the need to change and willingness to work toward that change.

Some remarks were: "I will somehow be able to change my attitudes not only toward others, but toward myself as well." "It is very difficult to relate to the other person in terms of his attitude." "I feel I understand the situation. This gives me a chance to consider how to act and react."

Workshop #5 - DEALING WITH EVALUATIVE FEEDBACK
(Participants 10;
duration 3hrs.)

The goals of this workshop were increased awareness of the importance of seeking and receiving feedback, the development and/or enhancement of the ability to process evaluative data from students and the consideration of issues involved in such a process.

Activity

Two weeks prior to this session, students enrolled in sections for which teaching fellows were responsible responded to a rating scale (Appendix D). The data generated by the student responses were presented to the participants of the workshop. For instance, "at times, the methods he supported did not agree with method suggested in lecture." "He explains things well."

A doctoral student in educational psychology, with experience in individual and group counseling, and myself, role played a situation where a hypothetical teaching fellow had gone to an "objective" person asking for help to get some meaning out of student comments

about him and his teaching.

The "teaching fellow" played the roles of a defensive, a hurt, a gullible,and a rational person in trying to process the information just received. This was done with the help of the "objective person," who probed, reflected, asked for illustrations, etc.

With the help of the consultant, the hypothetical teaching fellow (myself) processed the data within the framework of the following questions: 1) What are my students telling me? and , 2) To what extent am I willing and/or able to respond to their comments and negative feedback?

The participants of the workshop were then asked to form dyads and study their own evaluations by helping each other. The instructions were that they ask the same questions considered by the hypothetical teaching fellow.

There was general discussion and sharing of the findings of each group.

Feedback from Participants

Without exception, the teaching fellows responded that they viewed feedback from their students as a positive force for improving their teaching.

Some indicated that they had never before welcomed feedback. One remarked: "This session helped me not to get so emotional and defensive about feedback and therefore, I will be able to use feedback better."

The use of feedback in diagnosing a classroom group was brought up by one. "The rating scale was extremely helpful in bringing up problems that were specific in their nature, and helped to show what basic problems there were in the course."

CONSULTATIONS

As has been mentioned, there were three consultation hours per week during the Fall term, 1971, and six hours per week during the Winter term, 1972. Sixteen teaching fellows made use of this service.

The two themes that emerged from the consultation periods were 1) growth as person and 2) growth in competence as teacher.

Specific issues related to the first theme included the development of self-confidence, relationship with significant-others, awareness of one's strengths and weaknesses, and change-of-self projects.

Issues related to competence as teacher included the careful planning of presentations, listening to questions of students, providing for problem-solving skills during laboratory sessions, decision-making in the classroom, and avoiding the pitfall of answering according to knowledge and interest of teacher rather than questions of students.

CHAPTER V

ASSESSMENT OF THE PROGRAM

The impact of the program will be assessed in terms of 1) statistical treatment of available data for the total sample; 2) presentation of data for participant teaching fellows by the case method and 3) consequences for the department.

RESULTS OF STATISTICAL TREATMENT OF DATA

The sample is comprised of seven non-participant teaching fellows and their 137 students during the fall term; and eight participant teaching fellows with their 167 students during the fall term and 194 students during the winter term. Data from students were collected at the end of the fall term and, the beginning and end of winter term. Non-participant teaching fellows responded to the instruments at the beginning of the academic year, while the participant teaching fellows responded to the instruments both at the beginning and the end of the of the academic year. The means for each variable for each major group are summarized in table 1.

TABLE I

MEAN SCORES FOR EACH VARIABLE
FOR EACH MAJOR GROUP

GROUPS BY TF PARTICIPATION IN PROGRAM	TIME[a] OF TEST	STUDENTS N[b]	STUDENTS SATIS WITH TEACHER	TEACHING FELLOWS N	TEACHING FELLOWS ATTITUDE	TEACHING FELLOWS DOM	TEACHING FELLOWS LOV	TEACHING FELLOWS JOB SATIS
NON-PARTICIPANT	FALL TERM (12th week)	137	27.30	7	35.14	53.57	41.12	(c)
PARTICIPANT	FALL TERM (12th week)	167	30.27	8	28.75	55.63	61.12	.45
PARTICIPANT	(4th week) WINTER TERM	159	32.89					
	(12th week)	142	32.73	8	28.75	62.00	69.75	.55
Range of Possible Scores:Max. to Min.			40 to 10		11 to 66	100 to 0		1 to -1

(a) Teaching fellows responded to instruments at the beginning of the Fall term and the end of the Winter term.

(b) The total number of students enrolled in classes of participants during the Winter term was 194

(c) Data not available for non-participants

A number of specific questions served as guidelines to compare the following major groups: 1) students of participant and non-participant teaching fellows at the end of fall term, 2) students of participant teaching fellows at the end of fall term and the end of winter term, 3) students of participant teaching fellows at the beginning and end of winter term, 4) participant and non-participant teaching fellows at the beginning of the academic year, and 5) participant teaching fellows at the beginning and end of the academic year.

Student Satisfaction

The first question deals with whether there were differences in student satisfaction between classes taught by program participants (P) and classes taught by program non-participants (NP) during the fall term and following eleven weeks of training.

The Null Hypothesis is symbolically presented below:

$$H_o: U_P - U_{NP} = 0$$

The student t was used to test this Null hypothesis. The results are reported in table 2. The total satisfaction

mean was 30.27 for classes of participants and 27.30 for non-participants. The obtained t was 2.57 with 302 df and is significant at p=.02 level.

Thus it appears that the students of participant teaching fellows were more satisfied than the students of non-participants during the fall term.

TABLE 2

SUMMARY OF TOTAL STUDENT SATISFACTION MEAN SCORES, VARIANCES AND t-VALUES COMPARING FALL TERM CLASSES OF PARTICIPANT AND NON-PARTICIPANT TEACHING FELLOWS BY THE INDEPENDENT t-TEST METHOD

GROUP(a)	MEAN	N	VARIANCE	t	P
PARTICIPANT	30.27	167	5.998	2.57	.02
NON-PARTICIPANT	27.30	137	3.765		

(a) there were eight participant and seven non-non-participant teaching fellows

It was then of interest to look at each item of the test which is summarized in table 3. For each of the ten items the obtained t is significant at p=.02 level.

TABLE 3

SUMMARY OF STUDENT SATISFACTION MEAN SCORES, VARIANCES and t-VALUES COMPARING FALL TERM CLASSES OF PARTICIPANTS AND NON-PARTICIPANTS BY THE INDEPENDENT t-TEST METHOD

	GROUP	MEAN	N	VARIANCE	t	P
CARING OF TEACHER	HELPS STUDENTS GET DOWN TO WORK					
	Participant	2.91	167	.383	3.66	.0003
	Non-particip	2.64	137	.422		
	IS ATTENTIVE TO STUDENTS' WORK IN LAB.					
	Participant	3.12	167	.339	2.83	.004
	Non-particip	2.92	137	.406		
	IS PROMPT IN CHECKING AND RETURNING PAPERS					
	Participant	3.26	167	.330	2.38	.0176
	Non-particip	3.08	137	.565		
	IS WILLING TO ASSIST STUDENTS					
	Participant	3.33	167	.392	3.15	.0017
	Non-particip	3.10	137	.430		
RELEVANCE OF COURSE	ENCOURAGES QUESTIONS BY STUDENTS					
	Participant	3.10	167	.277	3.90	.0001
	Non-particip	2.84	137	.410		
	STIMULATES INTEREST IN STUDENTS					
	Participant	2.93	167	.290	4.78	.0000
	Non-particip	2.63	137	.431		
	EXPLAINS DIFFICULT POINTS					
	Participant	2.88	167	.334	4.52	.0000
	Non-particip	2.55	137	.454		
OTHER	SPEAKS CLEARLY					
	Participant	3.28	167	.311	6.23	.0000
	Non-particip	2.85	137	.405		
	GIVES ENOUGH TIME FOR VARIOUS ACTIVITIES					
	Participant	2.65	167	.312	2.90	.0039
	Non-particip	2.45	137	.353		
	MY LEARNINGS AS COMPARED TO MY EXPECTATIONS					
	Participant	2.61	167	.298	4.07	.0001
	Non-particip	2.34	137	.388		

Therefore, the differences were significant both for total satisfaction and for satisfaction on each item.

The second question deals with whether there were differences in student satisfaction between classes taught by program participants in the fall term (F) and in the winter term (W).

The Null Hypothesis is symbolically presented below:

$$H_o: U_F - U_W = 0$$

The student t was used to test this null hypothesis. The results are reported in table 4. The total satisfaction mean was 30.27 for the fall term classes of participant teaching fellows and 32.27 for winter term classes. The obtained t was -5.57 with 307 df and is significant at p=.03 level.

Thus it appears that the students of participant teaching fellows were more satisfied in the winter term and after two semesters of program participation than students in their classes in the fall term and after eleven weeks of program participation. Considering

that the scale used was being developed and the items on the two tests were worded differently, no comparison by item was made for these two groups.

TABLE 4

SUMMARY OF TOTAL STUDENT SATISFACTION MEAN SCORES, VARIANCES AND t-VALUES COMPARING FALL AND WINTER TERM CLASSES OF PARTICIPANT TEACHING FELLOWS BY THE INDEPENDENT t-TEST METHOD

GROUP	MEAN	N	VARIANCE	t	P
FALL	30.27	167	5.998	-2.57	.03
WINTER[a]	32.73	142	1.804		

(a) scores are for the posttest of the winter term

N.B. time of testing for both groups is the end of the term

The third question deals with whether there were differences in student satisfaction in classes taught by program participants in the winter term

between pretest (pre) and posttest (post).

The Null Hypothesis is symbolically presented below:

$$H_o: U_{pre} - U_{post} = 0$$

The student t was used to test this null hypothesis for each item on the scale. The results are summarized in table 5 . It appears that satisfaction of students in classes of participant teaching fellows during the winter term shows pretest-posttest differences significant at $p \leq .05$ level for only one item: is prompt in checking and returning papers.

It was then of interest to look at the different groups according to enrollment in various courses. The results, pre and post, for each item for each group - 1) general chemistry, 2) organic chemistry, 3) general chemistry taught by the Keller plan - are summarized in tables 6, 7 and 8 respectively. It appears that student satisfaction for each group shows no significant pretest-posttest difference for any of the items at $p \leq .05$ level.

TABLE 5

SUMMARY OF STUDENT SATISFACTION MEAN SCORES, VARIANCES AND t-VALUES COMPARING PRE AND POST SCORES FOR WINTER TERM CLASSES OF PARTICIPANTS BY THE INDEPENDENT t-TEST METHOD

	GROUP	MEAN	N	VARIANCE	t	P
CARING OF TEACHER	HELPS STUDENTS GET DOWN TO WORK					
	pre	3.24	159	.274	.17	.98
	post	3.25	142	.399		
	SENSES WHEN STUDENTS NEED HELP					
	pre	3.09	159	.389	-1.45	.14
	post	3.20	142	.475		
	IS PROMPT IN CHECKING AND RETURNING PAPERS					
	pre	3.40	159	.319	2.05	.04
	post	3.26	142	.395		
	IS WILLING TO ASSIST STUDENTS					
	pre	3.56	159	.297	1.30	.19
	post	3.47	142	.378		
RELEVANCE OF COURSE	ENCOURAGES QUESTIONS BY STUDENTS					
	pre	3.22	159	.340	- .67	.49
	post	3.27	142	.427		
	ENCOURAGES STUDENTS TO TAKE INITIATIVE					
	pre	3.33	159	.299	.33	.74
	post	3.30	142	.470		
	PROMOTES OPEN-END DISCUSSIONS					
	pre	3.04	159	.409	.65	.51
	post	2.98	142	.794		
	SENSES WHEN STUDENTS WANT TO WORK ON THEIR OWN					
	pre	3.05	159	.332	.97	.33
	post	2.97	142	.836		
OTHER	SPEAKS CLEARLY					
	pre	3.45	159	.313	1.13	.25
	post	3.38	142	.421		
	WILL GRADE STUDENTS FAIRLY					
	pre	3.55	159	.653	-1.16	.24
	post	3.65	142	.482		

TABLE 6

SUMMARY OF STUDENT SATISFACTION MEAN SCORES, VARIANCES AND t-VALUES COMPARING PRE AND POST SCORES OF WINTER TERM CLASSES IN GENERAL CHEMISTRY BY THE INDEPENDENT t-TEST METHOD

	GROUP	MEAN	N	VARIANCE	t	P
CARING OF TEACHER	HELPS STUDENTS GET DOWN TO WORK					
	pre	3.29	97	.274	1.12	.26
	post	3.20	90	.459		
	SENSES WHEN STUDENTS NEED HELP					
	pre	3.19	97	.367	.39	.69
	post	3.23	90	.473		
	IS PROMPT IN CHECKING AND RETURNING PAPERS					
	pre	3.46	97	.355	1.29	.19
	post	3.35	90	.209		
	IS WILLING TO ASSIST STUDENTS					
	pre	3.64	97	.230	1.29	.19
	post	3.54	90	.380		
RELEVANCE OF COURSE	ENCOURAGES QUESTIONS BY STUDENTS					
	pre	3.29	97	.336	.65	.51
	post	3.35	90	.336		
	ENCOURAGES STUDENTS TO TAKE INITIATIVE					
	pre	3.32	97	.285	.34	.73
	post	3.30	90	.437		
	PROMOTES OPEN-END DISCUSSIONS					
	pre	3.07	97	.421	.25	.79
	post	3.04	90	.571		
	SENSES WHEN STUDENTS WANT TO WORK ON THEIR OWN					
	pre	3.08	97	.305	1.00	.31
	post	2.97	90	.718		
OTHER	SPEAKS CLEARLY					
	pre	3.51	97	.252	.84	.39
	post	3.44	90	.406		
	WILL GRADE STUDENTS FAIRLY					
	pre	3.61	97	.592	.52	.52
	post	3.68	90	.531		

TABLE 7

SUMMARY OF STUDENT SATISFACTION MEAN SCORES, VARIANCES AND t-VALUES COMPARING PRE AND POST SCORES OF WINTER TERM CLASSES IN CHEMISTRY USING THE KELLER PLAN BY THE INDEPENDENT t-TEST METHOD

	GROUP	MEAN	N	VARIANCE	t	P
CARING OF TEACHER	HELPS STUDENTS GET DOWN TO WORK					
	pre	3.08	23	.830	1.42	.16
	post	3.27	22	.303		
	SENSES WHEN STUDENTS NEED HELP					
	pre	3.08	23	.355	1.17	.24
	post	3.27	22	.207		
	IS PROMPT IN CHECKING AND RETURNING PAPERS					
	pre	3.34	23	.237	1.90	.06
	post	3.04	22	.331		
	IS WILLING TO ASSIST STUDENTS					
	pre	3.39	23	.339	.95	.92
	post	3.40	22	.443		
RELEVANCE OF COURSE	ENCOURAGES QUESTIONS BY STUDENTS					
	pre	3.26	23	.201	.87	.93
	post	3.27	22	.207		
	ENCOURAGES STUDENTS TO TAKE INITIATIVE					
	pre	3.56	23	.256	1.37	.17
	post	3.27	22	.779		
	PROMOTES OPEN-END DISCUSSIONS					
	pre	3.26	23	.292	1.90	.06
	post	2.86	22	.694		
	SENSES WHEN STUDENTS WANT TO WORK ON THEIR OWN					
	pre	3.08	23	.173	.47	.63
	post	3.18	22	.727		
OTHER	SPEAKS CLEARLY					
	pre	3.47	23	.260	.42	.67
	post	3.40	22	.348		
	WILL GRADE STUDENTS FAIRLY					
	pre	3.82	23	.150	.59	.95
	post	3.81	22	.251		

TABLE 8

SUMMARY OF STUDENT SATISFACTION MEAN SCORES, VARIANCES AND t-VALUES COMPARING PRE AND POST SCORES OF WINTER TERM CLASSES IN ORGANIC CHEMISTRY BY THE INDEPENDENT t-TEST METHOD

	GROUP	MEAN	N	VARIANCE	t	P
CARING OF TEACHER	HELPS STUDENTS GET DOWN TO WORK					
	pre	3.20	39	.377	1.12	.26
	post	3.36	30	.309		
	SENSES WHEN STUDENTS NEED HELP					
	pre	2.84	39	.396	1.25	.21
	post	3.06	30	.685		
	IS PROMPT IN CHECKING AND RETURNING PAPERS					
	pre	3.30	39	.271	.86	.39
	post	3.16	30	.695		
	IS WILLING TO ASSIST STUDENTS					
	pre	3.46	39	.412	.87	.38
	post	3.33	30	.298		
RELEVANCE OF COURSE	ENCOURAGES QUESTIONS BY STUDENTS					
	pre	3.02	39	.394	.43	.96
	post	3.03	30	.722		
	ENCOURAGES STUDENTS TO TAKE INITIATIVE					
	pre	3.20	39	.325	1.12	.26
	post	3.36	30	.378		
	PROMOTES OPEN-END DISCUSSIONS					
	pre	2.84	39	.396	.25	.80
	post	2.90	30	1.265		
	SENSES WHEN STUDENTS WANT TO WORK ON THEIR OWN					
	pre	2.97	39	.499	.78	.43
	post	2.80	30	1.269		
OTHER	SPEAKS CLEARLY					
	pre	3.30	39	.481	.83	.40
	post	3.16	30	.488		
	WILL GRADE STUDENTS FAIRLY					
	pre	3.23	39	.971	.96	.33
	post	3.43	30	.460		

Considering that the major concern of the in-service program was the teaching of general chemistry, it was of interest to compare the general chemistry group with the organic chemistry group, and with the Keller group for both pretest and posttest.

The results of comparison between the general chemistry group and the Keller group are summarized by item in table 9 for pretest and table 10 for posttest.

The item "encourages students to take initiative" shows significant difference at $p \leq .05$ level on the pretest and no significant difference at the same level on the posttest. It appears that on the pretest the Keller group were more satisfied than the general chemistry group, while the satisfaction of the two groups are more similar on the posttest. This may be due to pressures in the Keller group at the end of the term to complete the course curriculum, while the difference at the beginning of the term may have been related to the reaction of the students to the personalized format of the course.

TABLE 9

SUMMARY OF STUDENT SATISFACTION MEAN SCORES, VARIANCES AND t-VALUES COMPARING PRE SCORES OF CLASSES IN GENERAL CHEMISTRY AND IN CHEMISTRY USING THE KELLER PLAN (WINTER TERM) BY THE INDEPENDENT t-TEST METHOD

	GROUP	MEAN	N	VARIANCE	t	P
CARING OF TEACHER	HELPS STUDENTS GET DOWN TO WORK					
	General	3.29	97	.274	1.87	.06
	Keller	3.08	23	.830		
	SENSES WHEN STUDENTS NEED HELP					
	General	3.19	97	.367	.77	.43
	Keller	3.08	23	.355		
	IS PROMPT IN CHECKING AND RETURNING PAPERS					
	General	3.46	97	.355	.86	.38
	Keller	3.34	23	.237		
	IS WILLING TO ASSIST STUDENTS					
	General	3.62	97	.592	1.25	.21
	Keller	3.82	23	.150		
RELEVANCE OF COURSE	ENCOURAGES QUESTIONS BY STUDENTS					
	General	3.29	97	.336	.29	.76
	Keller	3.26	23	.201		
	ENCOURAGES STUDENTS TO TAKE INITIATIVE					
	General	3.32	97	.285	1.91	.05
	Keller	3.56	23	.256		
	PROMOTES OPEN-END DISCUSSIONS					
	General	3.07	97	.421	1.29	.19
	Keller	3.26	23	.292		
	SENSES WHEN STUDENTS WANT TO WORK ON THEIR OWN					
	General	3.09	97	.305	.36	.97
	Keller	3.08	23	.173		
OTHER	SPEAKS CLEARLY					
	General	3.51	97	.252	.31	.75
	Keller	3.47	23	.260		
	WILL GRADE STUDENTS FAIRLY					
	General	3.61	97	.592	1.25	.21
	Keller	3.82	23	.150		

TABLE 10

SUMMARY OF STUDENT SATISFACTION MEAN SCORES, VARIANCES AND t-VALUES COMPARING POST SCORES OF CLASSES IN GENERAL CHEMISTRY AND IN CHEMISTRY USING THE KELLER PLAN (WINTER TERM) BY THE INDEPENDENT t-TEST METHOD

	GROUP	MEAN	N	VARIANCE	t	P
CARING OF TEACHER	HELPS STUDENTS GET DOWN TO WORK					
	General	3.20	90	.453	.46	.64
	Keller	3.27	22	.303		
	SENSES WHEN STUDENTS NEED HELP					
	General	3.23	90	.473	.25	.79
	Keller	3.35	22	.207		
	IS PROMPT IN CHECKING AND RETURNING PAPERS					
	General	3.35	90	.299	2.36	.02
	Keller	3.04	22	.331		
	IS WILLING TO ASSIST STUDENTS					
	General	3.54	90	.385	.90	.36
	Keller	3.41	22	.443		
RELEVANCE OF COURSE	ENCOURAGES QUESTIONS BY STUDENTS					
	General	3.35	90	.366	.60	.54
	Keller	3.27	22	.207		
	ENCOURAGES STUDENTS TO TAKE INITIATIVE					
	General	3.30	90	.437	.16	.87
	Keller	3.27	22	.779		
	PROMOTES OPEN-END DISCUSSIONS					
	General	3.04	90	.672	.92	.35
	Keller	2.86	22	.694		
	SENSES WHEN STUDENTS WANT TO WORK ON THEIR OWN					
	General	2.98	90	.718	1.01	.31
	Keller	3.18	22	.727		
OTHER	SPEAKS CLEARLY					
	General	3.44	90	.406	.23	.81
	Keller	3.40	22	.348		
	WILL GRADE STUDENTS FAIRLY					
	General	3.69	90	.531	.78	.43
	Keller	3.82	22	.251		

The item " is prompt in checking and returning papers" shows no significant difference at $p \leq .05$ level on the pretest and significant difference on the same level on the posttest. The general chemistry group appears to be more satisfied than the Keller group at the end of the term. This may be due to some students having to wait for the results of the test on particular units in order to proceed with work on the next unit in the course taught by the Keller plan.

The results of comparisen between the general chemistry group and the organic chemistry group are summarized for each item in table 11 for pretest and table 12 for posttest.

The item "senses when students need help" shows significant difference at $p \leq .05$ level on the pretest and no significant difference on the posttest at the same level. It appears that the general chemistry group was more satisfied than the organic chemistry group at the beginning of the term, while at the end

TABLE 11

SUMMARY OF STUDENT SATISFACTION MEAN SCORES, VARIANCES AND t-VALUES COMPARING PRE SCORES OF GENERAL CHEMISTRY AND ORGANIC CHEMISTRY CLASSES (WINTER TERM) BY THE INDEPENDENT t-TEST METHOD

	GROUP	MEAN	N	VARIANCE	t	P
CARING OF TEACHER	HELPS STUDENTS GET DOWN TO WORK					
	General	3.29	97	.274	.89	.37
	Organic	3.20	39	.377		
	SENSES WHEN STUDENTS NEED HELP					
	General	3.19	97	.367	3.00	.003
	Organic	2.84	39	.396		
	IS PROMPT IN CHECKING AND RETURNING PAPERS					
	General	3.46	97	.355	1.43	.15
	Organic	3.30	39	.271		
	IS WILLING TO ASSIST STUDENTS					
	General	3.64	97	.230	1.86	.06
	Organic	3.46	39	.421		
RELEVANCE OF COURSE	ENCOURAGES QUESTIONS BY STUDENTS					
	General	3.29	97	.336	2.42	.01
	Organic	3.02	39	.394		
	ENCOURAGES STUDENTS TO TAKE INITIATIVE					
	General	3.32	97	.285	1.20	.22
	Organic	3.20	39	.325		
	PROMOTES OPEN-END DISCUSSIONS					
	General	3.07	97	.421	1.85	.06
	Organic	2.84	39	.396		
	SENSES WHEN STUDENTS WANT TO WORK ON THEIR OWN					
	General	3.08	97	.305	.94	.34
	Organic	2.97	39	.499		
OTHER	SPEAKS CLEARLY					
	General	3.51	97	.252	1.94	.05
	Organic	3.30	39	.481		
	WILL GRADE STUDENTS FAIRLY					
	General	3.61	97	.592	2.44	.01
	Organic	3.23	39	.971		

TABLE 12

SUMMARY OF STUDENT SATISFACTION MEAN SCORES, VARIANCES AND t-VALUES COMPARING POST SCORES OF GENERAL CHEMISTRY AND ORGANIC CHEMISTRY CLASSES (WINTER TERM) BY THE INDEPENDENT t-TEST METHOD

	GROUP	MEAN	N	VARIANCE	t	P
CARING OF TEACHER	HELPS STUDENTS GET DOWN TO WORK					
	General	3.20	90	.454	1.22	.22
	Organic	3.67	30	.309		
	SENSES WHEN STUDENTS NEED HELP					
	General	3.23	90	.473	1.09	.27
	Organic	3.07	30	.685		
	IS PROMPT IN CHECKING AND RETURNING PAPERS					
	General	3.35	90	.299	1.42	.15
	Organic	3.16	30	.695		
	IS WILLING TO ASSIST STUDENTS					
	General	3.69	90	.531	1.69	.09
	Organic	3.43	30	.460		
RELEVANCE OF COURSE	ENCOURAGES QUESTIONS BY STUDENTS					
	General	3.35	90	.366	2.26	.02
	Organic	3.03	30	.722		
	ENCOURAGES STUDENTS TO TAKE INITIATIVE					
	General	3.30	90	.437	.48	.62
	Organic	3.36	30	.378		
	PROMOTES OPEN-END DISCUSSIONS					
	General	3.04	90	.672	.75	.45
	Organic	2.90	30	1.26		
	SENSES WHEN STUDENTS WANT TO WORK ON THEIR OWN					
	General	2.97	90	.718	.91	.36
	Organic	2.80	30	1.269		
OTHER	SPEAKS CLEARLY					
	General	3.44	90	.406	2.01	.04
	Organic	3.16	30	.488		
	WILL GRADE STUDENTS FAIRLY					
	General	3.68	90	.531	1.69	.09
	Organic	3.43	30	.460		

of the term the differences were less. This may have a relation to attempts,on the part of those teaching the organic chemistry group,for the transfer of general teaching skills to the teaching of organic chemistry.

The item "encourages questions by students" shows significant differences at $p \leq .05$ level both for pretest and posttest results. It appears that the general chemistry group was more satisfied than the organic chemistry group. This may be due to students in organic chemistry having more questions than they have a chance to ask, as well as teaching fellows being apprehensive to encourage questions which may call for greater competence in subject matter than they possess.

The item "will grade students fairly" shows significant difference at $p \leq .05$ level on the pretest and no significant difference at the same level on the posttest. It appears that the general chemistry group was more satisfied than the organic chemistry group at the beginning of the term, while the difference was

less at the end of the term. This may be due to an increase in the level of trust toward teacher among the organic chemistry group.

Teacher Variables

The fourth question deals with whether there were differences in attitude toward teaching as a career and interpersonal style (DOM and LOV) between participant (P) and non-participant (NP) teaching fellows during the fall term.

The Null Hypothesis is symbolically presented below:

$$H_o: U_P - U_{NP} = 0$$

The student t was used to test this null hypothesis for each of the variables considered. The results are summarized in table 13 .

The ATTITUDE mean was 28.75 for participants and 35.14 for non-participants (the higher scores stand for less favorable attitude). The obtained t was 1.56 with 13 df and is sifnificant at p=.14 level.

TABLE 13

SUMMARY OF ATTITUDE, DOMINANCE AND LOVE MEAN SCORES, VARIANCES AND t-VALUES COMPARING PARTICIPANT AND NON-PARTICIPANT TEACHING FELLOWS BY THE INDEPENDENT t-TEST METHOD

GROUP	MEAN	N	VARIANCE	t	P
ATTITUDE TOWARD TEACHING AS A CAREER					
PARTICIPANT	28.75	8	57.07	1.56	.14
NON-PARTICIPANT	35.14	7	68.81		
DOMINANCE					
PARTICIPANT	55.62	8	666.27	.16	.87
NON-PARTICIPANT	53.57	7	510.95		
LOVE					
PARTICIPANT	61.12	8	288.13	1.43	.12
NON-PARTICIPANT	41.14	7	859.13		

The DOM mean was 55.62 for participants and 53.57 for non-participants. the obtained t was .16 with 13 df and is significant at p=.87 level.

The LOV mean was 61.12 for participants and 41.14 for non-participants. The obtained t was 1.43 with 13 df and is sifnificant at p=.12 level.

Thus it appears that there were no significant differences between participants and non-participants in attitude toward teaching as a career and interpersonal style.

Therefore, there seems to be a similarity in the presentation of self among the teaching fellows constituting the sample. It also seems that the similarity is greater on the dominance-submission dimension than it is on the affection-hostility dimension.

The fifth question deals with whether there were pretest-posttest differences in participants with regard to attitude toward teaching as a career, interpersonal style and job satisfaction.

The Null Hypothesis is symbolically presented below:

$$H_o: U_{pre} - U_{post} = 0$$

The correlated t was used to test this null hypothesis. The results are summarized in table 14.

The ATTITUDE mean was 28.75 on the pretest and 28.75 on the posttest. The obtained t was 0. with SD of 5.34 and is significant at p=1.00 level.

The DOM mean was 55.62 on the pretest and 62.00 on the posttest. The obtained t was -.76 with SD of 23.43 and is significant at p=.46 level.

The LOV mean was 61.12 on the pretest and 69.75 on the posttest. The obtained t was -1.46 with SD of 16.6 and is significant at p=.18 level.

The JOB SATISFACTION mean was .45 on the pretest and .55 on the posttest. The obtained t was -1.30 with SD of .23 and is significant at p=.23 level.

Thus it appears that there are no significant

TABLE 14

SUMMARY OF ATTITUDE, DOMINANCE, LOVE AND JOB SATISFACTION MEAN SCORES, MEAN DIFFERENCES, STANDARD DEVIATIONS AND t-VALUES COMPARING PRETEST AND POSTTEST OF PARTICIPANT TEACHING FELLOWS BY THE CORRELATED t-TEST METHOD

TEST	MEAN	M DIFF	ST DEV	t	P
ATTITUDE TOWARD TEACHING AS A CAREER					
pre	28.75	0.	5.345	0.	1.00
post	28.75				
DOMINANCE					
pre	55.62	6.38	23.43	- .76	.46
post	62.00				
LOVE					
pre	61.12	8.63	16.6	-1.46	.18
post	69.75				
JOB SATISFACTION					
pre	.45	.10	.23	-1.30	.23
post	.55				

pretest-posttest difference for participant teaching fellows for any of the variables considered.

Summary of Results

According to results of the statistical treatment of data, student satisfaction shows significant difference at $p \leq .05$ level between participant and non-participant teaching fellow classes during the fall term. The comparison between fall and winter term classes of participant teaching fellows shows sgnificant difference at $p \leq .05$ level also. Thus it appears that students of participant teaching fellows were more satisfied than students of non-participant teaching fellows during the fall term; and students of participant teaching fellows during the winter term were more satisfied than their students during the fall term.

On the other hand, there appears to be no significant difference at $p \leq .05$ level between participant and non-participant teaching fellows with regard to attitude toward teaching and interpersonal style. Likewise, there appears to be no significant difference

between pretest and posttest of participant teaching fellows at $p \leq .05$ level with regard to attitude toward teaching as a career, interpersonal style and job satisfaction.

In view of the results, it is of interest to examine the changes in each participant teaching fellow as a separate case. This will be done according to a format described in the next section.

Examination of Participant Data by the Case Method

Examination of changes in each participant teaching fellow by the case method will begin with a statement by the TF concerning his reasons for participation in the program. This will be followed by graphic presentation of the results of the two scales "attitudes toward teaching as a career" and "Job dimensions blank".

The "Job Dimensions Blank" has four response categories: satisfied (S); not sure (A); dissatisfied (D); and not relevan. The score for each TF is derived acc according to the formula:

$$\text{Job Satisfaction Score} = \frac{S - D}{S + A + D}$$

The results of the Interpersonal Check List will be presented in terms of two circular diagnostic diagrams for each TF. The first one will present the profile of self-description. This will be done by plotting the pre scores for each octant by an interrupted line and the post scores by a continuous line. The areas of change will be shaded.

For purposes of this study, the terminology used to label each octant is related to an adaptive interpersonal mode. The designation of terms was done with the help of Leary's (1957) redefinition of psychiatric categories in terms of interpersonal operations (p.233). This redefinition and designation of terms for use in this study are presented in table 15.

As was mentioned above, the presentation will be done with the help of circular diagrams. The innermost area of the circle represents a low intensity of interpersonal responses in any particular octant, and the area nearest the circumference is indicative of a high intensity of their use (refer to Figure 5). Each octant contains sixteen items, weighted for each response category (refer to Appendix G). For instance, octant

TABLE 15

OPERATIONAL REDEFINITION OF PSYCHIATRIC CATEGORIES IN TERMS OF INTERPERSONAL OPERATIONS

Variable Code	Interpersonal Mode of Adjustment	Interpersonal Type of Maladjustment	Term for this study
AP	Executive, forceful respected personality	Managing, autocratic, power-oriented personality	ASSERTIVE
BC	Independent, competitive personality	Narcissistic, exploitive personality	COMPETITIVE
DE	Blunt, frank, critical, unconventional personality	Agressive, sadistic personality	CRITICAL
FG	Realistic, skeptical personality	Passively resistant, bitter, distrustful personality	SKEPTICAL
HI	Modest, sensitive personality	Passive, submissive, self-punishing, masochistic personality	MODEST
JK	Respectful, trustful personality	Docile, dependent personality	TRUSTFUL
LM	Bland, conventional, friendly, agreeable personality	Naive, sweet, over-conventional personality	FRIENDLY
NO	Popular, responsible personality	Hypernormal, hyperpopular, comulsively generous personality	RESPONSIBLE

AP words are arranged as follows:

A:
1 able to give orders
2 forceful, good leader likes responsibility
3 bossy, dominating, manages others
4 dictatorial

P:
1 well thought of
2 makes a good impression, often admired, respected by others
3 always giving advice, acts important, tries to be successful
4 expects everyone to admire him

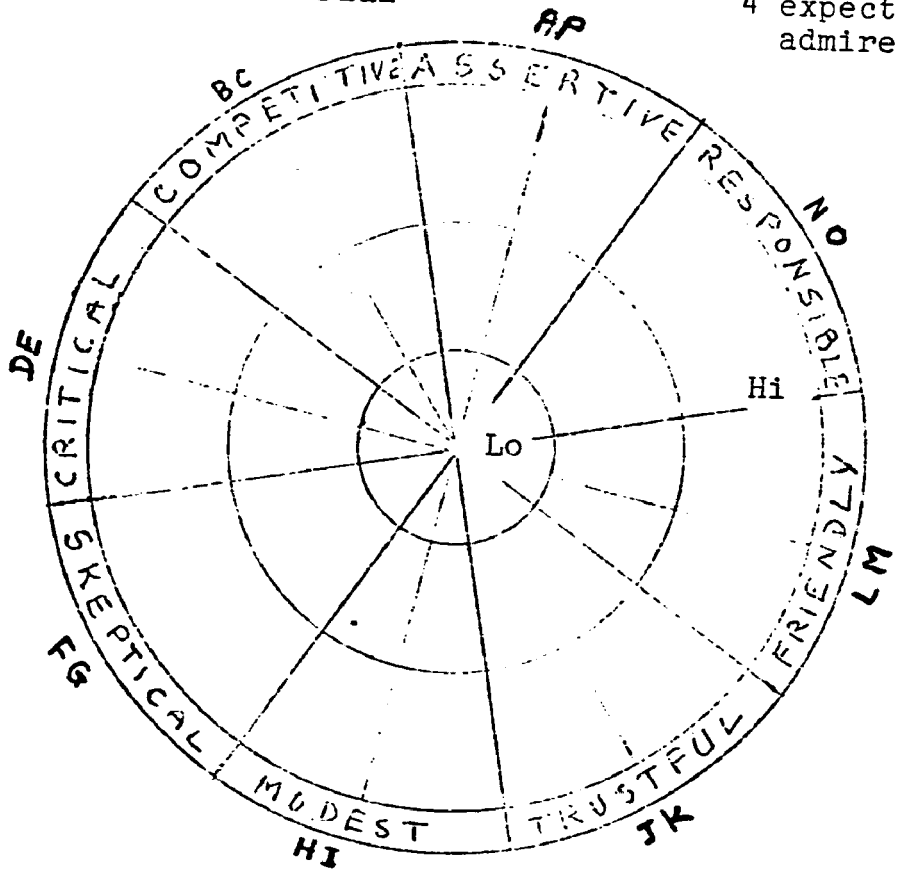


Figure 5: Outline of diagram for Profile of Self Description Based on Interpersonal Check List

Thus, in each response category there is one item each for intensity 1 and 4; and three items each for intensity 2 and 3. A score of 40 is the maximum possible in octant

AP as in each of the other octants.

The arrangement of categories is based on the intersection of two dimensions: dominance-submission (vertical axis) and hostility-affection (horizontal axis in Figure 6). The formulas for DOM (the former dimension) and LOV (the latter dimension), as derived by Leary (1957,p.68) are

$$DOM = AP-HI + .7\ (NO+BC-FG-JK)$$

$$LOV = LM-DE + .7\ (NO-BC-FG+JK)$$

Using these formulas, the pre and post scores for DOM and LOV are determined. After transformation to standard scores, with the help of a table (Leary,1957, p.495), these are plotted within circles illustrated by Figure 6. Each point, thus plotted, represents the interaction of the two dimensions, DOM and LOV . The line joining the pre and post position of this interaction stands for the movement of TF's presentation of self concept.

The DOM and LOV scores have the advantage of conveying the overall tendency of the circle in terms of predominating interpersonal response potential. The

disadvantage of such a presentation is that individual fluctuations may be obscured. The profile presentation, discussed earlier, illustrates this and deals with this disadvantage.

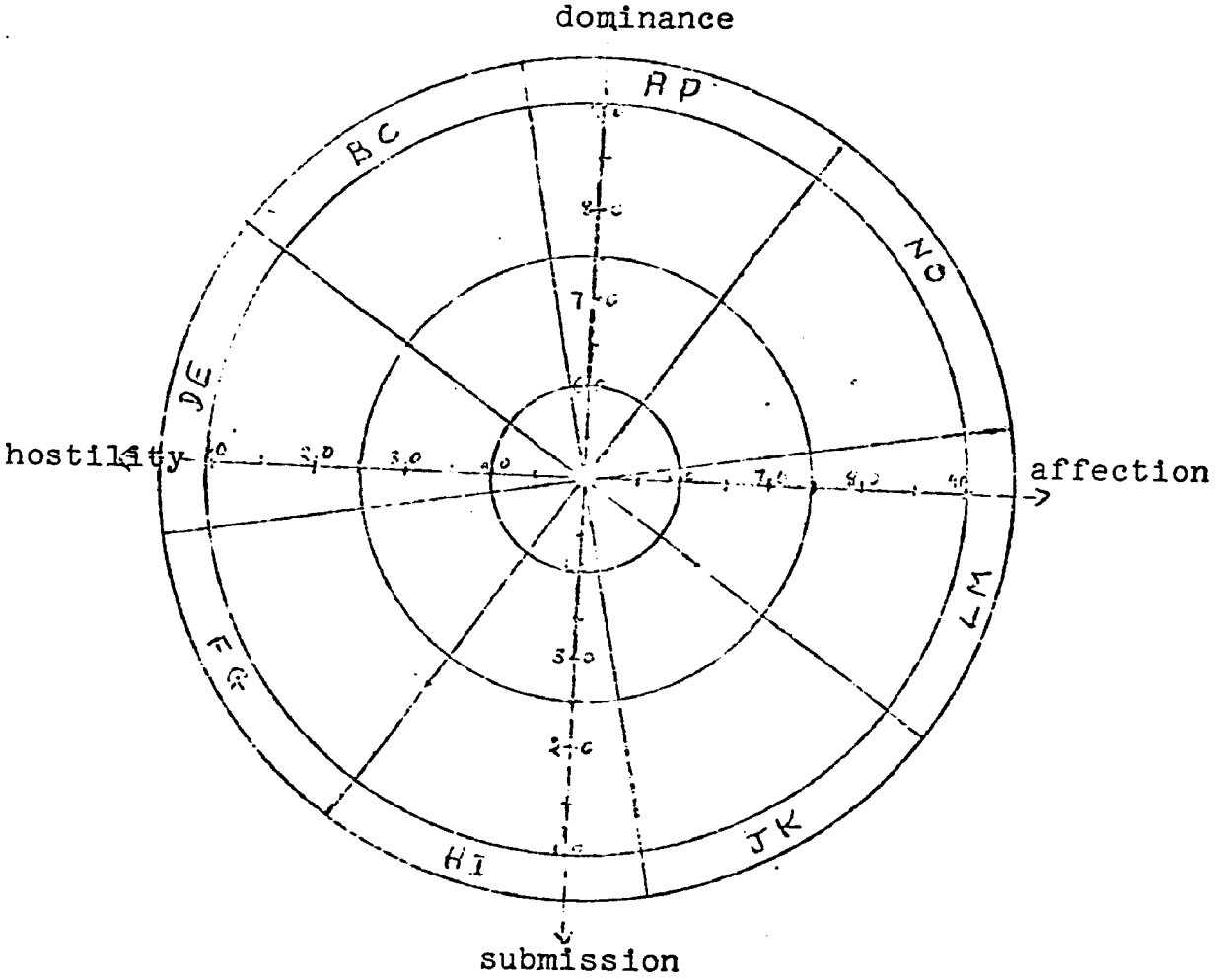


Figure 6: Summary Profile of Change of Self Concept Based on DOM,LOV Vector.
(Key: numbers on Horizontal and Vertical Axes refer to standard scores for LOV and DOM respectively.)

There will be a summary for each TF followed by a statement of the participant teaching fellow at the end of the in-service program expressing the meaning of the program to him. The section will be concluded by a general summary of trends of change in participant teaching fellows as a group.

TF_1

"My major interest is in college-university teaching. I believe participation in the program will aid my teaching, as well as help me deal with problems I am presently facing and might face in the future", was the reason given by TF_1 for participation in the program.

The score for attitude toward teaching as a career changed slightly toward more favorable over the academic

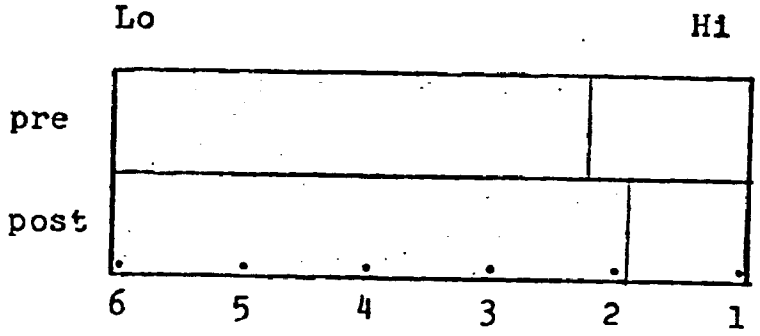


Figure 7: Change in TF_1 of Attitude Toward Teaching as a Career

year. The only item which was responsible for this slight difference was ' there are more advantages than disadvantages to teaching as a career '. (see figure 7).

The scores on the Job Dimensions Blank indicate a

change toward more satisfied (see figure 8). There was a change from 'not sure' to'satisfied' on ten items including " opportunity to be your own boss, feeling of accomplishment, personal satisfaction of job well done,

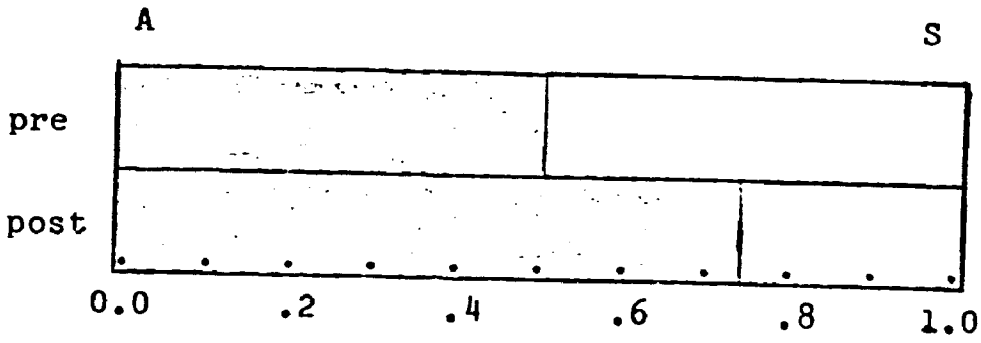


Figure 8 :Change in TF_1 of Satisfaction With Teaching. (Key: S for Satisfied, A for Not Sure.)

freedom to make decisions, recognition from peers and personal autonomy.". The one item which changed from dissatisfied to the category of satisfaction was 'opportunity to help in policy-making'.

The profile of self description on the pretest indicates a high intensity of responses in all octants except one: modest. The differences between pre and post tests, as summarized in Figure 9, show an increase in responsible traits, and a decrease in all other octants with highest decrease in the assertive interpersonal mode.

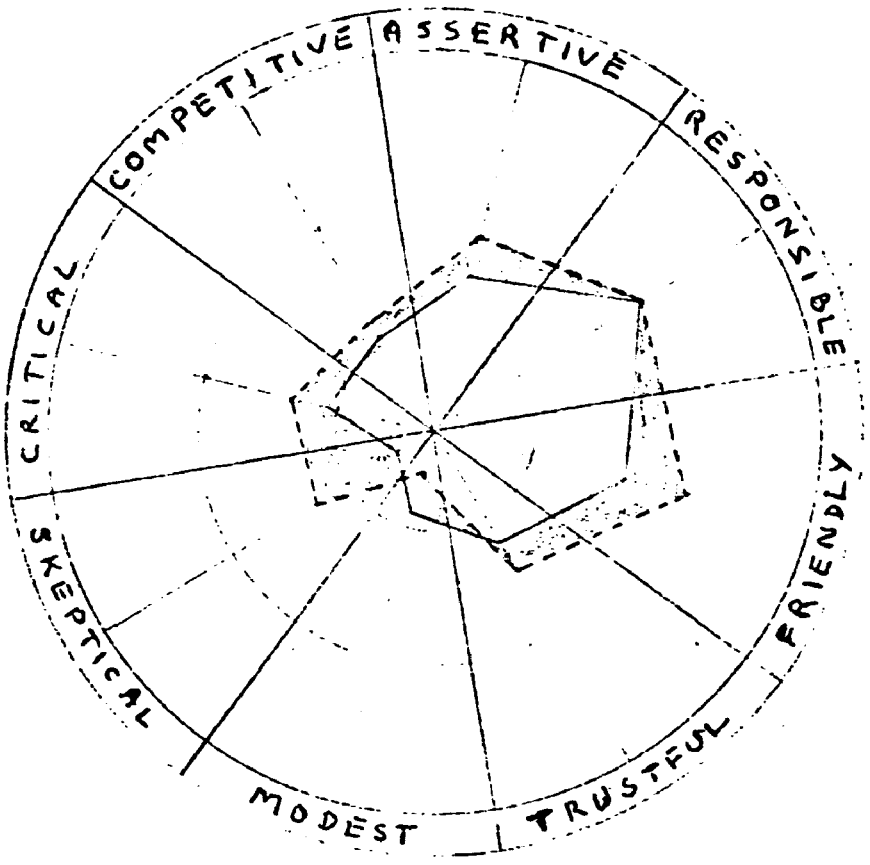


Figure 9 : TF_1 Profile of Self Description

(Key:Dotted Lines Indicate Pre-workshop Profile)

The DOM,LOV vector (refer to Figure 10) indicates that the self concept of TF_1 as responsible has remained consistent. His presentation of self, on both pre and post tests, indicates a high level of intensity of traits ascribed to self such as big-hearted and unselfish, generous to a fault, considerate, gives freely, tries to comfort everyone.

In summary, the changes over the academic year for TF_1 , as assessed by the instruments used in this study, show that his attitude toward teaching as a career remained mostly consistent while there was an increase in satisfaction with teaching. His self concept seems to have remained consistent: predominantly responsible in spite

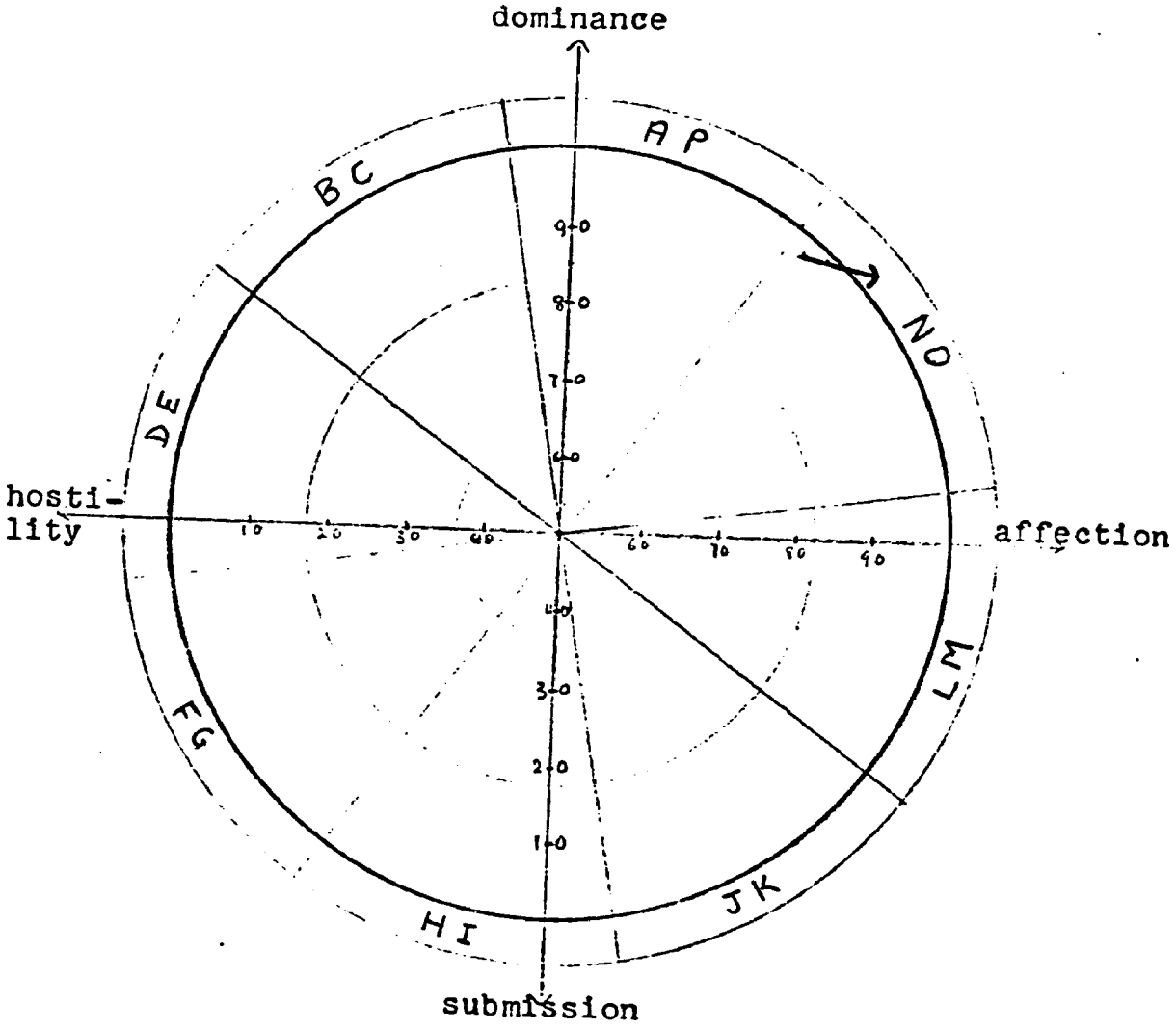


Figure 10: Summary Profile of Change in Self Concept Based on DOM, LOV Vector for TF_1

of fluctuations in various interpersonal traits as presented by his responses.

The meaning of the program to him is expressed in his own words:

> Due to the format of the course I have been teaching this term, the sessions on the non-verbal communication and how to ask question have helped immensely. I've also found my ability to work with my black students has increased, but I am not sure if that's due to the type of student or what.
>
> I've also built my confidence in my work due to an increased opportunity for independence and my increased recognition of my ability both professionally and as a human.
>
> Much of this is in response to the discussions I have had with you. Overall, the sessions helped, and I hope this can be extended to the new teaching fellows. I've also increased in my ability to accept criticism. Thank God.

TF_2

The statement of this teaching fellow concerning his reason for participation in the program was " because the [consultant-trainer] was giving it".

The score for attitude toward teaching as a career changed slightly toward less favorable over the academic year (refer to figure 11). The item that made the difference was 'there are more advantages than disadvantages

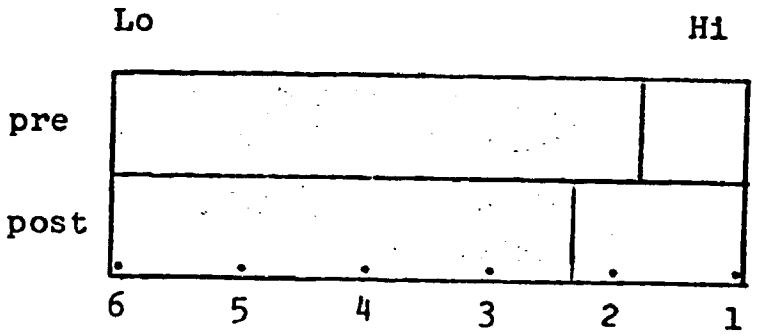


Figure 11: Change in TF_2 of Attitude Toward Teaching as a Career

to teaching as a career'.

The scores on the Job Dimensions Blank indicate a change toward less satisfied (see figure 12). Of the items that were checked as 'satisfied' on the pretest, some

changed to dissatisfied such as time for recreation, pressure on the job, evaluation of work of others. One item changes to not sure: opportunity to be your own boss. Two items changed from not sure to satisfied:

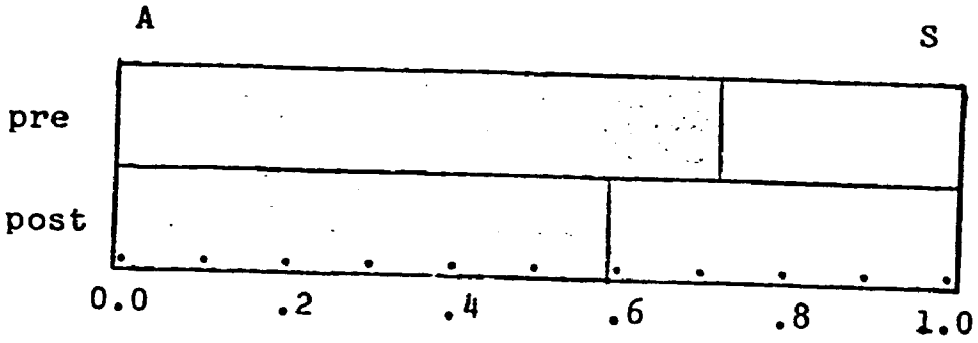


Figure 12: Change in TF_2 of Satisfaction With Teaching. (Key: S for Satisfied, A for Not Sure.)

opportunity to help in policy-making and thanks from those you benefit.

The profile of self description on the pretest indicates a total lack of response in the competitive octant. The highest score was for the modest mode of responses. Posttest responses include some in the competitive category, with greatest number of responses in the assertive octant.

Changes indicate an increase in competitive,

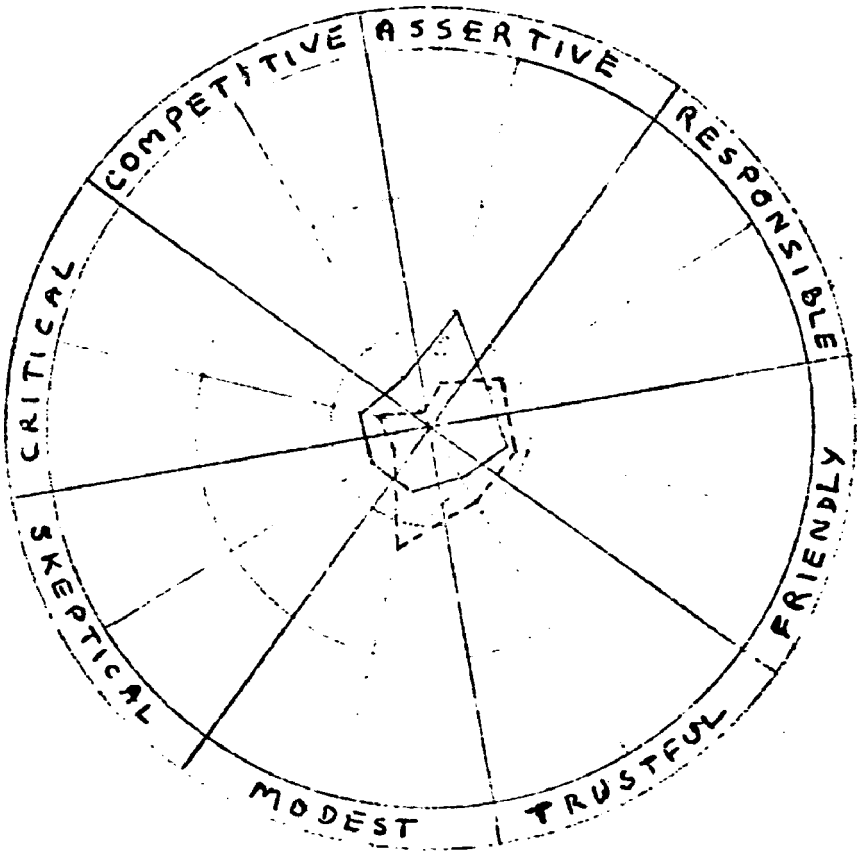


Figure 13: TF_2 Profile of Self Description

critical and skeptical modes of interpersonal response; and a slight decrease of responses in the trustful, friendly and responsible octants (see Figure 13).

The DOM,LOV vector indicates a movement from view of self as trustful to one as assertive with a low intensity of the trait (refer to Figure 14).

Thus, the change in self concept of this teaching fellow indicates an awareness of the potention to be assertive.

In summary, the changes in this TF over a period of eight months, as observed by the results of the

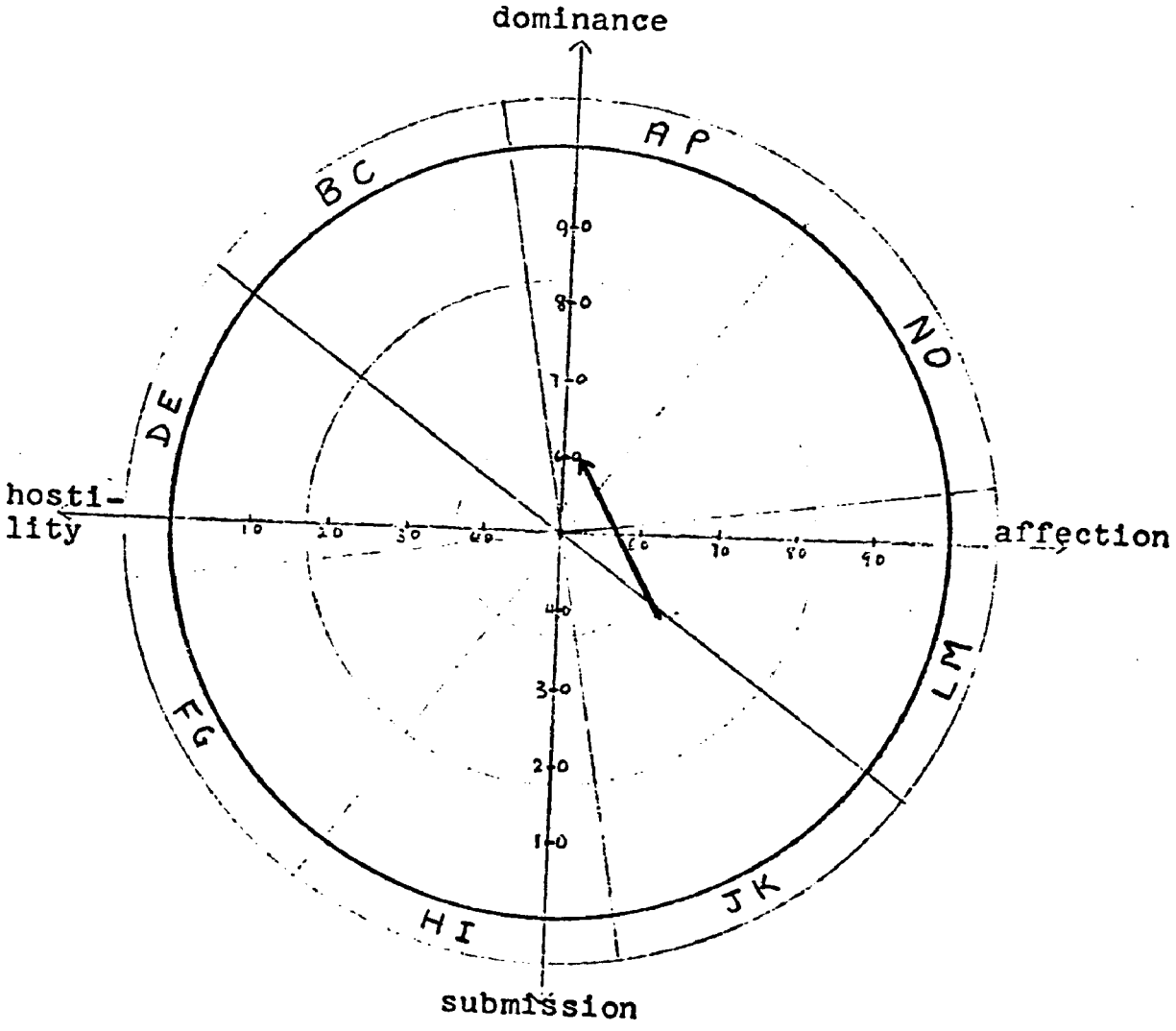


Figure 14: Summary Profile of Change in Self Concept Based on DOM,LOV Vector for TF_2

instruments used, show a less favorable attitude toward teaching and less satisfaction with teaching at the end of the academic year.

The self concept of TF_2 appears to have changed from trustful to assertive with accompanying fluctuations (low) over the range of interpersonal traits. At the end of the program TF_2 stated that the program was useful and

> sessions on interpersonal relationships were very good in terms of working with colleagues and relationships with students. It feels good to know why one is reacting, not just that one is reacting.
>
> Special sessions - the one on blacks, for example - were especially good. The greatest single advantage that I perceived was the setting up of a mechanism for discussion of problems and sharing ideas.

TF_3

"I need some ideas and moral boosting" was the reason given by TF_3 for participating in the program.

The score for attitude toward teaching as a career changed toward less favorable over the academic year (see Figure 15). The items which were checked differently on the posttest were 'I wouldn't care for the work of a teacher', 'teaching may be allright for some people

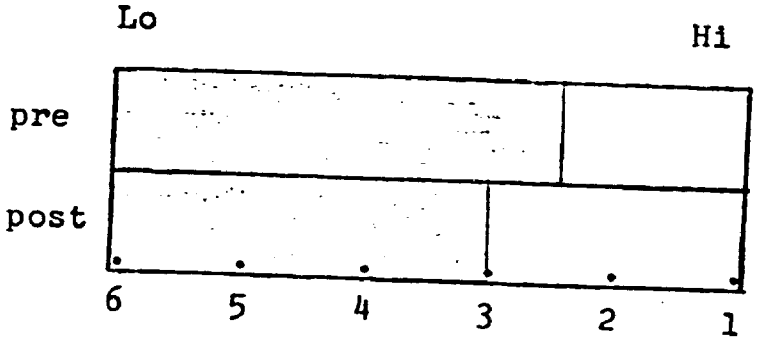


Figure 15:Change in TF_3 of Attitude Toward Teaching as a Career

but not for me', and 'I am not convinced of the importance of a teaching career'.

The scores on the Job Dimensions Blank indicate an increase in satisfaction with teaching. There was a

change from 'not sure' to 'satisfied' on ten items including 'opportunity to use initiative, opportunity to help others find success or happiness,prestige on the job,routine activities of the job'. The items that have changed from dissatisfied to satisfied are

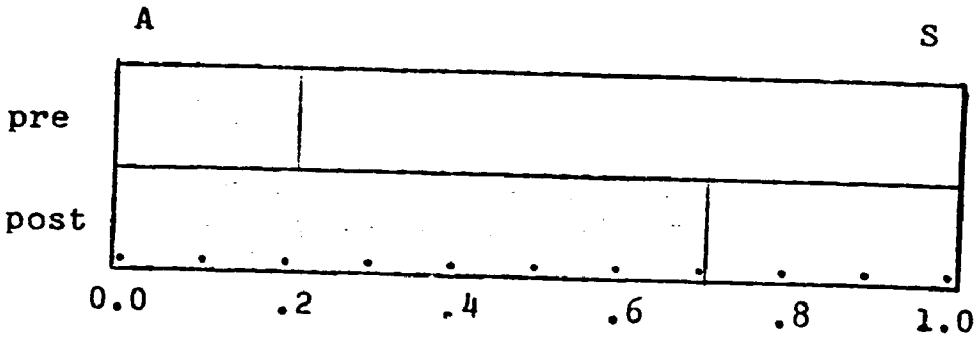


Figure 16:Change in TF_3 of Satisfaction With Teaching.(Key: S for Satisfied, A for Not Sure.)

'demands of students, and time for study in your own field'.

The self concept of this teaching fellow is characterized by competetive and critical responses as well as responsible, friendly and trustful responses on the pretest. This presentation of self combined with the number of items checked'not sure' on the Job Dimensions Blank may be viewed as indicative of ambivalences within TF_3 expressed during the consultations.

The self concept profile (refer to figure 17) shows

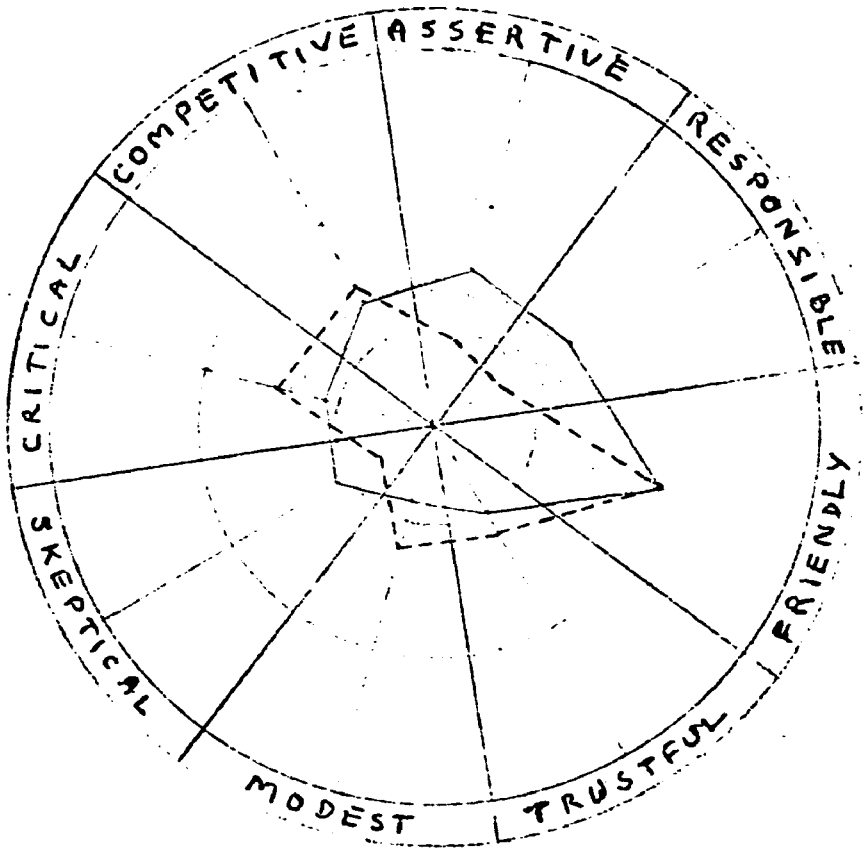


Figure 17: TF_3 Profile of Self Description

an increase in responses reported for the assertive, responsible and critical octants, and a decrease in skeptical, trustful, and modest interpersonal traits. There is no change for the friendly mode of behavior.

The DOM,LOV vector (as seen in Figure 18) indicates a movement from a low intensity of the critical mode to a moderate intensity of the responsible interpersonal mode. Thus, this teaching fellow perceives himself as having the potential to be helpful to others, and encouraging

of others.

In summary , the scores of this teaching fellow show a less favorable attitude toward teaching as a career and more satisfaction with teaching at present. According to data from consultations,this teaching

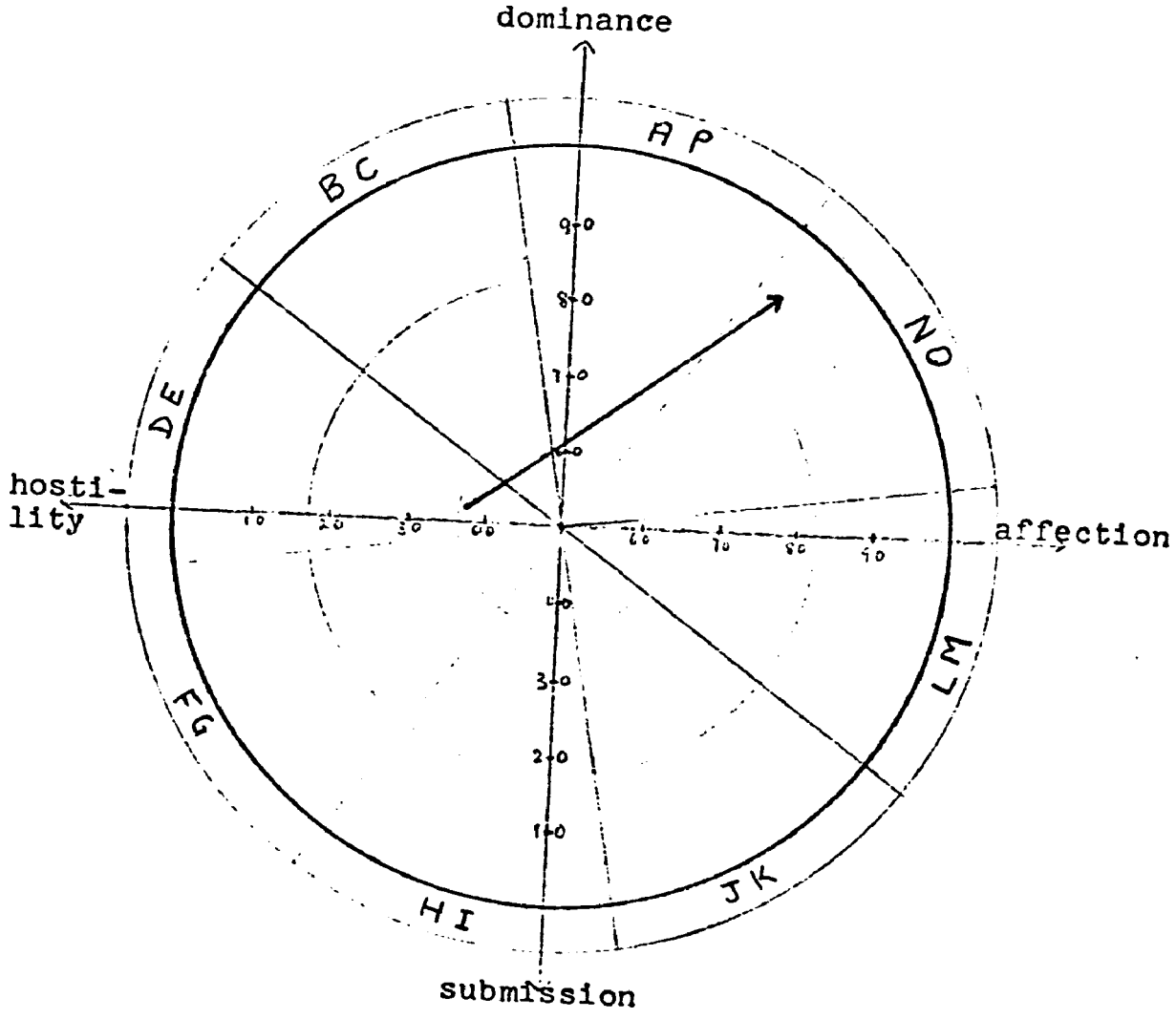


Figure 18: Summary Profile of Change in Self Concept Based on DOM,LOV Vector for TF_3

fellow perceives science teaching as interfering in the relationship with significant-others in his life. His self concept seems to have changed from critical to responsible mode of interpersonal behavior, with fluctuations in all other modes except friendly.

The meaning of the program to TF_3 is conveyed by his statement:

> I feel the difference in my feelings toward teaching. Last semester I taught a different course with different pressures.
>
> I have become much more aware of the safety conditions around the lab, which may affect the welfare of my students and myself. I even felt that sometimes those hindered the learning situation.
>
> The program helped me to satisfy my need to achieve in what I do. I wanted to do a good job of teaching and feel that I want to go to class and the students want to come to class.

TF_4

"I enjoy teaching. Anything I can do to improve my teaching is of value to me; also I am unsure of myself in the recitation periods. There seems to be a conflict in my section which I do not know how to handle" was TF_4's reason for participation in the program.

The score for attitude toward teaching as a career changed slightly toward more favorable over the academic

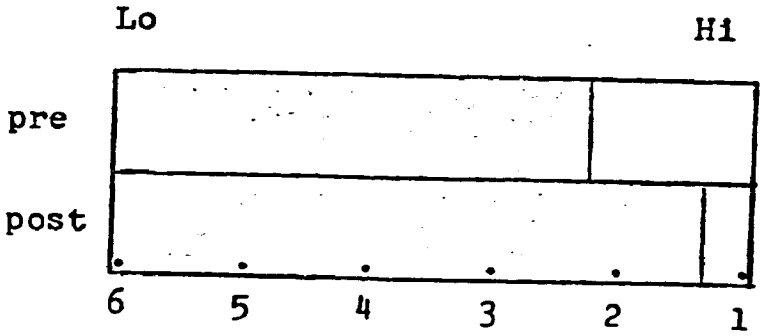


Figure 19:Change in TF_4 of Attitude Toward Teaching as a Career

year (see Figure 19). The items checked differently on the posttest includes'teaching is as good a job as any'.

The scores on the Job Dimensions Blank indicate a a change toward less satisfaction with teaching(see figure 20).

There was a change from 'not sure' to 'satisfied' on three items: prestige in the profession, experience, and chance to follow job through to its conclusion. Satisfaction changed to dissatisfaction for the items; earnings,

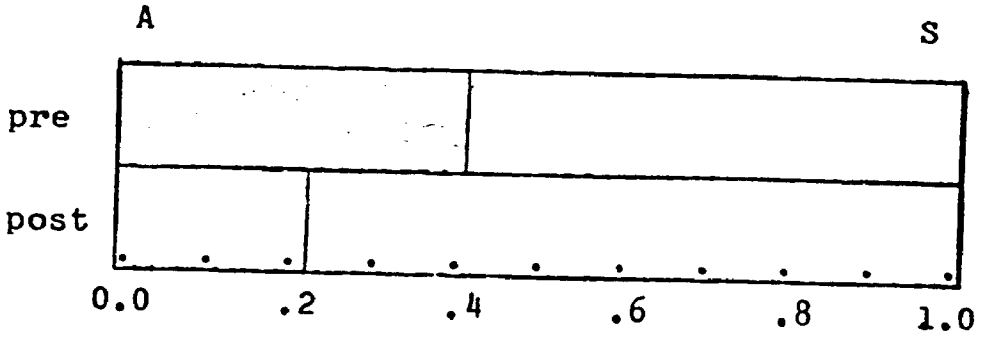


Figure 20: Change in TF_4 of Satisfaction With Teaching. (Key: S for Satisfied, A for Not Sure.)

committee work required, non-professional aspects of the job, written reports necessary. One item that was checked as not applicable had been checked as dissatisfied on the posttest: full credit for work done.

The self concept as revealed by the responses of TF_4 show a low intensity of overall responses with higher scores in the assertive and responsible octants (refer to figure 21). Posttest presentation of self indicates changes in all octants with greatest change for the friendly interpersonal mode.

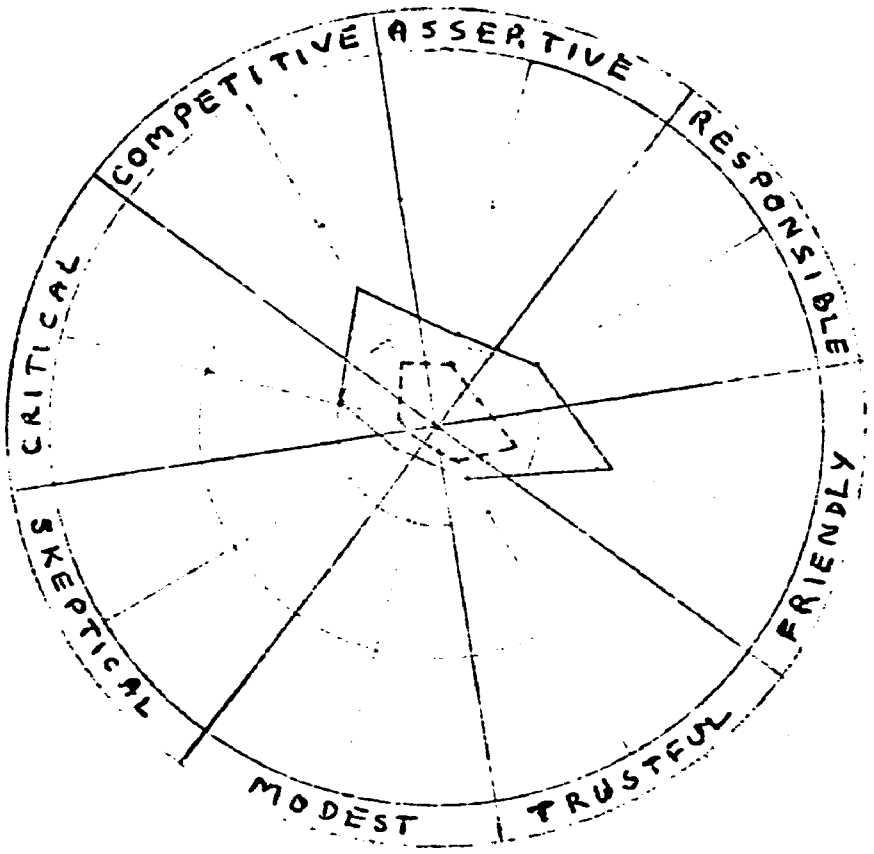


Figure 21: TF_4 Profile of Self Description

The DOM,LOV vector represents change in self concept from low assertive to moderate responsible. This indicates that TF_4 views himself as having the potential to encourage others and be helpful (refer to Figure 22).

In summary, the changes over the academic year for TF_4 are characterized by more favorable attitude toward teaching as a career and less satisfaction with his

teaching job.

The self concept of TF_4 has changed from assertive to responsible according to the summary profile. There has bee changes in all other areas of interpersonal responses.

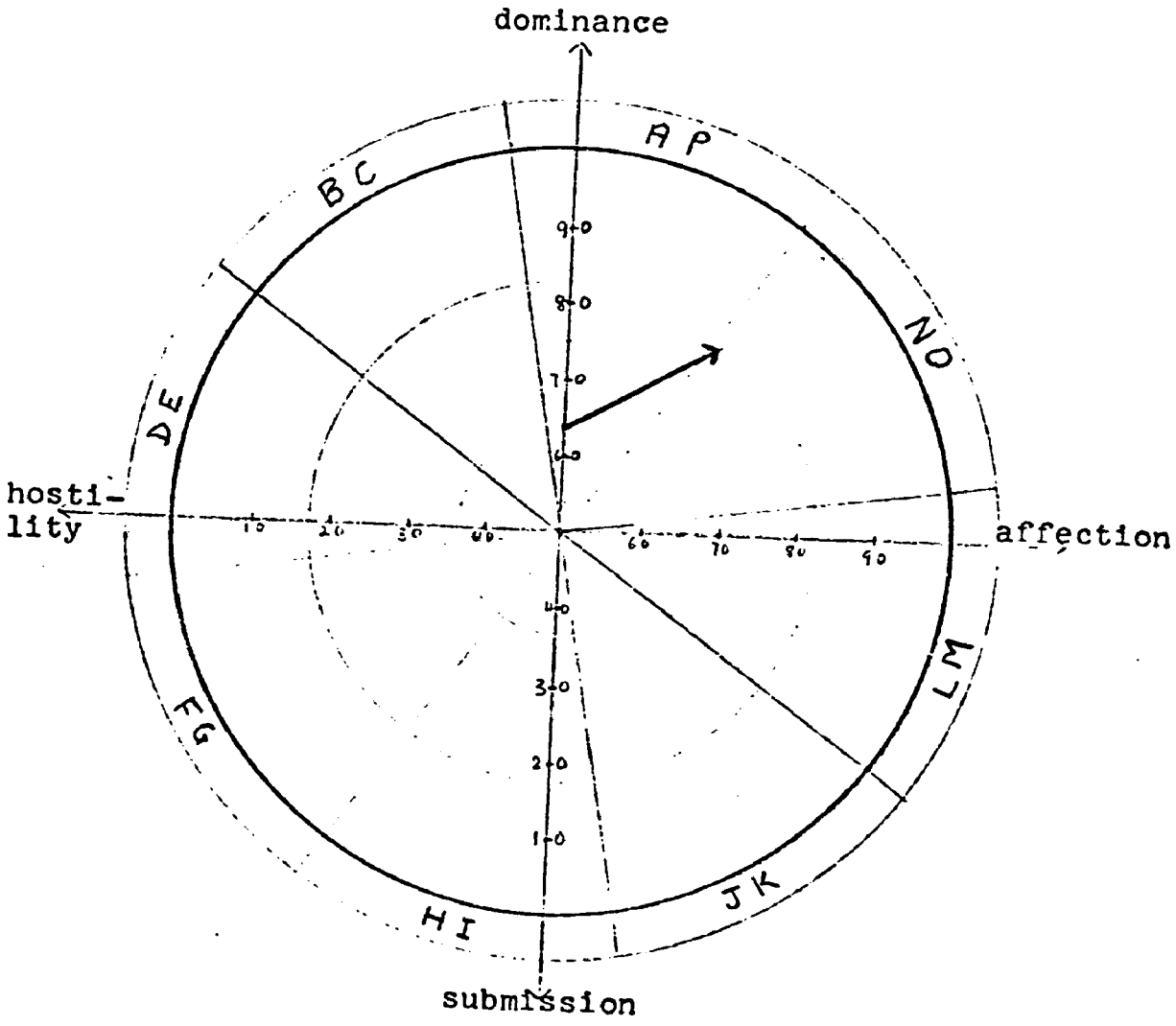


Figure 22: Summary Profile of Change in Self Concept Based on DOM,LOV Vector for TF_4

The reactions of TF_4 to the program and its meaning to him is expressed in his own words:

> I feel that the program helped me a great deal. Now, I have a better understanding of how the classroom situation operates and a better understanding of my students. In terms of my personal development as a teacher, the program was very valuable, but could of course have been better.
>
> The most significant problem is the small participation since we did, in part, learn from each other.
>
> A second session on the subject of race relations within the context of the classroom experience would have been useful. I, personally, have not completely resolved my conflicts in this regard.

TF_5

Participation in the program was "basically an attempt to improve [his] teaching techniques" for this teaching fellow.

The score for attitude toward teaching as a career changed slightly toward more favorable over the academic year.(see figure 23). The two items

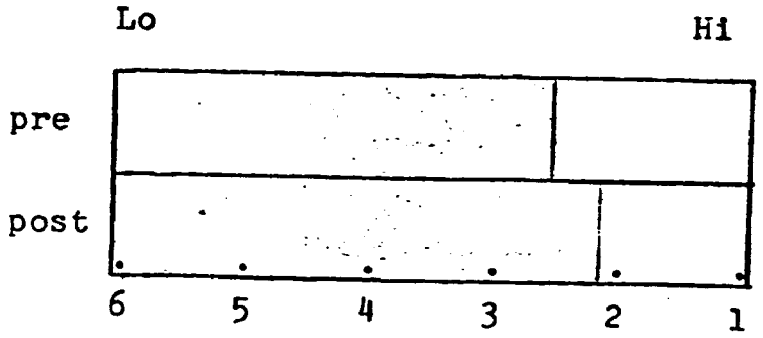


Figure 23:Change in TF_5 of Attitude Toward Teaching as a Career

responsible for this difference were ' teaching is as good a job as any' and ' there are more advantages than disadvantages to teaching as a career'.

The scores on the Job Dimensions Blank indicate

change toward more satisfied (see figure 24). There were ten items that changed from unsure to satisfied including " feelings of achievement , intellectual challenge, demand of students and professors,

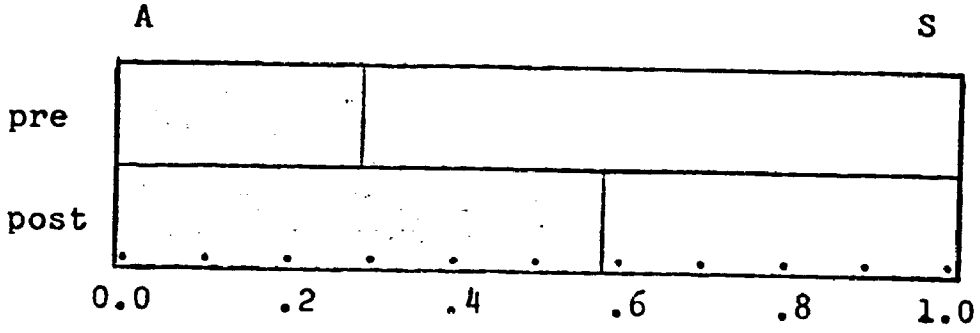


Figure 24:Change in TF_5 of Satisfaction With Teaching.(Key: S for Satisfied, A for Not Sure.)

opportunity to be your own boss." The items that show the reverse change include " pressure on the job, prospect of future earnings, change to evaluate own work, and competent co-workers".

According to his profile of self description,TF_5 seems to have viewed self as characterized by responses more in the responsible mode than any other (refer to figure 25). The change over the academic year seems to be related to the modest and the trustful octants with greatest decrease in both the responsible and critical areas.

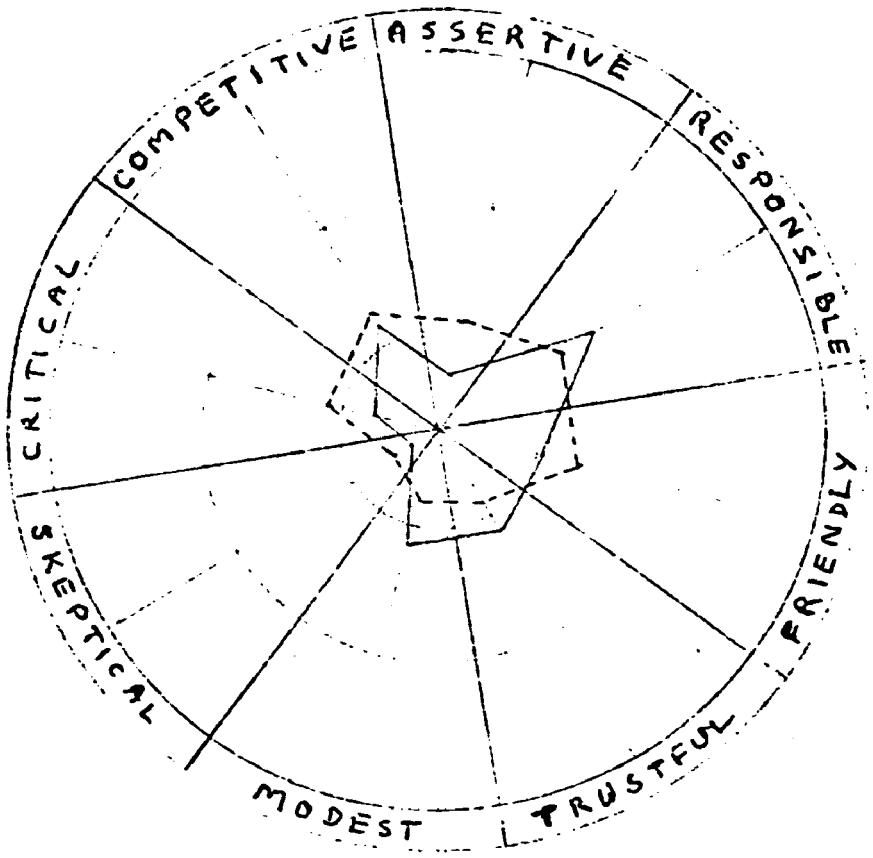


Figure 25 : TF_5 Profile of Self Description

The DOM,LOV vector (refer to figure 26) indicates movement in his view of his self as having potential for traits associated with responsible mode of interpersonal behavior. This means that TF_5 views self as capable of encouraging others, being helpful and considerate, kind and reassuring.

In summary, it appears that the attitude toward teaching as a career of TF_5 has moved slightly toward more favorable; also satisfaction with teaching has increased. His self concept has changed from assertive to responsible with greatest increase of responses

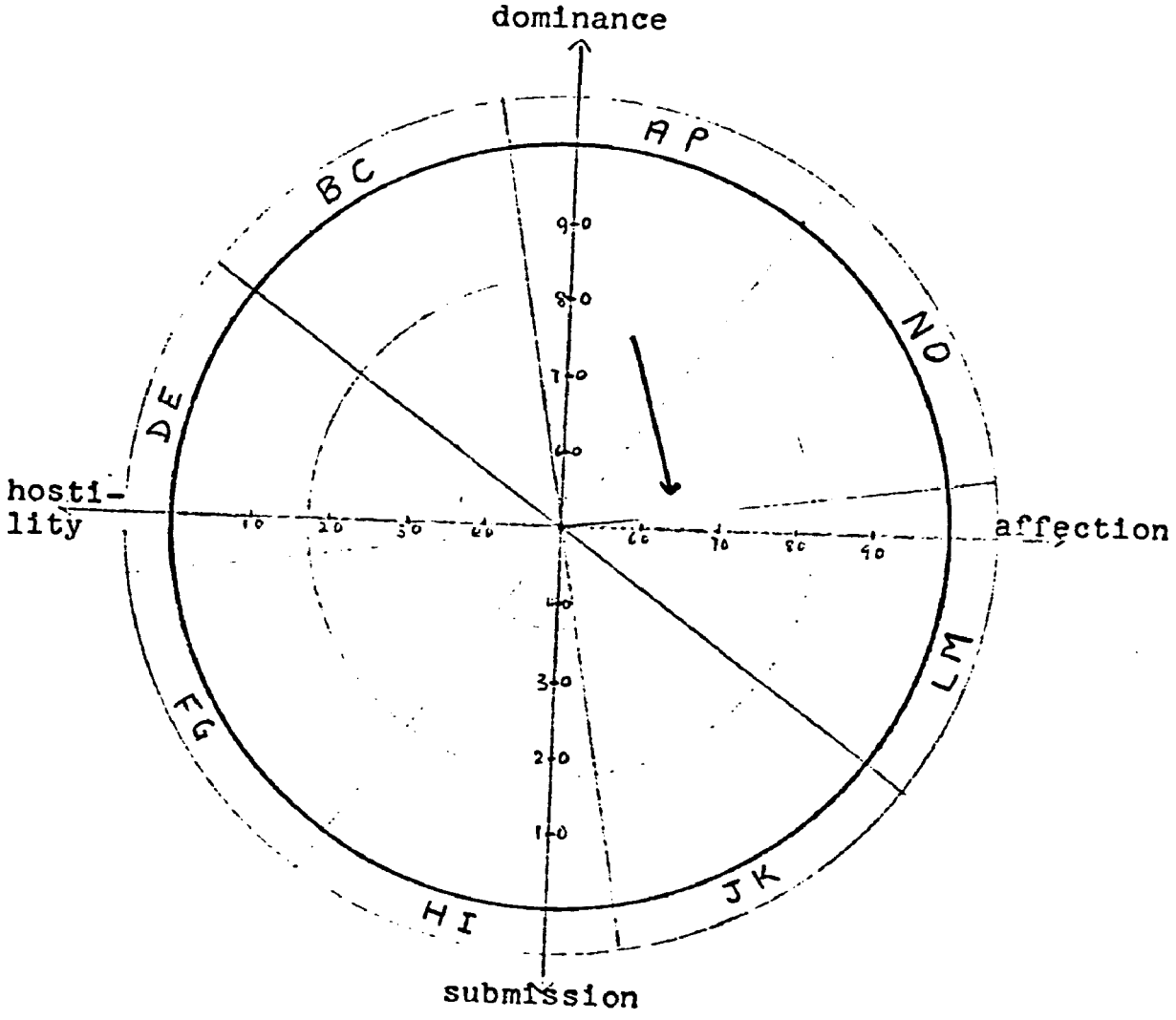


Figure 26: Summary Profile of Change in Self Concept Based on DOM,LOV Vector for TF_5

in the modest octant.

The meaning of his participation in the program for TF_5 is expressed by him:

> The entire idea of this program is a good one. It satisfied the need for some sort of satisfaction amongst ourselves concerning our teaching assignments, experiences and problems. In this was we would feel prepared for situations which may arise in the future.
>
> This program should be continued in the future with perhaps required attendance for at least one term or year. This tipe of coercion is bad, but perhaps improvement of teaching justifies the means, perhaps.

TF_6

"I wish to find out more about teaching in general, and about particular techniques that could make me a better teacher. Also, I wish to learn ways that can help me reach the students better", was the reason given by TF_6 for participation in the program.

The score for attitude toward teaching as a career changed slightly toward less favorable over

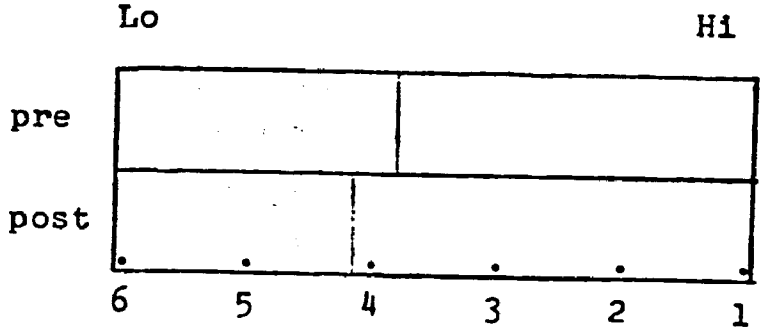


Figure 27:Change in TF_6 of Attitude Toward Teaching as a Career

the academic year (see figure 27). The items related to this change were " teaching may be allright for some people but not for me, there are more advantages than disadvantages to teaching as a career".

The scores on the Job Dimensions Blank indicate a change toward more favorable (see figure 28). There was a change from 'not sure' to 'satisfied' on the following items: opportunity to help in policy-making,

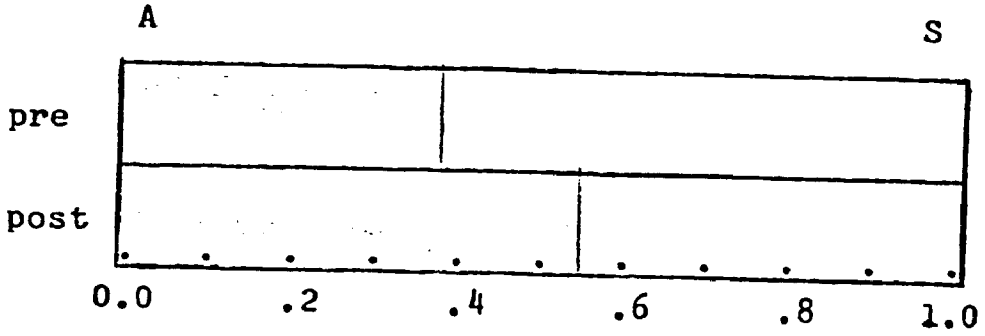


Figure 28: Change in TF_6 of Satisfaction With Teaching. (Key: S for Satisfied, A for Not Sure.)

demands of students. While items showing the reverse change were 'opportunity to use aptitudes and skills, change to evaluate own work'. The items that shifted from 'dissatisfied' to 'satisfied' were ' experience, and time for study in own field'.

The self concept of TF_6 seems to have changed as revealed by his responses. The pretest shows highest scores in the skeptical , modest and trustful octants with lowest scores in the assertive area (refer to figure 29). The changes that appear are an increase

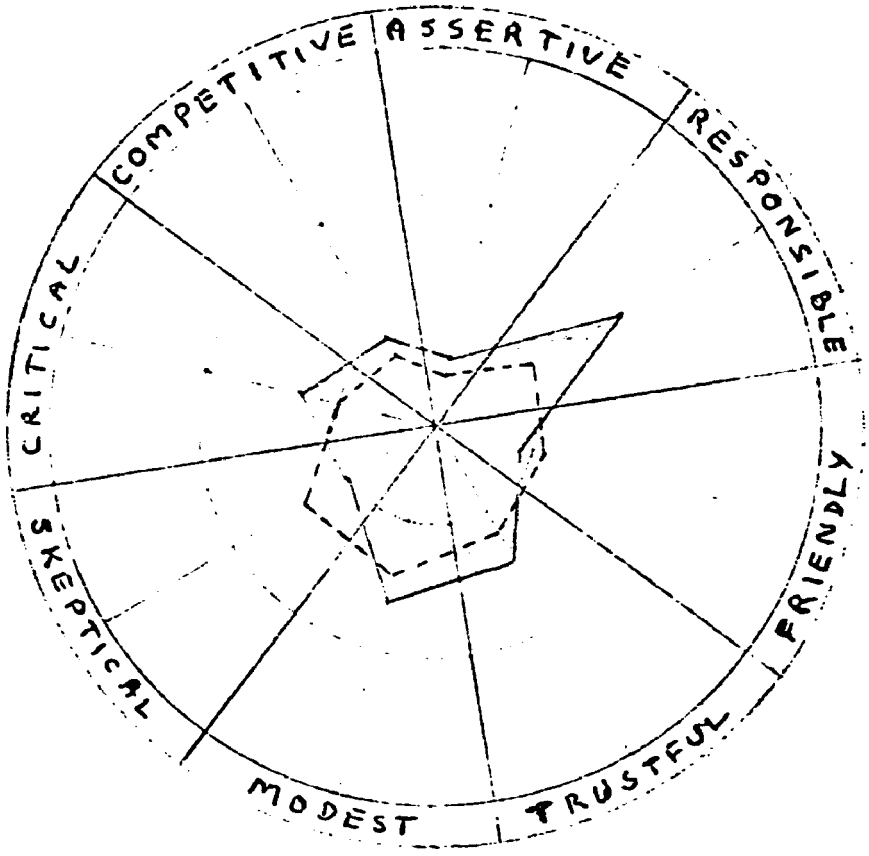


Figure 29: TF_6 Profile of Self Description

in the responsible octant and decrease in the trustful and skeptical areas.

The DOM,LOV vector present movement from the modest to the friendly octant, indicating that the perception of TF_6 of his own potential for interpersonal behavior includes the traits of co-operation, warmth and understanding (refer to figure 30).

In summary, the changes for TF_6 indicate a less favorable attitude toward teaching as a career and more satisfaction with teaching. The self concept has changes from modes to friendly with greatest flucutation in the responsible octant.

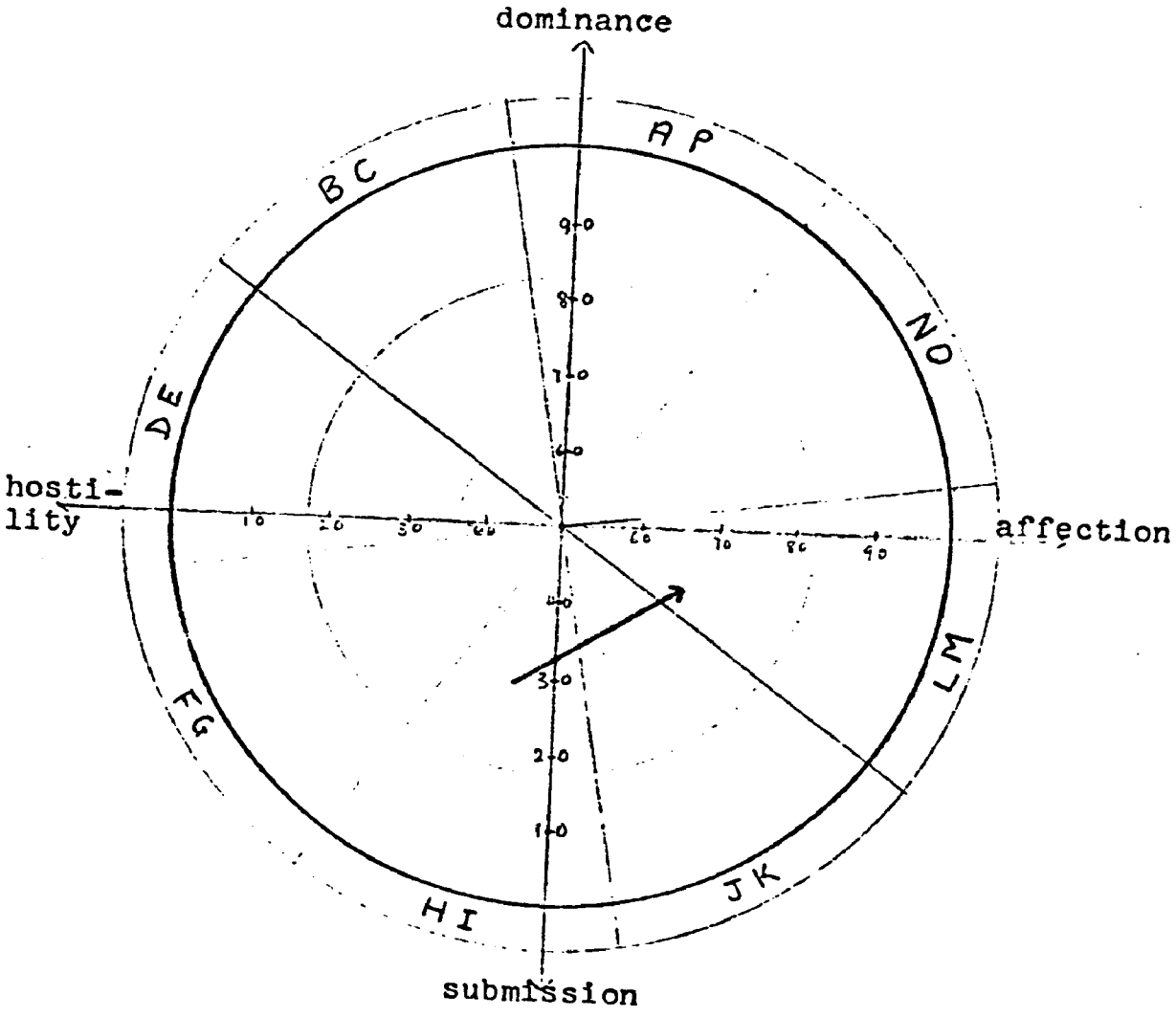


Figure 30: Summary Profile of Change in Self Concept Based on DOM,LOV Vector for TF_6

At the end of the program TF_6 gave his reactions:

> The program helped bring up and answer many questions which would otherwise gone by. In particular, I enjoued the way the sessions were conducted. They were all varied enough so that the subjects were interesting.
>
> Each means of presentation seemed to work well with the subject and helped trigger good discussions.
>
> Perhaps some more suggestions as to how to present problems which are specifically science oriented would be helpful.
>
> I would suggest that the program be kept on a coluntary basis; also keep the spontaneity and freedom that existed.

TF_7

"I think I need a lot of advice, so I can be a good teacher". was the statement of TF_7 regarding his participation in the program.

The score for attitude toward teaching as a career changed slightly toward more favorable (see figure 31). The items which were responsible for

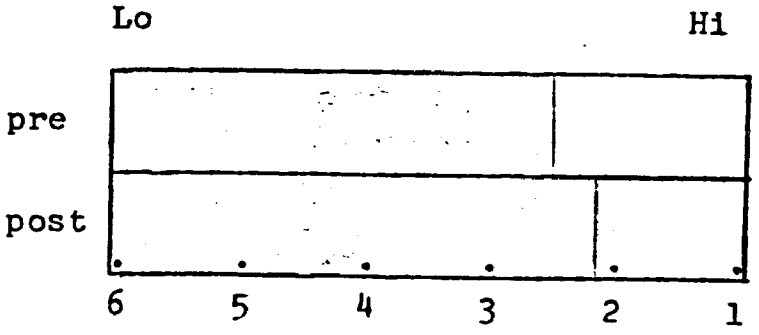


Figure 31:Change in TF_7 of Attitude Toward Teaching as a Career

this change include ' teaching is as good a job as any, there are more advantages than disadvantages to teaching as a career, I would be willing to take any job related to teaching'.

The scores on the Job Dimensions Blank indicate a change toward more satisfied. The items that changed from 'not sure' to 'satisfied' were ' chance to follow

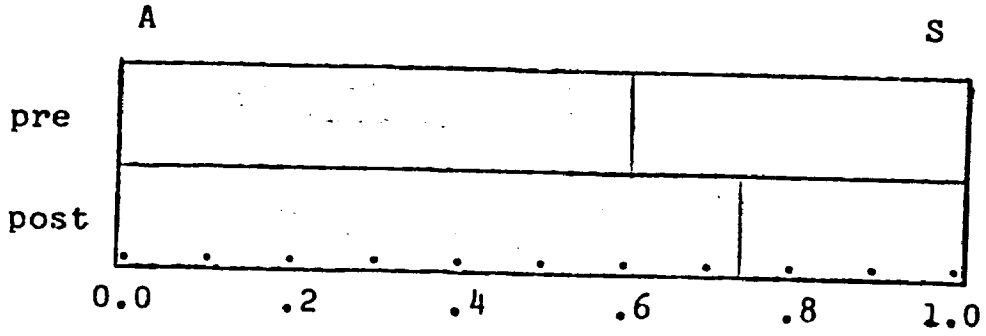


Figure 32: Change in TF_7 of Satisfaction With Teaching. (Key: S for Satisfied, A for Not Sure.)

job through to its conclusion, chance to evaluate own work'. The items that show the reverse change were ' routine activities of the job, intellectual challenge, thanks from those you benefit'. The item 'opportunity to advance professionally' changed from not applicable' to 'satisfied'.

The profile of self description on the pretest indicates the predominance of modest and trustful response modes and a low intensity of assertive and responsible responses (see figure 33)

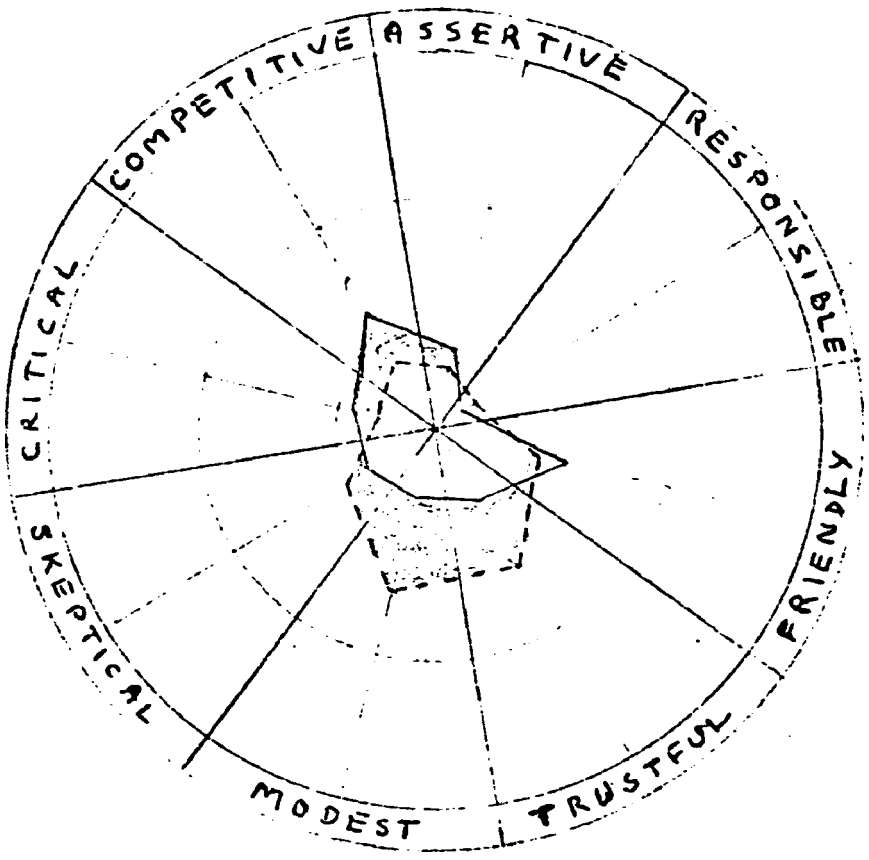


Figure 33: TF_7 Profile of Self Description

The changes that appear in the result of the posttest are decrease in responses in the modest and trustful interpersonal traits, and increase in all other modes of response with greatest change in the competetive octant.

The DOM,LOV vector indicates that the self

concept of TF_7 has changed from being predominantly trustful to having the potential for a low intensity of competetive response traits. Thus, it appears that he views himself as able to be independent, self-reliant, self-confident and assertive (refer to figure 34).

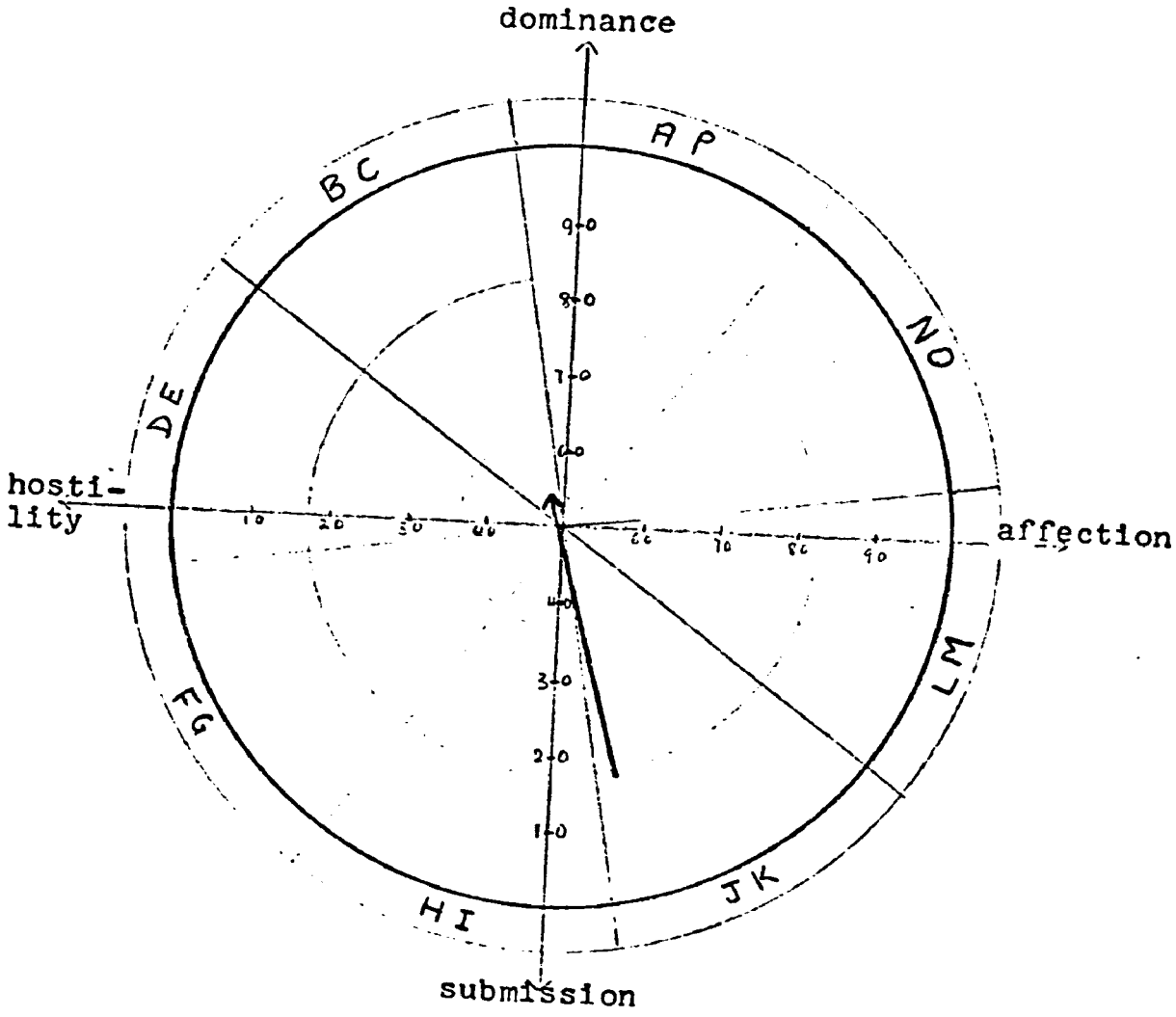


Figure 34: Summary Profile of Change in Self Concept Based on DOM,LOV Vector for TF_7

In summary, it appears that this teaching fellow had a more positive attitude toward teaching as a career and derived more satisfaction from teaching at the end of the year than he did at the beginning. The self description profile indicates an increase in competetive and decrease in modest and trustful responses. The self concept has changed from trustful to competetive.

The meaning of the experience as participant in the program for TF_7 is expressed by him:

> I have better rapport with the students.Also, I have made some progress in becoming a better listener.
>
> I am making an effort to avoid falling into the trap of <u>not</u> answering questions by students, and saying what's of interest to me. It is difficult, yet it is important to me,

TF_8

"I am interested in finding out what type of teacher I am and how I project myself to others", was the reason given by TF_8 for participation in the program.

The score for attitude toward teaching as a career changed slightly toward less favorable (see

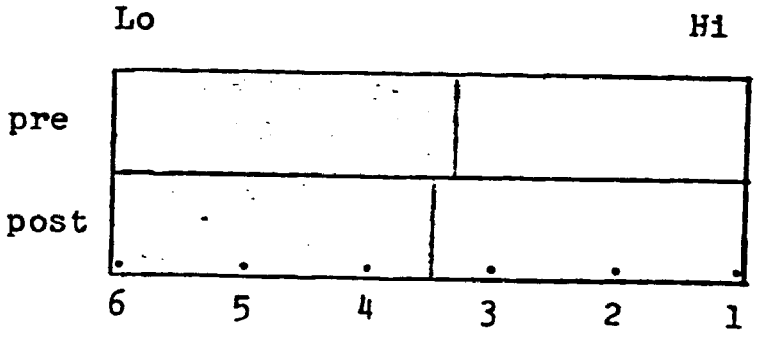


Figure 35:Change in TF_8 of Attitude Toward Teaching as a Career

figure 35). The items related to this change were ' teaching is about the best job that I can think of, teaching may be allright for some people but not for me, and there are more advantages than disadvantages to teaching as a career'.

The scores on the Job Dimensions Blank indicate change toward more satisfied (see figure 36). There was change from 'not sure' to 'satisfied' on two items: full credit for work done, and recognition

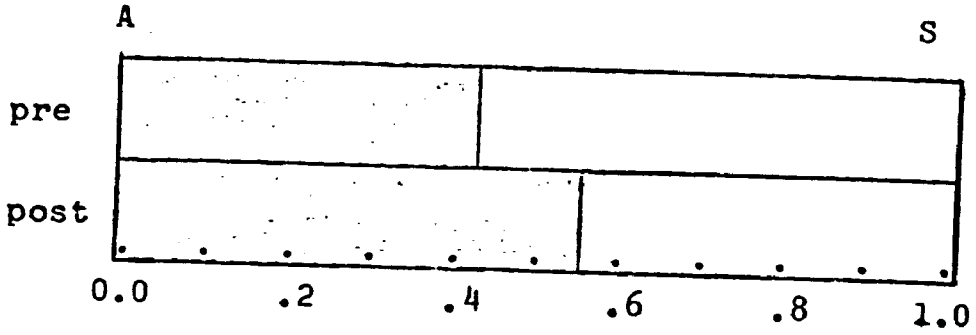


Figure 36: Change in TF_8 of Satisfaction With Teaching. (Key: S for Satisfied, A for Not Sure.)

from supervisors. While the items that changed from 'dissatisfied' to 'satisfied' were ' demands of professors, chance to evaluate own work, evaluation of work of others, opportunity to use initiative, freedom to make decisions'.

The profile of self description on the pretest indicates a moderate intensity of responses in the assertive, competetive, responsible and friendly octants, with a low level intensity of responses in the skeptical mode. Posttest results reveal changes

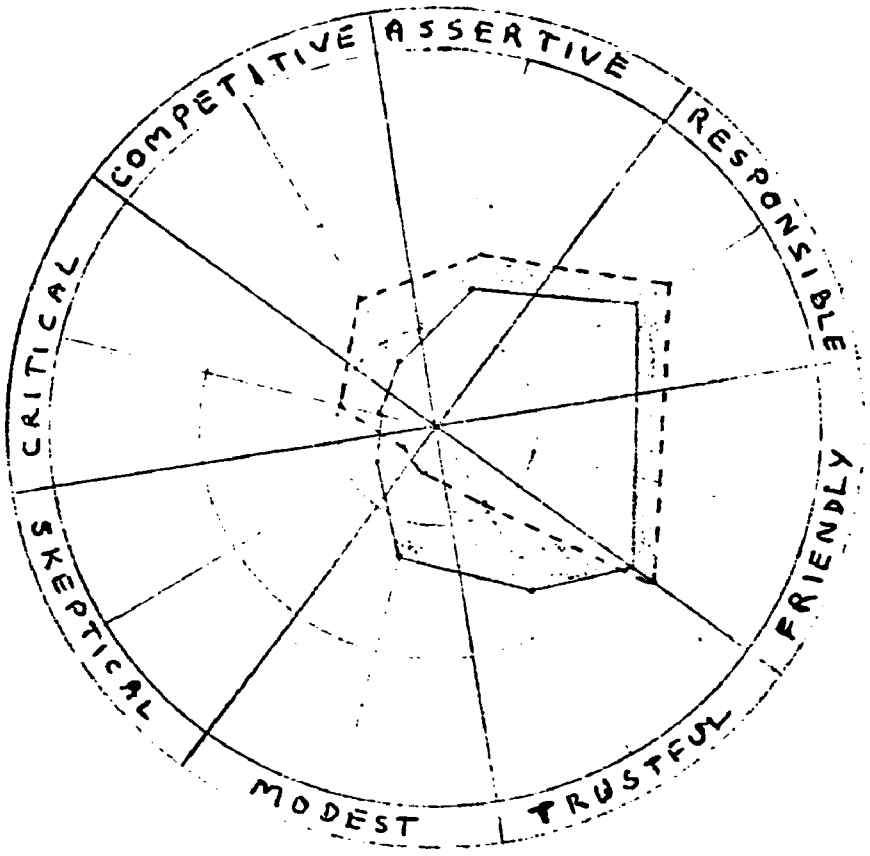


Figure 37: TF_8 Profile of Self Description

of increase in modest, skeptical and critical mode of responses; and a decrease in all other areas with greatest decrease in the competetive mode (see figure 37).

The DOM,LOV vector indicates that the self concept of TF_8 is characterized by the predominant use of the responsible mode of interpersonal traits. The movement

of the vector within the same octant is indicative of his perceived potential of a more appropriate use of that mode of interpersonal response (refer to figure 38).

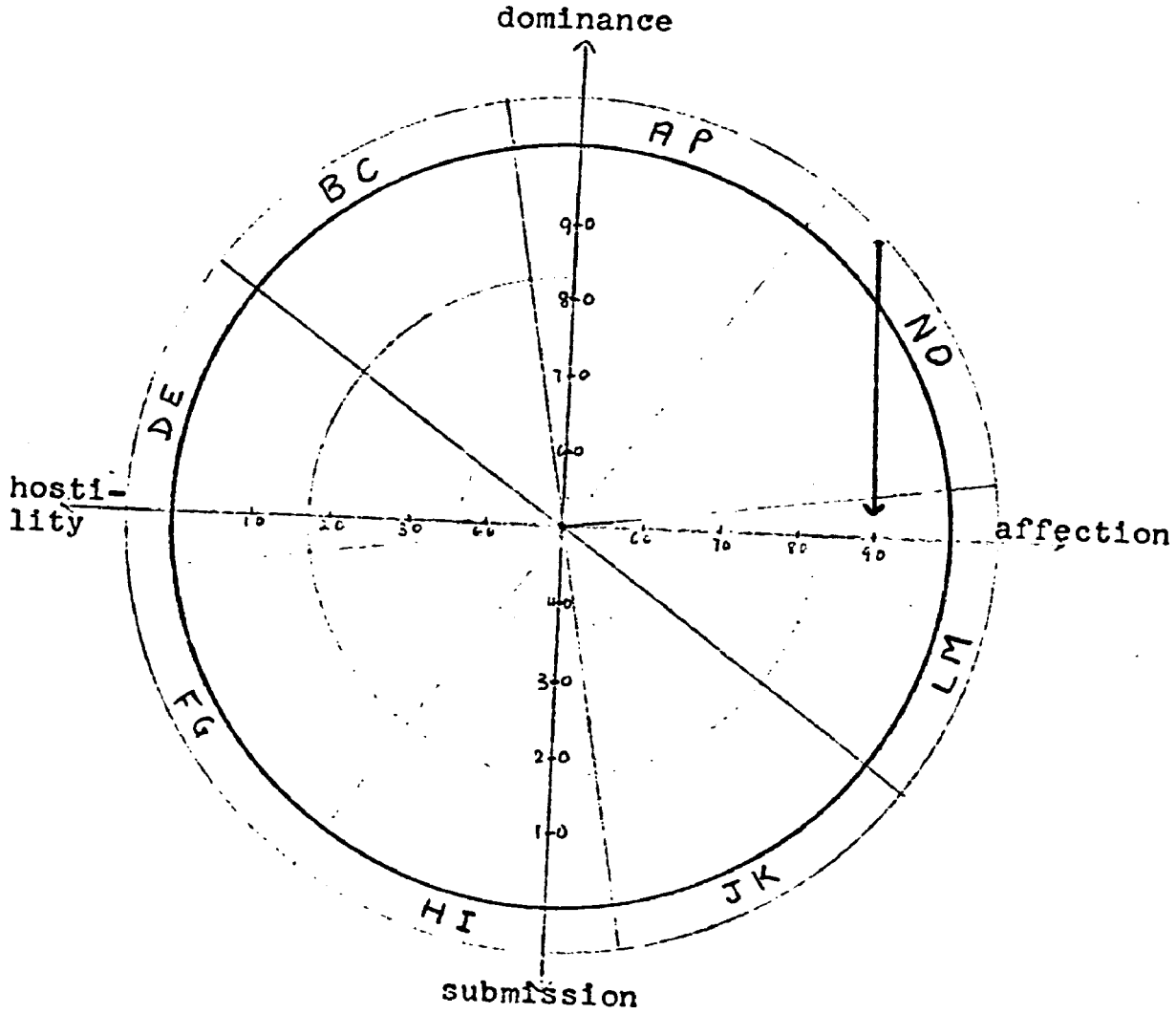


Figure 38: Summary Profile of Change in Self Concept Based on DOM,LOV Vector for TF 8

In summary, TF_8 appears to have a less favorable attitude toward teaching as a career and to feel more satisfied with teaching at the end of the academic year. His self concept seems to have changed indicating that he views himself as having potential to make more appropriate use of responsible interpersonal responses.

At the end of the program TF_8 expressed his reactions :

> I appreciate your help and I believe that the experience has changed my teaching ways to a large extent. I would like to learn much more, so I hope you continue your program.
>
> I am more aware now of the classroom atmosphere and the effect of my attitudes to my relationship with students.
>
> I learned that a teacher has to make decisions whether an individual student asking an unrelated question comes first or the class as a whole must be considered first.

Trends of change in program participants

While there were variations in the nature and extent of change for each participant teaching fellow on attitude toward teaching, job satisfaction and interpersonal style, the following common trends of change appear to have occurred:

a) change on overall attitude toward teaching seems to be related to change in the one item regarding advantages and disadvantages in teaching. The decrease or increase in the total score was affected by the score on this particular item in the case of each teaching fellow.

On the basis of data from consultations, change in attitude seems to be related to the practical question of availability of opportunities in the career, and to issues of a personal nature such as need to achieve, personal autonomy and relationship with significant-others in one's life. The combination of factors and the nature of their influence was different for each teaching fellow.

b) change on job satisfaction appears to be related predominantly to the response category 'not sure'. Assuming this category to signify ambivalences of respondents toward the job as a here-and-now phenomenon, the change on job satisfaction of the participant group appears to be related to the resolution of ambivalences for some and change of areas of ambivalences for others.

c) change on interpersonal style seems to follow the trend of perceiving self as having more potential of a response mode characterized by traits such as encouraging others, being helpful and considerate (refer to Appendix G, p.209 and see octant NO).

The DOM,LOV vector for the group mean indicates that the participant group is characterized by a low intensity of responsible (octant NO) interpersonal style on the pretest, and has changed in perception of having potential for the moderate use of the same interpersonal style (refer to figure 39).

It is interesting to note that the group mean

for DOM and LOV for the non-participant group indicates the use of a low intensity of the critical (octant DE) interpersonal style (refer to figure 39). Thus, it appears that the participants were a self-selected group who were already inclined toward the responsible interpersonal style.

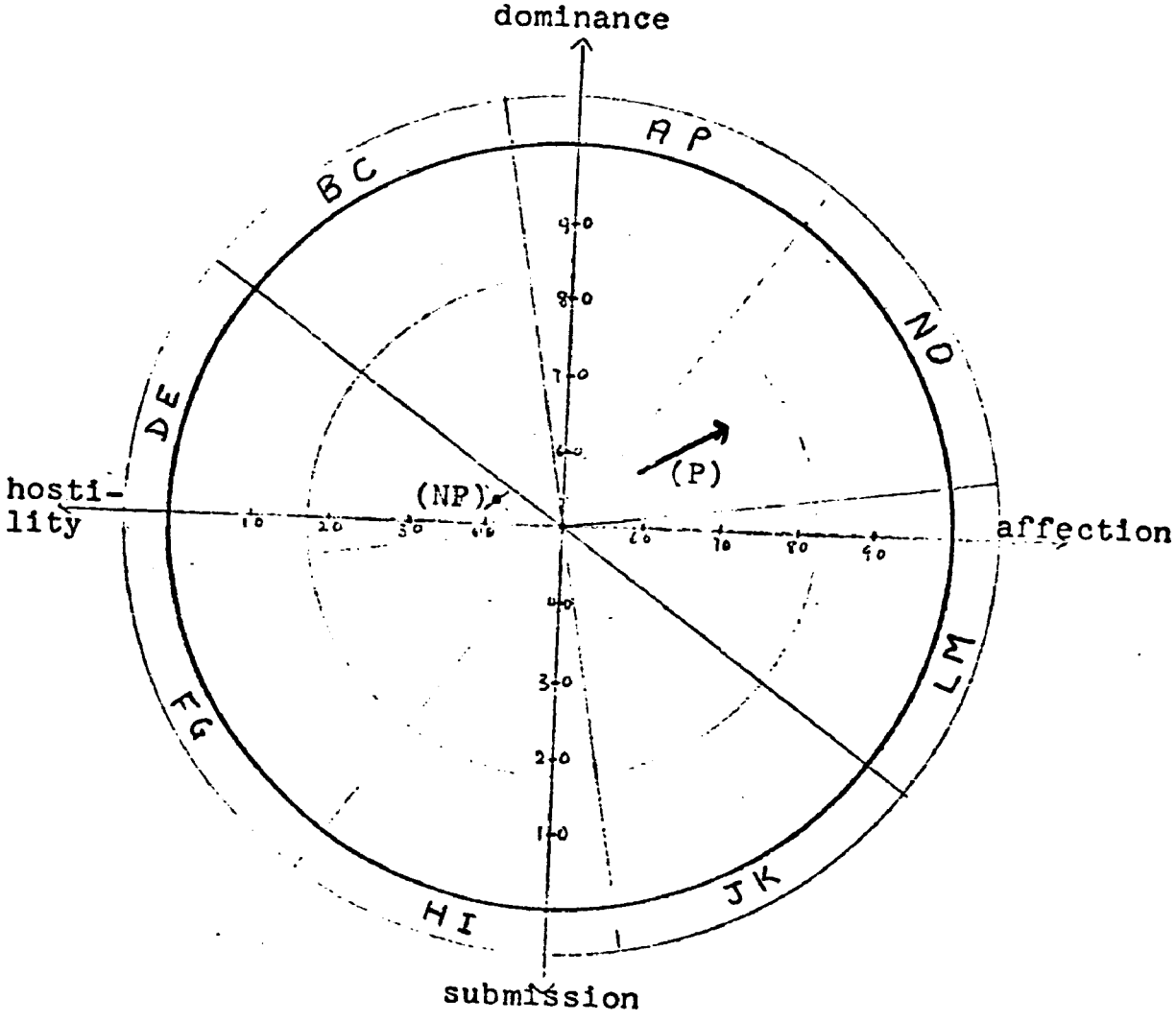


Figure : Summary Profile of Change in Self Concept Based on DOM,LOV Vector for Participant Group(P); pretest Result for Non-participant Group (NP)

Consequences for the System

There was feedback concerning the program to the system through contact between participants of the program and other teaching fellows; meetings of the Graduate Council and the faculty; communication between the consultant and the liaison persons, and a meeting between the consultant and the curriculum committee in February 1972.

In the winter term,1972 a proposal for a teaching fellow training program was prepared utilizing feedback from the program described in this study and submitted to the Danforth Foundation. As a result, the department received a grant from the foundation to conduct a training program for the year 1972-73.

The existing orientation program for new teaching fellows was modified as a result of the reaction of program participants and the grant received. Certain of the workshops were incorporated into the orientation program with the addition of the use of videotape for microteaching (see Appendix K and L)

The teaching fellow training committee for the 1972 orientation program was composed of a number of teaching fellows with experience in teaching, interest in improving undergraduate instruction and experience in the program described in this study. The consultant-trainer was asked to contribute to the program as a resource person to the training committee and to general group discussions; as well as conducting a a workshop session and being available to the new teaching fellows who wish to have feedback on their micro-teaching.

The extent of faculty member committment to shared responsibility in future teaching fellow training was illustrated by faculty members offering to provide their subject matter expertise in harmony with consultant-trainer teaching process expertise.

CHAPTER VI

SUMMARY OF THE STUDY: FINDINGS, CONSEQUENCES, AND RECOMMENDATIONS

This study has addressed itself to the development, implementation and evaluation of an in-service program for teaching fellows in the department of chemistry at The University of Michigan during the academic year 1971-72.

The model for the in-service program as a change project, both for individual teaching fellows and the department as a system, was the normative-re-educative change strategy using a team effort. The team combined the resources of persons from chemistry and educational psychology. An effort was made to use a language common to both content and method of teaching.

The theme underlying the in-service program was the interpersonal aspect of teaching. A variety of methods (trigger films, structured experiences for

human relations training, discussion, lecturettes) were used to consider topics related to the general theme. During the fall term there were five workshops which were a combination of pre-planned sessions and those that grew out of responding to the perceived needs of participants. Consultations during both terms for teaching fellows revolved around issues dealing with growth as a person and growth in competence as a teacher.

A total of fifteen teaching fellows were involved in different aspects of the program with eight of them participating in all phases of the program. A sample of four hundred and ninety-eight students enfolled in classes taught by the fifteen teaching fellows was also included in the study.

The variables considered for assessment of the program were attitude toward teaching as a career, job satisfaction, interpersonal style of teaching fellows, and satisfaction of students with teaching fellows. The assessment examined the impact of the program through statistical analysis of data, a study of each participant teaching fellow by the case method and consideration of consequences for the chemistry department.

According to the results of the statistical treatment of data, student satisfaction showed a significant difference at $p \leq .05$ level between participant and non-perticipant teaching fellow classes at the end of the fall term and after eleven weeks of training. The comparison between the fall and winter classes of participant teaching fellows showed a sifnificant difference at $p \leq .05$ level also.

Thus it appears that students of participant teaching fellows were more satisfied than students of non-participant teaching fellows during the fall term; likewise, the students of participant teaching fellows during the winter term were more satisfied than their students during the fall term.

On the other hand, there appears to be no significant difference between participant and non-participant teaching fellows with regard to attitude toward teaching as a career, and interpersonal style.Likewise, there appears to be no significant difference between pretest and posttest of participant teaching fellows with regard to attitude toward teaching, interpersonal style and job satisfaction.

An examination of the changes in each participant teaching fellow as a separate case revealed certain trends in the group. Change on attitude toward teaching seems to be related to a reconsideration on the part of the teaching fellows of the relative advantages and disadvantages in teaching, while change on job satisfaction seems to be related to the level of ambivalences toward teaching, and change in description of self seems to be related to perception of potential for an interpersonal style that is characterized by more intense use of such traits as encouraging others, being helpful and supportive.

As a consequence of the in-service program the existing orientation program for new teaching fellows was modified by the department to include a number of workshops developed specifically for, or implemented in, this program. The use of videotape in microteaching was a new feature also. The department submitted a proposal for a teaching fellow training program for 1972-73 to the Danforth Foundation and received a grant. A number of teaching fellows who had participated in the 1971-72 program served on the training committee and were leaders of small group sessions during the 1173 orientation program.

RECOMMENDATIONS FOR FUTURE IN-SERVICE PROJECTS

This study has had a number of limitations such as a small self-selcted sample, lack of a control group and no provision for classroom observation. On the other hand, experience showed that some of the program procedures used were of sepcial value.

A number of recommendations can be made for the design of subsequent efforts to conduct in-service education projects of this type. The recommendations will be made for the different phases of the project.

Preparation for the Program

1) It was helpful to have delineated the relashionship between consultant and the department. There were instances when it became evident that an agreed-upon liaison person(s) is a necessity. Also, a clear understanding of the nature of information to be imparted to the system proved to valuable.

Therefore, it is recommended that the consultant-system relationship be clarified before committment to carry out a project.

2) On the basis of comments by teaching fellows who did not participate in the program, it seems that the scheduling of sessions might have been given more attention.

In view of this, it is recommended that scheduling of sessions be given careful consideration through a survey of time preferences of all potential participants.

Development and Implementation of the Program

1) The combination of pre-planned sessions and those that grew out of translation of participant concerns into workshop topics seemed to be functional in meeting a variety of needs.

Thus, it is recommended that the curriculum of in-service programs consider needs of participants, as well as provide additional opportunities for them to develop skills of which they might not have been aware. It is also recommended that the search for, and use of, a variety of resources be considered vital to the development of a program to meet the diverse needs of the participants.

2) A team approach combining subject matter and teaching process expertise was found to be vital to this program.

Therefore, it is recommended that special attention be given to recruitment of an inservice or workshop coordinator who holds expertise in both subject matter and teaching process, and that emphasis be placed on including both subject matter specialists and process specialists among the workshop resource personnel.

3) Along with general sessions and individual consultations, small group sessions might have served the needs of interested teaching fellows who were not free at the time the general sessions were scheduled.

It is recommended that the inclusion of small group sessions be considered for the above purpose, as well as meeting the need for more skill practive of a nature that has a direct bearing on the subject matter taught.

4) On the basis of comments by teaching fellows and data from consultations, it became apparent that a

systematic consideration of feedback from students was helpful to the teaching fellows to make changes on the job.

It is recommended that there be provision for the development of skills to use feedback, through various methods such as workshops and videotape, before feedback is given to teachers. Furthermore, supportive services are needed to augment the efforts of teachers to make changes on the job.

Assessment of the Program

In addition to considering personality variables of teacher and student satisfaction with teacher on the basis of self-reports, it is recommended that the assessment of the program include the following:

1) comparison of the teacher's self description with teacher's description of the trainers' interpersonal styles. This will help examine the problem of modeling and may be an issue to be considered in the case that replication of a study such as this becomes a problem.

2) comparison of teacher's self description with student description of teacher's interpersonal style. This comparison may contribute to an explanation of student satisfaction with his teacher.

3) comparison of student satisfaction with teacher prior to and after participation in the program. This will contribute to the clarification of the impact of the teacher's experience in the in-service program on student satisfaction.

4) observation of classroom behavior before, during and after the program. This could be a source of data to explain the relationship between changes in teacher personality variables and changes in student satisfation through examination of the intervening variable of classroom behavior.

5) consideration of the relationship between teacher self description of interpersonal style, teacher behavior, student perception of teacher and student satisfaction.

In conclusion, this study has demonstrated that the design of the program, for assessment purposes, would be improved through the addition of a control group of teaching fellows and students. It has also demonstrated the value of language clarification for making an interdisciplinary team effort functional in the development and implementation of in-service education on the university level.

It is the earnest belief of the writer that the practice of bringing together subject matter and teaching process expertise for in-service projects will contribute to the enhancement of the educative process in universities.

BIBLIOGRAPHY

Adelson, J. "The Teacher as a Model," The American College, edited by N. Sanford. New York: Wiley, 1962.

Athanasiore, Robert. "Job Attitudes and Occupational Performance: A Review of Some Important Literature," Measure of Occupational Attitudes and Occupational Characteristics, edited by John P. Robinson, Robert Athanasiou and Kendra B. Head. Ann Arbor, Michigan: Institute of Social Research, The University of Michigan, 1969.

Axelrod, Joseph, Merwin B. Freedman, Winslow R. Hatch, Joseph Katz, Nevitt Sanford. Search for Relevance: The Campus in Crisis. San Francisco: Jossey-Bass, Inc., 1969.

Bennis, Warren G. The Planning of Change. 2nd Edition, edited by Warren G. Bennis, Kenneth D. Benne and Robert Chin. New York: Holt, Rinehart and Winston, Inc., 1969.

Bennis, Warren G. and Edgar H. Schein. "Principles and Strategies in the Use of Laboratory Training for Improving Social Systems," The Planning of Change. Edited by Warren G. Bennis, Kenneth D. Benne and Robert Chin. New York: Holt, Rinehart and Winston, Inc., 1969.

Berelson, Bernard. Graduate Education in the United States. New York: McGraw-Hill, 1960.

Bloom, Benjamin S., Max Englebart, Edward Furst, Walker Hill, and David Krathwohl. A Taxonomy of Educational Objectives. The Cognitive Domain. New York: Longmans, Green and Co., 1956.

Bond, Marjorie. "Growth in Human Relations," Toward Excellence in College Teaching, edited by Earl V. William C. Brown Company, 1963.

Bonner, Hubert. On Being Mindful of Man. Boston, Houghton Mifflin Company, 1965.

Bradford, Leland. "The Teaching-Learning Transaction," Human Forces in Teaching and Learning, Selected Reading Series Three. Washington, D. C.: NTL, 1968.

Bradford, L. P., J. Gibb and K. Benne. T-Group Theory and Laboratory Method. New York: John Wiley and Sons, 1964,

Brintzinger, Hans, et. al. A Self-Paced, Tutorial Chemistry Course by the Keller Plan: An Experiment Conducted During the Winter Term of 1972 at the Department of Chemistry, The University of Michigan. Unpublished. 1972.

Brown, James W. and James W. Thronton, Jr. College Teaching: A Systematic Approach. Second Edition. New York: McGraw-Hill Book Company, 1971.

Bruner, Jerome Seymour. The Relevance of Education. New York: W. W. Norton & Company, Inc., 1971.

Buchanan, I. and M. Dunnette. "Effectiveness of T-Group Experiences with Managerial Training and Development," Psychological Bulletin. LXX:2 (1968).

Buhler, Charlotte. "Humanistic Psychology as an Educational Program," American Psychologist, XXIV:8 (August, 1969), pp. 736-42.

Campbell, Donald T. and Julian C. Stanley, "Experimental and Quasi-Experimental Designs for Research." Handbook of Research on Teaching, edited by N. L. Gage, Chicago: Rand McNally, 1963.

Chin, Robert and Kenneth D. Benne. "General Strategies for Effecting Changes in Human Systems," The Planning of Change. Edited by Warren G. Bennis, Kenneth D. Benne and Robert Chin. New York: Holt, Rinehart and Winston, Inc., 1969.

Clark, Mildred L. "An Exploratory Study of Graduate Assistantships for Beginning College Teachers," Dissertation Abstracts. January, 1964, (24).

Combs, Arthur. Educational Accountability: Beyond Behavioral Objectives, Washington, D. C. : Association for Supervision and Curriculum Development, 1972.

Committee on Undergraduate Teaching. The Importance of Teaching: A Memorandum to the New College Teacher. New Haven, Connecticut: The Hazen Foundation, 1968.

Council of Graduate Schools in the United States. Proceedings of the Ninth Annual Meeting: Theme "Planning for an Uncertain Future," edited by James N. Esbelman. Washington, D. C., December 4-6, 1969.

De Chardin, Pierre Teilhard. Activation of Energy, Translated by Rene Hague, London, Collins, 1970.

De Nevi, Don. "Frank Lloyd Wright on College Teaching," Improving College and University Teaching. Vol. 15, Winter, 1967.

Dunkel, H. B. "Training College Teachers," Journal of Higher Education. XXXI, 1960.

Eisenberg, Marvin. "The Need for Responsible Laissez-Faire in Good Teaching," Memo to the Faculty, from the Center for Research on Learning and Teaching, The University of Michigan. No. 36, August, 1969.

Ericksen, Stanford, C. "Earning and Learning by the Hour," Effective College Teaching: The Quest for Relevance, edited by William H. Morris. Washington, D. C.: American Association for Higher Education, 1970.

Gage, N. L. "Paradigms for Research on Teaching," Handbook of Research on Teaching, edited by N. L. Gage. Chicago: Rand McNally and Company, 1963.

Gage, N. L. "Theories of Teaching," Theories of Learning and Instruction, edited by E. R. Hilgard. Chicago: University of Chicago Press, 1964.

Gergen, Kenneth J. The Concept of Self. New York: Holt, Rinehart and Winston, 1971.

Gibb, Jack R. "Socio-psychological Processes of Group Instruction," Human Forces in Teaching and Learning, Selected Reading Series Three. Washington, D. C.: NTL, 1968.

Gibran, Khalil. The Prophet. New York: Alfred, A. Knopf, 1923.

Giorgi, Amedeo. "Existential Phenomenology and the Psychology of the Human Person," Review of Existential Psychology and Psychiatry, VIII, 2 (Spring 1968) pp. 103-16.

Glidewell, John C. "The Entry Problem in Consultation," Journal of Social Issues, XV:2, 1959.

Hall, Calvin S. and Gardner Lindzey. Theories of Personality. Second Edition. New York: John Wiley and Sons, 1970.

Havelock, Ronald G. A Guide to Innovation in Education. Ann Arbor, Michigan: Institute for Social Research, The University of Michigan, 1970.

Henderson, Norman K. University Teaching. Hong Kong: Hong Kong University Press, 1969.

Isaacson, Robert I., W. J. McKeachie and J. E. Milholland. "Correlation of Teacher Personality Variables and Student Ratings," Journal of Educational Psychology. LIV:2 (1963).

Isaacson, R. L., W. J. McKeachie, J. E. Milholland, Y. G. Lin, M. Hofeller, and K. L. Zinn. "Dimensions of Studetn Evaluations of Teaching," Journal of Educational Psychology. LV (1964).

Jenkins, David. "Power Conflict in Classrooms and Motivation for Learning," Human Forces in Teaching and Learning, Selected Reading Series Three. Washington, D. C.: NTL, 1968.

Johnson, David W. The Social Psychology of Education. New York: Holt, Rinehart, Winston, 1970.

Klein, Donald. "Some Notes on the Dynamics of Resistance to Change: The Defender of Role," Concepts for Social Change, edited by Goodwin Watson. Washington, D. C.: National Training Laboratories, NEA, 1967.

Kluckhohn, Clyde. Personality in Nature, Society and Culture, edited by Clyde Kluckhohn and Henry A. Murray with collaboration of David M. Schneider. New York: Knopf, 1953.

Koen, Frank. Analysis of the Specific Features which Characterize the More Successful Programs for the Recruitment and Training of College Teachers. Ann Arbor, Michigan: Center of Research on Learning and Teaching, The University of Michigan, 1967.

Krathwohl, David R., Benjamin S. Bloom and Bertram B. Masia. Taxonomy of Educational Objectives: Affective Domain. New York: David McKay Company, 1964.

Laforge, Rolfe and Robert F. Suczek. "The Interpersonal Dimension of Personality: III. An Interpersonal Checklist," Journal of Personality. XXIV: 1 (September, 1955), 96-112.

Larder, David F. "A Plea in the Teaching of Chemistry," Improving College and University Teaching. XV (1967), 86-87.

Larder, David F. "Aspects of Science and a Liberal Education," Improving College and University Teaching. XV (1967), 76-9.

Leary, T. Interpersonal Diagnosis of Personality. New York: Ronald, 1957.

Lee, Bertram M. and Warren H. Schmidt. "Toward More Authentic Interpersonal Relations between Blacks and Whites," Human Relations Training News. XIII: 4 (1969).

Lindgren, H. C. The Psychology of College Success: A Dynamic Approach. New York: John Wiley and Sons, Inc., 1969.

Lippitt, Ronald, Jeanne Watson, and Bruce Westley. The Dynamics of Planned Change. New York: Harcourt, Brace and World, 1958.

McCall, Harlan. Problems of New Faculty Members in Colleges and Universities. A report of the study conducted in cooperation with the sub-committee on In-service Education of Teachers of the Commission of Research and Service, North Central Association. East Lansing, Michigan: Center for the Study of Higher Education, Michigan State University, 1961.

McGarth, Earl James. Quantity to Quality of College Teachers. New York: Teachers College, 1961.

McGarth, J. H. Research Methods and Designs for Education. Scranton, Pennsylvania: International Textbook Company, 1970.

McKeachie, Wilbert J. and others. Research on the Characteristics of Effective College Teachers. Ann Arbor: The University of Michigan, 1964.

McKeachie, Wilbert J. "Research on Teaching at the College and University Level," Handbook of Research on Teaching, edited by N. L. Gage. Chicago: Rand McNally and Company, 1963.

McKeachie, Wilbert J. "Toward an Educational Psychology of Higher Education," Educational Psychologist. VI:2 (March 1969), 1.

McKeachie, W. J., Y. G. Lin and W. Mann. "Student Ratings of Teacher Effectiveness," Validity Studies. American Educational Research Journal. VIII, (1971).

Maguire, J. D. "Strategies for Academic Reform," Identity Crisis in Higher Education, edited by H. Hodgkinson and M. Bloy. San Francisco: Jossey-Bass, Inc., 1971.

Mann, Richard, Stephen M. Arnold, Jeffre L. Binder, Solomon Cytrynbaum, Barbara Newman, Barbara Ringwald, John Ringwald and Robert Rosenwein. The College Classroom: Conflict, Change, and Learning. New York: John Wiley and Sons, 1970.

Menlo, Allen. "Enchancing Perceptions of Self and Others Through Classroom Learning Experiences," Educational Psychologist. VIII:2 (February, 1971).

Merleau-Ponty, Maurice. The Primacy of Perception and Other Essays on Phenomenological Psychology, the Philosophy of Art, History and Politics, edited with an Introduction by James M. Edie. Northwestern University Press, 1964.

Merwin, Jack C. and Francis J. D. Nesta. "A Study of Need Theory and Career Choice," Journal of Counseling Psychology. VI:4 (1959), 302-8.

Miles, Matthew B. "The Learning Process During Human Relations Training," Forces in Learning, Selected Reading Series Three. Washington, D. C.: NTL, 1968.

Mitzel, H. E. "Teacher Effectiveness," Encyclopedia of Educational Research, edited by C. W. Harris. New York: The Macmillan Company, 1960.

Morris, William H., editor. Effective College Teaching: The Quest for Relevance. Washington, D. C.: American Association for Higher Education, 1970.

Mouly, George J. The Science of Educational Research. Second Edition. New York: Van Nostrand Reinhold Company, 1970.

Mouton, Jan S. and Robert R. Blake. "University Training in Human Relationsh Skills," Human Forces in Teaching and Learning. Selected Readings Series Three. Washington, D. C.: NTL, 1968.

Musella, Donald. "Improving Teaching: Another Word," Improving College and University Teaching. XVI (1968), 167-9.

Neuberger, L. M. "In-Service Improvement of Teaching," Improving College and University Teaching. VII (1961), 48-51.

Pambookian, Hagop Sarkis. The Effect of Feedback from Students to College Instructors on Their Teaching Behavior. Dissertation. The University of Michigan, 1972.

Pfeiffer, J. William and John E. Jonew. A Handbook for Human Relations Training (Vol. I, II, III), Iowa City, Iowa: University Associates Press, 1970.

Pullias, Earl V. "Growth Toward Excellence in College Teaching: Personal Factors," Toward Excellence in College Teaching, edited by Earl Pullias, A. Lockhart et. al. Dubuque, Iowa: William C. Brown Company, 1963.

Report of the Subcommittee on Improvement of Instruction. Improvement of Instruction in Higher Education. The American Association of Colleges for Teacher Education Study Series. Washington, D. C., 1962.

Robinson, John P., Robert Athanasion, and Kendra B. Head. Measures of Occupational Attitudes and Occupational Characteristics. Ann Arbor; Institute of Social Research, 1969.

Rogers, Carl. "The Facilitation of Significant Learning," Instruction: Some Contemporary Viewpoints, edited by Laurence Siegel. San Francisco: Chandler Publishing Company, 1967.

Rogers, Carl. "Toward a Science of the Person," Journal of Humanistic Psychology. III (1963).

Shamos, Morris. "The Art of Teaching Science," Effective College Teaching: The Quest for Relevance, edited by William H. Morris. Washington, D. C.: American Association for Higher Education, 1970.

Shaw, Marvin E. and J. M. Wright. Scales for the Measurement of Attitudes. New York: McGraw-Hill, 1967.

Smith, B. Othanel. "Toward a Theory of Teaching," Theory and Research in Teaching, edited by Arno A. Bellack, Teachers College Press, Columbia University, 1967.

Super, Donald Edwin and Paul B. Bachrach. Scientific Careers and Vocational Development Theory. New York: Bureau of Publications, T. C., Columbia University, 1957.

Trimble, B. S. "Improvement of College and University Teaching," Improving College and University Teaching. XVI (1968), 210-13

Trow, W. C. "Role Functions of the Teacher in the Instructional Group," NSSE Yearbook (59), edited by N. B. Henry. Chicago : University of Chicago Press, 1960.

Tuckman, B. W. and W. F. Oliver. "Effectiveness of Feedback to Teachers as a Function of Source," Journal of Educational Psychology. LIX, (1968).

University of Michigan, Department of Community and Adult Education. Community Lay Leadership Training Program. Unpublished preliminary report, 1953.

APPENDIX A

THE UNIVERSITY OF MICHIGAN

School of Education
Corner East and South University Avenues
Ann Arbor, Michigan 48104

MEMO TO: Dr. C. Overberger, Chairman
Chemistry Department

FROM : Nevart Yaghlian

RE : The possibility of setting up a training program for teaching fellows in general chemistry for fall term, 1971

DATE : April 16, 1971

As a result of my interest and background in college teaching , I plan to develop, implement and evaluate a training program for interested teaching fellows within The University of Michigan.

I intend to use the evaluative data collected for my dissertation. My desire to explore the possibility of doing the above for teaching fellows within the department of chemistry derives from information I received regarding the interest of teaching fellows in general chemistry to improve their teaching skills, as well as my own academic background in chemistry. During a conference I recently had with Alice Cohen and Michael Blomme, it was my understanding that you will have a faculty meeting on April 16 and that the possibility of training program will be discussed. I would appreciate having some indication as to whether what I would have to offer will be acceptable to the chemistry department.

The program I would plan to develop for general chemistry teaching fellows, if that opportunity becomes available, would be based on the needs of the participating teaching fellows and of the chemistry department. While this is true, I visualize that such a program might speak to issues such as the following:

General

1) How to help students think scientifically

2) How to reach students with different ways of understanding and different "learning styles"

Laboratory Sessions

1) How to approach students to offer help while they are doing an experiment

2) How to help students think about what they are doing in the laboratory

Recitation Periods

1) How to help students be active during recitation

2) How to use short quizzes as a learning device

I would hope that participation would be on a voluntary basis. The number of involved Teaching Fellows and number of sessions can be jointly determined. The design and nature of each session will be developed in cooperation with my program advisor, Dr. Allen Menlo, Professor of Educational Psychology, who has conducted in-service workshops and courses for Teaching Fellows and regular faculty in several units on campus.

Nevart Yazician

Enclosure: Curriculum Vita

APPENDIX B

A TENTATIVE PROPOSAL

IN-SERVICE TRAINING OF TEACHING FELLOWS IN GENERAL CHEMISTRY

The University of Michigan
May, 1971

The purpose of this program is the development and improvement of teaching effectiveness of Teaching Fellows. Teaching effectiveness is related to competence in subject matter, in teaching skills and human relations skills. The focus of this program will be the enhancement of the latter two of the competencies related to teaching effectiveness through participatory activities (in total group sessions), through small group sessions, through individual consultation, and through feedback (to Teaching Fellows) of observation of recitation periods and/or laboratory sessions.

STAFF

The staff will consist of Miss Nevart Yaghlian, members from the Chemistry Graduate Council; Mrs. Alice Cohen may wish to serve as a consultant. Professor

Allen Menlo will be a resource person to the Teaching Fellows and Miss Yaghlian is planning, implementing and evaluating the program. Preliminary (tentative) arrangements have been made for classroom observers.

FORMAT OF THE PROGRAM

General Sessions - It is proposed that all first year Teaching Fellows participate as well as any of the second or third year Teaching Fellows who wish to do so.

The general sessions will consist of weekly sessions, either three hour sessions for three weeks at the beginning of the term, or three hour sessions for four weeks.

Issues to be considered during these sessions:

1. Energizing students

2. Giving instructions

3. Leading discussions

4. Asking questions

5. Clarifying statements

6. Giving help to students

7. Receiving help from others

8. Feeling comfortable with students

9. Increasing self-confidence

10. Establishing 'rapport' with students

Small Group Sessions - Participation in these sessions will be on a voluntary basis. This portion of the program will begin the week following the general sessions and will end the week of student evaluations of the course. Weekly sessions of one hour each will be arranged for each group (5-7 members per group). Issues to be considered during these sessions will be decided upon by the participants.

Individaul Consulation - This will be worked out cooperatively by the staff and the Teaching Fellows. There will be provision for consultations throughout the program.

Final General Session - Will take place during the week following student evaluations for participants in the program. Issues to be considered during this session:

How to deal with evaluative feedback.

During this and the following week provision will be made for small group and/or individual consultation.

Observation of Recitation Periods and Laboratory Sessions - Teaching Fellows will be encouraged to call upon Miss Yaghlian and each other to visit their recitation and laboratory sessions, unobtrusively view these sessions, and then provide helpful information on the student-teacher interactions from the perspective of a non-participant. Prior to an observation session the Teaching Fellow being observed may wish to outline to the observer some particular behaviors on which he would like feedback, thus helping the observer to focus his attention and provide feedback on specific concerns the Teaching Fellow may have. This procedure has the potential of helping initiate a practice of mutual support and consultation between Teaching Fellows.

APPENDIX C

FOR INTRA-UNIVERSITY CORRESPONDENCE

THE UNIVERSITY OF MICHIGAN
Department of Chemistry

July 14, 1971

Miss Nevart Yaghlian
Education and Psychology
4015 SEB

Dear Miss Yaghlian:

Tuesday, July 13, I had occasion to discuss your proposal with the Graduate Student Council in considerable detail. At this meeting I relayed to them the feelings of the general chemistry group cluster and the Policy Committee of the Chemistry Department. There is considerable agreement that we should try out your proposal on a voluntary basis, not excluding teaching fellows from other areas besides general chemistry but focusing most attention in the area of general chemistry. I now should present the proposal to the entire faculty and get their input. Unfortunately, we do not have a faculty meeting until Wednesday, August 25 and it will be somewhat difficult to get a meaningful portion of the faculty together before then.

I suggest we proceed, however, on the grounds that they will approve in principle the proposal and that you plan to carry out your program on a voluntary basis with the understanding and help of the Chemistry faculty and the Chemistry Graduate Student Council. We have at least three meetings of the new teaching fellows and all of the teaching fellows between August 30 and September 7 so that we can appropriately publicize the program. Perhaps you would wish to call me about any matter which you want to discuss in more detail.

With kindest regards.

Sincerely,

Charles G. Overberger
Chairman

CGO/nl
cc: A. Menlo
A. Cohen
R. Taylor
Policy Comm.

APPENDIX D

EVALUATIVE FEEDBACK TO TEACHING FELLOW

Check each item according to whether you are

Very satisfied
Satisfied
Dissatisfied
Very Dissatisfied

1. promptness in checking and returning papers
2. help given to students to get down to work
3. attentiveness to students' work in the laboratory
4. willingness to assist students
5. availability for consultation outside class time
6. ability to explain difficult points
7. extent to which enough time is spent for laboratory explanations, problems, clarification of lecture material
8. encouragement of questions by students
9. clarity with which he speaks
10. stimulation of interest in students
11. my learning as compared to my expectations

COMMENTS: Give examples of what was done that you liked, or what you did not like, and that you would want your instructor to know

APPENDIX E

ATTITUDE TOWARD TEACHING AS A CAREER

DESCRIPTION

This is an 11-item Likert scale designed to measure attitude toward teaching as a career. It was constructed by Merwin and Di Vesta (Di Vesta and Merwin, 1960; Merwin and Di Vesta, 1959) in connection with a study of attitude structure.

SCORING

Before the attitude score is computed, the direction of item scores is reversed for unfavorable items so that a response of "strongly agree" is given a value of 6; "moderately agree," a value of 5; and so on. The attitude score is then computed as the sum of the item scores. The theoretical range is from 11 to 66, with lower scores indicating a more favorable attitude toward teaching as a career.

RELIABILITY

Corrected split-half reliability based upon the responses of 300 college freshmen was .71. Test-retest reliability was .79 for a group of 218 college freshmen retested after a four-month interval.

VALIDITY

In addition to the usual contest validity, the scale was shown to differentiate between a group of subjects who had chosen teaching as a career and a group who had not so chosen.

ATTITUDE TOWARD TEACHING AS A CAREER

DIRECTIONS

Here are some different kinds of statements. They will help you to tell how YOU, personally, FEEL about teaching as a career for YOU. For each statement write in the appropriate space on your answer sheet the number which best describes your agreement or disagreement according to this code:

1 - Strongly Agree

2 - Moderately Agree

3 - Slightly Agree

4 - Slightly Disagree

5 - Moderately Disagree

6 - Strongly Disagree

1. Teaching is about the best job that I can think of.
2. There are a lot of advantages to teaching.
*3. I wouldn't care for the work of a teacher.
4. Teaching would be a wonderful occupation for anyone.
*5. Teaching may be all right for some people but not for me.
*6. I am not convinced of the importance of a teaching career.
*7. Teaching, as a career, is not worth the sacrifice of going to college, the long hours of work and the low pay.

8. I am sure I would enjoy teaching.

9. Teaching is as good a job as any.

10. There are more advantages than disadvantages to teaching as a career.

11. I would be willing to take any job related to teaching.

* Items marked with an asterisk are unfavorable toward teaching as a career.

References: J. C. Merwin and F. J. Di Vesta. A Study of need theory and career choice. J. Counsel. Psychol., 1959, 6, 302-308; F. J. Di Vesta and J. C. Merwin. The effects of need oriented communications on attitude change. J. Abnormal Social Psychology, 1960, 60, 80-85. Items obtained from authors and published with their permission.

APPENDIX F

JOB DIMENSIONS BLANK
(Schletzer, 1965)

VARIABLE

This instrument attempts to measure general job satisfaction by tapping a number of job components. Not all of which are applicable to each person's job. Inapplicable items are then disregarded in the person's final score.

DESCRIPTION

In all, the respondent is asked to rate 62* aspects of his job as to whether he is satisfied, not satisfied, not sure about an aspect, or whether he feels the aspect is not applicable. The final score is determined by taking the percentage of satisfied responses, subtracting the number of dissatisfied responses, dividing this total by the number of relevant items, and then adding 100 to each score (to prevent negative scores).

RELIABILITY

No information of this kind is reported in the materials available.

VALIDITY

The instrument correlates moderately with Brayfield and Rothe's measure and Hoppock's index.

LOCATION

Schletzter, V. "A Study of the Predictive Effectiveness of the Strong Vocation Interest Blank for Job Satisfaction" (Unpublished doctoral dissertation, University of Minnesota, 1965).

*For purposes of this study only 50 items were selected.

JOB DIMENSIONS BLANK
(Schletzer, 1965)

DIRECTIONS

Check each item with your present job as teaching fellow in mind:

S - if you are satisfied

D - if you are dissatisfied

? - if you are not sure

NA - if item is not appropriate

1. ____Your earnings
2. ____Time for recreation and/or family activities
3. ____Community in which you live
4. ____Your prestige on the job
5. ____Opportunities for promotion
6. ____Prestige in your profession
7. ____Administrative details of the job
8. ____Committee work required
9. ____Written reports necessary
10. ____Non-professional aspects of the job
11. ____Routine activities of the job
12. ____Time for study in your field

13. ____Opportunity to advance professionally
14. ____Opportunity to help in policy-making
15. ____Opportunity to be your own boss
16. ____Interesting co-workers
17. ____Intelligent, competent co-workers
18. ____Fun and relaxation with co-workers
19. ____Competition
20. ____Demands of students
21. ____Demands of professors
22. ____Intellectual challenge
23. ____Variety of activities required
24. ____Chance to improve skills
25. ____Experience
26. ____Physical fatigue
27. ____Pressure on the job
28. ____Hours
29. ____Opportunity to use learned skills
30. ____Opportunity to use aptitudes and abilities
31. ____Fulfillment of personal needs
32. ____Feeling of achievement
33. ____Feeling of being needed
34. ____Feeling of accomplishment
35. ____Full credit for work done
36. ____Thanks from those you benefit
37. ____Recognition from your supervisors.

38. ____Recognition from your peers

39. ____Personal satisfaction of job well done

40. ____Chance to see results of work

41. ____Chance to follow job through to its conclusion

42. ____Chance to evaluate own work

43. ____Evaluation of work with others

44. ____Opportunity to use initiative

45. ____Freedom to make decisions

46. ____Personal autonomy

47. ____Freedom to use own judgment

48. ____Opportunity to do socially significant tasks

49. ____Opportunity to help others find success of happiness

50. ____Prospects for future earnings

APPENDIX G

INTERPERSONAL CHECK LIST
(Leary, 1957)

DESCRIPTION

The check list is comprised of 128 adjectives.

SAMPLE

The check list has been administered to thousands of respondents, many of them clinic patients, but also including college students, dermatitis patients, and overweight women.

RELIABILITY

Reliability coefficients for sixteenths (of the circle figure) were of similar magnitude, ranging from .64 to .83.

VALIDITY

The circular arrangement of traits, recall, is based on a claim that adjacent traits are most similar. One would expect, therefore, that the relationships between

two traits would be a monotonic decreasing function of their separation. Using data from three groups - clinic males, clinic females, and the obese women - this prediction was borne out without exception (whether octants or sixteenths were chosen as variables). Other predicted relationships are discussed throughout Leary's book.

LOCATION

La Forge, R. and Suczek, R. The interpersonal dimension of personality: III. An interpersonal check list, Journal of Personality, 1955, 24, 94-112.

Leary, T. Interpersonal Diagnosis of Personality. New York, Ronald, 1957.

ADMINISTRATION

Leary reports no information regarding typical administration time, but a single self-description would probably take about 15 minutes.

INTERPERSONAL CHECK LIST

DIRECTIONS

On the attached you will find a list of descriptive words and phrases. Please place a check mark by each one which describes YOU as you really are. Work quickly, describing yourself as well as you can by using these words and phrases. DON'T worry about considerations like "sometimes," "a little bit," etc., but provide a general, over-all impression. Try to respond to each item independently of the others, and do not worry about being consistent. Your first impression is usually the most valid.

1. ____ Able to give orders
2. ____ Appreciative
3. ____ Apologetic
4. ____ Able to take care of self
5. ____ Accepts advice readily
6. ____ Able to doubt others
7. ____ Affectionate and understanding
8. ____ Acts important
9. ____ Able to criticize self
10. ____ Admires and imitates others
11. ____ Agrees with everyone
12. ____ Always ashamed of self
13. ____ Very anxious to be approved of
14. ____ Always giving advice

15. ____ Bitter
16. ____ Bighearted and unselfish
17. ____ Boastful
18. ____ Businesslike
19. ____ Bossy
20. ____ Can be frank and honest
21. ____ Clinging vine
22. ____ Can be strict if necessary
23. ____ Considerate
24. ____ Cold and unfeeling
25. ____ Can complain if necessary
26. ____ Cooperative
27. ____ Complaining
28. ____ Can be indifferent to others
29. ____ Critical of others
30. ____ Can be obedient
31. ____ Cruel and unkind
32. ____ Dependent
33. ____ Dictatorial
34. ____ Distrusts everybody
35. ____ Dominating
36. ____ Easily embarrassed
37. ____ Eager to get along with others
38. ____ Easily fooled
39. ____ Egotistical and conceited

40. ____ Easily led
41. ____ Encouraging to others
42. ____ Enjoys taking care of others
43. ____ Expects everyone to admire him
44. ____ Frequently disappointed
45. ____ Firm but just
46. ____ Fond of everyone
47. ____ Forceful
48. ____ Friendly
49. ____ Forgives anything
50. ____ Frequently angry
51. ____ Friendly all the time
52. ____ Generous to a fault
53. ____ Gives freely of self
54. ____ Good leader
55. ____ Grateful
56. ____ Hard-boiled when necessary
57. ____ Helpful
58. ____ Hard-hearted
59. ____ Hard to impress
60. ____ Impatient with others mistakes
61. ____ Independent
62. ____ Irritable
63. ____ Jealous
64. ____ Kind and reassuring

65. ____ Likes responsibility
66. ____ Lacks self-confidence
67. ____ Likes to compete with others
68. ____ Lets others make decisions
69. ____ Likes everybody
70. ____ Likes to be taken care of
71. ____ Loves everybody
72. ____ Makes a good impression
73. ____ Manages others
74. ____ Meek
75. ____ Modest
76. ____ Hardly ever talks back
77. ____ Often admired
78. ____ Obeys too willingly
79. ____ Often gloomy
80. ____ Outspoken
81. ____ Overprotective of others
82. ____ Often unfriendly
83. ____ Oversympathetic
84. ____ Often helped by others
85. ____ Passive and unaggressive
86. ____ Proud and self-satisfied
87. ____ Always pleasant and agreeable
88. ____ Resentful
89. ____ Respected by others

90. ____ Rebels against everything
91. ____ Resents being bossed
92. ____ Self-reliant and assertive
93. ____ Sarcastic
94. ____ Self-punishing
95. ____ Self-confident
96. ____ Self-seeking
97. ____ Shrewd and calculating
98. ____ Self-respecting
99. ____ Shy
100. ____ Selfish
101. ____ Skeptical
102. ____ Sociable and neighborly
103. ____ Slow to forgive a wrong
104. ____ Somewhat snobbish
105. ____ Spineless
106. ____ Stern but fair
107. ____ Spoils people with kindness
108. ____ Straightforward and direct
109. ____ Stubborn
110. ____ Too easily influenced by friends
111. ____ Thinks only of self
112. ____ Tender and softhearted
113. ____ Timid
114. ____ Too lenient with others

115. ____ Touchy and easily hurt

116. ____ Too willing to give to others

117. ____ Tries to be too successful

118. ____ Trusting and eager to please

119. ____ Tries to comfort everyone

120. ____ Usually gives in

121. ____ Very respectful to authority

122. ____ Wants everyone's love

123. ____ Well thought of

124. ____ Wants to be led

125. ____ Will confide in anyone

126. ____ Warm

127. ____ Wants everyone to like him

128. ____ Will believe anyone

INTERPERSONAL CHECK LIST (FORM 4)
(Words arranged by octant and intensity)

Octant 1: AP

A: 1 Able to give orders
2 Forceful
Good leader
Likes responsibility
3 Bossy
Dominating
Manages others
4 Dictatorial

P: 1 Well thought of
2 Makes a good impression
Often admired
Respected by others
3 Always giving advice
Acts important
Tries to be too successful
4 Expects everyone to admire him

Octant 2: BC

B: 1 Self-respecting
2 Independent
Self-confident
Self-reliant and assertive
3 Boastful
Proud and self-satisfied
Somewhat snobbish
4 Egotistical and conceited

C: 1 Able to take care of self
2 Can be indifferent to others
Businesslike
Likes to compete with others
3 Thinks only of himself
Shrewd and calculating
Selfish
4 Cold and unfeeling

Octant 3: DE

D: 1 Can be strict if necessary
2 Firm but just
Hardboiled when necessary
Stern but fair
3 Impatient with others' mistakes
Self-seeking
Sarcastic
4 Cruel and unkind

E: 1 Can be frank and honest
2 Critical of others
Irritable
Straightforward and direct
3 Outspoken
Often unfriendly
Frequently angry
4 Hard-hearted

Octant 4: FG

F: 1 Can complain if necessary
2 Often gloomy
Resents being bossed
Skeptical
3 Bitter
Complaining
Resentful
4 Rebels against everything

G: 1 Able to doubt others
2 Frequently disappointed
Hard to impress
Touchy and easily hurt
3 Jealous
Slow to forgive a wrong
Stubborn
4 Distrusts everybody

Octant 5: HI

H: 1 Able to criticize self
2 Apologetic
Easily embarrassed
Lacks self-confidence
3 Self-punishing
Shy
Timid
4 Always ashamed of self

I: 1 Can be obedient
2 Usually gives in
Easily led
Modest
3 Passive and unaggressive
Meek
Obeys too willingly
4 Spineless

Octant 6: JK

J: 1 Grateful
2 Admires and imitates others
Often helped by others
Very respectful to authority
3 Dependent
Wants to be led
Hardly ever talks back
4 Clinging vine

K: 1 Appreciative
2 Very anxious to be approved of
Accepts advice readily
Trusting and eager to please
3 Lets others make decisions
Easily fooled
Likes to be taken care of
4 Will believe anyone

Octant 7: LM

L: 1 Cooperative
2 Eager to get along with others
Always pleasant and agreeable
Wants everyone to like him
3 Too easily influenced by friends
Will confide in anyone
Wants everyone's love
4 Agrees with everyone

M: 1 Friendly
2 Affectionate and understanding
Sociable and neighborly
Warm
3 Fond of everyone
Likes everybody
Friendly all the time
4 Loves everyone

Octant 8: NO

N: 1 Considerate
2 Encouraging others
Kind and reassuring
Tender and soft-hearted
3 Forgives anything
Oversympathetic
Too lenient with others
4 Tries to comfort everyone

O: 1 Helpful
2 Big-hearted and unselfish
Enjoys taking care of others
Gives freely of self
3 Generous to a fault
Overprotective of others
Too willing to give to others
4 Spoils people with kindness

APPENDIX H

STUDENT SATISFACTION SCALE

A. During the laboratory sessions, this Teaching Fellow:

1. Helps students to get down to work

____ Strongly Agree

____ Agree

____ Disagree

____ Strongly Disagree

2. Senses when students need help

____ Strongly Agree

____ Agree

____ Disagree

____ Strongly Disagree

3. Encourages questions by students

____ Strongly Agree

____ Agree

____ Disagree

____ Strongly Disagree

4. Speaks Clearly

____ Strongly Agree

____ Agree

____ Disagree

____ Strongly Disagree

5. Is prompt in returning papers

____ Strongly Agree

____ Agree

____ Disagree

____ Strongly Disagree

6. Encourages students to take initiative

____ Strongly Agree

____ Agree

____ Disagree

____ Strongly Disagree

7. Promotes open-ended discussions

____ Strongly Agree

____ Agree

____ Disagree

____ Strongly Disagree

8. Senses when students want to work on their own

____ Strongly Agree

____ Agree

____ Disagree

____ Strongly Disagree

9. Is willing to assist students

____ Strongly Agree

____ Agree

____ Disagree

____ Strongly Disagree

10. Will grade me fairly

____ Strongly Agree

____ Agree

____ Disagree

____ Strongly Disagree

B. What I like about the laboratory sessions:

C. What I do not like about laboratory sessions:

APPENDIX I

SCHEDULE OF ACTIVITIES OF IN-SERVICE PROGRAM

SCHEDULE OF ACTIVITIES OF PROGRAM
FALL TERM, 1971

DATE		ACTIVITY
SEPTEMBER	9	(classes begin)
	11	collection of pre data from TFs
		workshop #1 COMMUNICATION
	25	workshop #2 INTERPERSONAL RELATIONS
OCTOBER	10	workshop #3 STYLES OF INFLUENCE
NOVEMBER	13	workshop #4 CROSS-ETHNIC RELATIONS
	22	students respond to rating scale
DECEMBER	4	workshop #5 DEALING WITH FEEDBACK FROM STUDENTS
	13	(classes end)

CONSULTATION

SCHEDULE OF ACTIVITIES OF PROGRAM
WINTER TERM, 1972

DATE			ACTIVITY
JANUARY	13		(classes begin)
FEBRUARY	14-28	CONSULTATION	collection of pre data from students
			laboratory section
	21-25		feedback of data from students to TFs through consultation hour
APRIL	10-15		collection of post data from students
			laboratory sections
	17-21		collection of post data from TFs
	21		(classes end)

STYLES OF INFLUENCE*

	Tough Battler	Friendly Helper	Objective Thinker
Emotion	Accepts aggression Rejects affection	Accepts affection Rejects aggression	Rejects both affection and interpersonal aggression
Goal	Dominance	Acceptance	Correctness
Judges others by	Strength Power	Warmth	Cognitive ability
Influences others by	Direction, intimidation, control of rewards	Offering understanding, praise; favors friendship	Factual data, logical arguments
Role in Group	Initiates, demands, desciplines	Supports, harmonizes, relieves tension	Defines, clarifies, criticizes, tests
overuses	Fight	Kindness	Analysis
Under Stress becomes	Pugnacious	sloppy sentimental	Pedantic
Is afraid of	Being 'soft' or dependent	desertion; conflict	Emotions, irrational acts
needs to learn	Warmth, consideration. objectivity, humility	Strength, integrity, firmness, self-assertion	Awarness, of feeling, ability to love and to fight

*Source: course (Applications of Educational Psychology to the preparation of teachers)
School of Education
The University of Michigan
Spring Term, 1970

APPENDIX K

DEPARTMENT OF CHEMISTRY

THE UNIVERSITY OF MICHIGAN • ANN ARBOR, MICHIGAN

July 24, 1972

Nevart Yaghlian
School of Education
The University of Michigan
Ann Arbor, Michigan

Dear Nevart,

On behalf of the Chemistry Graduate Student Council, I would like to thank you for all of the help you have given the teaching fellows in this department during the past year.

The response of the graduate students to the trigger films, the exercises dealing with communication and supportive-non-supportive class atmospheres, and the session on how to deal with evaluative feedback was outstanding. Because of this positive feedback, the department has planned to incorporate the trigger films and supportive-non-supportive exercises into the traditional training session this fall.

Due to the increasing interest in quality teaching which your program catalyzed, the Chemistry Department applied for and received a Danforth Foundation Grant. With these funds the teaching fellows who participated in your training sessions will be working extensively with the rest of the teaching fellows in the department. I hope that your suggestion of class observation will be incorporated into this training program.

I would like to make a personal comment in reference to your work. I believe that the one thing that made the program work was the fact that you were accepted as part of the group. Your project became our project. The whole project was adjustable to our demands.

Once again, many thanks.

Sincerely yours,

Linda

Linda A. Eggleston, President
Chemistry Graduate Council

APPENDIX L

DEPARTMENT OF CHEMISTRY
THE UNIVERSITY OF MICHIGAN • ANN ARBOR, MICHIGAN

August 2, 1972

Nevart Yaghlian
400 Maynard St, Apt. 502
Ann Arbor, Michigan 48108

Dear Nevart,

I'm glad to hear that you are joining us in the Teaching Fellow Training Session. Enclosed is a copy of our tentative schedule.

There are a number of meetings scheduled for the Training Session Committee (you, Walt Holloway, Fred Ochs, and Barry Menegnelli). Can you attend the following ones?

Tuesday, August 8th at 10 AM in Room 3203 -- meeting with Wayne Laris to talk about the evaluation of model recitations by new TF's.

Monday, August 14th 4-6 PM in School of Education (room information to follow later) -- meeting to talk about use of video tape and playback in the training session. Meeting with Michael Andes.

Monday, August 28th at 8:30 AM in Room 3203 -- meeting with Linc Fisch to talk about use of trigger films and discussion of them with new TF's.

I'll send reminders of the later meetings shortly before they come up. Hope you can come.

Sincerely,

Jackie

Jackie Livesay
Assistant to the General
Chemistry Coordinator