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DEVELOPMENT OF AN INSERVICE PROGRAM FOR
GEOLOGY TEACHING ASSISTANTS TO REDUCE
ROLE CONFLICT AND TO IMPROVE TEACHING
SKILLS.

The Ohio State University, Ph.D., 1971
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DEVELOPMENT OF AN INSERVICE PROGRAM FOR GEOLOGY
TEACHING ASSISTANTS TO REDUCE ROLE CONFLICT
AND TO IMPROVE TEACHING SKILLS

DISSERTATION
Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
Mildred Wines Graham, B.S., M.A.

The Ohio State University
1971

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CHAPTER I

INTRODUCTION

Inservice training is not a new concept to American culture or American education. Teachers in public schools have been getting some form of inservice training for over a century. Business and industry have found inservice training to be effective.¹

Graduate students who teach undergraduate courses in colleges and universities are getting many different kinds of inservice training for teaching. There is a wealth of examples cited in the literature. This is not to infer that the graduate teaching assistants receive

adequate or even minimal training to teach undergraduate students.

In the sciences such as biology, physics, chemistry, geology, the problem of training to teach is different from that in other areas. Perhaps each content area is unique in its problems, but science graduate students who are well qualified in their subject matter may have had a minimum of courses in the social sciences and humanities. That is not to say that these graduate students are not humanists or not socially oriented only that they have had little formal training in these disciplines. The investigator's interests in geology and teacher education led her to delve into the particular problems of teaching assistants in geology at The Ohio State University.

Discussions were held with the chairman and assistant chairman of the Geology Department as well as the chairman of the Committee on Graduate Studies in the Geology Department. The department was enthusiastic about offering a seminar for the graduate students. There had been different orientation sessions and seminars offered by professors in specific courses, but nothing offered department-wide.

Geology teaching assistants come to The Ohio State University from diverse backgrounds; from small colleges and large universities; from general geology and earth
science education backgrounds to specialized disciplines such as geochronology, and paleomagnetism. These teaching assistants have specific needs for inservice training. Other than an orientation to the content of the specific course, there is a need for training for their unique duties in the laboratories of the introductory level geology courses. Statistics show that the largest percentage of these teaching assistants will enter the teaching profession on graduation and this assignment may be their only training for their vocations. These are some specifics of the situation for geology teaching assistants in the Department of Geology which precipitated this study.

The college teachers of tomorrow are probably now acting as teaching assistants in the graduate schools where they are working toward advanced degrees. Much of the teaching and other work of our universities is being done by these graduate students. This arrangement is beneficial to the universities because the universities may then relieve higher salaried faculty for upper division and graduate level courses as well as for research. Up to a certain point, this arrangement can also be beneficial to the graduate student. A teaching assistantship can be the financial means to further his education, and the experience gained can be an internship of sorts for the career he may assume after graduation. It can also enhance
his credentials in the job market. A fringe benefit may be better understanding of material he is studying because of review of more basic substantive material for his teaching.

How the undergraduates fare under such an arrangement is by no means clear. . . . Some preliminary investigations suggest that there is no significant difference in the examination performance of graduates taught by the two categories of instructors (i.e., graduate students or full time faculty).

Much has been written about the excesses of the system. Labels of "slave labor," "stipened barrel bottoms," and others have been used to describe the teaching assistant. Rogal sums it up by saying, "The employment of graduate teaching assistants is nothing more than base financial security for those pursuing higher degrees and an economy measure for the college."³

The teaching assistant must assume at least two roles—teacher and student.

He is neither fish nor fowl. He has one foot in each of two groups whose standards, norms, responsibilities, power reward structure, and communication channels differ and often conflict. His clearest sense of identity is probably that of a graduate student and it is with this "face" that he enters the presence of others. There are times throughout the day, however, when he must project a different face, that of someone

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preparing for and performing the role of teacher. 4

Weissberg states that the graduate teaching assistant is classed as a marginal man. The concept of the marginal man has been introduced into psychological literature by R. E. Park. 5 One of his students, Everett Stonequist, has done much to elaborate on the concept; Stonequist says that,

The marginal man . . . is one who is poised in psychological uncertainty between two (or more) social worlds; reflecting in his soul the discords and harmonies, repulsions and attractions of these worlds, one of which is often "dominant" over the other. . . . 6

Stonequist later said that this occurs only if the individual perceives it as a personal problem. This could be true of the graduate teaching assistant. He may perceive no conflict between his two roles. However, according to Getzels and Guba,

In certain situations role conflicts occur. That is, the situations are so ordered that an actor is required to fill simultaneously two or more roles that present inconsistent, contradictory, or even mutually exclusive expectations. . . . In


5 R. E. Park, Race and Culture (Glencoe, Ill.: The Free Press, 1950).

any event, over any long term period he cannot fully meet the expectations of all roles.  

The Problem

This study was conducted in direct relation to an effort to provide inservice education for teaching assistants in geology at The Ohio State University. To investigate some of the problems associated with serving as a teaching assistant, interviews were conducted with teaching assistants, the chairman and assistant chairman of the department, and the chairman of the graduate studies committee to diagnose the needs of teaching assistants in their professional setting. A curriculum program was developed especially for this group. The program was implemented and evaluated.

A subproblem was defined after interviews with the different people involved and a review of the literature concerning problems of teaching assistants. The subproblem was the conflict teaching assistants have between their dual roles as teachers and students. The subproblem led to a measure of role conflict.

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Objectives

The objectives of the study were as follows:

1. To diagnose the particular needs of the teaching assistants in Geology at The Ohio State University.
2. To design inservice seminars to fit those needs of teaching assistants.
3. To conduct the inservice seminars for teaching assistants.
4. To gather descriptive information on teaching assistants in their teaching situation.
5. To develop an instrument to measure role conflict in the participants.
6. To judge the effect of inservice seminars on the teaching assistants' conflict between the roles of teacher and student.
7. To evaluate the seminars through the teaching assistants' perceptions.

Assumptions

The study was predicated on the following assumptions:

1. Inservice training program could be an indicator of the potential for improving the performance of teaching assistants with an extended intensive program.
2. Inservice training could increase the teaching assistants' satisfaction with their performance.
3. Role conflict produces dissatisfactions among teaching assistants.

4. Role conflict can be measured reliably by paper and pencil tests.

5. Eight hours of planned seminars experiences dealing with methodology of teaching and learning is sufficient to induce modifications in behavior and in degree of role conflict.

**Limitations**

The study was subject to the following limitations:

1. The study was limited to graduate-student Teaching Assistants with responsibilities for Geology 100, Geology 101, and Geology 102.

2. The study was based on a convenience sample of those Teaching Assistants in Geology whose characteristics will be discussed later.

3. This study dealt with only a few of the possible variables which might relate to role conflict in Teaching Assistants.

4. It is believed that the close personal relationship between the participants and the investigator did influence the responses of the participants.
Definitions

Terms used in the study are defined as follows:

1. TA—a graduate student given some responsibility in teaching, may be a Teaching Assistant (usually a Master's student) or a Teaching Associate (usually a Ph.D. student). This acronym will be used interchangeably with Teaching Assistant or Teaching Associate.

2. Geology 100—a 5-credit-hour course which surveys the materials of the earth, their development, and modification through time. The course serves as an introductory sequence to a fifteen-hour natural science requirement elected by students having either non-professional or pre-professional interest in geology.

3. Geology 101—Physical Geology, a 5-credit-hour course that is the beginning of the pre-professional sequence. The course deals with minerals and rocks, landforms, and structural features of the earth's crust. The course is used by the non-professional to help fulfill the fifteen-credit-hour sequence in general science.

4. Geology 102—Historical Geology, a 5-credit-hour course in the pre-professional sequence. The course deals with the history of the earth and its inhabitants through geologic time. This course is used by the non-professional to help fulfill the fifteen-credit-hour sequence in general science.
5. AVT—an acronym describing the Audio-Visual Tutorial laboratory. The AVT laboratory is one designed in such a way that the student can complete the laboratory exercises independently in a carrel and at his own speed.

Methodology

These introductory remarks may help to give a background for the methodology used. The department of Geology employs approximately twenty-five graduate teaching associates and assistants. These TA's have responsibilities of teaching the laboratory portion, but none of the lecture portion, of most undergraduate and some graduate courses in the department. There are three introductory courses taught, General Introductory Geology, Physical Geology, and Historical Geology. As a general rule each TA serves in either the Physical Geology or Historical Geology laboratories as well as in the Introductory Geology laboratory. These assignments change each quarter, with each TA getting experience in teaching the laboratory portion of each of the three introductory courses.

The laboratory for General Introductory Geology (Geology 100) is an Audio-Visual Tutorial (AVT) laboratory where the students come and go at will and do their laboratory assignments in individual carrels. The TA's have the responsibility of answering questions that these students
have concerning content or mechanics of the AVT set up. Physical Geology (Geology 101) and Historical Geology (Geology 102) are taught in a more traditional manner with certain students assigned to laboratories for specific times. The TA's in these courses are called upon to describe the laboratory exercise, explain procedure, answer questions about the laboratory exercise, and sometimes give short background lectures before the exercise is started. Approximately three thousand students are enrolled in these courses each quarter.

The procedures that were used in the study are as follows:

1. Interviews were held with approximately twenty TA's to discover those things that bother TA's, and to identify their dissatisfactions and frustrations with the situation. Information was also received from the TA's about what should be put in the seminar. Interviews were held with professors in the department to add their perceptions to development of the instrument and design of the inservice seminar.

2. Using the information gained through the preliminary interviews, objectives for the seminars, reflecting the needs and concerns of the TA's, were written.

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8Ibid., p. 167. (Procedure was adapted from Getzels and Guba.)
3. Seminars were designed to include the topics of (a) Instructional skills, (b) Interpersonal Communication skills, (c) Self-perception and Role-perception, and (d) Perceptions of the learner.

4. There was an attempt to identify major items that cause some dissatisfaction with combined roles of teacher and student. These items were sorted according to different phases of their roles.

5. A role conflict instrument was constructed and tested on TA's not in the sample. The instrument described certain situations that bother TA's, as suggested by the TA's in the interviews. That instrument measured the extent to which the individual TA was bothered by the situation. Another instrument was developed that measured the extent to which the individual TA believed the other TA's were bothered by the situation.

6. The role-conflict instrument was administered to Biology TA's to validate the instrument. While their situation may be slightly different from Geology TA's, role conflicts may develop with them in much the same way.

7. The role-conflict instrument was administered to a sample of TA's who volunteered for the inservice seminar on methodologies of teaching and learning. The sample was a convenience sample of those TA's who did not have laboratory responsibilities or classes on the night of the seminar meetings and who volunteered to participate.
8. Four two-hour seminars were held. An opportunity was given for informal discussion, with those who wished, for two or three hours following the formal session. The seminars were given the last four weeks of the winter quarter. The dates of the seminars were February 9 and 16 and March 2 and 9.

9. The role conflict instrument was administered for the second time eight weeks after the first administration (the third week of the spring quarter).

10. Data were collected on selected characteristics of each participant of the study. The material collected contained the following: age, grade point average in graduate school, undergraduate school attended, the area of the country where he lived, his marital status, how far along he was into his graduate program.

11. Observational data on the actual laboratories taught by a sample of the TA's in the study were collected. The observer sat in the laboratories for two weeks taking anecdotal records of what transpired. An anecdotal report was made on each TA observed. Half of the TA's were observed. Some of the TA's in the study did not have assignments in Geology 101 and Geology 102 for the spring quarter when the observations were made. There were some time conflicts with several TA's serving in the laboratory during the same hour.
12. Audio-tape interviews were made with each of the TA's in the study. Affective information such as his feeling toward teaching and his feeling toward students was collected from each TA.

13. Evaluation of general descriptive data was made to determine the outcomes of the seminar.

14. Statistical evaluation of the data was made to ascertain whether there was a shift in the TA's perception of role conflict and a shift in the TA's perception of his teaching behavior.

Chapter II contains a review of selected pieces of literature on role theory, role conflict, problems of the graduate teaching assistant and his training.
CHAPTER II

REVIEW OF RELATED LITERATURE

The intent of this chapter is to review literature related to areas concerned in this study. The areas researched were role-conflict, teaching assistants, and the training of teaching assistants. Due to the large volume of literature under these headings, this chapter will review selected offerings only. There is no attempt to present all the literature, only a representative sample of appropriate studies, books and articles.

Role Conflict

Role theory

Before one can discuss the conflict of roles, it is necessary to go to sociological and psychological literature to find what the historical or extant role theory is. Parsons says:

All social systems arise out of the interaction of human individuals as units. Hence the most important exigencies of the situation in which collectivities as units perform social functions are the conditions for effective performance by the constituent human individuals (including their command of physical facilities). But since the typical individual participates in more than one collectivity, the relevant
structural unit is not the "total" individual or personality, but the individual in a role. In its normative aspect, then, a role may be thought of as a system of normative expectations for the performance of a participating individual in his capacity as a member of a collectivity. The role is the primary point of direct articulation between the personality of the individual and the structure of the social system.¹

Linton regarded role as the set of expectations prescribing the behavior appropriate to a position occupant.² To Linton, there seemed to be one role for every position. Role was considered by those coming later more as expected behavior. Using Linton's idea role could only be "one role one position" at one time and relations such as mother-child relation could be discussed using role theory, but no more complex role relationships were possible under this concept.

According to Bates, Linton's work initiated other work with role theory. Bates said

"Roles need to be defined in two ways: in terms of ideal behavior or cultural structure, and in terms of real behavior or actual performance. A role as ideal behavior consists of a set of norms and is therefore a part of culture. As real behavior, it consists of a set of acts that are a product of culturally defined roles, personality, situational and interactional factors.

In one sense then, an occupation is a cluster of norms that defines the kind of behavior expected of, or appropriate to, a person with a given kind of job. 3

Many people worked on a multiple role theory. For example, Gross, et al. explained a "multiple role theory" that recognizes that a person may perform a set of roles as the occupant of a single position, and that a single individual occupies multiple positions in society. 4

In role theory, four major independent variables are accepted: (a) a culture consideration, (b) a personality consideration, (c) a situation consideration, and (d) the social interaction consideration. In this study we are deeply concerned with the situational consideration. Lewin said that the situation consists of all those objects in the environment that the individual or actor perceives. 5 Parsons identifies three systems which contribute to action as the dependent variable: social


systems, personality systems and cultural systems. He sees these functioning in a situational context. Parsons and Shils said that culture contains a set of ideas about how people ought to behave, feel and think in social situations.

Other writers have their own criteria for analyzing group behavior. Homans identifies norms, activity, interaction and sentiment as major variables in this analysis.

Bates believes the situational variables are of most importance. He says by way of example of importance of the situation, "a secretary cannot, or will not, answer a telephone unless she is able to hear the bell ring, and the telephone is present within the situation. Situational variables must be taken into account in exploring individual actions as systems of actions on the part of human beings."

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In conclusion, it seems that the most widely accepted way of looking at role theory is the multiple role theory. The Merton,\textsuperscript{10} Gross\textsuperscript{11} and Bates\textsuperscript{12} conceptions have the common characteristics of recognizing multiple roles assigned to a given person as a member of a single group.

Role conflict

A role is a set of expected acts or norms that defines the behavior appropriate to performing a given function in a given group.\textsuperscript{13} These norms form a plan of action for an actor performing a function. "The real behavior in performing the function in the group is a product of the role (definition), the personality of the actor, situational factors that are operating, and the interaction that is taking place."\textsuperscript{14}

Role conflict has almost as many definitions as there are people defining the term. It is a conflict between, or among, norms that apply to the behavior of a single actor. The conflict takes the form of a logical or moral inconsistency among norms (these norms clustered are


\textsuperscript{11} Gross, et al., op. cit., pp. 11-70.


\textsuperscript{13} Bates, The Structure of Occupations, p. 172.

\textsuperscript{14} Ibid.
called roles). Two contradictory behaviors are both defined as correct or right. In the case of the situational consideration, the various objects or elements within the situation may become disorganized. In another form, the behavior required by one norm makes it impossible or more difficult to perform the behavior required by the other. This type of conflict involves an inconsistency between two or more parts of the same culture and is therefore built into, and internal to, culture.

Both Gullahorn\textsuperscript{15} and Seeman\textsuperscript{16} define role conflict as cultural incompatibilities or inconsistencies existing between role elements as noted by an observer. Incompatibility is generally used to mean in this sense that fulfillment of one prescription negates fulfillment of another simultaneously applied prescription. Biddle, Twyman and Rankin, in The Concept of Role Conflict (in which there is a good review of role conflict literature) say that additional difficulties arise from the fact that prescriptions of roles for

The persons for whom problems are engendered by role conflict are often not made clear. Usually the recipient of the conflict


\textsuperscript{16}Melvin Seeman, "Role Conflict and Ambivalence in Leadership," American Sociological Review, XVII (August, 1953), 373-380.
pressure is the member of a primary position towards which behavior is directed or for which norms and expectations are held by others. However, there are other cases in which conflict is generated out of norms or expectations held for one's own position, for the individual who holds simultaneously two different positions, or for the simple holder of norms or expectations for others. In addition, some discussions seem to emphasize the problems of role conflict for the institution, community or society, thus focusing upon dysfunctional group outcomes of disparate role elements.17

Getzels and Guba18 argue that the intensity of role conflict is a function of the rigor with which the role expectations are defined within a given situation.

Role conflict could easily be put on a continuum according to its intensity. Many use the term role conflict when others faced with the same intensity of discomfort might say it is only role strain. Role incompatibilities produce results which last and are a problem, but are less severe in terms of behavior consequences. Goode says role strain is "... the felt difficulty in fulfilling

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role obligations. An actor may feel slightly disconcerted and experience some mild discomfort when exposed to incompatible role prescriptions. This sort of discomfort is probably more prevalent than severe conflict and perhaps the concept of role strain should be used to cover situations in which the difficulty in fulfilling role obligations is not severe. Palola had much the same idea as Goode concerning role strain.

The previous paragraphs have given a few of the concepts existing about role conflict. The following paragraphs will give abstracts of a few of the studies done on role conflict.

There have been several studies dealing with role conflict in vocational agriculture teachers. Bible and McComas analyzed role expectations and role performances of vocational agriculture teachers in Ohio as perceived by thirty teachers and their school administrators. Both teachers and administrators were rated in terms of effectiveness according to selected criteria. It was found

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that teachers rate "higher" in effectiveness. School administrators had greater agreement on role expectations than on role performance for the teacher's role.

Mayo,²² using the same approach, collected data from 26 teachers of Vocational Agriculture in North Carolina. He examined the position of Vocational Agriculture teachers in terms of the source, direction, and intensity of expectations relative to developing and sustaining the formal organizations through which their educational objectives were attained. He also ascertained the correspondence between role performance and role expectations of Vocational Agriculture teachers.

Bible and Brown²³ studied 170 county and advisory committeemen and 32 professional extension agents in Pennsylvania on role consensus and its relation to satisfaction for the county extension-advisory-committee role. As in the previously mentioned study, higher consensus was found on perception of role expectations than on perception of role performance.

The comprehensiveness of these three studies may be limited. One limitation is that they have derived


²³ B. L. Bible and E. J. Brown, "Role Consensus and Satisfaction of Extension Advisory Committee Member," Rural Sociology, XXVIII (1963), 31-90.
prescriptions making up the role of vocational agriculture teacher from either the teachers themselves or from the teachers and a single set of actors occupying a counter position.

Another study on vocational teachers was done by Sutker, Egermeier, and Twyman.\textsuperscript{24} This study demonstrated in a measurable fashion the potential for role conflict which vocational teachers may face, displayed through an emphasis on the extent of differences between the focal role and important counter roles.

Getzels and Guba\textsuperscript{25} did a study on role conflict concerned with discrepancies between what community members wanted the teacher to do as a teacher and what the teacher was expected to do as a church member, family member, voter, etc. This study identified conflicts experienced by teachers as a result of their multiple position occupancy, that is as teachers and community members. Behavioral areas for the questionnaire was selected upon the basis of previous interviews with other teachers.

\textsuperscript{24}Solomon Sutker, John C. Egermeier, and J. Paschal Twyman, An Exploratory Analysis of the Roles and Role Conflicts of Vocational Teachers in Oklahoma (Stillwater: Oklahoma State University Final Report, United States Office of Education Project No. 5-0095, August 1967), pp. 1-195.

Twyman and Biddle\textsuperscript{26} studied public school teachers in Kansas City to determine the extent of disagreement about the teachers' role as examined with relation to role expectancies of four positions: teachers, parents, pupils, and school officials. Items for inclusion in this investigation were based on results from a series of pilot studies.

Palola\textsuperscript{27} investigated the relationship between organization types of strain created in the laboratory setting and the distribution of three types of role strains—role uncertainty, role disparity, and role incompatibility. Two laboratory work-organizations were created with identical structures. After a specified time, one of the structures was experimentally changed to a contrasting type. It was hypothesized that certain role strains will predominate within each of the contrasting organizational types. Some support was found for the hypothesis that role incompatibility would be predominant in a regulated unit with more emphasis on rules.

In another study outside the field of education, Gullahorn\textsuperscript{28} studied role conflict among labor-union leaders.

\begin{itemize}
\item \textsuperscript{26}J. P. Twyman and B. J. Biddle, "Role Conflicts of Public School Teachers," \textit{Journal of Psychology}, LV (1963), 183-198.
\item \textsuperscript{27}Palola, "Organization Types and Role Strains," pp. 191-184.
\item \textsuperscript{28}Gullahorn, "Measuring Role Conflict," pp. 299-303.
\end{itemize}
He found that certain desired information could not be secured by traditional techniques. Interviews and observations had uncovered a number of typical role conflict dilemmas met by union officers. Using these situations, a forced choice questionnaire was devised to assay the importance of pressure from groups in competition for the men's loyalty. The questionnaire measured sensitivity to both positive and negative pressures from the same reference groups and at the same time provided a technique for detecting and estimating the extent of felt role conflict. It was found that when role conflict became so intense that actors were unable to resolve it, a characteristic of such role conflict is an increasing tendency to view the dilemma unrealistically.

Getzels and Guba\textsuperscript{29} did another study on role conflict trying to avoid shortcomings of contrived situations by using a real life setting. It examined the relationships existing between two highly organized roles, that of military officer and teacher. They studied the conflict between these roles when held by a single person and the effectiveness of the actors in managing the teaching role. It seemed clear that ineffectiveness was directly related to degree of personal involvement in role

\textsuperscript{29}Getzels and Guba, "Role, Role Conflict and Effectiveness," pp. 164-175.
conflict. It was also shown that the extent of role conflict as seen by the actors is a function of the number and magnitude of incompatible expectations placed upon or held by the actors.

In summary, role conflict is a condition of stress within the socio-cultural structure of a social system. It involves inconsistency or conflict between and among various norms comprising that system. When a person tries to perform the behavior called for by the role, he finds himself in a situation where one of the following is manifested: (1) his behavior is perceived by himself or by others as being inconsistent, (2) behavior performed in conformity to one of the norms defeats or negates behavior performed in conformity to another norm contained within the person's roles, or (3) the same person is expected by different people to perform behavior which conforms to one of the two conditions stated previously.

Role conflict involves inconsistencies among the contents of role. The more roles within a job, the more likelihood there is for role conflict to exist. That is to say, the more complex the job is, and the more roles a person is called on to perform in order to fulfill expectations, the more likely he is to be exposed to role conflict.
It is obvious from the different studies that role conflict may lead to different consequences for different actors. It is possible that the actor will choose one role as dominant and neglect his duties in the other roles. The actor may try to switch back and forth from role to role being ineffective in all. Another alternative is that he may become totally negative to all roles. The way an actor handles his role conflict is a function of his personality, his background, how well he perceived the inconsistencies inherent in the situation, and perhaps some other variables.

The Graduate Teaching Assistant

Much of the teaching and research in universities is done by graduate students who are working toward degrees in the same institution. According to a study made by Monson, 20 per cent of all teaching in an average-sized university is done by teaching assistants. Much has been written about these graduate assistants, but there has been a dearth of research on the problems peculiar to their roles. The graduate assistant is a great boon to the university because graduate-assistant labor is much cheaper than regularly faculty. An assistantship may be a boon to the graduate student also. It may provide the income to allow him a graduate degree. Teaching may give

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him useful experience for his first full time job. A 1965 National Education Association study showed that 45 percent of those who receive Ph.D.'s enter college teaching as a career.31

The teaching assistant was virtually ignored by academia before the 1960's. Until 1964, he was treated in a casual exploitative way in most universities. Then in 1964 the graduate assistants at the University of California, Berkeley awakened academia to graduate student problems by their activism for reform. After 1964 the University of Utah began a study that led the way in studying the roles, rights, and responsibilities of teaching assistants.32,33

Very real issues relating to the welfare of the graduate student arise if his workload becomes so substantial that it cuts deeply into the time available for his own studies, or if he is remunerated at rates substantially below those offered to others with similar preparation, ability, and experience for comparable jobs.34

Graduate teaching assistants receive, on the average, stipends of between $2,000 and 2,500 per year and are expected to pursue from six to nine hours of graduate study per term. In return for the stipends, they are required to teach one or two sections of freshman English. Now what is more important—that is, what is more important to the graduate assistants? If a teaching assistant is conscientious in preparing his lessons and reading his themes and promptly returning them, his studies are neglected. When this occurs, he earns too many complimentary "C" grades, with the result that at the end of the term he is neither teacher nor graduate student.35

TA's can hardly be considered employees of the university when they receive no fringe benefits that other university teaching-personnel receive. At many universities they receive no hospitalization or workmen's compensation, discounts on books, secretarial help, pay increases with experience, or parking privileges so they too can arrive to teach on time. They are not guaranteed the rights of academic freedom nor even due process. A survey of "job" satisfaction was conducted among TA's and all graduate students in two universities, and it was found that the major source of dissatisfaction for all groups, both TA's and non-TA graduate students, was a voice in influencing department policy.36 Although graduate students do not reap the benefits of regular employment, they usually pay an income tax, in some cases city, state, and federal, on their stipends.

35Rogal, "Train Them First," p. 44.

There are mixed opinions about the competence of TA's in their teaching role. Clark\textsuperscript{37} states that in a study at the University of Rochester it was found that the undergraduate students were delighted with the role graduate students play. Clark is one who is unequivocal in his support of TA's as teachers. He says,

I look upon the graduate student as a great resource in our campaign to improve the quality of undergraduate instruction. . . . He sees, from behind the instructor's desk, problems with which he has just struggled as a student. He is more likely to be willing to shake up the system in order to make the entire program of instruction more effective for our students.\textsuperscript{38}

Gadlin and Rosenwein\textsuperscript{39} write that the TA has unique advantages in teaching.

Particularly in the introductory courses in which there is strong emphasis on the use of discussion techniques in the classroom the teaching fellow (and perhaps the younger teacher in general) can identify with and understand students in a way in which older faculty members frequently seem incapable. There exists the potential for communicating with students on a somewhat equal basis and, if used properly, this can be tremendous advantage. . . . They are of the same generation, they share a common language, a common upbringing, and common social and political problems.


\textsuperscript{38}Ibid.

Not all writers are so supportive of TA's as teachers. Rogal, while having many things to say in defense of TA's, is worried about the deterioration of the freshman English program.

The logical rebuttal at this point is that both the former graduate teaching assistant and the unaided graduate students can receive on-the-job training and counsel during the first year of full-time teaching. This indeed is often attempted, but is it a valid operation? In the first place, is the primary responsibility of a college or university English department to instruct students or to train its staff members? Second, do department chairmen, directors of Freshman English, or senior staff members have the time or the facilities to train inexperienced newcomers? Finally, can the new teachers themselves take the time from preparing lessons and reading themes to expend the additional energy required of attendance in on-the-job teaching seminars? The answer to all of these questions is a definite no... The only present conclusion, therefore, is that the graduate university English department and the English department staff room converted to a teacher training seminar are hardly adequate training grounds for college composition teachers.40

McIntyre,41 in defending televised instruction says that with television more of the instruction can be given by senior faculty instead of by teaching assistants. This, McIntyre claims, will improve the overall quality of instruction.

Most universities realize that it would be quite difficult to operate without their TA's. Departments guard

40Rogal, Train Them First," p. 45.

41Charles J. McIntyre, "Responsibility, Rights and Incentives for Faculty with Respect to Televised Instruction," Feasibility Study for Inter-Institutional Television, Minneapolis: University of Minnesota (October, 1966), pp. 1-21.
against the loss of TA funds. A reduction in need of TA's, as might result from televised instruction, is a threat to a department because this means a reduction in the number of graduate students a department can support. Departments have to offer support in order to recruit good graduate students; good graduate students are a necessity for a good graduate program. Loss of graduate TA's could also cause a cutback in the undergraduate program because regular faculty are often not able to man all the undergraduate courses.

**Training of Teaching Assistants**

Egner and Pierce\(^4\)\(^2\) cited a survey by the Department of Health, Education, and Welfare which projected the need for an increase of 61 per cent full time instructional staff for colleges. This increase would be from 248,000 college and university teachers in 1966 to 408,000 in 1973-74. Generally, people have drifted into the college and university teaching pool with no formal training for teaching. This may be due to a lack of formal courses in teaching at the college-university level.

Koen says that the two requirements for teaching in college should be a scholarly-subject-matter sophistication, and some reasonable amount of teaching skill. Since the Ph.D. is taken as evidence of the first, then what about the teaching skill?

Indeed, it may be suggested that perhaps the training and supervision of assistants is functionally more significant, with regard to undergraduate instruction, than is the production of more Ph.D.'s.

TA's are a reality, and most universities accept this. If TA's are going to teach, then there is consensus that there should be some sort of training to help them. Piedmont states that the "McAlister report of 1964, which on the basis of its nationwide investigation, stated that 60% of our major colleges and universities did not provide any training or guidance for their teaching assistants." A few training programs for TA's will be described.

At the University of Indiana where there are 35 TA's in the Department of German, Piedmont describes their

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44 Ibid., p. 93.

45 Ferdinand Piedmont, "Group Observation and the Training of Teaching Assistants," American Association of Teachers of German. Die Unterrichtspraxis (Spring, 1968), pp. 82-86.

46 Ibid.
training and supervision. The training is divided into the following phases: (1) **Orientation**: at the beginning of the term with first and second year TA's, the TA advisor and course chairmen conduct the orientation. (2) **Course work**: the TA's are required to take a three-credit hour course "Problems and Methods of College German Teaching." (3) **Teaching**: (a) pre-semester and weekly meetings led by the course chairmen, (b) mimeographed day by day outlines and teaching hints are given to the TA's, (c) a TA has close cooperation between the course chairmen and fellow TA's in planning and grading of examinations, (d) grade evaluation reports are given to the course chairmen or TA advisor before midterms and finals, (e) there is discussion of individual mid-semester and semester grades with course chairmen or TA advisor. (4) **Visitation**: (a) by course chairmen, (b) by TA advisor, (c) other faculty (each faculty member is assigned one TA whom he visits (2 times) during the semester. Following the visit the faculty member discusses the period with TA and by end of semester submits a written report on his observations to department chairman and TA advisor). (5) **Observation**: A TA is required to visit, a minimum of three times, either classes of course chairmen or fellow TA's. New observations have been instituted where a group of 4 to 6 TA's make a prearranged visit to one faculty or experienced TA. After group visit there
is a discussion of the class. The TA signs up for two
group observation sessions per semester. The Department of
German also uses 8-10 minute videotape segments to teach
presentation of specific techniques as well as self
evaluation.

The Indiana experience is one of the most compre­
hensive programs of training studied. At the University of
Missouri, the chemistry department uses large numbers of
TA's. The University of Missouri chemistry department held
an intensive seven-day training workshop emphasizing discus­
sion classes and self-criticism based on TV tape recordings.
The TA's were given background information on courses,
students and TA responsibilities. The TA's saw old examina­
tions and were given a set of discussion guides and lecture
topics, lecture problems, and outlines. Experienced TA's
conducted discussion groups. The new TA's gave discussions
and after several trials these discussions were taped.
These tapes were reviewed and discussed with an advisor.
Garland said that the program was intensive, but satisfying
to TA's, and there were fewer complaints about TA's.

At the University of California at Los Angeles,
Halio reports a three phase training period for English


TA's. The apprentice first works as an assistant to a regular staff member. During Phase 2 the TA teaches a freshman English section under close supervision of a regular faculty member. Finally, with advancement to candidacy under a Ph.D. program and careful screening, the TA is given full direction of his course "... even born teachers must be developed."^49

The 1965 report of the Cornell University Faculty Committee on the Quality of Undergraduate Instruction recommended that the quality of TA's be improved.50 This report suggested a summer briefing program to discuss content, planning procedures, and awareness of staff and student expectations of TA's. The School of Education offers each spring an informal course entitled "College Teaching." It is a non-credit lecture series meeting one night a week. It has received strong support from staff and students.

The Department of Romance Languages at the University of Washington held its first preservice internship training program in 1966. The terms of the TA's appointment included obligatory attendance in the internship program. The program began before the school term and the

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^49 Ibid.

^50 Egner and Pierce, "Inducting Graduate Students into College Teaching," p. 55.
TA's were paid an additional half-month's salary. The program consisted of: 13 hours of lecture-discussion about French teaching; 7 hours of viewing and discussing films specially prepared for the program; 5 hours of observation of a demonstration class; 6 hours of simulated practice teaching—their fellow interns acted as students; and 5 hours of general discussion. Observation of students in the language laboratory was abandoned because there were so few students during the internship period. The program was expanded to Spanish in 1967 and plans were made for further expansion in subsequent years.51

A seminar was initiated at the University of Illinois (Champaign-Urbana) campus in 1964 and required of all graduate teaching assistants in the Department of Psychology.52 One of the objectives of the program, besides the initial ones, was to prepare the TA's for the "teaching jobs many of them will be engaged in after completing graduate work."53 The content areas were: course objectives, course content, teaching-learning situations, 


53 Ibid.
teacher-student relationships, evaluation, ethics in teaching, issues of "teaching versus research," and research problems on the teaching of psychology. Students are now being asked to rate the TA's twice in the semester, and this rating is discussed with the seminar leader; direct observations in the TA's classes are made by the leader.

At The Ohio State University a training period is set up for first-time teachers of Spanish and French. Meiden describes this program\textsuperscript{54} as follows: a 2 hour orientation before beginning of Autumn quarter, observation of a demonstration class taught by a supervisor, 3 full hours and several shorter visits by a supervisor to each class taught by a TA, conferences after each visit, frequent directives and suggestions on aspects of teaching various types of lessons, called meeting, of TA's, meetings concerning evaluation, of all TA's before examinations, conference with supervisor after examinations to check over course grades.

These are samples of the way universities are trying to prepare graduate students to become teachers of undergraduates. No studies were found that measure the effectiveness of such programs.

Chapter III describes the development and implementation of the seminar programs used in this study as an inservice program for Teaching Associates in Geology at The Ohio State University.
CHAPTER III

DEVELOPMENT AND DESCRIPTION
OF SEMINAR PROGRAMS

The major objective of this study was to design, implement and evaluate an inservice seminar for teaching assistants in the Department of Geology at The Ohio State University. The planning and implementation of such an inservice seminar was divided into three categories: (a) objectives, (b) activities, and (c) implementation.

Objectives

The development of the program required some clarification of objectives. Through interviews with the department chairman and students much data was gathered around which the particular objectives were developed. Because the formal sessions were to last only eight hours, it was incumbent on the investigator to plan the sessions to fulfill the maximum number of needs expressed by the TA's in the preliminary interviews. It was decided finally that the four sessions would cover: interpersonal communications skills, instructional skills, professional role-perceptions, self-perceptions, and perceptions of the learner.
The objectives for the seminar were written. These objectives express the outcomes that the investigator hoped for through the seminar experience. They are expressed in terms of manifest behaviors.

1. The TA's would be able to engage the undergraduate students in informal conversations that would be satisfying to participant (TA) and undergraduate.

2. The TA's would be able to respond to students' verbal communication in a pleasant and nonthreatening manner.

3. The TA's would be able to respond to students substantive questions in a manner which would help the student to discover his own answer to the problem.

4. The TA's would be able to respond to students' substantive questions in a manner which would lead to an exchange of questions and ideas over a period of several minutes.

5. The TA's would be able to correct themselves or accept correction if they made a mistake.

6. The TA's would be able to admit they did not know the answer to a specific question.

7. The TA's would be able to portray an attitude of encouragement toward student-initiated questions.

8. The TA's would receive student initiated verbal interaction with a warm and open attitude toward the student initiator.
9. The TA's would improve direct communication by use of analogies which should be in the common background of the students.

10. The TA's would be able to improve direct communication by varying types of expository statements, using naming, definition, clarification, explanation or elaboration, etc.

11. The TA's would be able to improve direct communication by using audiovisual materials, i.e., maps, rock samples, fossils, pictures, chalkboard, overhead projectuals, filmstrips, movies, demonstrations, etc.

12. The TA's would be able to improve direct communication by interspersing discussion in the lecture portions of the class.

13. The TA's would be able to reinforce students positively when they responded or took part in class discussion.

14. The TA's would be able to identify those aspects of their teaching situation which they could modify.

15. The TA's would be able to identify those aspects of their teaching situation which cannot be modified and adapt to them.

16. The TA's would be able to understand the constraints placed on their supervisors in changing the situation.
17. The TA's would be able to take positive action in bettering the situation where possible.

18. The TA's would be able to identify those aspects of the situation which cause a role conflict for themselves.

19. The TA's would be able to adapt their behavior in such a way that they be effective in their different roles.

20. The TA's would be able to question the students in a manner conducive to the students learning.

21. The TA's would be able to effectively communicate to the students their need for seeing students on a one-to-one basis during the TA's office hours.

22. The TA's would be able to acquire a knowledge of students, i.e., their background, activities at The Ohio State University, whether they were having difficulties, if they were especially able students, etc.

23. The TA's would be able to distinguish between teacher role as an executive manager and teacher role in reaching substantive objectives.

24. Identify and work at tasks of facilitating through managerial behavior.

25. Identify the conditions in which they are uneasy with students and explore the significance of these conditions.
26. Specify the nature of student expectations of the TA as teacher.

27. Analyze the nature of student expectations of the TA as teacher and decide whether they are legitimate or not.

The objectives were divided into the categories mentioned before to give direction for planning specific seminars. The objectives were divided into the following categories:

- **Interpersonal communication skills**
  Objectives: 1, 2, 7, 8, 20, 21, 26

- **Instructional skills**
  Objectives: 3, 4, 9, 10, 11, 12, 13, 24.

- **Professional role perceptions**
  Objectives: 14, 15, 16, 17, 18, 19

- **Self-perceptions**
  Objectives: 5, 6, 18, 23, 27

- **Perceptions of the learner**
  Objectives: 19, 20, 22, 25

In dividing the objectives in this manner, it was discovered that many of the objectives overlapped and fit into more than one category. In the light of these objectives, certain program activities were developed.

**Activities**

The content of the first session of the seminar was self-perceptions and role-perceptions of the TA's. The instrument on role conflict was administered for the first time.
The first session was to be one of introspection and discussion of the roles each TA felt he had to play. The TA's were encouraged to discuss the situation, as they saw it, of being TA's in the introductory courses in Geology. They were encouraged to discuss what was wrong with the situation and whether these things could be changed. They were asked to discuss what could or could not be changed by the TA's, and what changes the department could or could not make and for what reasons.

The first seminar session was designed to include discussion about the TA's knowledge of the students in their laboratory. It was hoped that the TA's could be made aware of the desirability of knowing their students as well as possible in the time allotted for the laboratory and office hours.

The second session was planned to include work on instruction skills of the learner. Instructional strategies to be discussed were taken from Hough-Duncan. The strategies were: instruction as a function of student-teacher interaction, instruction as a function of direct communication, instruction as a function of independent student activity, instruction as a function of group activity. The tapes of the authors, Hough and Duncan, and

students discussing their system of interaction analysis of teaching was to be shown using these as a springboard for discussion of the different instructional strategies.

A short time was allotted to an overview of motivation of the learner. Some handouts were prepared using material by Frymier. There would be a short discussion on problems connected with motivation of introductory Geology students.

Session three was to be devoted to questioning. The rationale behind the decision to devote an entire session to questioning was that the TA's main role as instructors in the introductory geology laboratory was one of asking and answering questions. Dr. Patricia Blosser of the Science Education Faculty was to lead this session because of her work with questioning. Dr. Blosser would ask questions of the participants and give a presentation on questioning techniques. It was planned that the TA's would participate in this session fully.

The last session was left rather open in the planning. It was believed there might be more time spent on skills in interpersonal relations or discussions of the conflict the TA's felt in their teaching-student roles.

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Implementation

Session one

The first session began with an explanation of the purposes of the seminar. Participation in the seminars was voluntary. In attendance were sixteen TA participants, two undergraduates, and four graduate students who were not in the study because they were no longer TA's.

The role conflict instrument was administered after some explanation by the investigator, and after some good-natured jibes from the participants about the nature and items of the instrument.

A question was asked by the investigator concerning the items on the test that bothered the TA's. Two or three TA's initiated the interaction which followed, whereas some sat without talking for perhaps one-half hour.

Some were quite vocal in their condemnation of the laboratories. Many cited cases of inaccurate marking of specimens, or no specimens. Equipment was in disarray, and some TA's spent much time in organizing. There were bitter examples of lack of interest by the professors teaching the courses and lack of coordination between lecture material and laboratory exercises. One professor was cited for his successful attempts at coordination. There was consensus that this was indeed an outstanding teacher who got his TA's together once a week for a lunch
meeting where the lectures and laboratory exercises were discussed and planned. Many cases were cited where this type of rapport between TA's and lecturers was absent. It was repeated that coordination was simple and inexpensive, and was the major change which could be effected by the department.

The subject was switched to the students in the laboratories and how well the TA's knew them. The physical arrangements inhibited the process of getting acquainted. For example, many cited the noise level of the 101 and 102 laboratories as a deterrent in establishing rapport with their students. One group of TA's had divided the large laboratories of sixty into three groups with one TA responsible for his own twenty students. This seemed to be much more satisfactory for two reasons, (a) the TA was responsible for a smaller group and got to know them better and (b) before the three TA's in a large laboratory had wandered around answering random questions and often chatting together.

The question was brought up whether the TA's knew the names of students. Most of the TA's agreed that they did not know all the names, some knew only a few, and none knew the names of students in the AVT laboratories. It was explained that few TA's saw a given student there more than once because it was an open laboratory which the student could attend at any time he chose. There was a
lively interchange over the desirability of knowing names. Some felt that a TA could do a good job without knowing, but others gave examples from their own experience as students when they worked very hard for some one who showed an interest in them. This led to a short discussion of self-concept.

TA's voiced the feeling that the caliber of student was not high because most were in a non-science field and were taking the introductory Geology courses only to fulfill basic university requirements. It was hard for the TA to pick out those students of high ability because their general apathy toward, or real distaste for, any science. When asked their major difficulty with students, many said getting the students to want to learn geology and knowing when to give direct answers to questions.

The informal session which followed the seminar meeting was a continuation of arguments that the open enrollment policy at The Ohio State University did or did not let in students psychologically and intellectually unready for college. There was good interaction during this informal session with all who attended vying for a chance to voice their agreement or opposition on issues raised in the formal session.
Session two

The second session began with a review of what had transpired during the first. There were fourteen of the sample present with others who dropped in out of curiosity or interest because the topic had been posted. In reviewing the week preceding, some told of trying to get to know something about the students in their labs. It seemed to be a frustrating experience for a few but rewarding for others. One comment was, "I felt that I was prying and I thought the kid did too." Another said, "You should have seen his face when I called him by name, now we're real buddies."

The leader of the session, the investigator, gave a brief overview of strategies used in teaching, using Hough-Duncan\textsuperscript{3} classification. A hand-out was given to the participants containing the OSIA (Observation System for Instructional Analysis) categories. The categories were explained. Two video-tapes were shown with the authors (Hough-Duncan) describing the use of interaction analysis systems and describing instructional strategies. The tapes presented film clips of classes that were analyzed using the OSIA.

Although they had been extremely receptive to ideas about teaching-strategies, many participants became hostile to analysis of teaching. There were scathing denunciations

\textsuperscript{3}Hough, Duncan, op. cit.
of systematic analysis and heated arguments over its purpose and worth. A typical comment was, "any teacher worth his salt could sit in a class and tell what goes on without this kind of picky analysis." It was finally decided that these systems might be alright for people in education who had a scientific interest in the teaching act.

There was little time left to discuss motivation, but the investigator gave out sheets which she had compiled on facilitation of learning and copies of the Motivation Quarterly Vol. 1, No. 1, containing an article by Frymier on "The Need to Know." There was subdued but active discussion of trying to motivate a typical introductory geology student to learn.

The informal session followed the same pattern as the previous informal session. The after-hours group was composed of many of the same people as the first week, and the discussion was lively and lasted for about four hours. There were eight people in the group.

Session three

The third session was conducted by Dr. Patricia Blosser of The Ohio State University Science Education Faculty. Present were only ten TA's in the sample, because one of the geology professors had called for a midterm the following day and the TA's were not expecting the examination until the following week. Dr. Blosser started the
session by asking questions. She had learned the names of the participants as they came in to the seminar. She made comments and directed questions to individuals as well as the group. In this manner she elicited good participation from all the TA's and particularly from one who had taken little part in the previous seminar meetings.

Dr. Blosser used the overhead projector. She was relaxed and informal and the TA's responded in an informal manner. The question asked first was, "Why do we ask questions?" Many reasons were given which were listed and projected so all could see. The need for asking "better" questions was discussed. It was decided that making good questions was a way of teaching students to ask questions of classmates and perhaps decrease teacher talk in the classroom. It was the consensus of the group, led by Dr. Blosser, that if the teachers asked good questions students were motivated to reflect on, analyze, and initiate their own questioning interchanges.

Dr. Blosser encouraged the TA's to try to use better questions. An explanation of different kinds of questions followed, with examples and interruptions by the TA's as they thought of examples from their own experiences.

Dr. Blosser explained her system of categorizing
questions, the Question Category System for Science\(^4\) (see Appendix).

The Question Category system and the handbook of which it is a part are components of an instructional sequence designed to provide prospective secondary school science teachers with some help and guidance in recognizing the types of questions they ask. In addition, the instructional sequence has been planned to provide experience in formulating questions as a part of a lesson, both when preplanning and when reacting to the immediate teaching-learning situation in the classroom. Hopefully, the information in this handbook and the experiences in the instructional sequence will provide opportunities for structuring and guiding class discussion just as working with laboratory equipment provides some degree of familiarity with the equipment before using it in a classroom teaching situation.\(^5\)

Dr. Blosser explained the categories of questions which she used. The main categories were closed questions, open questions, managerial questions, and rhetorical questions. Closed questions were of two types (a) Cognitive memory questions and (b) Convergent thinking questions. According to Dr. Blosser, Cognitive memory questions required recall of facts, or identification or naming, or observations. Some examples were given of cognitive


\(^5\)Ibid., p. 13.
memory questions. Convergent question may involve "an analysis and integration of given or remembered data using such mental activities as translation of information in a slightly different context, association, explanation, and drawing conclusions." Examples were given from simple geologic concepts.

Open questions were described as those with a greater number of acceptable responses. These were divided into (a) Divergent thinking questions and (b) Evaluative thinking questions. A teacher may not predict the answer from a divergent thinking question. These questions may come from a background weak in cognitive material, but may cause the students to reflect, imagine, invent, or predict what might happen if a certain hypothesis were true. Evaluative thinking questions are those where students must make value judgments from their background knowledge, give opinions or criticism, or set up procedures for testing a hypothesis they might propose.

Many questions in the classroom and particularly in laboratories were assigned to the Managerial class. In this category are those through which the teacher learns what the student knows about the operation he is investigating, what equipment is needed, how much time is needed.

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6Patricia Blosser, from seminar tape, March 2, 1971.
In other words, these questions deal with simple classroom procedure and have little to do with cognitive or value material.

Rhetorical questions are those to which the teacher does not solicit an answer. They are used to elaborate, reinforce or emphasize points made in talking to students.

The uses of questions as a teaching strategy was discussed. The TA's were asked how and when certain types of questions could be used. It was the consensus that it was best to vary your question types so as to have a little creative instability in the class. Closed questions were defended by the TA's because they felt it necessary to have a strong background of facts from which the students could operate in the divergent and evaluative realm. The participants indicated that much of their questioning was in the managerial category.

In the informal session which followed much talk was given to planning for different kinds of questions. There was sharing of ideas on divergent questions which might be asked.

Session four

The last seminar session was revised from the original plans to include areas of interest of the TA's as they had been voiced in formal and informal sessions. The last session had basically two components, (a) models of direct
communication as a teaching strategy, and (b) how the laboratories could be changed to make them more effective. All the sessions were taped, but the tapes of the first three sessions were destroyed and made at least partially unusable in an automobile accident. The tape of the fourth session was the only one which remained completely intact. The fourth and last session was indicative of much of the interaction throughout the seminars. For these reasons, many excerpts from the fourth session are reported.

Tapes of two lectures by professors of geology were used. These two were chosen because of their different styles and use or lack of use of audiovisual materials. The two professors were also among the most popular lecturers in the department.

The TA's discussed the organizational structure of the presentations. There was a difference in the two lectures in that professor One had a well planned introduction which delineated the points he was to make in the lecture and professor Two did not outline what he was planning to discuss. The following are comments on the introductory remarks:

"____, I noticed, was different in that he didn't really start out with an introduction about what he was going to talk about, he just started going and talking and doing specific things, I don't think that this presents problems."
"I think he concealed his introduction, because if you'll notice after about ten minutes he said, 'my point is that there could be a sequential ...' and all the previous stuff, it's just a different approach to an introduction; in other words, he was trying to, it was his attempt to make people infer what he was going to talk about whereas ___ came out with "paa, paa, paa," that this is what I'm going to talk about."

"I think every new topic should be prefaced by some sort of introduction which should include not only a statement of the problem but why it's important. There's nothing more frustrating than having to sit through three or four lectures and not know what you're doing."

The seminar shifted to a discussion of one-way communication as in lecture or how TA's begin a laboratory. It was felt that there was little two-way communication in the big lectures except in rare instances. According to TA's, more two-way communication took place in their introduction to the laboratory exercises. The TA's thought that many misconceptions received from the one-way communication in the large lectures were corrected by two-way communication in the laboratories.

The use of analogies in one-way communication was discussed. Some of the comments follow:

"At least if you use more than one example, you may catch more people. It's very difficult to catch all the students with an example for which they have some background and can understand. If you make an analogy to something,  

\[ TA's \text{ as taken from seminar tape.} \]
in geology particularly, and you make it to one specific area of the country—that you may know a whole lot about—a lot of people here in geology refer to Utah (all geology undergraduate majors spend one summer at a field station in Utah) all the time and use Utah as an example, when many of the students haven't been there, it means nothing. So it seems to me that you have to be careful when you use an example that it is something which is familiar to all the people to whom you are talking."

"So you are saying that when you are speaking to a group like this, with direct communication, you have at least to know what kind of group you are speaking to."

"You have to have some general idea of the background."8

Another comparison which was made between the two models was the use of audiovisual materials. Professor One used no material except for one hastily drawn picture on the chalkboard, but Professor Two used slides, maps, charts and the chalkboard.

Examples of the TA interchange follow:

"How are you going to show the sewage sloshing back and forth? You can't, I mean, he was talking about things that people can imagine but would be very difficult to photograph, whereas, was showing things that would be very difficult to imagine if you hadn't seen them, but a photograph made them quite clear."

"Visual aids often make something more meaningful to people who are listening to a talk, than just to tell them about something although I imagine most of us have pretty good mental pictures of

8 Ibid.
that sewage sloshing back and forth in the Hudson."

"Yes, but I think the reason that we have is because we have seen it or some picture of it. I doubt if everyone has. I think it would have helped if we would have had visual aids, at least slides of it."

"I think the blackboard use was pretty effective in these two cases. I mean, you could visualize Columbus had grown like that. ____ had a more dynamic picture, while ____ just drew it . . . . ____ was showing the progressive changes; he was also doing that with his slides showing the different pictures at different times. I don't know if this is so much a function of teaching style or a function of what they are talking about."

"Just to add to that, there is a basic difference in what they are trying to do. ____ was just talking in generalities, and the only time he did get into specifics it was necessary for him to illustrate his point with a diagram. . . . I guess what we saw was just one generalization after another not requiring any type of really specific illustration. On the other hand, ____ was talking about a specific problem. For this particular kind of talk, slides were a necessary ingredient to illustrate his points."

"If the roles had been reversed. I'm sure ____ would have used slides in ____'s lecture and ____ would not have used slides in ____' lecture. That's really a function of two different people with two different styles."

"Sometimes these audiovisual things are used wrong. I've sat through numerous cases where the person is obviously not prepared and he is using slides for merely filling in time."

"There are problems in lots of aids even the blackboard. If you're in a large lecture hall the people in back can't see what's on the board."

"When a professor turns around and writes on the chalkboard, he's facing away from the class and if he's talking while he's writing, he's talking into
the chalkboard which means that the kids in back will not hear as well as not see."

"But in a smaller class, if the guy turns toward the blackboard, rather than interrupt his train of thought, just continues to speak, I don't see anything wrong with that. I don't think anyone should adopt a hard and fast rule that they only speak when facing the class. It makes it seem unnatural."

"There's always the character who writes with one hand and erases with the other."

"Or who writes everything on the board. Starts with one board and fills up the board and comes back and starts over again."

"I think one problem at the blackboard is people who put really intricate diagrams on the blackboard which you have no prayer of ever reproducing in your notes."

"... you miss the points the guy's making when the whole problem could have been alleviated by simply having the professor mimeograph whatever it was he wanted to do beforehand and just hand it out so you didn't have to waste your time fooling around with an impossible task."

"In one class I knew they spent a lot of time before class putting the intricate diagrams on the board and then changing them during class. If the same amount of time could be spent, as you say, putting them on stencils, Then you know everyone has got the same thing."

"On the other hand, if you walk into a room and get 15 or 16 handouts, and for the rest of the hour have no idea which one the guy is talking about or anything else."

"These are supposed to be two examples of people who are pretty good at this direct communication; but how many people do present a lecture this good, and use slides and glowing examples?"
"I think the main thing that sets these two apart from certain teachers is organization showing good planning and preparation. They care enough to work hard at it."9

During the last part of session four, the participants were asked to consider (1) that which the TA's could change about their labs, (2) that which could not be changed because of scheduling or administrative difficulties including money, and (3) that which the department could do to change the situation. These questions started heated and sometimes cynical discussion. Some of the comments follow:

"Well I have one comment on that one, I think the whole direction of those introductory courses needs to be reexamined. For one thing, there has to be some attempt made to standardize the courses. As it stands now, the professor is told that he is going to teach and it's my impression that for many, not for all, but for some of them, it's a chore that one wants to get over with because he has to teach it once a year or whatever and it's a big pain in the neck. The way it turns out is that if you have ten people teaching this course, you get ten different courses."

"That's something the department could change."

"Right, and yet you're still using the same materials and the end result is bad in some cases. Some quarters in both 101 and 102 you have prime examples of what utter chaos is like and so is 100."

"Seven different lecturers."

"It would be very simple for the department, without limiting academic freedom or anything like that, to standardize the course."

9 Ibid.
"What are some suggestions for the department to help them?"

"Labs could be correlated with lecture. That would be very easy to do."

"Lab shouldn't be considered as a separate entity, lab should be used to illustrate what goes on in lecture. That's the purpose of lab."

"It's very important, this correlation."

"What do you do in 100? You've got a course with the same questions every time. Especially in 100, I don't think there is anything TA's can do to help the situation."

"That's not quite true, you see what their problems are if they don't understand, not only what they're doing but how to do it. Okay? Now we can tell them how to do it because that's what we are supposed to do. We're supposed to be able to ask questions about how to do it, technicalities. That's our job."

"They're all solvable problems, that's what makes it so frustrating."

"It's not solvable, I don't think on the TA level."

"It's not solvable on our level, but like I've said this to myself a thousand times, you know, if I was lecturing in this course, there wouldn't be these problems, and I'm sure everybody else says the same thing."

"They can't go to a guy (professor) and say that's the big problem. Write a syllabus, what's the big deal everyone ends up teaching the same thing. Decide what's important and do it that way."

"I don't see the relationship between members in the course and organization. That's not the biggest problem."

"The worst, basic problem stems from the fact that there is no correlation between lab and lecture, and that there is no organization in the lecture."
How to handle students was always a concern of the TA's. Some excerpts from the tape are:

"We can handle all those hoards of people."

"Just by the simple switching from the TA's milling around the room to being given specific groups increased the interaction between TA's and students, I'd say by three times."

"We changed that and it worked quite well in courses that were organized and correlated with lab."

"We get it from the students."

"Why shouldn't we get it from the students. Totally unnecessary"!

"It's your fault—at least in students eyes."

"Of these problems we've discussed there are few or none the department doesn't have control over."

"I think it's a selling job, you've got to sell them. You've got to know your stuff and your students to keep it interesting."

"Everybody here knows what it's like to try to get some interest out of the students. That's kind of discouraging after a while."

"I think people are too pessimistic. These people are still exercising some free will in what course to take and they're not all taking geology because they think it's the easiest course."

"Be realistic"!

"If you want to talk about advertising, I'd be hesitant to sign up if someone told me how it's been. I'd expect our enrollment to drop if the word were spread."

"That may solve the money problem."
The informal session which followed with 11 of the TA's continued in this vein. New courses were proposed, one to be taught by rotating professors. Another course proposed would be a series of field trips using experts in various fields of geology and being a reward for doing well in the introductory sequence. It was suggested that TA's take over small sections of 101 and 102 and teach the whole thing, laboratory and lecture. There was a sort of camaraderie formed by the voicing of their opinions and learning others shared the same ideas.

The seminars opened for discussion some of the areas in which there had been dissatisfaction among TA's. There was surprise shown by some TA's that other TA's had the same feelings. Many of the instructional and interactional topics were considered important by the TA's, and feedback from the TA's indicated that they tried some of these methods discussed.

Chapter IV will treat the role conflict assessment. Topics to be discussed are: development of the role conflict assessment instrument, observations made in laboratories taught by the TA's, and taped interviews with the TA's.
CHAPTER IV

ROLE CONFLICT ASSESSMENT

Development of the Role Conflict Assessment Instrument

In order to measure some of the effects of an inservice seminar on TA's, an instrument for measurement was necessary. The basis for the development of the Role Conflict Questionnaire was the complaints the TA's had about what bothered them. It was decided that, if the intensity of their discomfort decreased after attending an inservice seminar, it might be possible to measure this.

The chronology for the development of the Role Conflict Assessment Instrument follows:

1. The investigator interviewed the TA's to find what were their complaints and dissatisfactions.
2. Preliminary items were written reflecting the material received from the TA interviews.
3. Dr. James K. Duncan and Dr. John Belland reviewed the items and made suggestions about rewriting items and adding others. In writing items, two things were considered essential to the form of each item—each item was to describe a situation and then pose a problem.¹

¹Getzels and Guba,"Role, Role Conflict, and Effectiveness."
4. The items were then investigated by two TA's who were not in the study. Discussions were held with the two TA judges about the items. These TA's were considered mature and knowledgeable about the department, being a TA, and investigation procedures.

5. Belland and Duncan reviewed the comments of the TA's and suggested revision of the instrument.

6. The revised instrument was again investigated by the two TA's.

7. The TA's agreed that the revised instrument better reflected the actual situations.

8. The Role Conflict instrument was administered to Biology 100 TA's.

9. A second administration to the Biology TA's was made.

In writing the Assessment Instrument, the situations that were given to the investigator by the TA's as complaints were turned into items for an instrument to be administered before and after the seminars (see Appendix). In writing items for the Role Conflict Questionnaire much care was taken to describe accurately a situation which had been described by the TA's. The interviews with individual TA's contained similar material, and could be divided into: complaints about students, role-conflict between teaching and student roles and the TA's self-perception as
teachers, complaints about the specific situation in the Geology Department at The Ohio State University, and complaints about their status as TA's in the Department of Geology. The item in the questionnaire reflected these areas. The following are the four main problem areas and illustrations of items dealing with these problems:

**Students**

The items in this area reflect the conflict the TA's feel in teaching students whom they feel are intellectually incapable, ill prepared, or not motivated to study geology. The Ohio State University has an open enrollment policy that allows any Ohio high school graduate to enroll as a freshman. Each student who matriculates at The Ohio State University must take 15-credit hours in Humanities, 15-credit hours in Social Sciences, and 15-credit hours in Natural sciences divided between biological and physical sciences. A student may take a ten-hour sequence in the 100 level Geology courses to fulfill the physical science requirement. This situation causes concern in the TA's. Typical items on the questionnaire are:

3. The undergraduate student has limited experience and understanding in geology and this tends to make it boring to work with them.

4. The general university policy presently admits many students who have limited ability in science. This results in TA's being asked to deal with a large number of students who do not seem to be qualified to study geology.
Role conflict

At The Ohio State University much of the undergraduate teaching is done by TA's. The undergraduates soon learn that many TA's have little authority, cannot cite them for cheating, and have their own work as students which they must complete. The TA must change his posture from teacher to student daily with some problems arising for him from performing in these two areas.

Typical items are:

5. The department of Geology expects the TA's to help students learn but fails to give them enough control over which topics are treated in the labs or how the material is to be presented.

9. Graduate students have a heavy course load in addition to their teaching responsibilities, TA's often have trouble in budgeting time.

11. A professor sometimes makes schedule changes concerning exam times, laboratory procedures, etc. If these changes are not received by TA's in time for class, students lose confidence in the TA.

Self-perception

Most TA's have little or no training for teaching. In this study two people in the sample had been enrolled in education courses and done student teaching as undergraduates. Many feel unsure of their ability to teach and ask for help from anyone who has had experience in teaching.

Typical items are:

15. TA's are not trained as teachers or lecturers, but they must give talks to the students in their labs.
22. TA's are given considerable instruction about how to teach certain labs in the fall, but little help during the winter and spring. If an assignment is changed or if a TA is new these quarters, there is some frustration.

Situation

Most of the complaints TA's made came from the situation. The TA's felt the Geology Department could do much to better the situation. Many said it would cost no money, but a little time, thought, and effort to clear up the problems the TA's felt were in the introductory courses. In all the interviews, the TA's voiced concern about the quality of the course and the frustration they felt at not being able to change the situation. They said, many professors teach the course the same way from year to year, some do not attempt to coordinate the lecture material with the laboratories, and there are several different courses (contentwise) being taught using the same laboratory exercises. For example, there were seven different professors lecturing in Geology 100 spring quarter. In most cases, the TA's claimed, the only similarity was the adopted textbook and the laboratory.

Typical items are:

20. There is not enough coordination between the labs and the lectures, as a result of this situation the TA must teach concepts which have not been discussed in the lecture portion of the course.
17. The lab equipment is often in a mess and must be straightened in order for it to be used. The TA is responsible for this type of activity, which takes little skill or intelligence.

24. Some of the lab exercises have been used for years without much revision. Some contain irrelevant material which the TA must teach.

Status

The TA's feel that they are in an ambiguous position of not knowing when they are to act or get permission to act. TA's who procter examinations do not have authority to take an examination paper away from a student who is cheating. If the professor does not show up for the examination, the student may continue to cheat. In the Geology Department the status of the TA is different from some other university departments where the TA has autonomy in the course he teaches. In the Geology Department the TA is a support for the professors. Many graduate students in all areas feel that if one does not display humility, his graduate program will be slowed if not halted.

Typical items are:

12. The TA's spend considerable time and effort to help students learn. The professors fail to properly acknowledge this effort.

13. To the TA, the work he does is important in the total scheme of the undergraduate education program. It is disconcerting to learn that there is little selectivity in the choice of graduate students as TA's.
14. In the job of teaching as a TA, there are as many problems as there are in being a professor. However, the benefits of the position are not available to the TA.

Twenty-five items were used in each questionnaire. There were two questionnaires, identical except for directions. The participant was to respond to the first questionnaire by indicating how much each item bothered his colleagues and to the second questionnaire by indicating how much each item bothered him personally. The items were arranged in the same order on both questionnaires, but in random order as to classification of items. The participants were asked to respond on a five point scale as follows:

Questionnaire Part 1

The situations described below may bother your colleagues who are TA's. Please put a circle around 0 if you think that the situation described would not bother them; put a circle around 1 if you think that it would not bother them much; put a circle around 2 if you think that it would bother them some; put a circle around 3 if you think it would bother them a good bit; and put a circle around 4 if you think it would bother than a lot.

Questionnaire Part 2

As a TA, the situations described below may bother you. Please put a circle around 0 if the situation described does not bother you; put a 1 if the situation described would not bother you much; put a 2 if the situation would bother you some; put a 3 if the situation bothers you a good bit; and put a circle around 4 if the situation described bothers you a lot.
The instrument was first discussed with the two TA's who were not in the study. Errors and ambiguities were noted verbally to the investigator. All items questioned were rewritten for correctness and clarity. If both TA's agreed that the item was bad or repeating another, the item was discarded. Of thirty-two items originally written, twenty-five were retained. The first two TA's passed on the items retained. On February 12, the questionnaires were given to a group of TA's in Biology. Fifteen returned the questionnaires by February 17. The second set of questionnaires was given to these fifteen TA's who returned the first questionnaire. Seven were returned by February 22. Little usable information was obtained from these.

On the basis of prior efforts to establish reliability and validity it was believed that the test was sufficiently valid and reliable for use in this study.

Administration of Instrument

On February 9, at the beginning of the first in-service seminar of methodology of teaching and learning, the questionnaires were distributed to the sample of Geology TA's who were to take part in the study. The investigator gave some explanation as to the way it was to be filled out. The term role-conflict was not used, and there were very few questions about how the instrument was
to be used. It required approximately one half hour for the
TA's to respond to the questionnaires.

The second administration was during the third week
of spring quarter (eight weeks after the first administra-
tion). A letter was written to each TA requesting that he
fill out the questionnaire again and return it to the
investigator in five days. All were returned but two, and
when contacted these TA's responded and returned the
questionnaires. Results of changes in the two administra-
tions, one pre-seminar and the other post-seminar, were
then computed.

Observations
Between May 6 and June 2, the investigator observed
twenty laboratory sessions of Geology 101 and Geology 102.
Observations were made of nine TA's in their laboratory
assignments. The other TA's in the sample were not teaching
these laboratories spring quarter. Anecdotal notes were
made on the laboratory sessions. The investigator was
particularly looking for those questioning techniques,
teaching strategies, and interpersonal relations that had been discussed in the seminars.

Interviews
It was necessary to get more personal data on indi-
vidual TA's, and to get their feelings about teaching, their
situation, and the inservice seminars. Taped interviews were held with each TA in the sample. The following questions were asked of each TA:

I.
1. Name
2. Age
3. Marital status
4. How far along the TA's is in graduate program?
5. What area of the U.S. the TA considered home?
6. How long had the TA been at The Ohio State University? As a graduate student?
7. Whether the TA had served in same capacity at another college or university. If yes, comparison of the situations in the two schools.

II. The second set of questions concern teaching role.

1. Do you like to teach?
2. Do you plan to teach after graduation?
3. Does your teaching role cut into time you need for other activities?
4. What do you feel is your status in regard to the University? That is, do you feel you are employed by the university or do you feel you are a student being supported by the university while getting an educational experience?
5. Please give a free response, that is tell anything you would like to this question--what does teaching mean to you?

III. The third set of questions deals with your students

1. Give the first thing that comes to mind--your students.
2. How do they measure up against the students you were in class with as an undergraduate?
3. What are the students' attitudes toward Geology?
4. Please give a free response to the following question:
   What do you think of the undergraduate students at Ohio State in general?

IV. The fourth section concerns the seminar you attended. during winter quarter, please be candid, it will help us design any later experience (another seminar) of this sort.
1. Did the workshop or seminar provide practical information?
2. Was the experience in the seminars professionally stimulating?
3. Was the content appropriate to your needs?
4. Please give me a free response to the question—Whether the workshop had a positive or negative impact on you and what was it?

V.
1. What do you think should be included in a good training seminar for TA's?
2. Do you believe that any changes can be made in the situation as a result of complaints and suggestions being voiced in the seminar? In other words can this study have any impact for change?

The TA's were enthusiastic about giving their opinions individually. The investigator had strong feelings about abusing the TA's time and adding to the conflict for TA's. The interviews were kept short—they lasted between fifteen and twenty minutes for each. Many of the TA's wanted to hear the replay, and on hearing their responses made additional comments.

Chapter V will deal with the treatment of the data from the various sources. Both quantified and non-quantified data will be included.
CHAPTER V

ANALYSIS OF DATA

Data were collected on the demographics of the geology TA's, the process of conducting the inservice program, the reduction of role conflict, the TA's perceptions of their teaching, and the actual teaching of the TA's. These data are presented and analyzed below.

Description of Sample

The sample was made up of those TA's who taught or had taught in the 100 level Geology courses at The Ohio State University and were free to attend the inservice seminars. Out of a population of 22, 16 volunteered to participate. Of the sixteen who participated, there were three females and thirteen males. There was a range of ages from 21 through 28. There was one who was 21 years old, one who was 22, four were 23, five were 24, two were 25, two were 26, and one was 28. The median age was twenty-four years and the mean was 24.06 years. Seven of the participants said Ohio was home; five were from the state of New York; two were from New England, one from Connecticut, the other from Massachusetts; one was from
<table>
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<tr>
<th></th>
<th>Below 23</th>
<th>23 - 26</th>
<th>Over 26</th>
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<tbody>
<tr>
<td>Age</td>
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<tr>
<td>Marital Status</td>
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<td></td>
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<tr>
<td>Single</td>
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<tr>
<td>Length of Time in Graduate School at Ohio State University</td>
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<tr>
<td>5 Quarters or Less</td>
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<td>Had Teaching Assistantship at Other School</td>
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<td>Yes</td>
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<td></td>
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<td>No</td>
<td>12</td>
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<tr>
<td>Had Some Kind of Formal Teaching Experience Before</td>
<td></td>
<td></td>
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<tr>
<td>Yes</td>
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<tr>
<td>No</td>
<td>10</td>
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</table>
Tennessee and the other was from Pennsylvania. It was not possible to note any regional differences.

Of the sixteen participants, seven were married and nine were unmarried. Eight of the participants had received undergraduate degrees from institutions with enrollments under 20,000 students and eight had received undergraduate degrees from institutions with enrollments greater than 20,000 students. Six participants were working toward a Ph.D. degree and ten participants were working toward a Master's degree.

Analysis of Role Conflict Data

An instrument designed for the purpose of discerning the role conflict was administered before and several weeks after the training period. Two tests were given, one, to judge how the TA perceived the intensity of role conflict in the group and, two, how the TA perceived the intensity of role conflict himself. Table 2 gives the totals for each TA on each of the tests, pre and post. There is a decrease in total score shown in Test I between Parts One and Two and in Test II between Parts One and Two. This suggests that the group of TA's perceived other TA's as having a greater conflict than they as individuals perceived themselves.
Table 3 shows a comparison of perceived group role conflict pre-seminar and delayed post-seminar. There is a definite shift to less role conflict for the group, as perceived by the TA's in the study, after the seminar as shown by the totals and the mean decrease after the training session.
**TABLE 3**

**COMPARISON OF PERCEIVED GROUP ROLE CONFLICT**
**PRE-TRAINING AND POST-TRAINING**

<table>
<thead>
<tr>
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<th>Pre-Training</th>
<th>Post-Training</th>
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<td>69</td>
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<td>54</td>
<td>54</td>
<td>0</td>
</tr>
</tbody>
</table>

Total (N=16) | 834 | 743 | -91 |
Means          | 52.12 | 46.43 |

Table 4 gives the individual TA's total on self-perceived role conflict. It shows that there was a decrease in total role conflict for the individuals. This is evidenced by the decrease in total scores on Part Two of the Role Conflict assessment instrument from the pre-seminar to the delayed post-seminar testing. The mean decrease was from 45.06 to 40.12, a decrease of 4.94 mean points.
TABLE 4
COMPARISONS OF PERCEIVED INDIVIDUAL ROLE CONFLICT
PRE-TRAINING AND POST-TRAINING

<table>
<thead>
<tr>
<th>TA</th>
<th>Pre-Training</th>
<th>Post-Training</th>
<th>Points Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>63</td>
<td>47</td>
<td>-16</td>
</tr>
<tr>
<td>2</td>
<td>48</td>
<td>12</td>
<td>-36</td>
</tr>
<tr>
<td>3</td>
<td>38</td>
<td>24</td>
<td>-14</td>
</tr>
<tr>
<td>4</td>
<td>41</td>
<td>53</td>
<td>+12</td>
</tr>
<tr>
<td>5</td>
<td>35</td>
<td>38</td>
<td>+3</td>
</tr>
<tr>
<td>6</td>
<td>44</td>
<td>38</td>
<td>-6</td>
</tr>
<tr>
<td>7</td>
<td>70</td>
<td>73</td>
<td>+3</td>
</tr>
<tr>
<td>8</td>
<td>61</td>
<td>58</td>
<td>-3</td>
</tr>
<tr>
<td>9</td>
<td>42</td>
<td>33</td>
<td>-9</td>
</tr>
<tr>
<td>10</td>
<td>51</td>
<td>44</td>
<td>-4</td>
</tr>
<tr>
<td>11</td>
<td>48</td>
<td>40</td>
<td>-5</td>
</tr>
<tr>
<td>12</td>
<td>45</td>
<td>40</td>
<td>+12</td>
</tr>
<tr>
<td>13</td>
<td>44</td>
<td>13</td>
<td>-9</td>
</tr>
<tr>
<td>14</td>
<td>22</td>
<td>24</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>24</td>
<td>24</td>
<td>0</td>
</tr>
<tr>
<td>16</td>
<td>45</td>
<td>57</td>
<td>+12</td>
</tr>
<tr>
<td>Total</td>
<td>721</td>
<td>642</td>
<td>-79</td>
</tr>
<tr>
<td>Mean</td>
<td>45.06</td>
<td>40.12</td>
<td></td>
</tr>
</tbody>
</table>

A t-test for the difference between two means for correlated samples was run on the scores for two tests.¹ A one-tailed test was used because of the expected shift in only one direction. The t value for the mean difference pre and delayed post-seminar test on how the TA's perceived their colleagues was 1.64 (p < .01). The t value for the mean difference pre- and delayed post-seminar test on how the TA's perceived their own conflict was 1.56 (p < .01). These findings warrant rejecting the null hypothesis (p < .01).

that an inservice seminar can have no effect on the reduction of role conflict in TA's in the Geology Department of The Ohio State University.

Role Conflict in Their Peers As Perceived by TA's.

Part One of the pretest and posttest gives the amount of role conflict the TA's perceive in their colleagues. The most persistent item of conflict is the lack of coordination between the laboratories and the lectures. Both items 20 and 21 refer to this lack of coordination and score highest in the role conflict score—both on the pretest and the posttest. Tables 5 and 6 show the relation between the means on the highest items of conflict both pretest and posttest. The tables show a reduction in conflict caused by the situation after the inservice seminar. This reduction may be due to the TA's learning in the seminars that they are not alone in their reaction to the situation or it may be due to a general acceptance of the situation or adaptation to the situation.

To further examine the data from the role conflict assessment the items were ranked in order of degree of intensity of conflict. There were 25 items and the top 27 per cent and bottom 27 per cent of the items were drawn out for further study.
### TABLE 5

RANKING OF ITEMS SHOWING MOST CONFLICT ON PRETEST PART I

<table>
<thead>
<tr>
<th>Rank</th>
<th>Item</th>
<th>Mean Score for Total Sample on Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21</td>
<td>3.00</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>2.93</td>
</tr>
<tr>
<td>3</td>
<td>23</td>
<td>2.87</td>
</tr>
<tr>
<td>4</td>
<td>24</td>
<td>2.81</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
<td>2.56</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>2.43</td>
</tr>
</tbody>
</table>

Some professors are not aware of what is going on in the lab sections of the courses they are teaching. Some of the frustrations could be alleviated by better coordination of subject material from lecture to lab.

There is not enough coordination between the labs and the lectures, as a result of this situation, the TA must teach concepts which have not been discussed in the lecture portion of the course.

The laboratory sections are too large. A conscientious TA finds it difficult to help all.

Some of the lab exercises have been used for years without enough revision. Some contain irrelevant material which the TA must teach.

A professor sometimes makes schedule changes concerning exam times, laboratory procedures, etc. If these changes are not received by TA's in time for class, students lose confidence in the TA.

While TA's are expected to encourage learning through laboratory experience, the students seem to be so disinterested with the end result that little real teaching can be accomplished.
<table>
<thead>
<tr>
<th>Rank</th>
<th>Item</th>
<th>Item</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>25</td>
<td>2.06</td>
<td>At the elementary level, geology can be taught through field work. The lack of field work in the introductory courses cannot be remedied through the present laboratory settings.</td>
</tr>
<tr>
<td>Rank</td>
<td>Item</td>
<td>Mean Score for Total Sample on Item</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>-------------------------------------</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td>2.75</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>21</td>
<td>2.68</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>2.68</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>24</td>
<td>2.50</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>18</td>
<td>2.50</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>2.25</td>
<td></td>
</tr>
</tbody>
</table>

1. There is not enough coordination between the labs and the lectures, as a result of this situation, the TA must teach concepts which have not been discussed in the lecture portion of the course.

2. Some professors are not aware of what is going on in the lab sections of the courses they are teaching. Some of the frustrations could be alleviated by better coordination of subject material from lecture to lab.

3. A professor sometimes makes schedule changes concerning exam times, laboratory procedures, etc. If these changes are not received by TA's in time for class, students lose confidence in the TA.

4. Some of the lab exercises have been used for years without enough revision. Some contain irrelevant material which the TA must teach.

5. In some instances failure to revise course experiences results in the lab experiences remaining unchanged from quarter to quarter. This makes it difficult for TA's to teach with enthusiasm.

6. The Department of Geology expects the TA's to help students learn but fails to give them enough control over which topics are treated in the lab or how the material is to be presented.
Table 6—Continued

<table>
<thead>
<tr>
<th>Rank</th>
<th>Item</th>
<th>Mean Score for Total Sample on Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>23</td>
<td>2.18 The laboratory sections are too large. A conscientious TA finds it difficult to help all.</td>
</tr>
</tbody>
</table>

Items 1 and 25 rank in the top seven in the pretest of Part One but not in the posttest. They are replaced with items 18 and 5 in the posttest for Part One. Item 1 is concerned with students interest. The reduction in score may be due to better perception of students due to discussions in the seminars of students and their problems. Item 25 is concerned with lack of field work. The reduction of conflict on this item may be due to work in the seminars with audiovisual materials to simulate actual field conditions.

Item 18 was not in the top 27 per cent on the pretest Part 1 but scored higher on the posttest Part 1. Item 18 is quite similar to item 24 which scored in the upper 27 per cent on both pretest and posttest. These items (18 and 24) are concerned with the failure to revise laboratory experiences from year to year. This relates to the main item of conflict on coordination of laboratories to the lectures which is the area discussed most often as the area causing the most TA dissatisfaction. Item 5
over which TA's perceive their colleagues to have a conflict ranks in the first seven in the posttest. This rise in rank could be related to their insistence that there be better coordination. They may not have perceived this as such a problem with their peers until the seminar sessions.

The items which were rated by the TA's as causing their colleagues the least conflict rated the same after the seminars (see Tables 7 and 8). There were two exceptions to this, item 16 about the reasons students did not attend laboratories did not rate in the lowest seven on the posttest. This item was replaced by item 4, about students not being qualified to study geology. After the seminar discussion on perceptions of the learner and students, the TA's learned that their peers as a whole did not feel the students were unqualified to study geology. It goes along with item 3, which the TA's feel causes the least amount of conflict. Item 3 states that it is boring to work with these students because of limited experience and knowledge.

Role Conflict in TA's as They Perceive Themselves

In the pretest the items with highest role conflict scores on Part Two of the instrument which the TA's scored as their personal "bother" scale were very much the
<table>
<thead>
<tr>
<th>Rank</th>
<th>Item</th>
<th>Mean Score</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>0.87</td>
<td>The undergraduate student has limited experience and understanding in geology and this tends to make it boring to work with them.</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td>1.18</td>
<td>Sometimes the labs change each quarter according to the professor teaching the course. A TA learns to teach a certain lab and it is often changed the next quarter.</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>1.31</td>
<td>The undergraduate student has had limited experience with laboratory equipment. This tends to make him careless with the equipment and places an extra burden on the TA.</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>1.31</td>
<td>Ability is not a criterion for placement of students into particular lab sections. The TA seldom gets to work with students of superior ability.</td>
</tr>
<tr>
<td>5</td>
<td>15</td>
<td>1.50</td>
<td>TA's are not trained as teachers or lecturers, but they must give talks to the students in their labs.</td>
</tr>
<tr>
<td>6</td>
<td>16</td>
<td>1.50</td>
<td>There may be two reasons students do not attend labs: (1) they are not an integral part of a particular course and the students know they will not be tested on them, and (2) they are not scheduled into a specific lab section. The result of this situation is that the labs are not busy and the TA is left to stand around doing nothing.</td>
</tr>
</tbody>
</table>
TABLE 7—Continued

<table>
<thead>
<tr>
<th>Rank</th>
<th>Item</th>
<th>Mean Score</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>13</td>
<td>1.62</td>
<td>The TA believes the work he does is important in the total scheme of the undergraduate education program. It is disconcerting to learn that there is little selectivity in the choice of graduate students as TA's.</td>
</tr>
<tr>
<td>Rank</td>
<td>Item</td>
<td>Mean Score for Total Sample on Item</td>
<td>Item</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>-------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>1.06</td>
<td>The undergraduate student has limited experience and understanding in geology and this tends to make it boring to work with him.</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>1.06</td>
<td>The undergraduate student has had limited experience with laboratory equipment. This tends to make him careless with the equipment and places an extra burden on the TA.</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>1.18</td>
<td>The general university policy presently admits many students who have limited ability in science. This results in TA's being asked to deal with a large number of students who do not seem to be qualified to study geology.</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>1.25</td>
<td>Ability is not a criterion for placement of students into particular lab sections. The TA seldom gets to work with students of superior ability.</td>
</tr>
<tr>
<td>5</td>
<td>19</td>
<td>1.37</td>
<td>Sometimes the labs change each quarter according to the professor teaching the course. A TA learns to teach a certain lab and it is often changed the next quarter.</td>
</tr>
<tr>
<td>6</td>
<td>13</td>
<td>1.31</td>
<td>The TA believes the work he does is important in the total scheme of the undergraduate education program. It is disconcerting to learn that there is little selectivity in the choice of graduate students as TA's.</td>
</tr>
<tr>
<td>7</td>
<td>15</td>
<td>1.43</td>
<td>TA's are not trained as teachers or lecturers, but they must give talks to the students in their labs.</td>
</tr>
</tbody>
</table>
same as those which they (see Tables 9-10) indicated bothered their peers (see Tables 5 and 6). One exception to the commonality of highest scoring items was item 17 which ranked seventh highest on the individual scale but less on the group scale. Item 17 has to do with having to clean up the laboratory which could be construed as a menial task. The individual TA could easily see this as an inconsequential annoyance which bothered him but he didn't feel able to express it until after the seminars where he found others were bothered by the same thing.

On the posttest (Table 10) the same items have high scores for individual "bother" as in the pretest. Number 5 and number 11 are in the top seven in role conflict for the individual in the posttest but not in the pretest. Both of these items are concerned with self-concept of the TA which he may have felt more secure in expressing after the seminars.

As individuals, the TA's express the least amount of concern pretest and posttest on item 3 (see Tables 11-12). Item 3 ranks lowest in concern on all four of the tests. This item describes the situation of lack of experience and knowledge making the undergraduate boring to teach.
### TABLE 9
RANKING OF ITEMS SHOWING MOST CONFLICT ON PRETEST PART 2

<table>
<thead>
<tr>
<th>Rank</th>
<th>Item</th>
<th>Score</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>23</td>
<td>3.06</td>
<td>The laboratory sections are too large. A conscientious TA finds it difficult to help all.</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>2.81</td>
<td>While TA's are expected to encourage learning through laboratory experience, the students seem to be so disinterested with the end result that little real teaching can be accomplished.</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>2.75</td>
<td>There is not enough coordination between the labs and the lectures, as a result of this situation, the TA must teach concepts which have not been discussed in the lecture portion of the course.</td>
</tr>
<tr>
<td>4</td>
<td>21</td>
<td>2.75</td>
<td>Some professors are not aware of what is going on in the lab sections of the courses they are teaching. Some of the frustrations could be alleviated by better coordination of subject material from lecture to lab.</td>
</tr>
<tr>
<td>5</td>
<td>24</td>
<td>2.62</td>
<td>Some of the lab exercises have been used for years without enough revision. Some contain irrelevant material which the TA must teach.</td>
</tr>
<tr>
<td>6</td>
<td>18</td>
<td>2.37</td>
<td>In some instances failure to revise course experiences results in the lab experiences remaining unchanged from quarter to quarter. This makes it difficult for TA's to teach with enthusiasm.</td>
</tr>
<tr>
<td>Rank</td>
<td>Item</td>
<td>Item</td>
<td>Mean Score For Total Sample on Item</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>7</td>
<td>17</td>
<td>2.31</td>
<td>The lab equipment is often in a mess and must be straightened in order for it to be used. The TA is responsible for this type of activity which takes little skill or intelligence.</td>
</tr>
<tr>
<td>Rank</td>
<td>Item</td>
<td>Mean Score</td>
<td>Item</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>21</td>
<td>2.93</td>
<td>Some professors are not aware of what is going on in the lab sections of the courses they are teaching. Some of the frustrations could be alleviated by better coordination of subject material from lecture to lab.</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>2.56</td>
<td>There is not enough coordination between the labs and the lectures, as a result of this situation, the TA must teach concepts which have not been discussed in the lecture portion of the course.</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
<td>2.56</td>
<td>Some of the lab exercises have been used for years without enough revision. Some contain irrelevant material which the TA must teach.</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>2.43</td>
<td>The Department of Geology expects the TA's to help students learn but fails to give them enough control over which topics are treated in the lab or how the material is to be presented.</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
<td>2.31</td>
<td>A professor sometimes makes schedule changes concerning exam times, laboratory procedures, etc. If these changes are not received by TA's in time for class, students lose confidence in the TA.</td>
</tr>
<tr>
<td>6</td>
<td>23</td>
<td>2.25</td>
<td>The laboratory sections are too large. A conscientious TA finds it difficult to help all.</td>
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<tr>
<td>Rank</td>
<td>Item</td>
<td>Mean Score for Total Sample on Item</td>
<td>Item</td>
</tr>
<tr>
<td>------</td>
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<td>-------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>7</td>
<td>18</td>
<td>2.12</td>
<td>In some instances, failure to revise course experiences results in the lab experiences remaining unchanged from quarter to quarter. This makes it difficult for TA's to teach with enthusiasm.</td>
</tr>
<tr>
<td>Rank</td>
<td>Item</td>
<td>Item</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>-----------------------------</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>The undergraduate student has limited experience and understanding in geology and this tends to make it boring to work with them.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td>Sometimes the labs change each quarter according to the professor teaching the course. A TA learns to teach a certain lab and it is often changed the next quarter.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>TA’s are not trained as teachers or lecturers, but they must give talks to the students in their labs.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>The undergraduate student has had limited experience with laboratory equipment. This tends to make him careless with the equipment and places an extra burden on the TA.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>There are not enough different areas of financial support for graduate students. Too many TA’s are required to work in the labs whether or not they enjoy teaching.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>Ability is not a criterion for placement of students into particular lab sections. The TA seldom gets to work with students of superior ability.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>The general university policy presently admits many students who have limited ability in science. This results in TA’s being asked to deal with a large number of students who do not seem to be qualified to study geology.</td>
<td></td>
</tr>
<tr>
<td>Rank</td>
<td>Item</td>
<td>Mean Score</td>
<td>Item</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>------------</td>
<td>------</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>0.81</td>
<td>The undergraduate student has limited experience and understanding in geology and this tends to make it boring to work with them.</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>0.87</td>
<td>Ability is not a criterion for placement of students into particular lab sections. The TA seldom gets to work with students of superior ability.</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>1.00</td>
<td>The general university policy presently admits many students who have limited ability in science. This results in TA's being asked to deal with a large number of students who do not seem to be qualified to study geology.</td>
</tr>
<tr>
<td>4</td>
<td>22</td>
<td>1.06</td>
<td>TA's are given considerable instruction about how to teach certain labs in the fall, but little help during the winter and spring. If an assignment is changed or if a TA is new these quarters, there is frustration.</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>1.12</td>
<td>The undergraduate student has had limited experience with laboratory equipment. This tends to make him careless with the equipment and places an extra burden on the TA.</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>1.12</td>
<td>The TA's spend considerable time and effort to help students learn. The professors fail to properly acknowledge.</td>
</tr>
<tr>
<td>7</td>
<td>14</td>
<td>1.18</td>
<td>In the job of teaching as a TA, there are as many problems as there are in being a professor. However, the benefits of the position of professor are not available to the TA.</td>
</tr>
</tbody>
</table>
It is significant that the pretest and posttest are different on several items showing a change in perception by the TA's concerning their role. The posttest has lower scores on items concerning the TA's perception of their professional status. This seems to indicate that after the seminars the TA's are less concerned with the way they are perceived by faculty or they don't feel as much conflict because of a lack of recognition of their efforts as TA's.

There is a consistent change in role conflict scores from high to low. This shows a shift after the seminars to less role conflict.

Analysis of Interview Data

In order to get data on the participants which was unavailable by other means, audio-taped interviews were made with each of the sixteen people in the sample. Some of the demographic data was collected in this fashion. Much effective information was obtained from general feelings to feelings about teaching students, and training seminars.

Teaching

All sixteen people in the sample said that they liked to teach, but some were more enthusiastic about teaching than others. One commented that yes, sometimes he liked to teach if he had nothing else to do. Other comments to the question "Do you like to teach?" were:
"Definitely," "I love it," "Yes, very much so." "Yes, I enjoy it." "Yes, I think it's fun." "Yes I do, I really enjoy it." "Yes, I find it's fun at times."

Thirteen people said they planned to teach, two said not at first but eventually. Three did not plan to teach. One said he would teach, "partially, research and teach at the same time."

When asked if teaching cut into time needed for other things, three said it did, 13 said it did not. Some comments were, "Not too badly," "No, I don't let it," "It cuts into time I should be spending on courses," "It did this quarter," "Rarely," "Occasionally, but it doesn't overly effect me that way," "Not appreciably, No."

To the question whether the TA felt he was employed by the university or a student on a stipend getting an educational experience, ten felt they were mainly students getting an educational experience, five felt they were employees and one said "both." Two who felt they were employees had teacher training and were certified to teach earth science in secondary school, one who had a certificate to teach earth science felt it was an educational experience. Two who felt they were employees did not plan to teach after graduation. Some comments showing reactions to the question were:
"I don't feel that I am employed by the University. I think the teaching is similar to course work--maybe it should be a course--more of an internship."

"I feel both ways--both an employee and a student. I don't think they're merely supporting me, I'm doing a job for them as well."

"I feel, in my particular case, it's more a case of being supported by the University and getting an educational experience at the same time."

"In the Introductory labs, I don't really consider that it is an educational experience, strictly employment."

"I feel that I'm employed by the University. My primary function is as a teaching assistant and even though I'm working towards a degree, my primary role is still as teaching assistant."

An open response question was asked--what teaching meant to the TA. Many gave answers relating to their enjoyment at getting across knowledge about something they love, geology. Many thought of teaching as motivating students to learn about something the TA's had strong interest in or the communication of ideas they felt were important. An example of the free response was:

"Teaching is the successful communication of ideas and any way you can achieve it is a satisfactory method. Whether it is in a classroom, on the street, on a field trip, or by informal discussions, or by formal lectures. But I did say successful communication, which is a two-way street, so to speak. You need two people to communicate--both receptive."
Students

The TA's were asked to give the first response which came to mind when faced with the statement "My students are _____." The following are the answers received:

"Great, love them."
"I'd say generally pretty good."
"Young, young and hesitant to learn."
"General, run-of-the-mill Ohio State students. Most of them don't give a darn."
"Disinterested."
"Nice kids."
"Most of them are interested and they want to learn."
"Bored and indifferent."
"Apathetic."
"Mine."
"Very receptive to what I say."
"Trying to get a D."
"I've never really had anything I could call my students. You get into these large classes and you see a sort of endless sea of faces."
"Mostly freshmen and mostly uninterested in geology."
"Lazy."
"For the most part, lazy."

Ten of the TA's felt the students they had in laboratory were as good as their peers in undergraduate school. One thought they were better because of their
awareness, one said they weren't better or worse, but different in their interests. Three TA's who had gone to smaller schools thought that most of the students they taught would not have been able to enroll in their undergraduate schools. One felt that the background the students came with was not as strong as the undergraduate students he was in school with. Some of the comments made were:

"They're the same--generally the same. The general goals are the same, the specifics are different."

"Less disinterested than the ones I was with."

"About the same. Equally apathetic."

"About the same--I think, there have been some changes in attitude and philosophy, but I don't think it's anything major."

When the TA's were asked about their students attitudes toward geology, they all included in their answer that for most students taking geology was just fulfilling a science requirement. Some discussed the open enrollment policy at The Ohio State University which allows any Ohio high-school-student to enroll. Some said that there were a few who were interested in geology because of the emphasis placed on environmental problems at this time. The following comments are typical examples from the sample:

"In general it's just a course they have to take. "It's very difficult to get them excited about it, but usually you can muster a decent amount of interest."
"They want a "D" to fill their science requirement. That's it. I've had maybe 10 in two years who wanted to learn or cared."

"They're just satisfying a requirement and they want to do it in the most painless way possible."

Seminars

Eleven of the participants felt that the seminars gave them practical information, one did not. Four could not make the judgment as to the practicality of the material in the seminar. Some comments were:

"Not really. These were views of students that I have been working with for close to two years. Most of the ideas and most of the problems, I had heard before and we had discussed before informally in classes, out of classes, at Larry's or anywhere else."

"Yes, it did in one way. It showed me not to do all the talking in the classroom, but that I try to draw students out. One thing that bothered me, people in the seminar spent at least an hour arguing about classification schemes of what's going on in the classroom. They argued whether the classification system was good— not what it meant."

"In . . . one respect that I can think of: how to get the students to respond. This was by asking them direct questions or leading them on to other questions and not taking, 'No, I don't know' as an answer. We tried this in the lab after that one particular session and we noticed a bit of improvement."

All of the TA's felt the seminars were professionally stimulating. One said "Any time you get a group of people together, discussing topics of mutual concern, it is stimulating." One TA commented, "I finally had a chance to air some of our complaints and bring out some
constructive ideas." Another TA said, "It made me aware of things I wasn't aware of before. I will have to take a complete seminar in college teaching before I teach."

Another commented, "Yes, majority were good—techniques in teaching, method, testing, etc.

All of the TA's felt the material was appropriate. A TA commented, "Was appropriate. The best for me: observance—one being able to see yourself. Small scale analysis of TA's or whatever." Another TA said, "The session on questioning was very good. I would expand that part of it." One TA said he would have been happier with more practical techniques.

Ten TA's felt the seminars had a positive impact on them personally. Some of the reasons given for saying a positive impact were:

"It was positive. It was: go out there and try a little harder. Don't let them sit there like bumps on a log which some of them do. Go out there and push them; and we tried that; it worked."

"Positive I think. Because it showed whether people were concerned about whether their teaching methods were really working."

"Positive, in that teaching methods I employed in 100 (Geology 100) I'd never really thought about, it's just the way I did it, but the workshop gave me some insight to some other methods that had been used in teaching. I tried and it benefitted me and the students. The session on questioning was the highpoint for me."
"I'd say it was a positive impact, because it was reassuring to hear all the other TA's have the same problems I did. It made me feel that I fit in better; I didn't know how to judge myself compared to other TA's since I've never been a TA, never had an education course, and so it was reassuring."

In saying that the seminars had both a negative and a positive impact on him, one TA said,

"It was a negative impact insofar as it's kind of depressing to realize that there's probably not a whole lot you can do about the introductory courses as far as any individual or even a conscious effort by the department. As far as position impact—it was heartening to learn that a lot of TA's were concerned about the course and quality and there were a lot of good original ideas thrown out as far as modifying the course. In that instance it was a positive endeavor."

All sixteen felt that some sort of orientation or inservice was necessary for TA's. They felt that it should come before the TA has to teach, perhaps during his first teaching quarter. One TA answered,

"I think a training seminar should be given probably the first quarter a TA holds his position, and definitely while he is in a teaching situation. Most people, before they try to teach think that it is just nothing, just stand up there and come out with words of wisdom, but you find out very quickly that this is just not the case. Having training when the person is first exposed to teaching is most effective.

"A couple of us were discussing this, and as far as how to support graduate students, we thought that perhaps a first year graduate student coming from an undergraduate school should be given a research position the first year and perhaps sometime assisting in a lab; and let the people who are farther along in their studies come in and teach
the labs as TA's. As far as training—I would suggest a longer session before, one in the middle, to perhaps correct problems as they arise, and then one at the end to evaluate how they did."

"First of all they should know what they are about. People should share ideas from their different undergraduate background and talk with the professor who's going to lecture. There probably should be some training in how to ask questions and what to ask on quizzes. I know what concepts I want them to learn, but I don't know how to find out if they have learned them."

"Seminars should be held before the quarter starts, with some follow-up. There should be one person . . . to whom TA's can go for assistance with problems. I'd say a weekly encounter session if nothing more than Friday evening at some beer place. Just someplace where the TA's can meet and say—'so and so is not cleaning up the lab' or 'where in the hell is all the chalk and erasers.'"

"It would have to be held very early in their career—even before they actually teach. It should go into something about how to get the students motivated. In other words, instead of asking how do I turn on a projector, how you can get interchange going in 100. In 101, maybe a few pointers how to start a lesson—which I didn't really know too much about."

General

The TA's were asked for general comments as well as comments on whether the department was flexible enough to make changes they could afford. Thirteen felt that there was flexibility in the department and they would be willing to change things if the suggestions were presented properly, "in a responsible manner." Two were not sure, but one felt that no changes could be made because of
inflexibility. Many TA's cited the changes in Geology 102 during spring quarter to show that changes can be made. In Geology 102 spring quarter, the TA's met each week with the professor trying to coordinate the laboratories with the lecture. Much was left to the TA's about what to do in the laboratories within the framework of topics which would be covered in lecture. Another way the TA's felt the department showed flexibility was in taking the TA's suggestion to divide the large sections of the 101, 102 laboratories so each TA had his own small group of students.

Some comments about flexibility and change were:

"The department seems responsive to suggestions for change. In some cases, it appears that particular faculty members don't mesh with the type of courses to be taught. In a case like this, the department may find someone else who is more responsive to the problems, to teaching assistants and their problems."

"In the case of the University and specifically this department, the graduate and teaching assistants are chosen on scholastic ability. They can know an awful lot but have a personality which is adverse to communication of this information. So, I'm really not sure if the department could improve the TA as such because they are not chosen on their teaching ability. The coordination of lecture and labs could definitely be changed by the department."

"I think that maybe most of the problems are due to flexibility. In other words, there are no departmental controls on labs or on courses. This is where you run into trouble, having different people teaching courses, alternating quarters. You have a constant overturn in the labs and lab methods, in grading methods, in materials covered. So, I think more control is needed by the department."
"Yes, I think in the upper level 100 courses, something has occurred in the last couple of quarters, which I think has been an improvement."

"Teacher indifference with the course and lack of coordination, I don't think anything can be done about that. In reorganizing courses, I have a lot more hope that something will be done there."

"You could drop an atomic bomb on some people and they wouldn't change. I mean, it's a people thing some will change others won't. It's not so much the department."

"The TA's have quite a lot to say about what's happening in the labs and any decision they make as a group would certainly be reflected in the labs."

"I can't see them revising the whole 100 lab. The department too conservative to revise all of it even though most of the TA's felt it should be done."

**Analysis of Observation Data**

In order to see the TA's in actual teaching situations, the investigator observed twenty sessions of Geology 101 and 102 laboratories. Nine TA's were observed and anecdotal notes were made on each session. The seminars had stressed questioning, teaching strategies and interpersonal relations. In analyzing the following data from classroom observations an effort was made to be objective and to select a representative sample of the elements observed.
Questioning

There was an attempt by many of the TA's to use open questions. There were instances where direct recall questions were also used. Some examples of open questions are:

"What can you infer about the environment if you find this assemblage of fossils?"

"What do you think would happen to our animals if the climate changed drastically?"

"Alright you have the percentages of minerals what can you say about the rock?"

"That's the theory of peneplanation can you come up with an alternate explanation?"

Some closed convergent-memory questions seen were:

"Why do you think that these streams cut across structures instead of around structures?"

"What would you think of the environment and history if you had found many cephalopods here rather than brachiopods?"

"From looking at this fossil, and studying its body structure, what kind of an environment do you think it lived in?"

"What could have caused the banding on this sample of gneiss?"

Some examples of the closed or cognitive memory questions observed were:

"What phylum does this belong to?"

"What did you identify this rock sample as?"

"Show me which is the ground mass on this sample."
Many of the questions were strictly managerial. Examples observed were:

"Did any of you not receive the mimeographed sheets on identification?"

"Do you have all of the rock samples asked for in the exercise."

"How many of you need graph paper?"

Some interesting questioning interchanges took place between students and between student and TA. One example of this type of interchange took place over the identification of fossils:

1st student: "Maybe its algae."
2nd student: "Right, seaweed floats—what if it lands in mud?"
3rd student: "Couldn't it be algae?"
1st student: "It looks like it has a stem in the middle."
2nd student to TA, "Hey, could this be algae?"
TA - "What would it look like if it were algae? Tell me, why do you think this is algae?"

**Teaching strategies**

TA's were observed using direct communication, analogies, and audiovisual materials. One TA began his "mini-lecture" before the laboratory in this manner, "We're just going to have a conversation about metamorphic rocks." He showed a sample rock and asked what it meant, pointing to the lines in the sample, one student answered, "Bedding," TA "Afraid not, can you think of anything else it might be?" Answer, "How about foliation?" TA, "Good!"
Now let's see what the difference is and how it was formed." Ended discussion with, "That's what metamorphism is all about—squeezing, pressure, pushing."

One use of analogy which all the students probably had some experience with was the metamorphosis of clay. The TA said, "You wouldn't feel comfortable in a women's restroom so you find a place where you are more stable—ions do the same thing."

One TA used the chalkboard to draw a map and show how to make a cross section; he then used a large map to show how he had come up with the lines. Many samples of rocks and fossils were used when explaining characteristics. One student asked a TA if the sample were hornblende schist when asked why he thought so, answered, "color." TA responded with, "What if I told you augite was the same color?" He then explained how you can tell the difference.

Interpersonal relations

There were from six to fifteen students in the laboratories. One TA was observed in three different laboratories covering the same material. There was a marked difference in amount of interaction of the three. There was very little interaction in the laboratory from four to six o'clock. It could not be known whether the group of students was of a different makeup from other
classes. It could only be observed that while the TA behaved in the same friendly manner there was little rapport between him and the class or among class members. His other two classes, twelve till two, and one till three, were enthusiastic and worked well with the TA and each other. There were many examples to point out the good interpersonal relations in the labs. For examples

"Hey, Dave, we've got a problem over here."

"Oh, I know, the acid fizzes on dolomite, but reluctantly."

One student to others and the TA.

"Let's see if we can work together--team. I'm the individual star."

"Let's take a vote on it. Who wants to write the report here and who wants a 'take home'?"

"I don't live in Ohio, why should I do it."

"Aren't we allowed to miss a lab?"

"It's hot in here, let's take our things outside" (they did)

Since saying in the seminars that they knew very few names, it was observed that the TA's could call most of their students by first name. Only one of the TA's was observed to be called by the last name.

Two samples of the chronological records obtained through classroom observations are provided below.
1. TA took up homework that had been assigned the previous week.

2. Told students how to make cross sections—used chalkboard and simulated a map.

3. One very late student was welcomed, "Come on in Tom we were just—"

4. TA gave directions on how to do the lab. Checked the 11 students present to see if they were started properly.

5. Two students came in after directions were given.

6. TA gave directions to late comers individually going over material on making cross sections.

7. TA went from student to student giving help.

8. When problems of general interest were found, TA spoke loud enough and to the entire class, calling their attention to the problem.

9. TA corrected one who was going wrong in a supportive way, simply as an offhand suggestion, i.e., "I usually put the point down on the marked line, but if you prefer you may put the elevation for each point you have made and transfer it later."

10. Reinforced students who were doing well by saying, "That's a good start," "That's right."

11. Students working diligently.

Geology 102 laboratory May 19, 12-2 P.M.

1. Instructor (TA) gave talk on structure.

2. 12 students present.

3. TA used large map to illustrate points he was making. Students had small maps they referred to as discussion went on.
4. Students asked factual questions of TA and discussed questions with other students in the lab.

5. Different students responded to open-ended questions, "What do you think would have happened if this...?" Why do these streams cut across structures instead of around structure?

6. One student left.

7. Students worked on exercises together.

8. TA walked around and helped by asking questions leading the student to the proper conclusion.

9. Three male students kidding each other not working on exercise, TA did not stop them, they finally started working on exercise.

10. One student just sat staring into space. Started working after TA came around and the student asked him how to begin.

11. One student said she didn't understand anything about the whole course.

12. The same student gave the TA her views and asked for confirmation. He reinforced what she had said and asked her a question to make her explain more fully.

13. Comment from one student, "You shouldn't give him any points, he copied from me."

14. Much friendly, bantering interchange between students and TA.

15. One student made a big mistake in counting contour lines and transferring them to a cross-section. TA waited until student came up with right answer on his own then smiled and said, "Good, now you're on top of it."

16. Students quizzed TA about the questions coming up on the examination.
17. The atmosphere was informal and open.

Chapter VI will contain: a summary, results and some implications, and recommendations.
Summary

This investigation was conducted to study inservice education for teaching assistants in geology at The Ohio State University. To delineate some of the problems associated with serving as a teaching assistant, interviews were conducted with teaching assistants, the chairman and assistant chairman of the department, and the chairman of the graduate studies committee. A curriculum program was developed especially for this group. The program was implemented and evaluated.

A subproblem was defined after interviews with the different people and a review of the literature concerning problems of teaching assistants. The subproblem was the conflict teaching assistants have between their roles as teachers and students. The subproblem led to a measure of role conflict.

The sample was composed of 16 teaching assistants in the department of Geology. These graduate students have responsibilities for teaching the laboratory portion, but
none of the lecture portion, of the introductory courses, General Introductory Geology, Physical Geology, and Historical Geology.

Seminars were designed to include the topics of (a) instructional skills, (b) interpersonal communication skills, (c) self-perception and role perception, and (d) perceptions of the learner. A role conflict instrument was designed and administered pre- and delayed post-seminar. Four two-hour seminars were held with informal discussions held after each seminar session for those who wished to participate. Demographic and affective data were collected on each teaching assistant by means of audio-tapes. Observational data were collected on the assistants. These data were in the form of chronological anecdotal records of the teaching assistants in their actual teaching situations.

Findings

Most of the TA's were between twenty-three and twenty-six years old. The largest percentage was from Ohio with New York having only two less. They were evenly divided on marital status and length of time at The Ohio State University (nine had five quarters or less and seven had more than five quarters). Half had gone to large universities (over 20,000) for undergraduate work and half had gone to small colleges or universities. Six were working toward a Ph.D. degree and ten toward a M.S. degree.
On the role conflict analysis, it was found that there was a definite reduction of role conflict after the seminar ($p < .01$).

The items on the role conflict assessment showed that most dissatisfaction was caused by lack of coordination of laboratories and lectures. Another item of consistent conflict was an intermittent lack of communication between the professor and TA causing the TA to lose credibility with the students. Items causing least conflict changed little from pretest to posttest.

The interview data showed that the TA's liked to teach and that most of them planned to teach after graduation. Most (13 to 16) of the TA's felt their teaching rarely if ever cut into time needed for course work and they generally felt that they were students getting an educational experience rather than employees of the university. Two who felt they were employees were certified earth science teachers.

Most of the TA's felt the students were as good as their own undergraduate peers. Four felt that the undergraduates' background was not as strong as the TA's undergraduate peers.

The majority of TA's felt that students only take geology to fulfill university science requirements. A majority said the university open-door policy allowed
students with little background to enroll in courses they were unprepared to take.

The TA's felt the seminars gave practical information and were professionally stimulating. The seminar devoted to questioning techniques was considered the most helpful for the TA's particular job.

All sixteen TA's felt that inservice seminars should be held for beginning TA's. Most would have the seminars before or during the TA's first teaching experience.

Thirteen TA's felt there was enough flexibility in the Geology Department to allow for changes. They felt the changes should be suggested in a responsible manner.

In the observations of the TA's in actual teaching situations, many instances of open questions were noted. In the investigator's judgment, after studying the anecdotal records, a significant number of questions would be classed as open. There were evidence of a range of question types in the laboratories.

There were many chances to observe interaction between TA's and students. In no instance was a student treated with sarcasm or discourtesy. The TA's answered student questions patiently and gave help in a friendly manner. The TA's called the students by name.

The TA's were observed using different types of teaching strategies. In direct communication, analogies were used which seemed to be appropriate for the students
taught. There was use of different types of visual materials to aid the students in understanding the concepts underlying the exercises.

Results and Some Implications

When the demographic data on the sample were studied, there seemed to be enough diversity among the TA's to make one believe that they would be representative of a larger population. However, the investigator is cautious about generalizing findings beyond geology TA's at The Ohio State University.

Diagnosis

The preliminary interviews with the TA's to learn what bothers TA's revealed problems of interests and concerns of TA's. The conflict of roles was made evident in these interviews. It is believed that this is a way to get information to guide in the planning of inservice seminars.

Design

From the interview data, it was possible to write objectives for this specific population. This could imply that it would be possible to do this for other programs. Often the objectives are imposed upon participants in inservice, but this study shows that objectives appropriate to the needs of the specific population can be written from
data from those who will be most affected by the content.

In designing the seminars, resources and activities were available for handling some of the problems and needs of the TA's. There were other things which were not under the control of the investigator.

**Implementation**

The seminar sessions met with mixed success. There is sufficient evidence from the interview data to say that sessions three and four were the most successful. The informal sessions were quite successful. When a topic is stimulating in a structured situation, it is stimulating to discuss the same topic in informal unstructured situations.

**Evaluation**

It is clear from interview data and observation data that the program as a whole and session three particularly were received positively by the TA's.

In evaluating the success of the program, the role conflict assessment plays an important part. The rejection of the null hypothesis, that an inservice experience has no influence in reducing role conflict, has great implications, it is also a good-hard data evaluation of the program. If in a short seminar experience, there is a definite shift toward less conflict after the seminar, then
there must be potential for even greater change from a more comprehensive inservice experience.

The role conflict assessment showed that the area of greatest conflict is the perceived lack of coordination of laboratories with the lecture material. This has implications for planning the laboratory as a complement to the lecture material. The laboratory exercises could be planned to expand the concepts taught in the lecture; to give concrete examples of the concept.

The situation which causes the conflict manifested by a high score on the role conflict instrument was caused by the feeling the TA tends to lose credibility with the student. This could easily be remedied. An increase in communication in all areas such as planning, testing and particularly procedural changes would reduce the conflict in this area.

The interview data showed that the TA's like to teach. This could mean that only those who were interested in teaching volunteered to participate. It could mean that the seminar made them feel more secure, and therefore, they said they liked to teach.

The TA's felt that their teaching rarely took time needed for other things. This could be because of their positive attitude towards teaching or their department. It could also mean that they were aware that their teaching
load was lighter than that of TA's in some other departments in the university.

The fact that two TA's were certified teachers could account for the fact that they felt they were employees of the university. It could mean that the other TA's did not feel competent as teachers. It seems to point to the fact that most TA's have chosen the student role as the dominant one. It would be interesting to compare the relative success of two such subgroups as students.

One can observe an open quality to the performance of the TA's in the laboratories evidenced quite often. In view of the comments made about students being apathetic and lazy, it would seem to be an interesting idea to study. Why do TA's treat students well in the laboratories and still classify them as lazy and apathetic?

An item of evaluation of the program taken from the interviews was that TA's perceived the seminars to have positive worth in helping them with their problems in teaching. In view of this, establishing more extensive inservice activities could be the way to improve a large percentage of college teaching. It could be important for establishing a precedent for the college teacher to continue to try to improve his teaching after he takes a fulltime position as professor.
Outcomes

Although the TA's found many things which needed attention, they still had a positive feeling about the department. They felt that there were evidences that the department was encouraging innovation and the people were flexible enough to accept changes. This would seem to imply that with all who are involved being change oriented, some really worthwhile things could be done.

Three examples where change was observed in the participants after the seminars were:

In the seminars, the participants voiced concern that the undergraduate students were not qualified to be in college and apathetic to learning. In the laboratories the TA's were observed interacting warmly with the students. It may not be possible to say definitely that this was cause and effect, but the action did follow a discussion where the emphasis was on good interpersonal relations.

Along the same line, the TA's said it was impossible and unimportant to learn students' names. In the laboratories, they were observed using the names of students.

One complaint in the preliminary interviews was the large laboratory sessions. The laboratories were divided before spring quarter so that each TA had a small group of students he was responsible for.
Whether this division was a result of TA's complaints voiced in the seminars is conjecture, but the reorganization did take place after the seminars.

One of the most important implications is for the type of treatment given the problem. It is believed the findings show that, in many educational research problems, the results can be obtained through interview and observation data. This has been reinforced by the statistical treatment of the role conflict data. These data corresponded well with data obtained by other means.

**Recommendations**

To confirm and extend the findings of this investigation, the following recommendations were made:

1. Inservice seminars should be held to train TA's for their teaching responsibilities.

2. There should be more coordination between the laboratory exercises and the lecture material.

3. There should be good communication between professors and TA's concerning such areas as: philosophy, sequences, and any managerial changes early enough to disseminate to all students.

4. There should be continual evaluation and revision of the laboratory material.

5. A study be made comparing those TA's having had teacher training with other TA's who have not.

6. There should be TA input into curriculum changes.
7. Professors who teach the same course should meet together regularly to insure the development of a uniform course.

8. Selection criteria for TA's be revised to include an aspect of teaching competency.

9. The TA should be well aware of the expectations the Geology Department has of him in order to minimize role conflict.

Secondary teachers of science are supervised for an extended period of time before they are allowed to teach. Our college students are no less important, we must prepare their teachers. At the present, there are no internship or methodological requirements for the college teacher of geology. He must only prove a subject matter and research competency in his bachelor's degree program. It would seem that a supervised practice and methodological study built into the training would provide more effective college teachers. No surgeon is allowed to operate without this supervised practice, we must not allow future college geology teachers to move into the college teaching profession unable to provide education of reasonably good quality or the students they will be teaching. For the present generation of TA's, inservice training seems to be the answer.

While it would be unfair for all geology undergraduates to take teacher education courses, it would certainly
be advantageous for those who are going on for graduate work and expect to get a teaching assistantship. It may seem utopian to expect this type of preparation, but it would improve the quality of undergraduate education.

Undergraduate education could also be improved if the professors were exposed to this type of training during their graduate career. It is not suggested that content competency is not desirable. Nor is it being suggested that there are not Ph.D.'s in geology who are not intuitively good teachers. It is, however, being suggested that there is space in a graduate career for teacher education. Perhaps one quarter of internship and training before a TA becomes exposed to his first class on his own, could be beneficial. It may be expensive to support a TA for this quarter, but it could return the money many times in quality of undergraduate teaching. Many more expensive changes are being made which may not have the same effect on the undergraduate program. College teaching must be improved at all levels. Untrained teachers are too costly.
PART 1

The situations described below may bother your colleagues who are TA's. Please put a circle around 0 if you think that the situation described would not bother them; put a circle around 1 if you think that it would not bother them much; put a circle around 2 if you think that it would bother them some; put a circle around 3 if you think it would bother them a good bit; and put a circle around 4 if you think the situation would bother them a lot.

1. While TA's are expected to encourage learning through laboratory experience, the students seem to be so disinterested with the end result that little real teaching can be accomplished. 0 1 2 3 4

2. Questions asked by students fall into two major categories: (1) concepts involved in the subject matter and (2) the use and location of equipment. Too often the student questions are concerned with the equipment. 0 1 2 3 4

3. The undergraduate student has limited experience and understanding in geology and this tends to make it boring to work with him. 0 1 2 3 4

4. The general university policy presently admits many students who have limited ability in science. This results in TA's being asked to deal with a large number of students who do not seem to be qualified to study geology. 0 1 2 3 4

5. The department of geology expects the TA's to help students learn but fails to give them enough control over which topics are treated in the labs or how the material is to be presented. 0 1 2 3 4

6. The undergraduate student has had limited experience with laboratory equipment. This tends to make him careless with the equipment and places an extra burden on the TA. 0 1 2 3 4
7. Ability is not a criterion for placement of students into particular lab sections. The TA seldom gets to work with students of superior ability. 0 1 2 3 4

8. There are not enough different areas of financial support for graduate students. Too many TA's are required to work in the labs whether or not they enjoy teaching. 0 1 2 3 4

9. Graduate students have a heavy course load in addition to their teaching responsibilities, as a result, TA's often have trouble in budgeting time. 0 1 2 3 4

10. The elementary nature of introductory geology courses often means that TA's assigned to only Geology 100, 101, 102 do not get a chance to teach more advanced geologic concepts. 0 1 2 3 4

11. A professor sometimes makes schedule changes concerning exam times, laboratory procedures, etc. If these changes are not received by TA's in time for class, students lose confidence in the TA. 0 1 2 3 4

12. The TA's spend considerable time and effort to help students learn. The professors fail to properly acknowledge this effort. 0 1 2 3 4

13. The TA believes the work he does is important in the total scheme of the undergraduate education program. It is disconcerting to learn that there is little selectivity in the choice of graduate students as TA's. 0 1 2 3 4

14. In the job of teaching as a TA, there are as many problems as there are in being a professor. However, the benefits of the position of professor are not available to the TA. 0 1 2 3 4
15. TA's are not trained as teachers or lecturers, but they must give talks to the students in their labs.

16. There may be two reasons students do not attend labs: (1) they are not an integral part of a particular course and the students know they will not be tested on them, and (2) they are not scheduled into a specific lab section. The result of this situation is that the labs are not busy and the TA is left to stand around doing nothing.

17. The lab equipment is often in a mess and must be straightened in order for it to be used. The TA is responsible for this type of activity which takes little skill or intelligence.

18. In some instances, failure to revise course experiences results in the lab experiences remaining unchanged from quarter to quarter. This makes it difficult for TA's to teach with enthusiasm.

19. Sometimes the labs change each quarter according to the professor teaching the course. A Ta learns to teach a certain lab and it is often changed the next quarter.

20. There is not enough coordination between the labs and the lectures, as a result of this situation the TA must teach concepts which have not been discussed in the lecture portion of the course.

21. Some professors are not aware of what is going on in the lab sections of the courses they are teaching. Some of the frustrations could be alleviated by better coordination of subject material from lecture to lab.

22. TA's are given considerable instruction about how to teach certain labs in the fall, but little help during the winter and spring. If an assignment is changed or if a TA is new these quarters, there is some frustration.
23. The laboratory sections are too large. A conscientious TA finds it difficult to help all.

24. Some of the lab exercises have been used for years without enough revision. Some contain irrelevant material which the TA must teach.

25. At the elementary level, geology can be taught through field work. The lack of field work in the introductory courses cannot be remedied through the present laboratory settings.
PART 2

As a TA, the situations described below may bother you. Please put a circle around 0 if the situation described does not bother you; put a 1 if the situation described would not bother you much; put a 2 if the situation would bother you some; put a 3 if the situation bothers you a good bit; and put a circle around 4 if the situation described bothers you a lot.

1. While TA's are expected to encourage learning through laboratory experience, the students seem to be so disinterested with the end result that little real teaching can be accomplished. 0 1 2 3 4

2. Questions asked by students fall into two major categories: (1) concepts involved in the subject matter and (2) the use and location of equipment. Too often the student questions are concerned with the equipment. 0 1 2 3 4

3. The undergraduate student has limited experience and understanding in geology and this tends to make it boring to work with him. 0 1 2 3 4

4. The general university policy presently admits many students who have limited ability in science. This results in TA's being asked to deal with a large number of students who do not seem to be qualified to study geology. 0 1 2 3 4

5. The department of geology expects the TA's to help students learn but fails to give them enough control over which topics are treated in the labs or how the material is to be presented. 0 1 2 3 4

6. The undergraduate student has had limited experience with laboratory equipment. This tends to make him careless with the equipment and places an extra burden on the TA. 0 1 2 3 4

7. Ability is not a criterion for placement of students into particular lab sections. The TA seldom gets to work with students of superior ability. 0 1 2 3 4
Part 2 continued

8. There are not enough different areas of financial support for graduate students. Too many TA's are required to work in the labs whether or not they enjoy teaching. 0 1 2 3 4

9. Graduate students have a heavy course load in addition to their teaching responsibilities, therefore, TA's often have trouble in budgeting time. 0 1 2 3 4

10. The elementary nature of introductory geology courses often means that TA's assigned to only Geology 100, 101, 102 do not get a chance to teach more advanced geologic concepts. 0 1 2 3 4

11. A professor sometimes makes schedule changes concerning exam times, laboratory procedures, etc. If these changes are not received by TA's in time for class, students lose confidence in the TA. 0 1 2 3 4

12. The TA's spend considerable time and effort to help students learn. The professors fail to properly acknowledge this effort. 0 1 2 3 4

13. The TA believes the work he does is important in the total scheme of the undergraduate education program. It is disconcerting to learn that there is little selectivity in the choice of graduate students as TA's. 0 1 2 3 4

14. In the job of teaching as a TA, there are as many problems as there are in being a professor. However, the benefits of the position of professor are not available to the TA. 0 1 2 3 4

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19. Sometimes the labs change each quarter according to the professor teaching the course. A TA learns to teach a certain lab and it is often changed the next quarter.

20. There is not enough coordination between the labs and the lectures, as a result of this situation the TA must teach concepts which have not been discussed in the lecture portion of the course.

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24. Some of the lab exercises have been used for years without enough revision. Some contain irrelevant material which the TA must teach.

25. At the elementary level, geology can be taught through field work. The lack of field work in the introductory courses cannot be remedied through the present laboratory settings.
APPENDIX B
MEMORANDUM

TO: TA's in Biology

FROM: Mildred Graham, Graduate Student in Education and Geology

RE: Validation of instrument for dissertation.

Many graduate students must rely on their colleagues for help with dissertation projects. I find myself in this position.

I am soliciting your aid in the validation of this test. It will take approximately 1/2 hour to complete and the retest will be given you on Friday. Please return the first test to Mrs. Sanders in room 60 by Wednesday, February 17th. The retest will be given you Friday, February 19th to be returned to Mrs. Sanders on Monday, February 22nd.

Please answer the questions as to biology wherever the term geology is used.

Thank you for your cooperation.

Mildred W. Graham
### QUESTION CATEGORY SYSTEM

<table>
<thead>
<tr>
<th>Level I</th>
<th>Level II</th>
<th>Level III</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CLOSED QUESTIONS (limited number of acceptable responses)</td>
<td>A. COGNITIVE MEMORY*</td>
<td>1. RECALL; Includes repeat, duplicate, memorized definitions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. IDENTIFY or NAME or OBSERVE</td>
</tr>
<tr>
<td></td>
<td>B. CONVERGENT THINKING*</td>
<td>1. ASSOCIATE and/or DISCRIMINATE: CLASSIFY</td>
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<tr>
<td></td>
<td></td>
<td>2. REFORMULATE</td>
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<tr>
<td></td>
<td></td>
<td>3. APPLY: previously acquired information to solution of new and/or different problem</td>
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<td></td>
<td></td>
<td>4. SYNTHESIZE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. CLOSED PREDICTION: Limitations imposed by conditions or evidence</td>
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<tr>
<td></td>
<td></td>
<td>6. MAKE &quot;CRITICAL&quot; JUDGMENT: using standards commonly known by class</td>
</tr>
<tr>
<td>II. OPEN QUESTIONS (greater number of acceptable responses)</td>
<td>C. DIVERGENT THINKING*</td>
<td>1. GIVE OPINION</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. OPEN PREDICTION: data insufficient to limit response</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. INFERENCE</td>
</tr>
<tr>
<td></td>
<td>D. EVALUATIVE THINKING*</td>
<td>1. JUSTIFY; behavior, plan of action, position taken</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. DESIGN: new method(s), formulate hypotheses, conclusion(s)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. JUDGE A: matters of value, linked with affective behaviors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. JUDGE B: linked with cognitive behaviors</td>
</tr>
</tbody>
</table>

### III. MANAGERIAL
Teacher uses to facilitate classroom operations, discussion

### IV. RHETORICAL
Teacher uses to reinforce a point; does not expect (or want) a response

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*1. Cognitive-memory: evidence understood to be directly available (textbook, previous lesson or discussion, film, filmstrip, chart, experiment, field trip, etc.)

2. Convergent thinking: evidence directly available but not in the form called for by question

3. Divergent thinking: evidence for response not directly available
4. Evaluative thinking: evidence may or may not be directly available, criteria for responding available, directly or indirectly. Implication that student may be called upon to provide a defense for his response.

P. Blosser 1/70

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