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AN OBSERVATION OF COMMUNICATION PATTERNS AND THE DEVELOPMENT OF ATTITUDES
TOWARD THREE INNOVATIVE ASPECTS OF A METHODS OF EDUCATION CLASS

A Dissertation Presented

By

James Edward Catone

Submitted to the Graduate School of the
University of Massachusetts in
partial fulfillment of the requirements for the degree
of

DOCTOR OF EDUCATION

July

1976

Major Subject:

Education

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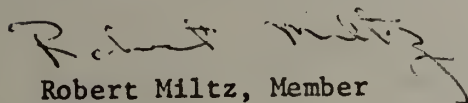
July 1976

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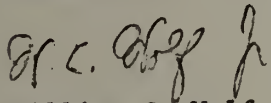
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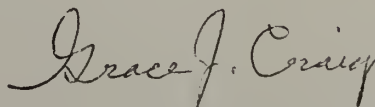
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Robert Miltz, Member



William C. Wolf, Jr., Member



Grace J. Craig, Acting Dean
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PREFACE

Although this investigator has long been interested in the study of innovation, it was not until this investigation was undertaken that a full appreciation of the field of diffusion research was realized. Diffusion, the process by which innovations spread to members of a social system, has many aspects. Diffusion researchers study communication channels, information sources, receiver variables, rates of adoption, characteristics of innovations, and change agent behavior, to name a few. The process of diffusion has been studied as part of such fields as rural sociology, medical sociology, education, anthropology, and marketing.

Largely through the work of Everett Rogers, the research findings of diffusion from various disciplines have been brought together. With Floyd Shoemaker, a comprehensive report of diffusion research results is presented in Communication of Innovations. It is through this book, preparing the related research for this study, and the investigation itself that the author has developed an appreciation of the cross-disciplinary approach to the study of diffusion. This author has drawn on the work of researchers of the many disciplines mentioned and has found the experience interesting and stimulating. For persons who read this study, it is hoped that an appreciation of this approach can be gained and, consequently, we in teacher education continue to explore ways of incorporating several disciplines into the field.

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ABSTRACT

AN OBSERVATION OF COMMUNICATION PATTERNS AND THE DEVELOPMENT OF ATTITUDES
TOWARD THREE INNOVATIVE ASPECTS OF A METHODS OF EDUCATION CLASS

(July 1976)

James Edward Catone, B. S., State University of New York at Albany

M. Ed., State University of New York at Buffalo

Directed by: Dr. R. Mason Bunker

This study has focused on three areas: (1) attitude and communication; (2) homophily and heterophily, and (3) opinion leaders and liaisons. The following seven hypotheses were postulated:

Communication Patterns and Attitude

1. As the group mean score of attitudes toward modules, competencies, and self-initiating learning activities increases, there will be no significant increase in the percentage of upward communication patterns in the population from the first week to the sixth week nor from the first week to the twelfth week.
2. As the group mean score of attitudes toward modules, competencies, and self-initiating learning activities increases, there will be no significant increase in the percentage of downward communication patterns in the population from the first week to the sixth week nor from the first week to the twelfth week.
3. As the group mean score of attitudes toward modules, competencies, and self-initiating learning activities increases, there will be no significant increase in the percentage of horizontal communication patterns in the population from the first week to the sixth week nor from the first week to the twelfth week.

Homophily and Heterophily

4. There will be no significant difference between scores of cosmopolitanism between individuals of a dyadic pair during the first, sixth, and twelfth weeks.

5. As the group mean scores of attitudes toward modules, competencies, and self-initiating learning activities increases, there will be no significant increase in the means of the differences between scores of cosmopolitanism of a dyadic pair.

Opinion Leaders and Liaisons

6. There is no relationship between persons who are considered opinion leaders the first week and persons who are considered opinion leaders the sixth week or the twelfth week.
7. There is no relationship between persons who act as liaisons the first week and persons who act as liaisons the sixth week or the twelfth week.

In addition, the following research questions were posed:

1. What are the characteristics of opinion leaders?
2. What are the characteristics of liaisons?

A t-test was used to determine significant increase in mean attitude scores for competencies, self-initiating learning activities, and modules. Increases in percentage of communication patterns were determined and compared to attitude scores. Since only one measurement for competencies reached the .05 level, the hypotheses concerning attitudes were only partially tested. A t-test was used to determine significance for the means of the differences between cosmopolitanism scores of dyads. In addition, sociometric analysis revealed opinion leaders and liaisons. Information gathered from data collection sheets was used to describe the characteristics of the opinion leaders and the liaisons.

The results indicated there was no relationship between the competency mean attitude score and communication patterns from the

first to the second measurement. No significant relationship was found between competency mean attitude score and means of the differences in regard to cosmopolitanness scores of dyads. There was, however, a significant increase in the means of the differences in regard to cosmopolitanness scores of dyads between the second and third measurements and between the first and third measurements. This finding indicated that there was a trend toward heterophily. Sociometric analysis revealed the existence of a total of five opinion leaders and one liaison. Except for one measurement interval, the subjects nominated as opinion leaders were different for each measurement interval. One liaison was identified at the time of the third measurement. No attempt was made to test the hypothesis regarding change in liaison role since only one was identified. Finally, the characteristics of opinion leaders and the liaison are described.

Discussion includes conclusions and possible explanations for the results obtained. In addition, implications for teacher education are discussed and suggestions for further research are presented.

C H A P T E R I

INTRODUCTION TO THE PROBLEM

"An innovation is an idea, practice, or object perceived as new by an individual" (Rogers and Shoemaker, 1971, p. 19). What is important is not whether it is actually new in terms of the individual's reaction to it, but that it is perceived as new. Rogers and Shoemaker go on to say:

"New" in an innovative idea need not be simply new knowledge. An innovation might be known by an individual for some time (that is, he is aware of the idea), but he has not yet developed a favorable or unfavorable attitude toward it, nor has he adopted or rejected it. The "newness" aspect of an innovation may be expressed in knowledge, in attitude, or regarding a decision to use it. (1971, p. 19)

The introduction of innovations is likely to result in varied reactions in individuals: ranging from rejection to acceptance. Innovations may be received with enthusiasm, frustration, or even hostility. In their report on "Student Learning in a Restructured Environment" at Southern Methodist University's School of Business Administration, Dunbar and Dutton noted the following:

From the instructor's point of view, the purpose and the design of the course were clear enough and reflected their beliefs as to what was necessary for student learning to occur. Specifically, for students to learn they would have to be active and responsible for their own behavior. However, many students felt lost and confused with this unfamiliar structural design. Some responded with curiosity, exploring what could be done in the new situation. But others became passive, sullen, or even violently angry because they could not understand what was expected of them. (1972, pp. 27-28)

This investigator observed similar reactions when three innovations (modules, competencies, and self-initiated learning

activities) were introduced in a methods of education course at Norwich University. A module is defined as a self-contained learning unit which generally has one central theme. Each module consists of a title, prerequisites (if any), general goal, competencies to be developed, resources, learning activities, evaluation, and extending (self-initiated) activities. (Appendix A) Although students were expected to complete a module with minimum competency, they had an opportunity to achieve a higher level competency through involvement in extending activities. The competencies listed for each module serve the same purpose as objectives in that they set minimum goals for students to achieve. Student reaction to these three innovations ranged from favorable to unfavorable, consistent with those reported above.

Reactions represent behavioral aspects of an individual's underlying attitude, and since attitudes toward an innovation precede acceptance or rejection, it is appropriate to study attitude development (Crandall, 1972; Lin, 1966; Hoffler, 1958).

The research on innovation also suggests that a relationship exists between communication and attitude (Lin, 1968; Crandall, 1972; Coughenour, 1964). Coughenour states: "One suspects that the attitude is primarily a product of the functioning of the communication structure in the diffusion process" (1964, p. 538).

Other research studies have identified key persons in the communication process as those who influence others or control the flow of information (Lin, 1968; Whyte, 1954; Blake, 1970; Jacobson

and Seashore, 1951; Weiss and Jacobson, 1955).

This investigation is an attempt to understand student reactions to innovation by the study of attitude development and its relationship in a classroom situation where few studies have focused.

The Rationale for the Study

The conceptual framework for this study has been developed from the area of diffusion research. Rogers defines diffusion as the process by which an innovation spreads: "The diffusion process is the spread of a new idea from its source of invention or creation to its ultimate users or adopters" (1962, p. 13). Several diffusion concepts and research methodologies seem particularly applicable for the study of innovative classroom structures and processes. The classroom provides an environment where variables can be readily manipulated and measured. Since this study focuses on communication patterns, such patterns can be readily identified in the classroom through sociometric techniques.

In fact, diffusion researchers have called for the study of group interaction (Rogers and Jain, 1968; Lin, 1968; Gross, 1971; Hilfiker, 1970; Rogers, 1971). Rogers and Jain (1968) point out that one of the biases resulting from diffusion research which was concerned with the study of adoption practices of farmers was that the focus was on the individual to the exclusion of social structures and organization variables. Attention should be directed less toward the individual as a unit of analysis and more toward the study of

group interaction as a unit of analysis.

In summarizing James Coleman (1958), Rogers (1971) justifies the use of the sociometric dyad, network, or clique as units more appropriate for investigating the process aspects of diffusion than demographic data collected about individuals. In a series of transfers of messages from sources to receivers, it is appropriate to utilize relationships or transactions among individuals rather than individuals per se.

Diffusion research needs to begin focusing on interaction among individuals within organizational settings. Specifically, research needs to be directed toward communication patterns which develop in a group. Rogers and Jain (1968) suggest as one of their four potential conceptual emphases in diffusion research in organizations the study of communication variables. They further suggest that communication variables affect the diffusion effects variables (such as attitude). Miller states: "The communication of information characterizing an innovation between individuals of a social system, is an essential feature of the adoption and diffusion process" (1968, p. 20).

Communication among individuals, then, should make a difference in the development of attitudes toward an innovation. The question has been raised by Rogers and Jain, "To what extent does diffusion occur between individuals who are homophilous in their characteristics, beliefs, and attitudes?" (1968, p. 5). They define homophily as the degree to which two individuals who interact are

similar. They suggest that diffusion research has shown that much information flow about an innovation occurs between pairs of individuals who are homophilous. They further raise the question: "When heterophily (the degree to which two individuals who interact are dissimilar) occurs, what is the nature of the communication pattern?" (1968, p. 5) This study addresses itself to such questions raised by Rogers and Jain (1968). Specifically, the degrees of homophily and heterophily are studied using pairs of individuals in order to establish communication patterns among them in a methods of education class. It is believed that analysis of communication patterns will reveal key persons in the diffusion process: liaisons¹ and opinion leaders.² Once identified, characteristics of these key persons can be analyzed.

In this study, the major dependent variable examined is attitude development toward three innovative aspects of a methods of education course: modules, competencies, and self-initiated learning activities. While diffusion research has mainly centered on innovativeness as the dependent variable, researchers have recently suggested that other dependent variables, such as attitude, should be studied. Lin (1968) has listed among the several weaknesses of diffusion research, overemphasis on innovativeness as the dependent variable.

¹ A term used interchangeably with "gatekeepers." Lin (1968, p. 10) describes gatekeeper as the immediate disseminator who exerts power in determining to what extent information about the innovation will be diffused.

² Rogers and Shoemaker (1971, p. 35) define opinion leadership as "the extent to which an individual is able to informally influence other individuals' attitudes or overt behavior in a desired way with relative frequency."

More recently, Rogers (1971) has observed that little attention is given to the consequences of innovation while almost total concentration has been on the dependent variable of innovativeness. He maintains that investigators should try to explain the consequences of innovation of education rather than innovativeness per se. He also proposes a model for studying change in education in which consequences of innovativeness become the "new" dependent variable. (Appendix B)

Rogers and Jain (1968) further suggest that a major dependent variable in studies of forced innovation decisions should be the teacher's attitude toward an innovation. They maintain that an organization may manipulate the overt behavior of its members, but that the teacher's attitude toward the innovation affects continued adoption or discontinuance of the idea over a relatively longer time period. If one of the goals of the introduction of modules, competencies, and self-initiated learning activities is to have students transfer these ideas in their own teaching, then developing a positive attitude toward them is more important than their practice of them with a forced-choice environment (the college methods class).

A study reported by Lin (1968) serves as a basis for this study in terms of concepts studied and methodologies utilized. Lin (1968) analyzed structural properties of school faculties in order to describe the diffusion of an education innovation (flexible scheduling) in three Michigan high schools. Awareness and innovation internalization (attitude) data were combined with sociometric data

to determine whether differences in variability of awareness data were due to differences in communication patterns. Further sociometric analysis determined isolates, cliques, opinion leaders, and liaisons. She found that the organization with highest degree of innovation internalization (attitude) and smallest variability in first awareness of flexible scheduling among the members had a communication structure superior³ to that of the other two schools studied. That is, the school in which the teachers showed the most favorable attitude toward flexible scheduling and at the same time showed the lowest degree of variation in terms of the time in which teachers first became aware of flexible scheduling had a communication network superior to the other two schools. This suggests that a communication network influences the rate at which attitude toward an innovation develops.

Studies such as the one by Lin answer the concerns expressed by Rogers and Jain (1968) in terms of conceptual emphases and research methodologies of diffusion research. That is, the study utilized relational analysis to study the relationship between attitudes toward an innovation and communication patterns among individuals. Furthermore, the research was concerned with interactive behavior in an organizational setting.

³ Lin (1968, p. 19) states: "The superiority of the organization (school 3) is reflected by the fact that it had (1) no teachers who were isolated or disconnected from the communication network; (2) no minor cliques separated from the main network; (3) no primary or secondary liaisons (which meant that the absence of one or two teachers, regardless of how crucially positioned they might be, could not break the network into cliques)."

Further studies such as that by Lin would seek to clarify the relationship between attitude toward an innovation and communication patterns in a group and at the same time could address themselves to suggestions made by diffusion researchers. The present study seeks to do such.

The Problem Defined

This investigation is concerned with the relationship between communication patterns and attitudes developed toward three innovative aspects of a methods of education class. Furthermore, the study identifies key persons in the diffusion process by constructing a characteristic profile of those persons. The study draws upon the model for diffusion developed by Rogers (1971) (Appendix C) and the concepts and methodologies from the Lin study (1968). Following the three major components of the Rogers model, the study focuses on receiver variables (antecedents) and the communication network in a social system (process) as they relate to the development of an attitude toward an innovation (consequences). Antecedents are those conditions present in a social system or in individuals (receivers) prior to the beginning of the innovation-decision process. The process variables include communication sources and channels and the perceived characteristics of an innovation. The consequences include adoption, discontinuance or rejection of the innovation, and attitudes toward the innovation.

In order to determine characteristics of individuals,

demographic data has been collected by administering a data collection sheet. (Appendix D) This information has been combined with sociometric analysis to determine communication patterns between persons as well as degrees of homophily and heterophily and to construct a profile of key persons in the diffusion process. Attitudes toward the innovative aspects of the methods course were determined three times during the semester. This information has been compared with communication patterns to determine differences between developing attitudes and developing communication patterns.

The following definitions will be used in this study:

Attitude score is the score derived from student responses to a semantic differential instrument which measures attitudes toward modules, competencies, and self-initiated learning activities.

Cosmopolitanness score is derived from points assigned⁴ to the following receiver variables: time of entry in the Psychology and Education Department as an education major; previous awareness or knowledge of modules, competencies, or self-initiating learning activities; number of books or articles read not required as part of an education course.

Dyad is a pair of individuals in interaction.

Downward communication pattern is a communication pattern derived from the "cosmopolitanness" scores and sociometric dyad. A person

⁴ See Data Collection Sheet for point assignment (Appendix D)

with a high score chooses a person with a low score to talk to about modules, competencies, and self-initiating learning activities.

Upward communication pattern is indicated when a person with a low cosmopolitaness score chooses a person with a high cosmopolitaness score to talk to about modules, competencies, and self-initiating learning activities.

Homophily is the degree to which two individuals who interact are similar.

Heterophily is the degree to which two individuals who interact are dissimilar.

Horizontal communication pattern is indicated when persons with similar cosmopolitaness scores choose each other to talk to about modules, competencies, and self-initiating learning activities.

Opinion leaders are defined as students whose sociometric scores fall within the top ten percent of the scores in a population of twenty-six. The sociometric score is derived from the choices made by fellow students. The weighted score is arrived at by the following method: first choice = 3 points; second choice = 2 points; and third choice = 1 point.

A liaison is defined as a student whose absence from the group structure would break one connected group into at least two separate subgroups.

Receiver is defined as a student reacting to the innovation.

The study focuses on three major areas of concern: (1) the interaction between pairs of individuals and the relationship of this interaction to the development of attitudes toward modules, competencies, and self-initiating learning activities; (2) the degrees of homophily and heterophily that exist between pairs of individuals; and (3) characteristics of liaisons and opinion leaders within cliques and/or subcliques.

Regarding the first area of concern the following null hypotheses are tested:

1. As the group mean score of attitudes toward modules, competencies, and self-initiating learning activities increases, there will be no significant⁵ increase in the percentage of upward communication patterns in the population from the first week to the sixth week nor from the first week to the twelfth week.
2. As the group mean score of attitudes toward modules, competencies, and self-initiating learning activities increases, there will be no significant⁵ increase in the percentage of downward communication patterns in the population from the first week to the sixth week nor from the first week to the twelfth week.
3. As the group mean score of attitudes toward modules, competencies, and self-initiating learning activities increases, there will be no significant⁵ increase in the percentage of horizontal communication patterns in the population from the first week to the sixth week nor from the first week to the twelfth week.

Regarding the second area of concern the following null hypotheses will be tested:

⁵ With a population of N=26, arbitrarily a change of 10 percentage points in the number of communication patterns was chosen to represent a significant increase.

4. There will be no significant⁶ difference between scores of cosmopolitaness between individuals of a dyadic pair during the first, sixth, and twelfth weeks.
5. As the group mean scores of attitudes toward modules, competencies, and self-initiating learning activities increases, there will be no significant⁷ increase in the means of the differences between scores of cosmopolitaness of dyadic pairs.

Regarding the third area of concern the following null hypotheses will be tested:

6. There is no relationship between persons who are considered opinion leaders the first week and persons who are considered opinion leaders the sixth week or the twelfth week.
7. There is no relationship between persons who act as liaisons the first week and persons who act as liaisons the sixth week or the twelfth week.

In addition, regarding the third area of concern the following research questions will be addressed:

1. What are the characteristics of opinion leaders?
2. What are the characteristics of liaisons?

Significance of the Study

This study, in utilizing diffusion research methodologies, not only adds to existing knowledge of diffusion research, but also helps to explain student reactions to innovative aspects of a methods of education class. It addresses itself to areas of concern raised by diffusion researchers; namely, that little attention has been given to the interaction

⁶ Significance will be represented by the equivalent of one standard deviation separating scores.

⁷ Level of significance is at the .05 level.

between individuals which occurs during the diffusion process. This study increases knowledge of the process by focusing on communication patterns as they relate to the development of attitudes toward an innovation. This is an area of concern in which Rogers (1971) urges more study: the consequence aspect of introducing an innovation to a group. Attitude development is an important aspect of the diffusion process because it can influence the acceptance or rejection of the innovation. With greater understanding of the relationship between communication patterns and attitude development together with manipulation of key persons in the diffusion process, the result might be a greater assurance of innovation acceptance.

The study is also significant from the point of view of methodologies utilized. Diffusion research has mainly used survey methods, but this study also utilizes sociometric techniques to determine interactive patterns among individuals. Since the diffusion process is dependent on the interaction of individuals, the continued use and refinement of sociometric techniques for studying diffusion becomes increasingly important.

Limitations of the Study

Since the study is conducted with a small intact group, the findings are not generalizable to large populations such as those used in similar studies mentioned earlier (Lin, 1966; Crandall, 1972). In their studies, the relationship between communication networks of school faculties and attitudes toward innovation were studied. Using

an undergraduate population in the study will also limit the application of the findings.

Another consideration is the fact that this researcher was also one of the instructors of the methods class. In order to reduce contamination, however, the data were not examined until the conclusion of the semester. Examination of the data may have influenced grouping of students and thus interfered with naturally occurring communication patterns. Checking the semantic differential may have caused subtle changes in the behavior of this researcher since this instrument revealed attitudes of students. While these precautions were taken, nevertheless students could have been influenced to complete the attitude scales with positive or negative attitudes directed toward the researcher instead of toward the innovations. The researcher's relationship with the students would also have to be considered as a limitation of the study.

In any research study, instrumentation is always a consideration. While the two major instruments used in the study (sociometric exercise and the semantic differential) have been widely utilized, one is not always sure of the reaction of a particular population to such instruments. The setting, administration, and attitudes toward "tests" in general could affect the results.

In summary, the limitations as seen by this researcher are: (1) use of small intact group as the population; (2) undergraduates as the population; (3) the researcher as one of the instructors of the class; and (4) the value of data gathering strategies.

Chapter Summary

Using diffusion research methodologies, this study focuses on the relationship between communication patterns and the development of attitudes toward three innovative aspects of a methods of education class. In addition, the study identifies through the collection of demographic data and sociometry, characteristics of persons who act as liaisons and opinion leaders in the diffusion process. Through the collection of demographic data, sociometric analysis, and semantic differentials, seven hypotheses are tested and two research questions addressed. The results add to the field of diffusion research and help to explain student reaction to innovation.

Organization of the Dissertation

The present study is reported in five chapters. Chapter I included: the introduction to the problem; rationale for the study; the problem defined; the study's significance and its limitations. In Chapter II, reviewed are studies of: attitude and communication patterns; homophily and heterophily; opinion leadership; and functions and characteristics of liaisons. Chapter III describes the research design, the population studied, the rationale for the use of the instruments, the procedures used in the study, and methods of analysis of data. In Chapter IV the findings are presented and analyzed. Conclusions and discussion of the findings are presented, implications for teacher education are discussed, and recommendations for further research are proposed in Chapter V.

C H A P T E R I I

REVIEW OF RELATED LITERATURE

It was reported in Chapter I that diffusion researchers have pointed out that the dependent variable in studies of innovation adoption has been innovativeness. They have called for the further study of attitude as the dependent variable. Furthermore, the researchers have criticized the fact that the unit of analysis has been the individual rather than the interaction between individuals. The issue of whether communication is mainly homophilous or heterophilous has been raised in addition to the extent to which one individual influences another. Finally, researchers have identified persons who act as liaisons between individuals and/or cliques and emphasized the need for further research as to their function and characteristics.

These questions and issues are applied to the classroom situation in this study in an attempt to understand student reaction to innovation. The study, furthermore, utilizes the concepts and methodologies of diffusion research.

The literature review in this chapter is presented in four sections. The relationship between attitude and communication patterns is presented in the first section. Studies of homophily and heterophily are reviewed in section two. In the third section an explanation of the functions of opinion leaders and their characteristics is made. Liaison functions and characteristics derived from past studies are presented in the fourth section.

Following the review, conclusions are drawn and their relationship to this study are presented. Specific references are made to the hypotheses postulated.

The related research is taken from studies representing many disciplines, including social psychology, rural sociology, medical sociology, education, and anthropology.

Attitude and Communication Patterns

Since the major concern in this study is the relationship between attitude development and communication patterns, it is germane to review such studies. This section begins with an introduction to attitude and attitude development in the context of the group and explores the use of the dyad and communication networks. Previous research studies utilizing communication networks are analyzed and related to the present study. A summary concludes this section.

Rokeach defines an attitude as a "relatively enduring organization of beliefs about an object or situation predisposing one to respond in some preferential manner" (1966, p. 530). He goes on to explain that attitude change, then, is a change in predisposition. The change would be either a change in the organization or structure of beliefs or a change in the content of one or more of the beliefs entering into the attitude organization. Sherif et al. (1965) claim attitudes refer to the stands the individual upholds and cherishes about objects, issues, persons, groups, or institutions. Individuals are influenced by others

in developing and changing attitudes. Kiesler has noted that: "An individual can express an attitude as a means of relating to other people and he incorporates the attitude of a reference group" (1969, p. 315). In the classroom situation individuals interact with one another and constitute a group. It can be assumed that members of a class through their communications influence one another's attitudes.

Sherif et al. (1965) describe an experiment by Pollis (1964) in which subjects, during the first training session, were asked to form reference scales by counting pulse rates. For the second session Pollis (1964) grouped the subjects by using sociometric analysis: (1) paired individuals equal in status, (2) paired individuals not friends, and (3) alone. A subject from each of the above categories was asked to judge the stimuli, but each reported different perceptions. He found those trained in the "group context" group showed more stability in maintaining their reference scale and those trained in the alone group showed the least stability. Sherif et al. conclude:

These findings confirm once more the powerful effect of the mere presence of other persons in affirming own positions, the superior efficacy of the group context in producing stable stands (which may be for good or evil) and individual assurance on the correctness of a stand relative to a problematic situation (1965, p. 211).

These researchers maintain that attitudes do not form without regard to others and that we do not change attitudes without regard to them. "The human group is necessarily part of the frame of reference in the study of attitudes" (Sherif et al., 1965, p. 205).

Probably the greatest advantage to be gained from linking the problems of attitude and attitude change to group contexts and the reference groups of individuals is the fact that single stands on specific issues are not discrete and unrelated items in the individual's personal scheme of things. On specific issues, his stands may be at variance with those of his group context, or even with his reference group in important respects. But whether they are or not, he is not unmindful of these people, these personal relationships with them, when his attitude on a specific issue is examined (Sherif et al., 1965, p. 212).

If individuals are to influence the group and vice versa, then channels of communication must be established. A group communication network is defined as "the patterns and channels of communication among members and subgroups of the group" (Miller, 1968, p. 36). The communication of information about innovations can be of a personal or impersonal nature. Personal communications involve a direct face-to-face exchange while impersonal communications do not involve such direct exchange. With the publication of The People's Choice, a relationship was established between these two types of communication linkages. Lazarsfeld et al. (1944) suggested the two-step flow of communication model. In their study of voter behavior it was found that certain individuals were primarily influenced by radio and print (impersonal linkage) and these individuals in turn influenced others (face-to-face contact). Later studies of farm practices by Copp and Sill (1958) and Sharma (1968) supported Lazarsfeld's notion of two types of communication linkages. In a study of farm practices in India, Sharma (1968) found that in the adoption of improved farming practices personal contacts in face-to-face situations were the basic means of communication and mass media were supporting communication

devices. In an earlier study Copp and Sill (1958), after interviewing one hundred and seventy-five farmers on three practices and classifying each as to stage of adoption, found that peer influence is highest during the interest and acceptance stage compared to other information sources, such as magazines, radio, or extension services.

While Copp and Sill (1958) identified which type of communication was most influential during certain stages in the adoption process, Sharma (1968) found that face-to-face contacts were more powerful than media throughout the adoption process. Perhaps this is due to the fact that Sharma's (1968) study was conducted in India where various media are not as readily available as in the United States. Both studies do, however, demonstrate that both communication linkages are utilized in the exchange of information about innovation.

Rogers describes the multi-flow model of communication which incorporates other models including the two-step flow model. He states:

The multi-step flow model is based on a sequential relaying function that seems to occur in most communication situations. It does not call for any particular number of steps nor does it specify that the message must emanate from a source by mass media channels (1971, p. 209).

This model is utilized in the present study because the investigation is concerned with interpersonal communication. In such studies, it is appropriate to employ the use of dyad, network, and/or clique to study communication.

The most basic unit in interpersonal diffusion is the dyad. Parks (1974) described the dyad or two-person group as the most frequent

of all social groupings and also the most important of all social groups. Moreno earlier described the dyad as "the idea and experience of the meeting of two actors, the concrete-situational event preliminary to all interpersonal relations" (1953, p. 461). Rogers and Jain (1968) describe dyadic analysis in diffusion research as obtaining information from source-receiver pairs by asking a sociometric question. Network analysis is similar to dyadic analysis except that the units of analysis consist of multiple-person communication chains rather than dyadic pairs (Rogers, 1971). Finally, clique analysis consists of determining communication groupings among members of a social system or group. Dyad, network, and clique analyses provide the means for understanding communication linkages of the multi-step flow model described above by Rogers (1971).

While studies of diffusion have not widely utilized the sociometric analyses described above, there is a trend to employ such methods in diffusion research. In two early studies (Menzel, 1955; Coleman, Katz, and Menzel, 1957), sociometric analysis was applied to the study of physicians' drug adoption practices. In these studies dyads, networks, and cliques were determined by asking such sociometric questions as: "To whom do you most often turn for advice and information?" "With whom do you most often discuss your cases in the course of an ordinary week?" "Who were the friends, among your colleagues, whom you saw most often socially?" Sociometric analysis was then compared to the date at which certain drugs were first adopted. It was found that doctors who were in direct sociometric contact with others had a higher

adoption rate than those doctors who lacked such contact. The degree of a doctor's integration among his local colleagues was strongly and positively related to the date of his use of the new drug. This suggests that communication between physicians influenced the decision to adopt the new drug. While other variables cannot be dismissed as influential, certainly messages exchanged between the doctors had an effect on the decision to adopt.

In the studies reported above, relatively small populations were used (thirty-three and one hundred twenty-five). It is not surprising, then, that Winick (1961) in a similar study among eight hundred and sixteen physicians in a city with a population of seven hundred and fifty thousand, did not obtain results similar to those found in smaller cities. He found no significant relationship between friendship groups, discussion with peers, or advice-seeking networks and drug adoption. He concluded that communication networks in large cities are of a different type than those in small ones.

Since the population of the present study is small (twenty-six), results similar to the first two studies described can be expected. That is, a significant relationship between sociometric choices and attitude should be found.

Studies in educational settings have confirmed the findings of the drug adoption studies (Carlson, 1975; Lin, 1968; and Crandall, 1972). Carlson (1965), using a sociometric question asking respondents to name their three best friends from the population of school super-

intendents within a certain area, found the number of friendship choices received by a superintendent was directly related to his rate of acceptance (favorable attitude) of modern math. The rate of acceptance was accelerated among superintendents who received a high number of choices and it was decelerated among those who received a low number of friendship choices. Those who were more integrated into the social structure were quick in accepting modern math and those less integrated were slower to adopt the new practice.

While the studies cited above (Menzel, 1955; Coleman, Katz and Menzel, 1957; and Carlson, 1965) related to social networks and rates of acceptance or adoption of an innovation and not to attitude per se, it must be assumed that in the studies of adoption a favorable attitude did exist prior to adoption. Rogers (1971) reminds us that the formation of a favorable or unfavorable attitude toward innovation does not always lead directly or immediately to an adoption or rejection decision, but nevertheless there is a tendency in that direction. These studies have demonstrated that communication networks play a vital part in the diffusion process.

While some diffusion studies have investigated attitude (Hoffler, 1958; Rogers, 1957), they did not draw a relationship between attitude and communication variables. However, Coughenour (1964) found in a study concerning five farming practices in twelve Kentucky localities that attitude toward scientific farming correlated with an index of integration of communication structure. He suggests that attitude is

primarily a product of the functioning of the communication structure in the diffusion process (1964, p. 538).

Two more recent studies in educational settings have more clearly demonstrated the relationship between communication networks and attitude (Lin, 1966 and 1968; Crandall, 1972). Both studies compared communication networks to innovation internalization (defined as attitudinal commitment to the innovation) and found that the schools with superior social networks had the highest innovation internalization and the schools with the most inferior social network had the lowest score of innovation internalization. Furthermore, Lin reported (1968) that in the three schools studied, more vertical communication occurred in the school with the superior network than was found in the other two. In this school there was more frequent communication between early and late knowers and these teachers had the most favorable attitude toward the innovation.

The present study postulates a relationship between communication and attitude. The question of which occurs more often, vertical or horizontal communication as it relates to attitude development toward innovative structures in a classroom, needs to be addressed. Vertical communication may play an important role because persons with higher status or better informed or with more favorable attitudes could influence others. A study within the classroom structure could shed light on such areas of concern.

The review presented here has provided a rationale for the

study of communication structures as they relate to attitudes developed toward innovation. The studies reviewed have dealt with the relationship between communication patterns and the acceptance, adoption, or attitudinal commitment to an innovation. It has been shown that while such a relationship exists, no studies have been carried to the classroom situation as students are forced to participate in innovative methods imposed upon them. Attitudinal studies of education courses carried out heretofore have focused on attitudes toward various social issues, methods employed, and children (Brin, 1966; Hoover, 1968; Hurst, 1963; and Leton, 1961), but little attention has been given to the relationship between attitude toward innovation and communication among members of a class.

Summarizing the literature on attitude change toward curriculum, courses, and instructors, Zewrekh concludes:

1. initial courses appear to produce positive change while courses in the final phases produce more negative attitudes;
2. teaching methods utilized by the instructor, when compared under similar situations, are not a significant component of attitude modification;
3. controversial and provocative materials tend to affect students' attitudes;
4. the instructor's attitudes toward his class and course material may be influential (1960, p. 19).

Zewrekh's summary does not include any mention of communication networks as they relate to attitude development toward innovative aspects of a class. Yet the study of such a relationship would be important in

order to better understand student reactions, how to deal with them effectively, and how to facilitate the process of innovation implementation.

Homophily and Heterophily

Dyadic analysis provides a way to answer a variety of research questions. Most appropriate are questions relating to homophily and heterophily. Rogers (1971) defines homophily as the degree to which individuals interact who are similar and heterophily as the degree to which individuals interact who are dissimilar. Since interaction occurs, homophily and heterophily are important elements in the communication process.

Rogers and Shoemaker have reviewed the research on homophily and heterophily and have formulated several generalizations. They have concluded that "better communication occurs when source and receiver are homophilous" (1971, p. 210). They further claim that heterophilic interaction is likely to cause cognitive dissonance because the receiver is exposed to messages that are inconsistent with his beliefs. Because people communicate with those who have similar beliefs, attitudes, and status, homophilic diffusion patterns cause new ideas to be spread horizontally rather than vertically and, therefore, homophily acts as a barrier to diffusion. This general pattern of homophily in interpersonal diffusion is not always followed in modern systems in relation to competence. It is not uncommon in modern systems for followers to seek advice from those more technically

competent than themselves. Generalizations about homophily/heterophily indicate "a tendency for followers to seek information and advice from opinion leaders who are perceived as more competent than themselves" (Rogers and Shoemaker, 1971, p. 213). When heterophily occurs it is usually in the direction of greater competency which may be perceived "as higher status, greater innovativeness, or more exposure to mass media communication channels" (Rogers and Shoemaker, 1971, p. 213).

The questions arise: "Do these patterns hold in the classroom situation?" "When heterophily occurs, are some individuals perceived as more knowledgeable and thus more competent to understand the innovation being implemented?" This study seeks answers to these questions.

Research studies have confirmed that the basic pattern of interpersonal diffusion is mainly homophilous. A wide variety of variables have been studied in an attempt to determine homophily: Lionburger and Campbell (1963) found that persons tend to choose to exchange information with others who used the same method of obtaining information about farm practices; Marsh and Coleman (1954) discovered that farm operators with low adoption scores tended to visit and exchange work with kin having similar low scores while those respondents with high adoption scores generally chose others with high adoption scores; Chou (1966) in a study in Colombian villages found mass media exposure and social participation to be determinants of homophily in information-seeking interaction; Yo (1969) investigated eight variables but found none to be significant determinants of homophily.

Troldahl and Van Dam (1965), in a study of face-to-face communication about major topics in the news, examined givers of opinions, askers of opinions, and inactives. They found askers and givers were similar in exposure to mass media news, public affairs information, social status, and gregariousness. They suggested that persons come together to share opinions and verify facts. When comparing askers and givers with inactives, it was found that inactives were low in news-magazine readership, knowledge of local and national news, occupational prestige and education, and several aspects of gregariousness. Thus, this study and others cited above supported the general pattern that communication is usually homophilous. In addition, the studies demonstrate that several variables can be used to measure homophily.

With such a variety of similarities postulated as measures of homophily, it is reasonable to ask which are relevant to communication and which are not. Alpert and Anderson suggest: "In any given communication situation one set of factors of heterophily/homophily may emerge as relevant determinants of communication effectiveness, while other attributes may not" (1973, p. 339). In other words, some similarities may help to facilitate communication between individuals and others may have no effect at all. Berscheid found that "communicator-communication similarities which are irrelevant to the communicator's influence attempt effect considerably more opinion change than do similarities which are irrelevant to the communicator" (1966, p. 670).

Simons et al., after reviewing the findings from studies linking types of source receiver similarities, conclude:

1. Attitude change toward the position advocated by the source depends on the type of perceived similarity or dissimilarity;
2. Relevant attitudinal similarities have positive effects on attitude change; equivalent dissimilarities have negative effects; irrelevant attitudinal similarities have insignificant effects (1970, p. 9).

Alpert and Anderson (1973) found that maximally effective communication occurred when the source was perceived as neither highly homophilous nor highly heterophilous, but somewhere between. Among their generalizations regarding homophily/heterophily, Rogers and Bhowmik have concluded that "for maximum communication effectiveness, a source and a receiver should be homophilous on certain variables and heterophilous on some" (1970, p. 530). Determination of the variables of homophily and heterophily is, however, a matter for further research and may in large part depend on the particular research setting.

Homophily and heterophily affect communication effectiveness and attitude, but which variables are relevant seems to be an area where the evidence is inconclusive or at least it depends on the situation.

The cosmopolitanness score described in Chapter I of this study represents a composite of factors which this investigator deems relevant in terms of communication patterns which develop in the class. It is appropriate to identify these variables in a

course as one introduces innovation because of the relationship between homophily/heterophily and attitude.

Studies reviewed in this section have shown that several variables have been investigated in an attempt to identify similarities between interacting individuals. There is little conclusive evidence as to which variables are relevant: which aid communication and which act as barriers. It has been suggested that perhaps individuals should be homophilous on certain variables and heterophilous on others. Previous experience with the innovative structures described in Chapter I, time of entry into the teacher education program, and number of education books and articles read have been selected as variables to indicate degrees of homophily in the present study. Only a few studies have investigated homophily/heterophily in the classroom situation (Runkel, 1956; McCroskey et al., 1974; Wheelers, 1973; Alpert and Anderson, 1973) and none were found in the field of teacher education. Such a study should be of importance to educators because of their interest in innovation.

Functions and Characteristics of Opinion Leaders

Rogers and Cartano (1962) and Eve (1971) provide basic definitions and describe the functions of opinion leaders. Eve reports that Katz (1957) describes the opinion leader as:

. . . an individual who repeatedly influences other members of his own group on a number of different issues, although there is still some disagreement within the literature as to how opinion leaders emerge and why their opinions are influential, and what communication processes are utilized in acquiring information from opinion leaders (1971, p. 109).

Rogers and Cartano define opinion leaders as "those individuals from whom others seek advice and information" (1962, p. 435). They claim that

. . .before making a decision individuals often seek to reinforce their opinions through consensual validation with certain others. Among these certain others are individuals who exert an unequal amount of influence on the decisions: they are called opinion leaders (1962, p. 432).

Opinion leaders are influential members of a group on a variety of issues and are important to the decision-making process. Eve has furthermore drawn on Katz (1957) to explain the functions of opinion leaders:

(1) information

(2) standard model to follow (wherein the opinion leader established reference group norms)

(3) the opinion leader provides social support for decisions regarding the adoption of innovations (1971, p. 110).

Opinion leaders exert influence on others and can be found in a variety of situations. It has been found that they influence voter decisions (Lazarsfeld, 1944), buying air conditioners (Whyte, 1954), adopting farm practices (Lionberger, 1953), or accepting innovations (Carlson, 1965). In his study of superintendents and the acceptance of modern math, Carlson (1965) found opinion leaders at each status level. Since opinion leaders are found in a variety of situations and influence the decisions of others, it would not be unreasonable to expect to find such persons in a college class. These persons can undoubtedly influence their peers in much the same way that opinion leaders do in various situations as described in the studies cited. Merton has noted:

One thus gains the impression that although a relatively few people -- the top influentials -- exert influence upon people on all levels of the influence-structure, there occurs a secondary tendency for people to be otherwise most influenced by their peers in that structure. If this proves to be generally true, it is a most important fact concerning the operation of interpersonal influence (1968, p. 465).

Several studies have been conducted in order to ascertain the characteristics of opinion leaders (Blake, 1970; Blanton et al., 1971; Lionberger, 1953; Marsh and Coleman, 1954; Wilkening, 1952; Ebre, 1962), and several characteristics have emerged. While some disagreement exists concerning such variables as years of experience in the field studied, length of residence in a community, and age, researchers do agree on others. Blake identifies the characteristics of opinion leaders thus:

Chief among the common elements shared by the center communicator of this study and the influential in studies on the flow of information, in the adoption of new occupational-professional ideas, and the adoption of new products in consumer behavior studies are a higher level of formal education than others about them, a degree of social integration as indicated by participation in formal organizations, a higher than average income, and as a person to whom others turn as a source of reliable information (1970, p. 19).

Rogers and Cartano have formulated three generalizations concerning opinion leaders:

1. Opinion leaders deviate less from group norms than the average group member. They exemplify the values of their followers.
2. There is little overlap among the different types of opinion leaders. (Two basic types are monomorphic and polymorphic⁸.)

⁸ Rogers and Shoemaker (1971) define "polymorphism" as the degree to which an individual acts as an opinion leader for a variety of topics, and its opposite, "monomorphism," as the tendency for an individual to act as an opinion leader for only one topic (Rogers and Shoemaker, 1971, p. 223).

3. Opinion leaders differ from their followers in information sources, cosmopolitanness, social participation, social status, and innovativeness (1962, p. 437).

These summaries fairly well reflect what is known about opinion leaders. However, the study of opinion leaders has occurred mainly in the fields of consumer behavior, education, rural sociology, and communication. Few studies have focused on the classroom and specifically teacher education courses. Several of the characteristics obviously would not apply to an undergraduate population, but others would (such as social participation, attitudes, values, and status), and a study at the undergraduate level would add new information to the field of diffusion research.

From the above it can be seen that opinion leaders influence others. They are sought after for advice. They are like their followers on certain dimensions such as values and different on such variables as status, innovativeness, social participation, and cosmopolitanness. As mentioned earlier, a source and a receiver probably should be homophilous on certain variables and heterophilous on others. In an investigation of homophily, McCroskey et al. found that opinion leaders were more homophilous with their followers than non-opinion leaders. They concluded that tentative support existed for the concept of optimal heterophily.

Although opinion leaders were perceived as substantially more homophilous than other students by these student subjects, on at least three dimensions, the absolute scores on the dimensions were substantially below the point of maximum homophily (McCroskey et al., 1974, p. 4).

In a teacher education course it would not be unreasonable to

expect to find opinion leaders in the class who share certain similarities, but who also exhibit some differences as reflected in previous studies. Identification of these opinion leaders can be an important part of the diffusion process as noted in Mechling's summary regarding opinion leadership:

Research attention should be directed to individuals from whom others seek advice and information about school matters. Evidence cited previously indicates that some persons have more influence than others, adopt innovations earlier than others, and that their knowledge and advice are likely to be sought by and shared with others. If such persons can be identified and utilized as targets for the innovational input of practices such as those developed by the science curriculum development projects, then here lies the multiplying potential for diffusing information which may facilitate the adoption of educational innovation (1969, p. 18).

The identification of opinion leaders, then, would be valuable for instructors in classes where innovation procedures have been introduced.

The Functions and Characteristics of Liaisons

The term gatekeeper has often been used interchangeably with liaison. Havelock (1971) reports that the concept of the gatekeeper is related to formal leadership, but used more typically in the area of planned change and diffusion. This term was first used by Lewin (1947) in describing housewives as focal persons through whom influence on household eating habits had to be channeled. Lewin (1947) defines gatekeepers as individuals or groups in a power position to make decisions between "in" and "out." Understanding the functioning of the gatekeeper becomes equivalent to understanding the factors which

determine the decisions of the gatekeeper and changing the social process or replacing the gatekeeper. Lewin (1947) further indicates that the gatekeeper needs to be determined in order to study his psychology and to determine who has to be educated if a change is to be accomplished. Benne states:

The gatekeeper and expediter attempts to keep communication channels open by encouraging or facilitating the participation of others by proposing regulation of the flow of communication (1951, p. 101).

Few research studies have concentrated on the function and characteristics of liaisons. However, two early studies were conducted in organizational settings (Jacobson and Seashore, 1951; Weiss and Jacobson, 1955). Jacobson and Seashore (1951), in studying interpersonal contacts among professional employees of a federal agency, found that liaisons function in the communication system of the organization, participate widely in the communication system, but are not identifiable in any simple way with a single sub-group. They go on to indicate that they are found at all status levels. Weiss and Jacobson (1955), using sociometric techniques to determine the over-all structure of a complex organization, found that by removing the liaisons in the matrix, it could be shown how the organization coordination structure was established through the activities of the liaison persons and the existence of the contacts between groups.

The liaison, then, functions as a connecting person, mainly between groups. In studies cited previously (Lin, 1968; Crandall, 1972), the analysis of communication networks in schools revealed persons who

acted as liaisons between sub-groups in the diffusion of an innovation. It could be said that they relay messages of one group to another and could have considerable influence in the development of attitudes. In their description of the liaison, Jacobson and Seashore have noted the liaisons' influence:

The liaison persons appear to be of critical importance in the conceptualization of organization in communication terms as they are in a position to influence significantly or to control the communication to and from certain groups. Through them, it is expected, it will be possible to trace differential influences throughout the agency as they are reflected in difference in attitudes among several subgroups (1951, p. 37).

Although the function of the liaison person has been adequately described, data concerning their characteristics are scarce. A study by Barnland and Hurland (1963) provides the basis for a general description of the liaison in their investigation of communication patterns of sorority women on a midwestern university campus. It was found that the sorority that was geographically isolated and which ranked in the middle status group had the widest communicative contact of all sororities studied. The researchers reasoned that this sorority was moving rapidly upward in status and that it communicated more with high status houses, but also with the low status non-resident group. This communication behavior is related to status inconsistency. Rogers and Bhowmik explain status inconsistency in relation to heterophily:

Heterophilous communication is more effective when source and/or receiver are status inconsistent. Status inconsistency is the relative lack of similarity in an individual's ranking on various indicators of social status. Status inconsistent individuals are internally heterophilous, which allows them the potential to be homophilous on different variables with different sets of receivers, and hence to bridge heterophily gaps in a system. They may tend to be liaisons in linking two or more heterophilous cliques within the system, and hence are able to play an important communication role (1970, p. 533).

Does the person who acts as liaison between cliques of students in a classroom exhibit such characteristics? It seems that this type of individual is able to relate to a variety of other persons or groups. The identification of specific personality characteristics of such liaison persons would be valuable in facilitating communication between groups or sub-groups, especially ones that differ greatly from one another.

Chapter Summary

The studies reviewed in this chapter have pointed out that diffusion is essentially a communication process. While early diffusion research focused on individuals as units of analysis, more recently attention has been given to dyadic, network, and clique analysis. It has been demonstrated that a relationship exists between communication patterns and the adoption of innovations and attitudes toward them (Menzel, 1957; Coleman, Katz and Menzel, 1957; Carlson, 1965; Lin, 1968; and Crandall, 1972). It has also been suggested that diffusion is mainly homophilous. That is, effective communication is most likely to occur between persons who are alike. Heterophily is more apt to occur when persons seek advice from those individuals who have been described as opinion leaders. Finally, liaisons have been identified in studies as persons who play a connecting role between differing groups or sub-groups.

The research included examples from rural sociology, education, consumer behavior, and medical sociology. Few studies have been reported on innovation in the classroom situation and few studies have concentrated

on the consequences of implementing an innovation. The concepts of communication discussed, including the dyad, the network, homophily/heterophily, the role of opinion leaders, and the functions of liaisons, are basic to the study of diffusion. These concepts should apply to a class where individuals are communicating as they react to innovation.

This study of the reaction of students to three innovative aspects of a methods of education class is concerned with: (1) the communication between two persons and the development of attitudes; (2) degrees of homophily and heterophily; and (3) identification and characteristics of opinion leaders and liaisons.

The hypotheses generated by the first area of concern address themselves to the relationship between attitudes and certain variables of students in the class, with the dyad as the unit of analysis. From this analysis, a determination as to which type of communication (vertical or horizontal) is positively related to attitude development can be made.

The second set of hypotheses has been postulated to ascertain degrees of homophily/heterophily of dyadic pairs. Is the diffusion process in the classroom situation mainly homophilous as previous studies have indicated?

An investigation of opinion leaders and liaisons is made through sociometric analysis and stated as two hypotheses and two research questions. It is reasonable to expect that such persons exist in class, but their characteristics may be different than those reported in studies reviewed because of the differences in the population used in this study.

In Chapter II a review of related research has attempted to clarify the issues raised in Chapter I and to present the relevance of the research to the hypotheses postulated. In Chapter III the procedures for the study will be outlined.

C H A P T E R I I I

DESIGN OF THE STUDY

Introduction

The review of the literature indicates a relationship exists between communication patterns and acceptance of, adoption of, or attitude toward innovation. Few studies have investigated this relationship in the classroom setting, and yet since innovations are often implemented in such a situation it seems important to investigate such a relationship.

In this chapter a general plan of the study is described based on the studies reviewed in Chapter II. The hypotheses generated from the general plan are presented in the next section followed by the research design and a description of the field testing situation; a profile of the population; a description and rationale for the use of the instruments; the procedures used in the administration of the instruments; the methods employed in the analysis; and a chapter summary.

General Plan of the Study

The plan for the present study was developed in a methods of education class. It was decided to examine student attitude toward three innovative aspects of the course and the communication network in the class. Since diffusion research has shown that attitude or adoption is influenced by persons communicating with others, it was

assumed that students in a class would influence each other. It was hypothesized that attitude would change as communication patterns changed and thus indicate that indeed persons were influencing one another.

Diffusion studies have also been concerned with homophily and heterophily. As was shown in the previous chapter, diffusion is mainly homophilous. That is, persons talk to other persons like themselves. This should also apply to students interacting in the classroom situation. The present study seeks to discover whether or not this is true by testing the hypothesis that students talk to those like themselves as they develop attitudes toward the three innovative aspects of the class.

Opinion leaders have played important roles in the adoption process. In Chapter II it was pointed out that opinion leaders are those persons who exert influence on others. Furthermore, it has been reported that they usually are homophilous on some characteristics and heterophilous on others (especially degree of competency with respect to the innovation). In the methods class it was assumed that some students would be viewed as opinion leaders. They were sought after for advice and, in this situation, their views on the innovative aspects of the course. In addition, the question of their characteristics was considered: Did they possess more knowledge of the innovations because of previous experience with them? Had they read more education books and articles than other students? Was their commitment to the teaching profession made earlier and

thus they were more likely to demonstrate more favorable attitudes toward innovation in general? In essence, the study was concerned with the identification of these persons and the construction of a profile of their characteristics.

Last, the review of previous research has indicated a need for the study of the role of liaisons in the diffusion process. Liaisons have been described as persons who act as "connectors," mainly between cliques or sub-cliques. Since these persons seem to identify with groups which are different, their function in the communication process is unique. One clique could be influenced by another through these persons. With the social consciousness of college students, the liaison person would probably play a vital role in the development of attitude. After identification of liaisons, it would be important to describe their characteristics.

The general plan described above was developed from the previous diffusion research as it relates to a college classroom setting. From this plan, specific hypotheses were generated.

Hypotheses of the Study

The general plan developed from previous research studies provided the focus of the present study: the relationship between communication patterns and attitude change in a methods of education class. The major areas of study are communication patterns and the development of attitudes toward three innovative aspects of the methods course, and homophily/heterophily. The minor areas of study

are the identification and the characteristics of opinion leaders and liaisons in the communication network. In order to examine these areas seven hypotheses are postulated and two research questions are posed. The hypotheses are stated in the conventional null form and are listed below.

Communication patterns and attitude

1. As the group mean score of attitudes toward modules, competencies, and self-initiating learning activities increases, there will be no significant⁹ increase in the percentage of upward communication patterns in the population from the first week to the sixth week nor from the first week to the twelfth week.
2. As the group mean score of attitudes toward modules, competencies, and self-initiating learning activities increases, there will be no significant⁹ increase in the percentage of downward communication patterns in the population from the first week to the sixth week nor from the first week to the twelfth week.
3. As the group mean score of attitudes toward modules, competencies, and self-initiating learning activities increases, there will be no significant⁹ increase in the percentage of horizontal communication patterns in the population from the first week to the sixth week nor from the first week to the twelfth week.

Homophily/heterophily

4. There will be no significant¹⁰ difference between scores of cosmopolitaness between individuals of a dyadic pair during the first, sixth, and twelfth weeks.

⁹ With a population of N=26, arbitrarily a change of 10 percentage points in the number of communication patterns was chosen to represent a significant increase.

¹⁰ Significance will be represented by the equivalent of one standard deviation separating scores.

5. As the group mean scores of attitudes toward modules, competencies, and self-initiating learning activities increases, there will be no significant¹¹ increase in the mean of the differences between scores of cosmopolitanness of a dyadic pair.

Opinion leaders and liaisons

6. There is no relationship between persons who are considered opinion leaders the first week and persons who are considered opinion leaders the sixth week or the twelfth week.
7. There is no relationship between persons who act as liaisons the first week and persons who act as liaisons the sixth week or the twelfth week.

In addition, the following research questions will be addressed regarding opinion leaders and liaisons:

1. What are the characteristics of opinion leaders?
2. What are the characteristics of liaisons?

Research Design and Field Testing Situation

Since this study is concerned with attitudes toward change and communication patterns as they relate to the diffusion process, it seemed appropriate to use a natural setting to study the variables. Since diffusion research attempts to understand the adoption of innovation among a variety of persons including farmers, teachers, and physicians, studies are carried out in field settings. This study utilizes the field experiment approach described by Kerlinger (1964, pp. 382-386). He defines a field experiment as "a research study in

¹¹ Level of significance is at the .05 level.

a realistic situation in which one or more independent variables are manipulated by the experimenter under as carefully controlled conditions as the situation will permit" (1964, p. 382). He points out that the field experiment is particularly valuable to educational investigators and discusses several of its strengths. Kerlinger indicates that "the variables in a field experiment usually have a stronger effect than those of laboratory experiments" (1964, p. 383). Their appropriateness for the study of complex social influences and process is another virtue of the field experiment. He points out that ". . .the dynamics and interactions of small groups have been fruitfully studied. . ." (1964, p. 383). Since the present study focuses on attitude development and communication in a small group, the field experiment is appropriate as the basic research design.

The specific research design of hypotheses Nos. 1, 2, and 3 is pictured below:

$$Y_b \quad \textcircled{X} \quad Y_{a1} \cdot \cdot \cdot Y_{a2}$$

Using the definitions described in Kerlinger (1964, p. 292), \textcircled{X} represents the independent variable (communication pattern) which is not manipulated; Y_b represents the initial measurement of the dependent variable (attitude); Y_{a1} represents the second measurement of attitude; Y_{a2} represents the third measurement of attitude.

Hypothesis No. 4 is a measure of the independent variable (homophily/heterophily) three times during the semester.

Hypothesis No. 5 is pictured below:

$$Y_b \quad \textcircled{X} \quad Y_{a1} \cdot \cdot \cdot Y_{a2}$$

where \textcircled{X} represents the non-manipulated independent variable (homophily/heterophily); Y_b represents the initial measurement of the dependent variable (attitude); Y_{a1} represents the second measurement of attitude; Y_{a2} represents the third measurement of attitude.

Hypotheses Nos. 6 and 7 seek to determine a change over time of persons who act as opinion leaders and liaisons.

Research questions Nos. 1 and 2 are concerned with characteristics of opinion leaders and liaisons.

The methods of education class in a teacher education program is the setting for this study. The course is required of all elementary and secondary education majors and for students majoring in other disciplines seeking certification. The course is organized in modular units (Appendix A) consisting of the title, prerequisites, competencies to be developed, resources, learning activities, method of evaluation, and extending activities. The modular format had been introduced in Methods of Education and Tests and Measurements a year prior to the beginning of the study. Since this meant several students had experienced the innovation, many of the subjects in the present study had developed expectations when they enrolled in the class. This was true because of the informal communication network which exists at a small college.

Students were expected to attend each class session, but no penalty was imposed if they did not attend. The importance of attending was stressed, however, because of the experiential nature of the class. Students were graded on their degree of achievement of the

competencies through tests, projects, and reports. They could, however, improve their grade through the extending and self-initiating learning activities. A minimum competency level was set at a grade of "C." This could be achieved through a method of evaluation described (test, project, or report) or by a combination of the method of evaluation and extending activities. Students not achieving a minimum grade of "C" were allowed to retake the test or resubmit a project or report. The reexamination focused only on areas where little or no competency had been demonstrated.

The teaching load for the course was divided between two instructors. Some modules were taught by one or the other and some were taught together. This investigator was one of the instructors. While biases could be expected here, the data were not examined until the end of the semester in order to reduce experimental contamination. In the attempt to reduce biases, the concepts being studied were not discussed during the semester by the investigator unless specific questions were asked by individual students.

The Population Studied

The samples examined in this study constitute the total population of Ed. 432, Methods of Education, at Norwich University. Norwich is a small military college in central Vermont offering a wide variety of programs in the liberal arts and in the professions. Its population of 1100 is made up primarily of students from Vermont and the suburban areas of Massachusetts, New York, Connecticut, and New Jersey. Methods

of Education is required of all elementary and secondary education majors as well as those students majoring in other fields who are seeking certification. The study took place during the fall semester of the academic year 1975-1976.

The population sample, according to class year, major, and sex, is described in Table 1.

The students in the course for the most part had middle-class backgrounds and all were Caucasian. Except for three older students, the age ranged from nineteen to twenty-one, representative of the typical age of undergraduates. Often the education major had transferred from another department, usually during the sophomore year. Students seeking certification who are not education majors typically have had fewer education courses and less experience with children. All education majors must have a practicum in a school during their sophomore year and again in their junior year. There was no random selection for the study sample since all of the students in the course were included in the sample.

Instruments

The semantic differential. This study focuses on the measurement of attitudes toward three innovative aspects of a methods of education class: modules, competencies, and self-initiated learning activities. Since the development of attitudes toward these three concepts had to be assessed, the semantic differential developed by Osgood, Suci, and Tannenbaum (1957) was selected. The semantic

Table 1
Population Description
According to Year, Major, and Sex

<u>Class</u>	<u>M</u>	<u>F</u>
Seniors	2	4
Juniors	10	6
Sophomores	2	-
M.A.T. students	-	1
Special students	<u>1</u>	<u>-</u>
Total by sex	15	11
<u>Major</u>		
Elementary Education	7	7
Secondary Education	5	-
Biology	1	1
Government	1	1
Philosophy	-	1
English	1	-
Foreign Language	-	1

differential measures the meanings people associate with particular concepts. Osgood et al. point out that the semantic differential is a very general way to ascertain information. They go on to say that it is

. . . a highly "generalizable technique of measurement" which must be adapted to the requirement of each research problem to which it is applied. There are no standard concepts and no standard scales; rather, the concepts and scales used in a particular study depend upon the purposes of the research (1957, p. 76).

The semantic differential measures the connotative meanings of concepts. Osgood et al. describe their use of the term "concept" as referring "to the 'stimulus' to which the subject's checking operation is a terminal 'response'" (1957, p. 77). The selection of concepts should be considered to be relevant to the research. In selecting the concepts the investigator uses good judgment. In the present study the investigator is interested in attitudes toward the three innovative aspects of the course and thus the concepts selected were: "modules," "competencies," and "self-initiated learning activities."

In order to measure the concepts, scales or adjective pairs are selected. Osgood et al. (1957) outline three criteria for selecting scales -- factorial composition, relevance, and semantic stability. Factorial composition usually includes selection of three scales, "these being maximally loaded on that factor and minimally on others" (Osgood et al., 1957, p. 78). The three factors most commonly used are: the evaluative factor, the potency

factor, and the oriented activity factor. Osgood et al. say that one would use sets of scales having ". . .high loadings in the evaluative factors across concepts generally and negligibly loading on other factors. . ." (1957, p. 191) in assessing attitudes because attitudes are predispositions toward an evaluative response. Most of the scales selected from those scales researched in the Thesaurus study (Osgood et al., 1957, pp. 53-61) and others added to measure attitudes toward the three innovative aspects of the class were evaluative in nature. (See Specimen Instrument No. 1, p. 52)

The second criterion in scale selection is relevance to the concepts. As mentioned previously, most of the scales were evaluative because attitudes toward the innovative aspects were being assessed. One of the scales added by the investigator in addition to those in the Thesaurus study (Osgood et al., pp. 53-61) was traditional-innovative since it was an appropriate set of adjectives for ascertaining attitude toward three innovations. This is an example of a scale selected because it was relevant to the study of introduction to modules, competencies, and self-initiated learning activities.

The last criterion for scale selection is its semantic stability. Is the pair of bipolar adjectives stable across a set of concepts concerning innovative aspects of a methods class? Regarding this, Deutschmann claims that ". . .the semantic differential provides a means of increasing the comparability attitude measurement across different social objects (concepts), across groups, and over time"

IMPORTANT:

- (1) Place your check-marks in the middle of spaces, not on the boundaries:

	THIS	NOT THIS
_____:	_____:	_____:
	X	X

- (2) Be sure you check every scale for every concept -- do not omit any.
- (3) Never put more than one check-mark on a single scale.

Sometimes you may feel as though you have had the same item before on the test. This will not be the case, so do not look back and forth through the items. Do not try to remember how you checked similar items earlier in the test. Make each item a separate and independent judgment. Work at fairly high speed through this test. Do not worry or puzzle over individual items. It is your first impressions, the immediate "feelings" about the items, that we want. On the other hand, please do not be careless, because we want your true impressions.

(1959, p. 435). The scales were pretested with seventeen students who had been enrolled in the methods course the previous semester and as a result three scales were eliminated.

The use of semantic differential has been reviewed by Zerwekh, and he summarizes thus:

All empirical evidence signifies that the semantic differential techniques are as reliable and valid as other popular inventories used in measuring attitude. The fact that it can assess direction as well as intensity makes it very effective for this type of evaluation (1970, p. 23).

In addition, Brinton claims that "Validity of the differential attitude scales appears to be high based on correlations with scores gathered by the traditional Thurston, Likert, and Guttman types of scales" (1961, p. 289).

Several investigations of attitude change have utilized the semantic differential in courses at the undergraduate level (Bunker, 1970; Zewrek, 1970; Wheelless, 1973; Hoover, 1968). Bartlett (1971) used the semantic differential to ascertain attitudes toward an experimental science curriculum. The measurement of attitudes in undergraduate courses using the semantic differential seems valid and appropriate.

Sociometric analysis. Moreno describes sociometry as "the mathematical study of psychological properties of populations, the experimental technique of and the results obtained by application of quantitative methods" (1953, p. 15). Lindzey adds:

A sociometric measure is a means of assessing the attraction, or attractions and repulsions, within a given group. It usually involves each member of the group privately specifying a number

of other persons in the group with whom he would like to engage in some particular activity and, further, a number of persons with whom he would not like to participate in the activity (1954, p. 407).

Furthermore, Lindzey states that one of the qualities of sociometric techniques is:

. . .their capacity to represent individuals in interaction within a miniature social system. Current theoretical formulations, in addition to the demands imposed by many empirical problems, make it necessary for the investigator to study the individual and his social environment simultaneously (1954, p. 406).

Sociometric analysis is used in the present study to ascertain communication patterns in the classroom. The analysis consists of identifying dyads, networks, and cliques. It has been previously established that evidence exists that the social network has an effect on the diffusion process. While several questions were asked, question No. 2 was used in the sociometric analysis since it was directly concerned with the innovation. (See Specimen Instrument No. 2, page 59) Question No. 4 was used as part of the individual analysis of individuals to determine characteristics of liaisons and opinion leaders.

The method used for analysis was the sociogram. Lindzey describes the sociogram as:

. . .the diagrammatic device for summarizing the choices and rejections among members of a group. It employs geometric figures to represent members of the group and various kinds of lines joining the figures to represent choices and rejections. At this point there is no single convention for the drawing of diagrams but rather there are many alternatives available to the investigator (1954, p. 410).

The sociogram is used in the present study to determine dyads, the network in the class, and the cliques. The sociogram provides a

Specimen Instrument No. 2Sociometry Exercise

Code Number _____

Date _____

Directions: Below are five questions which will help to determine relationships among individuals in the class. Please answer each one honestly. The information will be kept confidential and unless you reveal it yourself, no one in this class will know what choices you made. I will share this technique with you during the module on "Classroom Evaluation." I'm sure you'll find it a valuable tool when you teach.

1. In making assignments for group work when a task has to be completed, with whom would you prefer to be grouped?

1st choice _____

2nd choice _____

3rd choice _____

Is there anyone with whom you would not like to work? Indicate below:

2. With whom have you talked about modules, competencies, and/or extending self-initiating activities (other than Professors Smith and Catone)?

1st choice _____

2nd choice _____

3rd choice _____

3. With whom have you talked about the class in general (other than Professors Smith and Catone)?

1st choice _____

2nd choice _____

3rd choice _____

4. With whom have you talked outside this class concerning modules, competencies, and/or self-initiating learning activities?

5. With whom in the class do you regularly associate on a social basis?

diagram for determining: (1) the communication patterns which exist; (2) the opinion leaders; and (3) the liaisons (those individuals who act as "connectors" between cliques). When sociometric data is combined with demographic data, characteristics of opinion leaders and liaisons can be determined.

As previously mentioned, diffusion researchers have suggested the use of sociometric analysis (Rogers and Jain, 1968; Coleman, 1958). Adoption studies (Menzel, 1955; Coleman, Katz, and Menzel, 1957; Winick, 1961) and studies of attitudinal commitment toward innovation (Carlson, 1965; Lin, 1968; Crandall, 1972) have utilized sociometric analysis. In regard to the use of sociometric analysis to determine opinion leaders, Blanton (1971) found the use of informants revealed only one-third the number of opinion leaders nominated through the sociometric technique. Rogers and Cartano concluded: "The sociometric method has been used in past research on opinion leadership more often than any other method" (1962, p. 438). In his review of reliability, Lindzey notes that "most investigators report a relatively high degree of consistency in the sociometric pattern or sociogram over time even though individual choices and rejections may fluctuate considerably" (1954, p. 422). However, he also reports that the stability of choices increases with the passage of time during which the group has been in existence. Since the present study spans a semester, the stability pattern and the individual choices is of importance.

Data collection sheet. The data collection sheet was designed to gather demographic data about the population in order to determine characteristics of opinion leaders and liaisons as well as for the construction of a homophily index referred to in this study as a cosmopolitanness score. Items 5, 9, 10, 11, 12, 13, 14, and 15 were used to develop a cosmopolitanness score. Point values were assigned to each item as indicated. (See Specimen Instrument No. 3, page 62) Higher values were given for early entry into the department, greater number of books or articles read, and early experience with or knowledge of modules, competencies, or self-initiated learning experiences. In addition to these items, items 3, 7, and 8 were used to construct the profile of opinion leaders and liaisons. Since previous diffusion research has not focused on the college classroom, the data to be analyzed were chosen because of what this investigator deemed appropriate for the population being studied. It was reasoned that time of entry into the program, number of education books and articles, and knowledge of modules, competencies, and self-initiated learning experiences would have an effect on attitude toward innovative structures. A well informed, professional, committed person would probably exert influence on others in a positive direction. These assumptions are reflected in the postulated hypotheses.

Administration of the Instruments

During the first class meeting the students were informed of the format of the course. They received a handout (Appendix A) which

Specimen Instrument No. 3Data Collection Sheet for Ed. 432
Methods of Education

Code Number _____ Date _____

Directions: After reading the syllabus and listening to the explanation of the class, please complete the following questionnaire. Results will be treated as confidential information.

1. Age: _____ 2. Sex: (circle one) M. F.

3. Class: (circle one) 1976 1977 1978 1979 graduate
Other _____4. Program: _____ Elementary
_____ Secondary (teaching field _____)Points
Assigned(5)²

_____ 1st semester of my freshman year

_____ 2nd semester of my freshman year

(4)²

_____ 1st semester of my sophomore year

_____ 2nd semester of my sophomore year

(3)²

_____ 1st semester of my junior year

_____ 2nd semester of my junior year

(2)²

_____ 1st semester of my senior year

_____ 2nd semester of my senior year

1

_____ I'm not in the Department, but hope to be accepted

* _____ I'm taking the course as an elective

* _____ I'm taking the course as a M.A.T. student

* _____ I'm taking the course for certification

* _____ other

6. If you are a member of the Corps, state your rank. _____

7. What was your Q.P.A. as of June 1975? _____

8. List extracurricular activities in which you regularly participate:

* Since time of entry into the Department is a measure of commitment, interviews with M.A.T. students, students taking the course for certification or as an elective could reveal time of commitment and points assigned when that determination is made.

Answer the following as explained in the first half of the class:

10. When did you first hear about modules?
- 1 _____ a. Today
 (2)² _____ b. 1-2 months ago
 (3)² _____ c. 3-5 months ago
 (4)² _____ d. 6 months ago
 (5)² _____ e. _____ months ago
11. When did you first hear about competency-based courses?
- 1 _____ a. Today
 (2)² _____ b. 1-2 months ago
 (3)² _____ c. 3-5 months ago
 (4)² _____ d. 6 months ago
 (5)² _____ e. _____ months ago
12. Have you ever taken a competency-based course like this one?
- (2)² _____ Yes
 0 _____ No
 If yes, give the title and a brief description of the course.
13. Have you ever taken a modular course before?
- (2)² _____ Yes
 0 _____ No
 If yes, please describe the course.
14. Have you ever had the opportunity to initiate your own learning experiences in a course? If yes, briefly describe.
- (2)² _____ Yes
 0 _____ No
15. After hearing the explanation of the course, do you expect to have different learning experiences in this course?
- (2)² _____ Yes
 0 _____ No

described the format, procedures, and general nature of the course. After the items on the handout were discussed, the students were asked to read it again during the week. The subjects were also told that the Psychology and Education Department was interested in ascertaining student reaction to the new format of the course and their attitudes toward the modules, competencies, and self-initiated learning activities would be assessed three times during the semester. It was also explained that during the module on evaluation, sociometry would be discussed and, therefore, they would be asked to complete the sociometric questionnaire three times during the semester to provide data for that module. The subjects were then asked to complete the data collection sheet for general information as well as to determine if they had any prior knowledge of the three innovative aspects of the course.

During the second class meeting the semantic differential and sociometric exercise were completed. Arrangements were made for those students absent from class to complete the two instruments during the week but prior to the next class meeting. This procedure was followed for each of the administrations.

During two successive six-week intervals the semantic differential and sociometry exercise were administered. (See Chart No. 1 on page 65) With the exception of one student who was admitted to class late, all subjects completed all the instruments for each administration.

Chart No. 1

Data Collection Dates, Instruments Administered, Purpose of Instruments, and Hypotheses and Research Questions to Which Instruments Are Related

	<u>Date of Measurement</u>			
	<u>September 11, 1975</u>	<u>September 18, 1975</u>	<u>October 16, 1975</u>	<u>December 4, 1975</u>
<u>Instrument(s) Administered</u>	Data collection sheet	Semantic Differential Sociometric Exercise	Semantic Differential Sociometric Exercise	Semantic Differential Sociometric Exercise
<u>Purpose of Data Collection</u>	To determine: Cosmopolitanness Scores Characteristics of opinion leaders and liaisons	To determine: Relationship between attitudes and communication patterns Relationship between attitudes and homophily/heterophily Opinion leaders and liaisons	To determine: Relationship between attitudes and communication patterns Relationship between attitudes and homophily/heterophily Opinion leaders and liaisons	To determine: Relationship between attitudes and communication patterns Relationship between attitudes and homophily/heterophily Opinion leaders and liaisons
<u>Related to Hypotheses and/or Research Questions</u>	Hypotheses Nos. 1, 2, 3, 4, 5 Questions 1 and 2	Hypotheses Nos. 1, 2, 3, 4, 5, 6, 7	Hypotheses Nos. 1, 2, 3, 4, 5, 6, 7	Hypotheses Nos. 1, 2, 3, 4, 5, 6, 7

Methods of Data Analysis

Each of the subjects yielded a score of cosmopolitanness derived from the data collection sheet and three attitude scores derived from the semantic differential. In addition, each subject indicated sociometric choices through the sociometric exercise form.

Analysis of the semantic differential. Each of the subjects completed the semantic differential on three concepts: competencies, self-initiated learning activities, and modules. Since this investigator was interested in attitude, scales with high loadings on the evaluative factor were used to compute the attitude score. Osgood et al. (1957, p. 87) do not recommend summing different factor scores, but permit summing within factor categories. Nine scales were used to determine the attitude score of each concept. The scales of bipolar adjectives were scored with one representing the highest positive value and seven representing the lowest positive value. For nine scales the highest score would be nine and the lowest score would be sixty-three, while thirty-six represents a neutral attitude toward the concept. Decreases in scores, therefore, indicate attitude change in a positive direction while increases in scores indicate attitude change in a negative direction. Means and standard deviations were computed for each concept for each testing. These means were then subjected to a one-tailed t test for uncorrelated data to determine significance of increase.

Analysis of sociometric exercise. Dyads were constructed

from first choices indicated on the sociometric exercise form. Jennings has pointed out:

The chooser makes his greatest psychological investment in his first choice, reaching deep into the core of his personality in making his decision, and apparently this choice can be neither outgrown nor replaced as readily or as quickly as his other choices, which are less essential and less necessary to him. While for some individuals every choice has a depth value and while all choices (of any degree) are of importance to the chooser and the chosen, the implications of crucial needs lie chiefly in first choices (1959, p. 9).

A matrix was constructed to indicate first, second, and third choices of each subject and number of nominations received by each subject. A weighted score was derived for each subject based on the number of nominations he had received. Means and standard deviations for the weighted scores were computed and those subjects with scores which fell within the top ten percent of the total scores for the student t distribution were judged to be opinion leaders.

A sociogram was constructed from the first and second choices of all subjects in order to determine liaisons.

Analysis of the data collection sheet. Items 5, 9, 10, 11, 12, 13, 14, and 15 were used to develop a cosmopolitaness score for each subject. Point values were assigned to each item as indicated (Appendix D). A mean and standard deviation were computed for the total population. When combined with dyads constructed from the sociometric exercise, the differences between the scores were used to determine communication patterns. As previously stated, the standard deviation was used to indicate whether or not a difference

existed between scores of a dyadic pair. By definition, a communication pattern was judged to be horizontal if the difference between scores of a pair was the equivalent of one standard deviation or less. Upward and downward communication patterns were indicated when the difference in scores of a dyad was more than the equivalent of one standard deviation. The number and percentage of each type of communication pattern is reported for each of three data collecting periods.

By combining the number of upward and downward communication patterns, the number of vertical patterns was determined. The percentage of vertical patterns compared to the percentage of horizontal patterns indicates the degrees of heterophily and homophily, respectively, for each of the measurement times.

In order to determine change over time in degrees of homophily and heterophily, the mean of the difference between scores of dyads was compared for the three testing times. A one-tailed t test for uncorrelated data is reported.

The data collection sheet was also analyzed in order to determine characteristics of opinion leaders and liaisons.

Analysis for hypotheses related to communication patterns. The increase in mean attitude scores for each concept (competencies, self-initiating learning activities, and modules) compared to the percentage increase in upward, downward, and horizontal communication patterns and the decision to reject or not reject the null hypotheses Nos. 1, 2, and

3 are reported separately for each pattern.

Analysis for hypotheses related to homophily and heterophily.

The decision to reject or not to reject hypothesis No. 4 is based on previously described percentage of vertical and horizontal communication patterns since these percentages represent degrees of heterophily and homophily, respectively.

Hypothesis No. 5 is concerned with the relationship between attitude change and changing degrees of homophily and heterophily. The increase in mean attitude scores is compared to the mean of the difference between cosmopolitanness scores of dyads of the total sample and is reported separately for each concept.

Analysis for hypotheses related to opinion leaders and liaisons.

The decision to reject or not to reject hypotheses Nos. 6 and 7 was based on whether or not the persons who assumed the roles of opinion leaders and liaisons changed from one measurement to another. Each decision is reported separately for three measurements: between the first and second, second and third, and first and third.

Analysis for research questions related to characteristics of opinion leaders and liaisons. Information from the data sheets was used to describe the characteristics of the opinion leaders and liaisons. As previously mentioned, opinion leaders and liaisons were determined through sociometric analysis.

Chapter Summary

In this chapter the design of the study was presented. A rationale for the hypotheses was presented based on the review of the literature followed by descriptions of the field testing situation, population, instruments and procedures employed in the study, and methods of analysis. In the next chapter the results of the research will be presented.

CHAPTER IV

FINDINGS

In Chapter III, the procedures of the study were detailed, including the hypotheses to be tested, a description of the instruments used, and the methods of analysis of the data. As it was pointed out, the study explored three hypotheses related to attitude change and communication patterns; one hypothesis was postulated to determine degrees of homophily/heterophily of dyadic pairs three times during the semester; one hypothesis was postulated to determine the relationship between attitude change and changing degrees of homophily/heterophily; two hypotheses were concerned with change of opinion leaders and liaisons; and two research questions sought to determine characteristics of opinion leaders and liaisons. When appropriate, tests of significance were applied to the hypotheses to determine the probability of events observed occurring by chance. The findings presented in this chapter are grouped under five areas: communication patterns and attitude, degrees of homophily and heterophily, homophily and heterophily and attitude, changes of opinion leaders and liaisons, and characteristics of opinion leaders and liaisons.

Communication Patterns and Attitude

The following hypotheses were postulated in order to determine the relationship between attitude and communication patterns:

1. As the group mean score of attitudes toward modules, competencies, and self-initiating learning activities increases,

there will be no significant¹² increase in the percentage of upward communication patterns in the population from the first week to the sixth week nor from the first week to the twelfth week.

2. As the group mean score of attitudes toward modules, competencies, and self-initiating learning activities increases, there will be no significant¹² increase in the percentage of downward communication patterns in the population from the first week to the sixth week nor from the first week to the twelfth week.
3. As the group mean score of attitudes toward modules, competencies, and self-initiating learning activities increases, there will be no significant¹² increase in the percentage of horizontal communication patterns in the population from the first week to the sixth week nor from the first week to the twelfth week.

The hypotheses assume that an increase in the group mean attitude score occurs. It was decided, however, to test for significant increase. The results are shown in Table 2.

Analysis of the group mean attitude score for competencies showed a significant increase at the .05 level between the first and second testing. No other significant changes in mean attitude scores for competencies, self-initiated learning activities, or modules were shown. In fact, although not statistically significant, decreases in attitude occurred for competencies between the second and third testing; for self-initiated learning activities between the first and second testing, the first and third testing, and the second and third testing.

In order to determine communication patterns, the mean and standard deviation of cosmopolitanness scores were computed. The mean was 40.69 and the standard deviation was 27.39. Based on the differences

¹² With a population of N=26, arbitrarily a change of 10 percentage points in the number of communication patterns was chosen to represent a significant increase.

Table 2

T-Test Results on Competencies, Self-Initiated Learning Activities and Modules for Three Measurement Intervals

<u>Concept</u>	<u>Measurement</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Probability</u>	<u>Probability</u> (between 1st and 3rd measurements)
Competencies	I	23.80	8.4	2.08*	
	II	19.42	6.963		1.67
	III	19.96	8.37	.25	
Self-Initiated Learning Activities	I	20.28	5.94	.55	.75
	II	21.50	9.39	.17	
	III	21.92	9.35		
Modules	I	22.08	4.68	1.46	1.48
	II	19.77	6.47		
	III	19.42	9.76	.15	

* Significance at the .05 level

between cosmopolitanness scores of dyads, the number and percentage of each type of communication pattern were determined and are reported in Table 3. Significant increases are shown for the upward communication patterns from the second to the third testing and from the first to the third. Significant decreases were shown for the downward communication pattern from the first to the second testing; and for the horizontal pattern from the second to the third testing and from the first to the third testing.

Since the only significant increase in the mean group attitude score occurred for competencies between the first and second testing, it is the only one which can legitimately be subjected to decisions to reject or not to reject the null hypotheses.

The first hypothesis regarding the mean attitude score toward competencies between the first and second testing was not rejected since the percentage increase of upward patterns did not reach the level of significance. The second hypothesis regarding the mean attitude score toward competencies between the first and second testing was not rejected since there was no significant increase. There was, however, a significant decrease in the percentage of downward patterns. The third hypothesis regarding the increase of the mean attitude score toward competencies between the first and second testing was not rejected since there was no significant increase in the percentage of horizontal patterns. A comparison of the communications patterns and mean attitude scores for each concept is shown in Tables 4, 5, and 6.

Table 3
Number and Percentages of Communication Patterns
and Significant Change for Three Measurement Periods

Communication Pattern:	<u>Measurement</u>			
	<u>I</u> <u>1st week</u>	<u>II</u> <u>6th week</u>	<u>III</u> <u>12th week</u>	
Upward	3	4	8	
Downward	8	4	6	
Horizontal	14	14	11	
Total number of patterns	25	22	25	

Communication Pattern:	<u>%</u>	<u>%</u>	<u>%</u>	<u>Change in Percentage Points</u>
Horizontal	56	64		8
		64	44	20*↓
	56		44	12*↓
Downward	32	18		14*↓
		18	24	6
	32		24	8
Upward	12	18		6
		18	32	14*↑
	12		32	20*↑

* Significant with a change of 10 percentage points

Table 4

Comparison of Percentages of Upward Communication Patterns
and Group Mean Attitude Scores for Competencies,
Self-Initiating Learning Activities, and Modules

	<u>Measurement</u>		
	<u>I</u>	<u>II</u>	<u>III</u>
Upward Pattern Percentage	12	18	32
Significance in Percentage Points Between 1st and 3rd Testing	6	20*†	14*†
Mean Attitude Scores:			
Competencies	23.80	19.42	19.96
Self-Initiating Learning Activities	20.28	21.25	21.92
Modules	22.08	19.77	19.42

* Significant with a change of 10 percentage points

Table 5

Comparison of Percentages of Downward Communication Patterns
and Group Mean Attitude Scores for Competencies,
Self-Initiating Learning Activities, and Modules

	<u>Measurement</u>		
	<u>I</u>	<u>II</u>	<u>III</u>
Downward Pattern Percentage	32	18	24
Significance in Percentage Points Between 1st and 3rd Testing	14*↓	8	6
Mean Attitude Scores:			
Competencies	23.80	19.42	19.96
Self-Initiating Learning Activities	20.28	21.25	21.92
Modules	22.08	19.77	19.42

* Significant with a change of 10 percentage points

Table 6

Comparison of Percentages of Horizontal Communication Patterns
and Group Mean Attitude Scores for Competencies,
Self-Initiating Learning Activities, and Modules

	<u>Measurement</u>		
	<u>I</u>	<u>II</u>	<u>III</u>
Horizontal Pattern Percentage	56	64	44
Significance in Percentage Points Between 1st and 3rd Testing	8	12*↓	20*↓
Mean Attitude Scores:			
Competencies	23.80	19.42	19.96
Self-Initiating Learning Activities	20.28	21.50	21.92
Modules	22.08	19.77	19.42

* Significant with a change of 10 percentage points

Since the increases in mean attitude scores toward competencies for other measurement intervals were not significant, the hypotheses were not subjected to a decision to reject or not reject. Also, since no significant increases in mean attitude scores toward self-initiated learning activities and modules occurred for any of the measurement intervals, the hypotheses were not subjected to a decision to reject or not reject.

Degrees of Homophily and Heterophily

In order to determine degrees of homophily and heterophily at the time of each testing, the following hypothesis was tested:

4. There will be no significant¹³ difference between scores of cosmopolitaness between individuals of a dyadic pair during the first, sixth, and twelfth weeks.

The same procedures to determine communication patterns were used in order to indicate degrees of homophily and heterophily. Horizontal patterns were represented by the difference of the equivalent of one standard deviation between pairs and indicated homophilous interaction. Upward and downward communication patterns were represented by the difference of more than the standard deviation equivalent and thus indicated heterophilous interaction. The results are reported in Table 7.

For the first measurement hypothesis No. 4 was not rejected for fifty-six percent of the dyads, but was rejected for forty-four

¹³ Significance will be represented by the equivalent of one standard deviation separating scores.

Table 7

Percentages of Homophilous* and Heterophilous** Dyadic Pairs

	Measurement		
	<u>I</u>	<u>II</u>	<u>III</u>
<u>Homophilous Pairs</u>	56	64	44
<u>Heterophilous Pairs</u>	44	36	56

* Difference between cosmopolitanness scores one standard deviation equivalent or less

** Difference between cosmopolitanness scores more than one standard deviation equivalent

percent of the dyads. For the second measurement hypothesis No. 4 was not rejected for sixty-four percent of the dyads, but was rejected for thirty-six percent of the dyads. For the third measurement hypothesis No. 4 was not rejected for forty-four percent of the dyads, but was rejected for fifty-six percent of the dyads. It can be seen that from the initial measurement to the final measurement there was a trend away from homophily and toward heterophily since the percentage of homophilous dyads decreased and the percentage of heterophilous pairs increased.

Homophily and Heterophily and Attitude

In order to examine the relationship between attitude change and homophily and heterophily the following hypothesis was tested:

5. As the group mean scores of attitudes toward modules, competencies, and self-initiating learning activities increases, there will be no significant¹⁴ increase in the means of the differences between scores of cosmopolitaness of dyadic pairs.

The mean attitude scores toward competencies, self-initiated learning activities, and modules reported earlier showed a significant change for competencies from the first to the second testing. The t-tests for means of the differences between cosmopolitaness scores of dyadic pairs are reported in Table 8.

Hypothesis No. 4 was not rejected with regard to mean attitude score toward competencies from the first to the second measurement since the means of the differences of the cosmopolitaness scores of the dyadic

¹⁴ Level of significance is at the .05 level.

Table 8

T-tests for the Means of the Differences Between
Cosmopolitanness Scores of Dyads for Three Measurements

<u>Measurement</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Probability</u>	<u>Probability</u> (between 1st and 3rd measurement)
I	23.08	16.83	.196	
II	24.13	20.24		2.76**
III	36.63	26.15	3.43*	

* Significance at the .05 level

** Significance at the .01 level

pairs between the first and second measurements was not significant at the .05 level.

Since the mean attitude scores toward competencies for other measurement intervals was not significant and the mean attitude scores toward self-initiating learning activities and modules for any of the measurement intervals was not significant, hypothesis No. 5 was not subjected to further testing. It can be seen, however, that significant increases in the means of the differences of the cosmopolitanness scores of dyadic pairs occurred during the second and third measurement intervals and between the first and third measurement intervals. These increases confirm the earlier finding that between the first and third measurements a trend toward heterophily was indicated.

Changes of Opinion Leaders and Liaisons

In order to determine if there is a change in persons who act as opinion leaders and those who act as liaisons, the following two hypotheses were tested:

6. There is no relationship between persons who are considered opinion leaders the first week and persons who are considered opinion leaders the sixth week or the twelfth week.
7. There is no relationship between persons who act as liaisons the first week and persons who act as liaisons the sixth week or the twelfth week.

The subjects whose weighted scores were in the top ten percent of the student t-distribution are indicated in table Nos. 9, 10, and 11. For the first measurement, the opinion leaders were indicated by code Nos. 15 and 23. For the second measurement the opinion leaders were

Table 9

Matrix of Sociometric Choices for
Measurement I Indicating Opinion Leaders

Chooser	1	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
1									1									1									
2							2		1																		
5										1																	
6				2									2														
7															1												
8																	1										
9						1																					
10														1													
11													3		1		2				1						
12						3									1	2											
13							2	1					3														
14								3					2														
15									3																		
16													1														
17										1																	
18												2	1														
19																			2								
20																											
21																											
22																											
23																											
24																											
25																											
26																											
27																											
28																											
Total Choices	0	1	0	4	1	4	2	2	3	1	1	2	8	3	3	3	3	1	2	3	6	0	3	2	1	2	
Weighted Score	0	1	0	7	3	6	4	4	6	3	3	4	14*	8	7	7	7	3	4	7	14*	0	9	6	1	4	

Mean of weighted scores = 5.28
Standard deviation = 3.60

* Weighted score in the top 10% of the population

Table 10

Matrix of Sociometric Choices for
Measurement II Indicating Opinion Leaders

Chooser	1	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
1																											
2							2		1																		
5							1			2																	
6									3							1									2	3	
7				2											1												
8																											
9																											
10													2								1						
11															1		2				1						
12			3										2			2											
13			1				3		3							1	2										
14																2											
15																							1				
16																											
17																											
18																											
19			2																								
20									1																		
21																											
22																						3					
23																											
24																											
25																											
26																											
27																											
28																											
Total Choices	0	2	1	7	1	1	3	1	4	2	1	1	4	1	3	9	2	0	1	2	2	0	3	3	3	1	
Weighted Score	0	3	2	13*	2	3	6	1	8	6	2	2	5	3	8	24*	4	0	1	6	4	0	8	6	3	0	

Mean of weighted score = 4.61
Standard Deviation = 5.05

* Weighted score in the top 10% of the population

Table 11

Matrix of Sociometric Choices for
Measurement III Indicating Opinion Leaders

Chooser	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
1										1										1									
2											1								2										
5												1														1			
6													1									2							
7			3									1						1									2		
8											1																		
9											1								2										
10												1																	
11													1																
12														2															
13		3	1																										
14		2													2														
15											1																		
16																													
17												3																	
18													3																
19											1																		
20																													
21																													
22																													
23						2										1	3												
24																													
25																													
26		1																											
27																													
28																													
Total Choices	0	3	1	5	1	0	2	1	5	3	1	2	5	1	5	8	1	2	4	1	2	4	1	4	3	3	2	3	1
Weighted Score	0	6	3	9	2	0	6	1	14*	7	3	4	10	3	8	17*	2	5	8	3	6	5	6	5	5	6	4	2	

Mean of weighted score = 5.34
Standard Deviation = 3.99

* Weighted score in the top 10% of the population

indicated by code Nos. 6 and 18. For the third measurement the opinion leaders were indicated by code Nos. 11 and 18.

Hypothesis No. 6 was not rejected for the interval between the first and second measurements and for the interval between the first and third measurements since the opinion leaders changed. Hypothesis No. 6 was rejected for the interval between the second and third measurements since both opinion leaders did not change. However, it should be noted that one of the subjects who was a designated opinion leader at the second measurement (No. 6) did change at the third measurement (No. 11).

In order to test hypothesis No. 7, sociograms were constructed and are reported in charts Nos. 2, 3, and 4. The sociograms were used to determine those subjects in the population who acted as liaisons between cliques. By inspection liaisons were identified at each measurement reported here by code number. For the first and second measurements no liaisons were identified since by definition the absence of a subject designated as a liaison would not result in the formation of two separate groups. For measurement three, 23 was identified as a liaison since by the absence of 23, two separate groups would result from one originally connected.

Since no liaisons were identified for the first and second measurements, hypothesis No. 7 was not tested.

Characteristics of Opinion Leaders and Liaisons

In order to determine the characteristics of opinion leaders

Sociogram for Measurement I

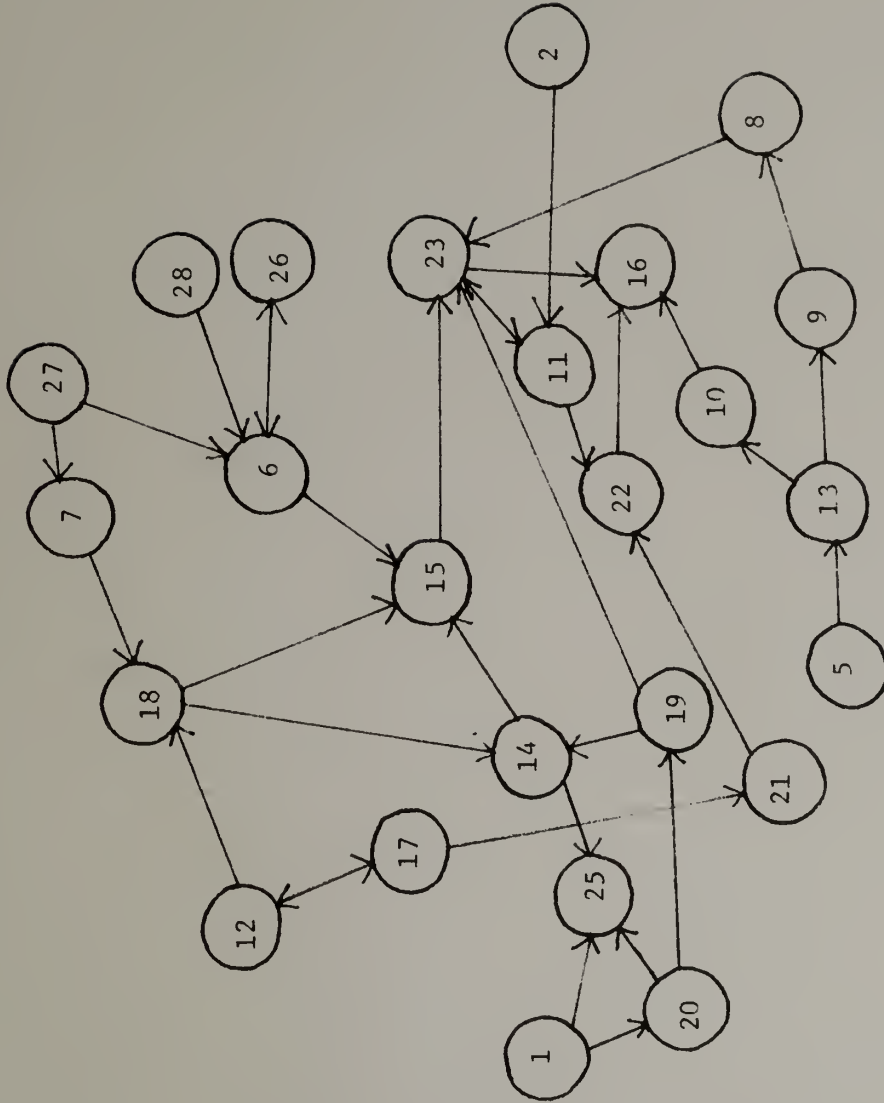
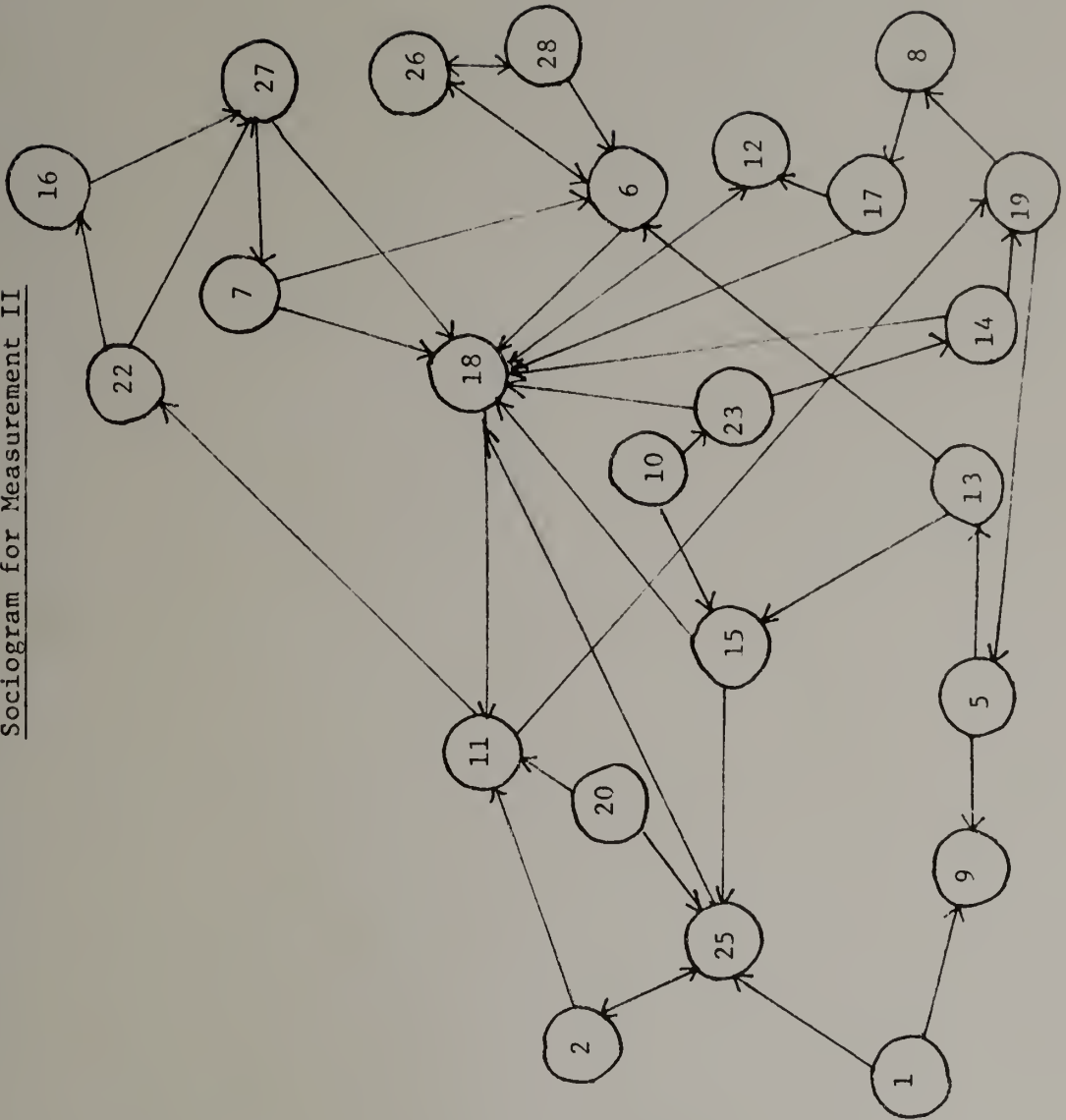
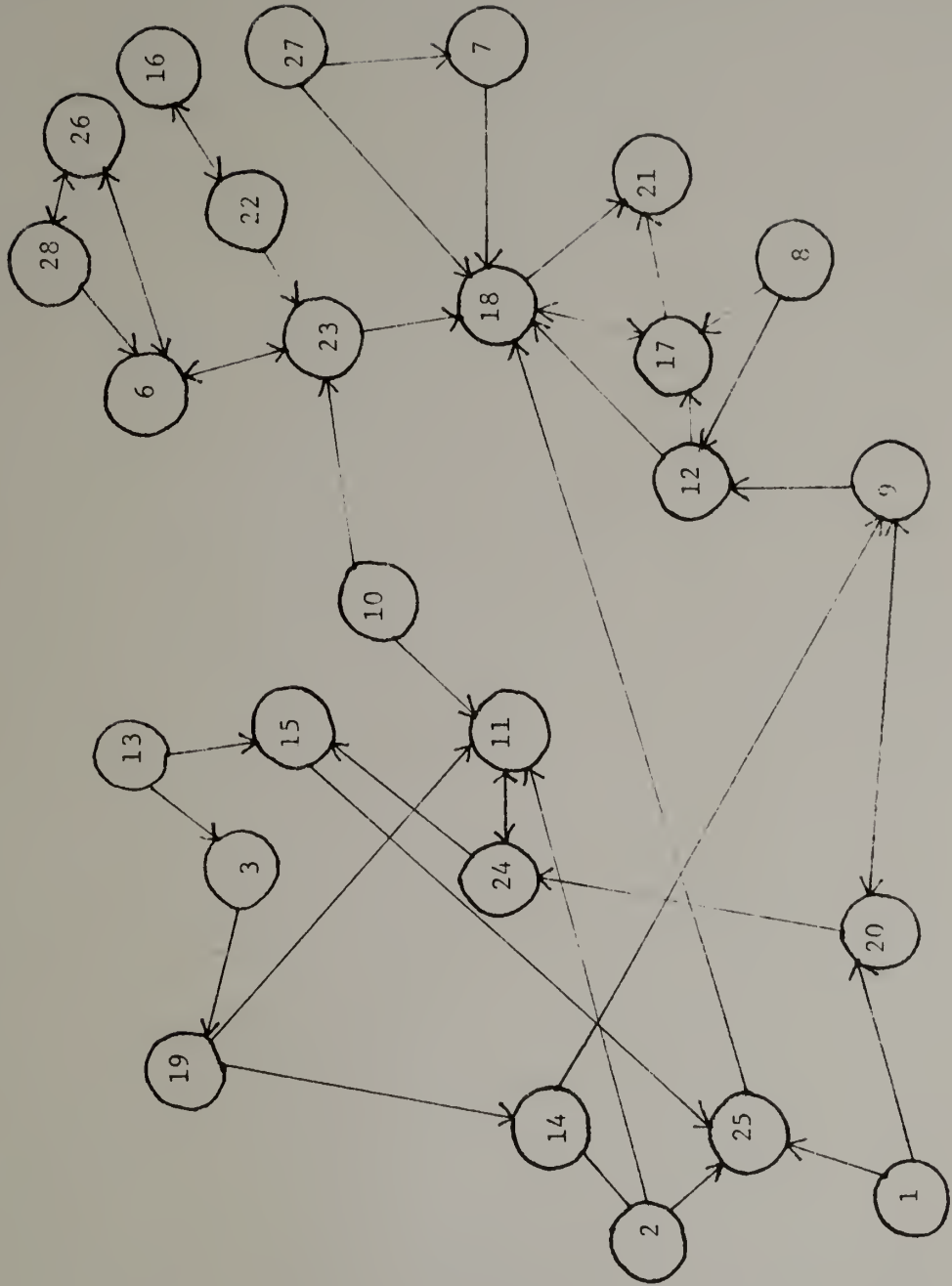


Chart No. 3

Sociogram for Measurement II



Sociogram for Measurement III



and liaisons, the following two research questions were posed:

1. What are the characteristics of opinion leaders?
2. What are the characteristics of liaisons?

The examination of the data collection revealed that the two opinion leaders identified* at the first measurement were both older than the typical undergraduate (32 years of age and 50 years of age). Neither opinion leader was part of the regular student body, and both lived in towns away from the university. Neither had experience with modules or competencies, but opinion leader A had initiated learning activities. Both had increasingly positive attitudes toward the three concepts under investigation over the semester. One was male (A) and the other female (B).

The opinion leaders identified** at the second measurement were both undergraduates (one male and one female) and part of the regular student body. Both participated in extracurricular activities and both showed the development of positive attitudes toward the innovations. Neither had previous experience with modular or competency-based courses, although opinion leader C had heard about modules and competencies three to five months before enrollment in the methods of education course. Opinion leader C had entered the department during the freshman year, and opinion leader D entered during the junior year.

* hereafter referred to as opinion leader A and opinion leader B

**hereafter referred to as opinion leader C and opinion leader D

During the third measurement, D again was identified as an opinion leader in addition to a new opinion leader.* Opinion leader E was a biology major who was enrolled in the course for certification purposes. He was a member of the regular student body and participated in extracurricular activities. He had taken a modular, competency-based course in mathematics as a freshman and he reported that he had had the opportunity to initiate learning experiences previous to enrolling in Methods of Education. His attitude scores for the innovations were well above the mean at each measurement.

The liaison identified for the third measurement period was identified earlier as opinion leader B. Since no other liaisons were identified, no characteristic profiles were constructed.

Additional Analyses

In order to better understand the attitude score results for self-initiating learning activities two additional analyses were made. The attitude scores of those subjects who completed three or more of the suggested learning activities were compared to those of subjects who completed less than three learning activities for the semester. The results are reported in Table 12. It can be seen that there are significant differences between the two groups for each measurement period. Furthermore, the scores of the group who completed three or more indicate the maintenance of a positive attitude while the scores of the other group reflect a change in a negative direction.

* hereafter referred to as opinion leader E

Table 12

Mean Attitude Scores for Self-Initiating Learning Activities
for Those Subjects Completing Three or More Learning Activities
Compared to Those Subjects Completing Less than Three Learning Activities

<u>Measurement</u>	<u>Mean Scores of Subjects Completing Three or More Learning Activities (N=12)</u>		<u>Mean Scores of Subjects Completing Less than Three Learning Activities (N=13)</u>	
	<u>Mean</u>	<u>Standard Deviation</u>	<u>Mean</u>	<u>Standard Deviation</u>
I	17.67	4.33	23.38	7.27
II	18.25	6.19	25.92	8.86
III	16.08	4.98	26.92	9.43
				<u>Probability</u>
				2.36*
				2.49*
				3.6 **

* Significant at the .05 level

** Significant at the .005 level

In a second analysis, the data were regrouped in order to compare subjects whose scores increased from one measurement to another. Group means were computed and t -tests were applied in order to test for significant differences occurring between the means of two groups. The results are reported in Table 13.

An additional analysis was made in order to determine if one variable was more relevant than another. Time of entry into the Education Department was compared with previous knowledge of or experience with the innovations under investigation. (Since only two students completed the item on number of education books/articles, it was not considered relevant.) Separate scores derived from the data collection sheet were computed for time of entry and previous knowledge of or experience with the innovations. The differences of these scores for dyads were determined and the means of the differences were computed for each measurement. T -tests to determine significant differences are presented in Table 14.

The only significant difference occurred at the .10 level between the first and third measurement for previous knowledge/experience. However, greater increases in the mean of the differences occurred for this variable than for the time of entry variable. The means of the differences for the time of entry variable are negligible.

One of the questions that was not addressed specifically in this study was concerned with attitude as a variable of homophily and heterophily: "Do persons communicate with those holding similar or dissimilar attitudes?" By analyzing the differences in attitude score for dyadic pairs, this question could be addressed. Scores were obtained

Table 13

T-Tests for Mean Attitude Scores
of Subjects Whose Score Increased
Compared to Subjects Whose Score Decreased

Concept	Subjects Whose Scores Increased			Subjects Whose Scores Decreased				
	Means of Three Administrations			Means of Three Administrations				
	I	II	III	Probability	I	II	III	Probability
Competencies	21.86	16.26	14.64	3.10***	22.42	25.71	28.75	1.27
	21.94	20.50	14.72	2.92***	22.28	20.62	31.42	.23
Self-Initiated Learning Activities	20.50	17.00	19.61	1.37	19.64	25.70		2.02*
	20.18	25.46	15.27	1.78*	20.81	20.30	24.75	1.78*
	26.16	18.00	15.27	2.40**	20.81	23.57	28.90	2.41**
Modules	26.36	20.77	16.69	3.81***	17.71	20.10	25.00	1.32
			18.4	1.50	16.8	23.6	1.09*	1.18

* Significance at the .05 level
** Significance at the .01 level
*** Significance at the .005 level

Table 14

Means of the Differences Between Dyadic Pairs and T-test Results
for Time of Entry and Previous Knowledge of the Innovations

<u>Measurement</u>	<u>Time of Entry</u>			<u>Probability</u>
	<u>I</u>	<u>II</u>	<u>III</u>	
Means	8.7	8.22	8.12	.23
	8.7		8.12	.26
		8.22	8.12	.04
<hr/>				
	<u>Previous Knowledge</u>			
	15.52	18.26		.51
Means	15.52		23.28	1.32*
		18.26	23.28	.81

* Significant at the .10 level

from the semantic differential and the difference between these scores was found for each of the dyads. A mean of these differences was computed for each measurement and a t-test was used to determine significant differences between means. The results are presented in Table 15.

A significance at the .05 level was reached for the difference of the means between the first and third measurements. It appears that persons communicated with others whose attitude toward self-initiating learning activities was dissimilar.

Chapter Summary

In this chapter, the results of the research have been presented. Significant increases in mean attitude scores occurred for competencies between the first and second measurement. When the hypotheses for competencies was tested, it was found that no relationship existed between attitude toward competencies and communication patterns. No other hypotheses were tested since no other attitude scores reached the acceptable level of significance.

Analysis of homophilous and heterophilous interactions revealed a trend toward heterophily. This was confirmed through the analysis of cosmopolitanism scores. No relationship was found between the mean competency attitude score and homophily or heterophily during the first measurement interval.

Through the analysis of the sociometric exercise five opinion

Table 15

T-Test Results for the Means of Attitude Score Differences of Dyadic Pairs

<u>Innovation</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>Probability</u>
Competencies	6.00		8.40	1.19
	6.00	8.57		1.64
Self-Initiating Learning Activities		8.57	8.40	.06
	5.40		10.28	2.72*
Modules	5.40	7.17		1.29
		7.17	10.28	1.62
Modules	6.48		8.32	.97
	6.48	8.00		.94
		8.00	8.32	.16

* Significant at the .05 level

leaders were identified. The results indicated that from the first to the second measurement opinion leadership changed and partially changed from the second to the third measurement. Only one liaison was identified and so the hypotheses regarding the change in subjects who act as liaisons was not tested. Following the identification of opinion leaders and liaisons, characteristics of each were described.

Two additional analyses were made in regard to attitudes toward self-initiating learning activities: (1) those subjects who completed three or more learning activities were compared with those subjects completing less than three learning activities; and (2) those subjects whose scores showed a decrease from one measurement to another. Additional analyses of possible relevant homophilous/heterophilous variables were made by comparing scores of dyadic pairs for time of entry and previous knowledge or experience and for differences of attitude scores of dyadic pairs.

The results presented in this chapter will be discussed in the chapter which follows. In addition, implications for teacher education and suggestions for further research will be discussed.

CHAPTER V

CONCLUSIONS AND DISCUSSION OF FINDINGS

This study probed into relationships between attitude change and communication patterns in a methods of education class which had implemented three innovative structures: competencies, self-initiated learning activities, and modules. Furthermore, the investigation sought to determine degrees of homophily and heterophily among students in the class and to relate these characteristics to attitude change. Finally, the research was concerned with both the identification of and characteristics of opinion leaders and liaisons.

The findings indicated that no relationship existed between communication patterns and attitude. Since a significant increase in attitude occurred only for one concept during one measurement interval, the hypotheses could not be fully tested. It was found, however, that changes occurred in the type of communication patterns over the semester. From the first to the third measurement, there was a significant decrease in the percentage of horizontal communication patterns and an increase in the percentage of vertical communication patterns.

The change in percentage of homophilous and heterophilous pairs revealed a trend toward heterophily. Furthermore, a significant increase in the means of the differences between cosmopolitaness scores of a dyad occurred between the initial and final measurements, again, indicating a trend toward heterophily.

Analysis of sociometric data for each measurement revealed five opinion leaders. Except for the third measurement, opinion leadership changed during the semester. Examination of sociograms revealed the existence of one liaison at the third measurement. Several characteristics of opinion leaders and one liaison were determined through the analysis of the data collection sheets.

Additional analyses revealed that: (1) subjects who completed three or more self-initiated learning activities had more positive attitudes toward those activities than subjects who had completed less than three; (2) previous knowledge or experience appeared to be more relevant than the variable time of entry into the education department; and (3) subjects tended, during the semester, to interact with other subjects holding dissimilar attitudes toward self-initiated learning activities.

Communication Patterns and Attitude

Of the nine total measurements reported for competencies, self-initiated learning activities, and modules, the only significant increase in the group mean attitude score occurred for competencies between the first and second measurement. Hypotheses Nos. 1, 2, and 3 for competencies were not rejected because there was no significant increase in any of the communication patterns. Since no other group mean increase was significant, the three innovative concepts were not subjected to further analyses.

An additional analysis was conducted to take into account the

lack of significant increase in attitude scores. The data was regrouped by comparing subjects whose scores increased from one measurement to another and those subjects whose scores decreased from one measurement to another. As previously reported, for those subjects who showed an increase, it was significant at least at the .05 level. For those subjects who showed a decrease, the mean decrease was significant for four of the nine measurement intervals. In general, then, attitudes toward the three innovations under investigation appeared to increase in a positive direction or at least remain the same since the lowest mean reported was 28.90, well above the neutral score of 36.90. No attempt was made to show a relationship between the results of the regrouped data and communication patterns since the unit of analysis was the dyad, and some individuals of a dyad would be in the group whose scores showed an increase and others would be in the group whose scores showed a decrease.

While not significant, the mean scores for competencies and modules did increase from the first to the third measurement. One reason why a significant increase did not occur could be attributed to the fact that the initial means were high. As mentioned in Chapter III, the highest possible individual score on the semantic differential was nine and the lowest was sixty-three, while a score of thirty-six represented a neutral position. The initial mean for competencies was 23.80, while the initial mean for modules was 22.08. Both means indicated a positive attitude. Although movement toward a more positive attitude, indicated by higher means, did

occur, the change was not significant.

In order to better understand reasons for the unexpected results, this investigator interviewed seven subjects involved in this study. One of the subjects explained the initial positive attitude scores as a residual of "wanting to please the professor." If other subjects felt similarly, these biases would result in unusually high mean scores. Other discussions with the subjects brought out that at the time of the first measurement, when subjects were asked to make judgments about concepts they had read about in the course syllabus and had heard explained in class, few had actually experienced these concepts. This explanation is particularly germane to self-initiated learning activities. Although not statistically significant, the mean scores for this concept steadily decreased. Many subjects did not take advantage of these learning activities, and so for many, subjects were asked to judge a concept without experiencing it. One subject interviewed indicated this was true in his case. Another interviewee said that he only took advantage of self-initiating learning activities when he knew that his grade could be improved by completion of one or more of the suggested activities.

To account further for the attitudes toward self-initiated learning activities, an additional analysis was made. A comparison between attitude scores of those subjects who completed three or more self-initiated learning activities was made with attitude scores of subjects who completed less than three learning activities. As reported previously, the scores of subjects who completed three or more learning

activities indicated a more positive attitude toward self-initiated learning activities than those subjects who completed less than three learning activities. Apparently actively experiencing the innovation produced positive attitudes. In a follow-through interview, one subject reported that she was originally motivated to complete a suggested learning activity for grade improvement. However, after completing several activities, learning became the primary motive and receiving a good grade was a secondary motivation. This leads one to the tentative conclusion that initially forcing a student to participate in an activity may produce the desirable result of "learning for learning's sake" in the final analysis.

About half of the subjects interviewed indicated confusion over the semantic differential. Some felt that it was administered too often and they were bored by it. Others felt initially that bipolar adjectives did not relate to the concept; on subsequent testings, however, they felt that this relationship became clearer. It was also pointed out that the semantic differential was viewed by some as just another course requirement and not completed with seriousness.

Knowledge of the results of a modular assessment given prior to the second measurement could have adversely affected the attitude measurement. Although the subjects were asked to complete the semantic differential before the results of the assessment of the first module was made known, many suspected they had done poorly. Two interviewees pointed out that they knew the results of the assessment would be made known on the same day as the administration of the semantic differential

and felt that this influenced their attitude. Grades, then, may have influenced attitudes toward competencies, self-initiating learning activities, and modules. If subjects felt that these innovations were beneficial to obtaining a good grade, then their attitude would probably be positive. If, on the other hand, subjects felt these innovations affected them in an adverse manner, then their attitude would probably be negative.

In summary, significant mean increases in attitude scores did not occur for the three concepts. Possible reasons for this include: high initial mean scores, little or no direct experience with the innovation (initially for all three concepts and throughout the semester for self-initiating learning activities), confusion over the semantic differential, and the effects of grades.

Since the increase in the mean score of attitudes toward competencies from the first to the second measurement was the only significant change, it was the only one subjected to a decision to reject or not to reject null hypotheses Nos. 1, 2, and 3. The three hypotheses were not rejected since there was no significant increase in upward, downward, or horizontal communication patterns between the first and second measurement. The results indicate that no relationship exists between communication patterns and attitude toward competencies. However, since the other concepts were not subjected to a decision to reject or not reject the null hypotheses, there is a lack of evidence on which to base this conclusion.

An analysis of the communication patterns suggested significant

changes were occurring. For the first measurement, the number of horizontal patterns was fourteen; of the downward, eight; and of the upward, three. For the third measurement there were eleven, six, and eight, respectively. Combining the upward patterns with the downward patterns reveals the degree of vertical communication which occurred. From the first to the third measurement there was a significant decrease in the percentage of horizontal communications while there was an increase in the percentage of vertical (combination of the upward and downward patterns) communication patterns. This finding is consistent with the finding reported earlier by Lin (1968). Of three schools studied, Lin (1968) found that the school with highest attitude scores had more vertical communication (between teachers aware of the innovation early and those aware of the innovation later) than the other two schools. This study found a trend toward vertical communication existed, but it was not possible to relate this pattern to attitude change because levels of statistical significance did not reach an acceptable level.

Although the relationship between attitude and communication patterns could not be fully investigated due to the lack of significant increases, three hypotheses were subjected to a decision to reject or not to reject. An increase in the mean scores of attitudes toward competencies from the first to the second measurement was significant, but the three hypotheses were not rejected since there was no significant increase in upward, downward, or horizontal communication patterns during the measurement interval.

In order to account for the lack of significant increases in

the means of the attitude scores, interviews with subjects were conducted and additional analyses were undertaken. The discussion centered on high initial means, lack of participation in the innovations, confusion over the semantic differential, and the effect of grades as possible reasons for the results obtained.

Mean scores indicated positive attitudes did exist, in general, toward the three innovations. All the mean attitude scores were well above the mean of thirty-six, which would represent the neutral positive on the semantic differential. In addition, the types of communication patterns changed over the semester. There was a significant increase in the percentage of vertical patterns and there was a significant decrease in the number of horizontal patterns indicating a trend toward heterophily. Heterophily and homophily are further discussed in the next section.

Degrees of Homophily and Heterophily

Results presented in Chapter IV depicted a trend from homophily to heterophily. Significant results were reported as a decrease in the percentage of homophilous pairs occurred between the second and third measurements and between the first and second measurements. At the same time significant increases occurred in the percentage of heterophilous pairs between the second and third measurements and between the first and third measurements. As reported in Chapter II, diffusion patterns are usually homophilous, but when heterophilous

interaction occurs it is usually because followers seek advice from persons more competent than themselves (Rogers and Shoemaker, 1971).

When the communication pattern changes discussed earlier are examined, it can be seen that the percentage of upward patterns increased significantly from the second to the third measurement and from the first to the third measurement. Upward communication, by definition, occurred when a person with a low cosmopolitanness score communicated with a person with a high cosmopolitanness score. It was suggested in Chapter II that this type of communication might exist among undergraduates in a methods of education class when they viewed certain individuals in the population as more knowledgeable about the innovation than themselves. Thus, the trend toward heterophily is not an unexpected result in view of the fact that it occurs when advice and knowledge are sought from those perceived as more competent.

Variables which determine homophily and heterophily were also examined. Evidence from earlier research, cited in Chapter II, was inconclusive as to which variables are relevant and which are not relevant. Variables pertaining to homophily and heterophily studied were time of entry into the Education Department, number of books or articles on education read as not part of a course, and previous knowledge of competencies, self-initiated learning activities, and modules. Examination of data collection sheets revealed the number of education books or articles read was not relevant since only two students completed the item. The other two variables appear relevant since they indicated

degrees of homophily and heterophily, the trend being toward heterophily. Rogers and Bhowmik (1970) suggested that a source and a receiver should perhaps be heterophilous on some variables and homophilous on others. For the dyads studied, it would appear that previous knowledge of an innovation and time of acceptance as an education major are relevant heterophilous variables.

Thus, data suggested the existence of a trend toward heterophily in the small group studied. The increase in number of upward communication patterns indicated that persons increasingly communicated with persons more unlike themselves over the semester. Furthermore, persons with higher cosmopolitanness scores (time of entry into the Education Department and previous knowledge of the innovations) were sought often by individuals with lower scores. It appears, therefore, that the items from which the cosmopolitanness scores were derived are relevant heterophilous variables. Each variable, however, would require separate empirical testing to determine which is more relevant.

Such an attempt was made and reported as one of the additional analyses in Chapter IV. Separate scores derived from data collection sheets were computed for time of entry and previous knowledge of or experience with the innovation. The only significant difference occurred at the .10 level between the first and third measurement for previous knowledge/experience. However, greater increases in the mean of the differences occurred for this variable than for the time of entry variable. The means of the differences for the time of entry variable are negligible. While there is some evidence, then, that previous

knowledge of or experience with the innovation is a more relevant variable than time of entry, further study is required to confirm this finding.

Another homophilous/heterophilous variable investigated was attitude similarity. It was reported in Chapter IV as an additional analysis that a significant difference in attitude scores for dyadic pairs occurred for self-initiated learning activities between the first and third measurements. This finding indicates that persons communicated with others whose attitudes toward self-initiated learning activities was dissimilar. Perhaps persons who regularly completed the suggested activities communicated with those who did not do so. Without further investigation, however, this remains a question. For competencies and modules it seems that persons communicated with those holding similar attitudes toward these innovations.

Homophily and Heterophily and Attitude

It was not possible to effectively test hypothesis No. 5 because only one mean attitude score increased significantly. Hypothesis No. 5 was designed to measure the relationship between homophily/heterophily and attitudes toward the three innovations for each of three measurements. However, significant increases in attitude scores did not occur for self-initiated learning activities and modules during any of the measurement intervals and only one significant increase was found for competencies from the first to the second measurement. As reported in Chapter IV, when the mean attitude score for competencies

for this measurement period was subjected to a decision to reject or not to reject the hypothesis, it was not rejected since there was no significant increase in the means of the differences between cosmopolitanness scores of dyadic pairs. Therefore, no relationship was found to exist between homophily/heterophily and attitude between the first and second measurements. Since further testings were not possible, conclusions from this partial testing cannot be drawn.

It was noted, in regard to means of the differences between cosmopolitanness scores of a dyad, that significant increases occurred between the second and third measurement and between the first and third measurement. Again, from the beginning to the end of the semester there is a trend toward heterophily. As mentioned earlier, this is consistent with conclusions drawn by previous researchers (Rogers and Shoemaker, 1971). In follow-up discussions with several subjects, it was discovered that many felt the methods of education class was particularly worthwhile because they met many new persons. Thus, it is not unexpected to find this trend toward heterophily if subjects did indeed interact with others they had met unlike themselves as measured by the variables of heterophily previously discussed.

From the discussions of this and the previous sections, it seems that heterophily occurred in an undergraduate methods of education class as part of the diffusion process. When it did occur, it was because persons sought others who were perceived as more knowledgeable in regard to the innovations than themselves. The heterophilous variables which appear relevant are time of entry into the

Education Department and previous knowledge or experience with competencies, self-initiated learning activities, and modules.

Changes of Opinion Leaders and Liaisons

Changes in opinion leadership were reported to occur between the first and second measurement and between the first and third measurement. Further, a partial change occurred between the second and third measurement. Five different opinion leaders were identified over the semester. These changes in opinion leadership were not expected.

The unanticipated data may be explained in several ways. Opinion leaders identified at the first measurement were both older than the typical undergraduate (32 years of age and 50 years of age). The choice of them as opinion leaders early in the semester may have been due to the age factor. Subjects selected these persons because they were perceived as more knowledgeable. In a study by Blanton (1971) it was found that opinion leaders were older than those persons who were advice-seekers. It is not unreasonable, then, to expect older persons to be chosen as opinion leaders.

Opinion leadership was found to change in this study. The change could have occurred because as subjects communicated about the innovations, they sought others in the population more like themselves in age, but unlike themselves in knowledge of or experience with the three innovations. In Chapter II, it was suggested that opinion leaders

should be homophilous on some variables and heterophilous on others. Perhaps age is a homophilous variable in this study and knowledge of the innovations is a heterophilous variable. As it was noted earlier, there was a trend toward heterophily in the population and perhaps this could be applied to the change in opinion leadership.

It was also noted that one subject was identified as an opinion leader at both the second and third measurements. This finding is consistent with an earlier study by Blanton (1971) which reported opinion leadership to be stable over time. In addition, the other opinion leader identified at the second measurement had a high weighted sociometric score at the third measurement, but the score was not in the top ten percent of scores. Perhaps the apparent lack of stability of opinion leadership is due to the arbitrary designation that opinion leaders are those whose weighted score falls in the top ten percent of the total scores of the population. Also, the reliability of the sociometric technique must be a consideration.

Change in opinion leadership unexpectedly occurred in this investigation. Initial impressions that older people are more knowledgeable, the perception that peers are knowledgeable, the arbitrary selection of identification criteria, and the question of instrument reliability are possible reasons which might account for lack of stability of opinion leadership.

As reported in Chapter IV, it was discovered that by definition only one liaison was identified for one measurement. This subject had

been identified at the time of the first measurement as an opinion leader. The hypothesis regarding change in subjects who act as liaisons was not, therefore, tested. The lack of identification of more liaisons could be due to the operational definition. Analysis of the sociograms revealed that each time a subject was subjected to the criteria stated in the definition, the connected group remained in communication with members through another channel. By definition, a liaison is one whose absence causes one group to be separated into two subgroups. Since other channels of communication were available, it was assumed that the original group was not separated. A different definition may have revealed liaisons. In fact, it appears that the opinion leaders in each case acted as liaisons since much of the communication did flow through them, as indicated by the sociograms.

It should be noted that, although as previously reported, the increase in heterophily was not significant between the first and second measurements, it was significant between the second and third measurements and between the first and third measurements. The sociograms are similar for the first and second measurement, but dissimilar for the second and third and for the first and third. Perhaps the lack of liaisons is related to homophily and heterophily. Homophilous interaction may depend less on liaisons, but as heterophily increases, the need for liaisons to facilitate communication increases.

The sociometric technique used in this study may also be a possible reason why only one liaison was identified. Rogers and Jain

(1968) suggest matrix multiplication as a way of identifying liaisons.

In summary, it has been suggested that the operational definition of the liaison and the method used to identify liaisons could be possible reasons why only one liaison was found to exist in the sample. Also, liaisons may, indeed, not have been present because of homophilous interaction occurring at the time of the first two measurements.

Characteristics of Opinion Leaders and Liaisons

Several characteristics of the five opinion leaders were described in Chapter IV. The opinion leaders similar in age participated in extracurricular activities while the two older subjects did not. This may be related to gregariousness which Troldahl and Von Dam (1965) found to be a variable which differentiated givers of opinion from askers of opinion. All the subjects initially had or developed during the semester positive attitudes toward the innovations. Of the five opinion leaders, only one had entered the Education Department at an early date, two had initiated learning experiences, and one had previously taken a modular, competency-based course. It appears that variables investigated are not relevant to the study of opinion leadership. It was pointed out in Chapter II that previous researchers have disagreed on identifying variables relevant to characteristics of opinion leaders.

In this study, participation in extracurricular activities and holding positive attitudes toward the innovations appear to be relevant to opinion leadership. Given the evidence reported, it seems that the

other variables discussed are irrelevant.

Characteristics of the liaison were described in the section under opinion leaders in Chapter IV, since the liaison was also an opinion leader (B). This subject was older than the typical subject in the population and had no previous experience with modules or competencies, but had previously initiated her own learning experiences. With an N=1, it is difficult to draw conclusions regarding characteristics of liaisons. It is worthwhile to note that the liaison identified had been identified earlier as an opinion leader. While not viewed as an opinion leader throughout the semester, she probably continued to hold status for some of the subjects while less status for other subjects. Perhaps this can be explained by status inconsistency described in Chapter II. Rogers and Bhowmik explain:

Heterophilous communication is more effective when source and/or receiver are status inconsistent. Status inconsistency is the relative lack of similarity in an individual's ranking on various indicators of social status. Status inconsistent individuals are internally heterophilous, which allows them the potential to be homophilous on different variables with different sets of receivers, and hence to bridge heterophily gaps in a system. They may tend to be liaisons in linking two or more heterophilous cliques within the system, and hence are able to play an important communication role (1970, p. 533).

While the evidence is insufficient to conclude with certainty that this explanation is correct, it appears that status inconsistency may have occurred.

Summary of Conclusions and Findings

In the previous four sections, the discussion has focused on possible reasons for the results obtained. Instrumentation, sample

size, field setting, operational definitions, and methods of analysis may partially account for these results.

Except during one measurement for one concept, significant mean increases in attitude scores did not occur for the three innovations. In addition, significant relationships between attitude scores and the communication patterns were not found. In regard to communication patterns, there was an increase in vertical patterns and a decrease in horizontal patterns.

There was a significant (.05 level) increase in the means of the differences in regard to cosmopolitanness scores of dyads between the second and third measurements and between the first and third measurements. It was concluded that a trend toward heterophily unfolded over the semester.

Through sociometric analysis, it was revealed that a total of five opinion leaders and one liaison existed in the group. Except for one measurement interval, opinion leadership changed each measurement. Since only one liaison was identified at the third measurement, the hypothesis regarding change in liaison role was not tested. The evidence concerning the characteristics of opinion leaders and liaisons was inconclusive.

Implications for Teacher Education

This study and others similar to this could be valuable to the field of teacher education. When innovations are introduced to the undergraduate population, a better chance of acceptance of new

programs might be realized if the innovator has some knowledge of the diffusion process. Specifically suggested by this study are knowledge of attitudes, communication patterns, and the roles of opinion leaders and liaisons.

Attitudes that are developed toward innovations are especially important in cases of forced innovation (Rogers and Jain, 1968). The development of positive attitudes becomes particularly important when the innovation is to serve as a model for the undergraduates. For instance, in this study it was hoped that students might see the relevance of using competencies, modules, and self-initiating learning activities in their own teaching. The development of positive attitudes was seen as a prerequisite to the use of these structures by the perspective of teachers enrolled in the methods class. While the attitudes toward the three innovations in this study were positive, the question as to whether or not these positive dispositions would lead to implementation of these structures in a teacher candidate's own teaching will remain unanswered until a follow-up is undertaken.

Knowledge of group structure could aid the innovator in the acceptance of innovation. Identification of those variables in the diffusion process which are relevant to the flow of communication is important. This investigation tentatively concluded that persons sought out others in the class who were aware of the innovation prior to enrollment in the methods class. Additionally, certain persons in the class acted as opinion leaders and liaisons and were identified through sociometry. With a knowledge of the relevant variables which

affect communication and with the identification of those persons who exert influence on others, it would be possible for innovators to intervene early in the diffusion process and manipulate the communication network. Such manipulations might include pairing of heterophilous individuals for assignments, formation of work groups to include an opinion leader or liaison, and making a concentrated effort to include procedures which would promote group interaction in the classroom.

Finally, it seems that if indeed other studies in the diffusion process at the undergraduate level confirm the finding that opinion leadership changes throughout the semester, then periodic measurements of these changes should be made. Interviews with these key persons could provide valuable insights about the innovations and as a result modifications of strategies in the implementing process could be developed.

It appears from a review of past research that little attention has been given to the process aspects of diffusion or to the consequence stage of diffusion in teacher education. Yet, teacher educators interested in change in their own programs could benefit from such investigation. Attitude development, communication networks, and opinion leadership are important to the study of diffusion and should be part of an innovative teacher education program.

Suggestions for Further Research

The conclusions and discussion of the research have posed several possibilities for further research.

First, a different instrument could be used to measure attitude. If significant increases in attitude scores toward the innovation occurred using another instrument, hypotheses regarding attitude and change and communication patterns could be fully tested, possibly revealing the existence of a relationship between these variables. Another possibility would be using interviewing techniques to determine attitude. Or perhaps the combination of an attitude instrument and the interview would be a better way of uncovering attitudes.

Drawing of samples from a different population from the one studied would be another research suggestion. A study of innovation acceptance at the graduate level, in an elective course, and with a larger population might yield quite different results. As mentioned earlier, the sample in this study was part of a larger population of undergraduates attending a small, private military college. A civilian college or large university setting would be variations worthy of further study.

An in-depth study of selected individuals in a population employing the case method would be another avenue to explore. The focus could be individuals in the population chosen at random or specifically selected because they were identified as opinion leaders or liaisons at the beginning of the study. Several interviews, administrations of personality inventories and attitude scales, might reveal several important variables as individuals experience a forced innovation.

A refinement of the variables which comprise the cosmopolitanness score would not only present a different way of defining the communication patterns, but also would provide a different way of defining homophily and heterophily. As indicated earlier in this chapter, the evidence concerning relevant variables with respect to homophily and heterophily needs further study. This is especially true for the undergraduate population as innovation occurs. A study completely devoted to homophily and heterophily as they relate to the diffusion process for the undergraduate population is indicated. Other variables which are related to opinion leadership and the characteristics of liaisons are in need of investigation. Few studies have explored the role or characteristics of opinion leaders and liaisons at the undergraduate level. As mentioned earlier in this chapter, such variables as values, status, and social participation have been identified as relevant (Rogers and Cartano, 1962) from previous research, but the question as to their relevance for an undergraduate population remains largely unanswered.

In addition to the use of instruments other than the semantic differential, the technique of matrix multiplication seems to hold promise for the analysis of sociometric data (Rogers and Jain, 1968). Sociograms for more than twenty subjects are difficult to construct and interpret.

In summary, further research studies should continue to focus on attitudes toward innovations and their relationship to communication

patterns and homophily and heterophily. In addition, it is important to continue to explore the question of relevant variables for homophily and heterophily, opinion leaders, and liaisons. With a refinement of measuring devices and analysis techniques, much new information could be added to the field of diffusion research.

Chapter Summary

This study has focused on (1) attitude change and communication, (2) homophily and heterophily, and (3) opinion leaders and liaisons. Since increases in mean attitude scores were not significant, hypotheses relative to the first area were only partially tested. There was, however, a significant increase in the mean score which measured attitude toward competencies between the first and second measurements. When the hypotheses regarding the increase in the mean attitude score and increase in percentage of a communication pattern was tested, it was found that no significant relationship existed between the variables.

A discussion of the possible reasons for the lack of significant increase in attitude scores focused on initial high means, confusion over the semantic differential and the effects of grades. Additional analyses and interviewing of subjects also revealed that not taking full opportunity of suggested self-initiated learning activities might explain the results for the lack in the development of more positive attitudes toward these activities. In fact, it appears that those subjects who did complete several self-initiated learning activities

developed more positive attitudes than those who completed few or none of the suggested activities.

In analyzing the communication patterns, it was found that there was an increase in the percentage of vertical communication patterns and a decrease in the number of horizontal patterns. This indicated that over a twelve-week period, a trend toward heterophily had unfolded.

This finding was confirmed by analysis of the means of the differences in cosmopolitanness scores of dyads. That is, the means of the differences of the scores increased over the semester, indicating individuals were interacting with persons dissimilar on the variables time of entry into the Education Department and previous knowledge of or experience with the innovations. Additional analyses of homophilous/heterophilous variables showed that persons tended to communicate with persons holding similar attitudes toward modules and competencies, but that interacting pairs held dissimilar attitudes toward self-initiated learning activities.

It was not possible to fully test the hypothesis which postulated a relationship between attitude and homophily/heterophily. Again, this was due to the fact that a significant increase in the mean attitude score occurred only for competencies during the first measurement interval. When the hypothesis was tested for this measurement period, no significant relationship was found to exist between the means of the differences between scores of cosmopolitanness of dyadic pairs and

and the mean attitude score for competencies.

Through sociometric analysis, five opinion leaders and one liaison were revealed. In general, opinion leadership changed during measurement intervals. It was believed that subjects sought advice from persons more knowledgeable about the innovations than themselves. This view is supported by the trend toward heterophily discussed previously. One of the heterophilous variables was previous knowledge of or experience with the innovation.

One liaison was identified at the third measurement and this liaison had been nominated earlier as an opinion leader. Conclusions as to the characteristics of opinion leaders and the liaison were inconclusive.

Although several hypotheses in the study were not fully tested, two clear findings emerged: (1) over time, there was a trend toward heterophily; and (2) opinion leadership changed over time. If the suggestions for further research are carried out, it should be possible to draw more definite conclusions regarding: (1) the relationship between attitude change and communication patterns; (2) the relationship between attitudes and homophily/heterophily; (3) characteristics of opinion leaders and liaisons of the undergraduate population.

While significant results were not generally found, this investigator feels the study has addressed itself to areas of diffusion research which are in need of attention. In the first chapter, it was pointed out by diffusion researchers that a dependent variable

other than innovativeness should be studied, that group interaction as the unit of analysis should be investigated, and that there should be an increase in the use of sociometric techniques to analyze the process aspects of diffusion. This study, in attempting to understand the consequences of implementing innovations in a methods of education course, has focused on the areas mentioned. With the refinement of measurement techniques and methods of analysis, future studies should add much to the field of diffusion.

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APPENDIX A

Syllabus

Ed 432

Fall, 1975

Instructors Smith and Catone

Introduction

Methods of education is a competency-based course utilizing a modular approach. A module is a self-contained learning unit designed to help you acquire certain skills, knowledge, and attitude competencies. Because the emphasis of our course is on the acquisition of competencies, we have adopted a system which allows you to achieve a minimum competency level during a specified period. If necessary, you will have additional time to achieve that level.

<u>Date</u>	<u>Module</u>	<u>Instructor</u>	<u>Due Date</u>	<u>Make-up</u>
Sept. 4	Introduction & Communication	Catone	Sept. 25	Oct. 9
11	Communication	Catone		
18	Communication	Catone		
25	*Assessment on Communication	Catone		
	Instructional Objectives	Smith	Oct. 9	Oct. 23
Oct. 2	Resources & Materials	Smith	Oct. 9	Oct. 23
9	**Assessment on Resources & Materials & Objectives	Smith		
	Audio-Visual Techniques	Smith	Oct. 23	Nov. 6
16	Audio-Visual Techniques	Smith		
23	**Assessment on Audio-Visual	Smith		
	Open Education	Catone/ Smith	Nov. 13	Dec. 4
30	Open Education (Elem.)	Catone	Nov. 13	Dec. 4
	Teaching Strategies (Second.)	Smith	Nov. 13	Dec. 4

* Major Assessments (worth 20% each)

**Minor Assessments (worth 10% each)

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<u>Date</u>	<u>Module</u>	<u>Instructor</u>	<u>Due Date</u>	<u>Make-up</u>
Nov. 6	Open Education	Catone		
	Teaching Strategies/Evaluation (Second.)	Smith		
13	*Assessment on Open Ed (Elem.)	Catone		
	*Assessment on Teaching Strategies & Evaluation (Second.)	Smith		
	Instruction Sequence	Smith		
20	*Planning Instruction	Smith	Dec. 4	Dec. 11
Dec. 4	**Social Studies/**Electives	Catone/ Smith		
11	**Social Studies/**Electives	Catone/ Smith		

Electives (2 required)

Introduction to guitar
 Introduction to educational literature
 Journal keeping
 Field trips
 Needs fulfillment reports (12)
 Library research paper
 Independent study project
 Value clarification workshop
 Interviewing teachers
 Reports on teaching methods observed in the public schools
 Professional conferences
 Create your own elective(s)
 Social studies (required for social studies majors)

* Major Assessments (worth 20% each)

**Minor Assessments (worth 10% each)

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Texts:

Human Interaction in Education, by Standford & Roark (Elem. & Second.)

Systematic Instruction, by Popham & Baker (Second.)

A Teacher's Guide to Open Education, by Stephens (Elem.)

Additional books and articles are available at the library, in the student lounge in Webb 13, at the bookstore, or from Professors Smith and Catone.

Requirements: Each student must complete all required modules listed as well as two electives.

Attendance: Each student is expected to attend all classes. You will discover that the classes are activity oriented while at the same time much information is exchanged. Missing the class will put you at a distinct disadvantage because the experience cannot usually be repeated. If you feel, however, you have attained the competencies listed or can achieve them in a way other than that suggested, you are invited to submit a plan to achieve the competencies to the instructor in charge of the module.

Grading: While we believe the emphasis will be on learning rather than grade achievement, we nevertheless have to assign grades. Each module will be graded individually. You will experience a number of evaluative instruments including tests, brief reports, critiques, performance tests, and peer and self-evaluation.

Each student will have an opportunity to achieve minimum competency ("C") on each module. You may achieve higher than minimum level either by scoring higher on an assessment or by initiating your own learning experiences or both. On each module handout, you will notice a section entitled "Extending Activities." These activities are suggestions for you to extend your own learning. You may also obtain approval from the instructor in charge of the module to design your own "extending activities."

Your final grade will be determined from your performance on all modules with major assessments receiving the greatest weight.

LEX 400

Communication in the Classroom

Prerequisite: None

Estimated time: 6 hours in the classroom, 12 hours outside classroom

General Goals: This module is designed to help persons understand the basic principles of interactive education, trust building, communication, and group discussion.

Competencies to be developed:

1. A basic understanding of the goals and principles of education through written discussion.
2. The ability to explain in writing each of the following:
 - a. synthesis approach to understanding the nature of man
 - b. self-concept
 - c. perceptual field
 - d. relationship between meaning and learning in personal terms of experiencing this module
 - e. basic concepts in communication (expectations, threat, personal needs, trust, security and openness, non-verbal messages)
 - f. I-thou and I-It
 - g. interdependence
 - h. characteristics of the helping relationship
 - i. two types of group-centered discussion
 - j. the basic principles in organizing group discussions
3. The ability to describe briefly what is done to help students develop skills for group discussion.
4. The ability to explain how to cope with obstacles in facilitating group discussion.
5. The ability to explain how to achieve personal involvement in discussion.
6. The ability to explain how to focus on ideas, feelings, and the present in discussion.
7. The ability to explain how to handle special problems of discussion.

Resources: Human Interaction in Education
Members of the class
Professors Catone and Smith

Activities: Trust building exercises
Discussion experiences
Communication exercises
Reading: "Interaction" -- chapters 1, 2, 4, 5

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- Evaluation: (1) Attendance at two module sessions
 (2) Written assessment on competencies described above
 (3) Write a letter described below
 (4) Extending activities

All are due on date listed.

Evaluation of module: Write a letter to Professor Catone expressing your personal feelings about the module.

Extending Activities:

- A. Read (in whole or part) and report on:
 Chapter 3 in Abnormal Psychology (Coleman)
Teaching as a Subversive Activity (Postman & Weingartner)
 Chapter 1 in Clinical Supervision (Goldhammer)
Freedom to Learn (Rogers)
Professional Education of Teachers (Coombs)
 Chapters 1-4 in Education as a Human Enterprise (Hitt)
The Transparent Self (Jourard)
Toward a Psychology of Being (Maslow)
On Becoming a Person (Rogers)
Fantasy and Feeling in Education (Jones)
Learning to Feel-Feeling to Learn (Lyons)
Reach, Touch, Teach (Borton)
Human Teaching for Human Learning (Brown)
 Chapter 3 in "Interaction"
Human Development Program
- B. Articles in Student Lounge (submit a summary on 4 x 6 card)
- C. Try some communication and trust exercises with friends or among yourselves.
- D. Submit two Weekly Reports on how the course has fulfilled intellectual, social, organizational, and aesthetic needs.

Laboratory - Communication

Purpose: To explore concepts for facilitating discussion.

Materials: Professors, students, and exercises

Exercises: I, II, III, IV.

Evaluation: Describe in a sentence or two your reactions to each of the exercises. Hand in with module assessment.

- I. Divide the class into dyads. Instruct each pair to find out as much as possible about each other in, say, fifteen minutes. Then reconvene the class and have each person introduce his partner to the group.
- II. Name game: give first name and the name of a building you feel like. Total group participates with each person naming not only himself and building, but also those who preceded him.
- III. Have a discussion on a topic suggested by the group, but before a participant can speak, he must repeat (to speaker's satisfaction) what the speaker has just said.
- IV.
 - (1) Choose a partner
 - (2) One member of the dyad sit in an inner circle with members of five other dyads.
 - (3) The other members of the dyads sit in the outer circle opposite their friend.
 - (4) The inner circle limits their discussion to the Now Members of the outer circle listen.
 - (5) Partners get together for feedback and then reverse positions.
 - (6) The original inner circle fantasizes what it is like to be joyful, going to place where they would be most joyful. Each shares what he experiences. Feedback and reverse the process as before.

LEX 401

Instructional Objectives

Estimated time: 3 hours

Operational Objective: The student's post-module response will reflect a position consonant with the use of behavioral objectives.

Competencies to be developed:

1. The student will be able to construct valid objectives.
2. The student will be able to develop long-range behavioral objectives.
3. The student will be able to construct behavioral objectives which could be achieved in one class period, module or lesson.
4. When given a valid behavioral objective the student will be able to identify the A, B, C, D conditions.
5. The student will be able to identify minimal acceptable limits when describing terminal behavior resulting from a planned experience.

Activities: Planning game, discussion, lecture and reading.

Evaluation of student: High level of expertise must be illustrated on the following required "hand-ins":

1. Three long-range objectives designed to apply to your own teaching area of interest.
2. Three short-range objectives consistent with the above objectives.
3. The terminal behavior in each of the above has to be identified.
4. The minimal acceptable performance in each of the above has to be identified.
5. Attendance at both sessions.

Resources:

1. Using Instructional Objectives in Teaching, by D. Cecil Clark
2. Planning an Instructional Sequence, by Popham and Baker
3. Establishing Instructional Goals, Popham and Baker
4. Preparing Instructional Objectives, Robert F. Mager
5. Effective Teaching Strategies, by Muriel Gerhard
6. Professors Smith and Catone
7. Readings in Elementary Ed, Haas, Cooper, Wiles

Extending Activities:

1. Complete the "mini-book" Preparing Instructional Objectives, by Mager.

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2. Take the Standard "Self-Test" by Mager and repeat until your grade is 90% or better.
3. Read in whole or in part resource book #5.
4. Arrange to tutor a child for 3 hours in an area where there is a diagnosed deficiency. Prepare an instructional sequence involving a pre-test and a post-test which definitely proves that the deficiency existed and the learning experiences provided by you either improved or eliminated the problem. All instruction must be planned and executed utilizing the behavioral outcomes approach and complete reports are to be submitted to Professor Smith on or before February 28.

LEX 402

Resources for the Teacher

Prerequisites: LEX 400, LEX 401

Estimated time: 3 hours

General Goal: The module is designed to acquaint the teacher with the many resources available to be used by the teacher to provide more meaningful learning experiences for his students.

Competencies to be developed:

1. The student will be able to list at least 7 major publishers of textbooks or programmed material.
2. The student will be able to distinguish between programmed learning and self-learning experiences.
3. The student will be able to list 5 areas of responsibility which a teacher has which can be shared with other school personnel.
4. The student will be able to list at least 3 major suppliers of films.
5. The student will be able to list 3 suppliers of filmstrips, tapes, and slides.
6. The student will be able to name at least 5 local resource people normally available in a community who could provide assistance in his teaching area.
7. The student will be able to construct a resource file on normally available field trips which would provide meaningful experiences for his students.
8. The student will be able to list three types of student activities which could expand teaching resources in the classroom.
9. The student will be able to list three advantages of carrels.
10. The student will be able to name three types of television experiences which can be used by the teacher.
11. The student will be able to differentiate audio materials from visual materials and be able to list at least 6 of each.
12. The student will be able to list at least 6 audio-visual materials.
13. The student will be able to identify at least 5 organizations or agencies which will provide assistance to the teacher.
14. The student will be able to list three methods of supplementing the local school budget which are available to the teacher.

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Evaluation of Module:

1. An assessment will be given based on the competencies listed.
2. High level of expertise must be evident in the lesson plans to be done with second half of LEX 401.
3. Attendance at session -- LEX 402.

Resources:

1. Audio-visual Methods in Teaching, Edgar Dale.
2. Magazines:
 - A. The Teacher
 - B. The Nations Schools
 - C. Education
 - D. School and Society
 - E. Impact
 - F. The Personnel and Guidance Journal
 - G. Media and Methods
3. ERIC
4. A-V Instruction, Brown, Lewis, Harcleroad
5. Professors Smith and Catone

Extending Activities:

1. Attend V.E.A. Convention -- spend Thursday evening in exhibit. (October 17)
2. Build a resource file on catalogs of instructional materials.
3. Subscribe to The Teacher.
4. Order (free) "The Vermont Guide to E.T.V."

LEX 403

Audio-Visual Equipment

Prerequisites: LEX 401, LEX 402

Estimated time: 3 hours in class
2 hours outside class

General Goal: The module is planned to enable each student to gain the competency necessary to operate thirteen basic pieces of audio-visual equipment which teachers normally use.

Competencies to be developed:

1. Each student must have the proficiency necessary to set up and operate each of the pieces of equipment listed on the appended contract. The contract must be signed by the student and submitted to Professor Smith prior to October 23.
2. The student will be able to list three methods of providing multiple copies of handouts for his class which are available to the classroom teacher.
3. The student will be able to list at least two advantages and two disadvantages of each piece of equipment listed on the contract.
4. The student will be able to list four of the six suggested steps to follow when showing a film to a class.
5. The student will be able to differentiate and compare the following:
 - a. Direct, purposeful experiences
 - b. Contrived experiences
 - c. Dramatized experiences
 - d. Demonstrations
 - e. Field trips
 - f. Exhibits
 - g. Visual symbols
 - h. Verbal symbols
6. The student will be able to list two disadvantages and two advantages of programmed instruction.

Evaluation of Competencies:

1. An assessment will be given on October 23.
2. Attendance at session - LEX 403
3. Final Evaluation will be done by your supervisor when you are in the classroom!

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Resources:

1. Professors Smith and Catone
2. A-V Instruction - Understanding Media: The Extension of Man
3. A-V Methods in Teaching, Edgar Dale
4. Media & Methods

Extending Activities:

1. Develop a multi-media presentation to use in your teaching.
2. Use each piece of equipment in your practicum experiences.
3. Read some Marshall McLuhan:
 - a. Understanding Media
 - b. The Medium is the Message
4. Prepare some transparencies for future use.

LEX 403
Lab

- I. Areas of Teacher's Responsibility
 - A. Intellectual
 - 1. Field trips
 - 2. A-V aids
 - 3. Speakers
 - 4. Bulletin boards
 - 5. Textbooks
 - 6. Scrounge (used as aids)
 - 7. Maps, globes, magazines, etc.
 - B. Physical Development
 - 1. Health
 - a. Diagnose minor ailments
 - b. Teeth
 - c. Posture
 - d. Diet, etc.
 - 2. Safety
 - a. Dispensing medication
 - b. First aid
 - (1) Broken bones
 - (2) Bleeding
 - (3) Epileptic seizure
 - (4) Unconsciousness
 - c. School equipment
 - d. Fire (drills and actual)
 - C. Emotional
 - 1. Hyperactivity
 - 2. Home problems
 - 3. Depression, etc.
 - D. Social growth
 - 1. Acceptance by peers
 - 2. Development of values

People and Agencies:

- 1. Guidance Personnel
- 2. Principal
- 3. Speech therapist
- 4. Librarian
- 5. Department of Education
- 6. Nurse
- 7. Ministers, priests, rabbi, etc.
- 8. Department of Social Welfare
- 9. Probation officers

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10. Police officers
11. Doctors
12. Lawyers
13. Vermont Education Association
14. Film libraries
15. Mini-grants
16. Mental health agencies
17. Legislators and other politicians
18. Department of Libraries
19. Planned Parenthood agencies
20. Curriculum centers/A-V centers

LEX 404

How To Be a Scrounge

Prerequisite: NoneEstimated time: 1 hour in the classroom
3 hours outside the classroomGeneral goals: This module is designed to help persons acquire a knowledge of the whereabouts of various materials, their acquisition, and their use in the classroom.Competencies to be developed: After completion of this module a person should be able to:

1. List several sources in the community where free or inexpensive materials can be obtained.
2. Make contact with at least one source and acquire materials.
3. Explain their use in the classroom.

Resources:Some Basic Equipment for Infant Classrooms, by Mary E. Brown, pp. 73-74.
The Teachers Guide to Open EducationActivities:

Class lecture and discussion on techniques of scrounging
 Brainstorming in creative use of materials
 Scrounging in the community
 Sharing scrounging experiences

Evaluation:

1. Attendance at modular session
2. Acquisition of materials
3. Panel of student judges will determine a letter grade with Professor Catone and you. Based on materials acquired, techniques used, and creative use of material.

Evaluation of module: Class discussionExtending activities:

1. Scrounge for the rest of the semester for yourself or for the Psychology and Education Department.
2. Locate other resources which tell about other scrounging techniques.

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3. Write home and have some materials sent to you.
4. Weekly visits to the dump.
5. Go back to the place where you originally got your materials and get some more.
6. Have an interview with Mrs. Groff or her staff on scrounging. They're good at it.

LEX 405

Introduction to Open Education

Prerequisite: NoneEstimated time: 9 hours in class, 12 hours outside classGeneral Goal: This module is designed to acquaint persons with the philosophy, structure, and curriculum of the open classroom in the elementary school.Competencies to be developed: Upon successful completion of this module a student should be able to:

1. Analyze the relationship between 5 philosophical assumptions and 5 structures or procedures in the open classroom.
2. Synthesize a personal position on the open classroom based on a knowledge of facts and self.
3. Recognize three types of "Glasser Class Meetings."
4. List the contributions of at least 3 psychologists, philosophers, or educators to open education.
5. Explain the differences between open and traditional classrooms in terms of the nature of education and the views of ways children learn.
6. Explain the relationship between progressive education and open education.
7. Explain each of the following in relation to the open classroom:
 - a. role of the teacher
 - b. freedom
 - c. responsibility
 - d. decisions
8. 3 principles for arranging the open classroom
9. List 3 methods for organizing and assigning work.
10. Explain several unique features of the open classroom curriculum, including specific content areas.
11. Explain how individualization is accomplished in the open classroom.
12. Explain how grouping is accomplished in the open classroom.
13. Explain how record keeping in the open classroom differs from that in the traditional classroom.
14. Name several record keeping methods in the open classroom.
15. Explain how evaluation is accomplished in the open classroom.

In addition, each person is required to:

1. Bind "Assumptions Scale" and "Teacher Questionnaire" and competencies No. 1 and 2 in a book using the technique learned in the workshop.

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2. Prepare either 5 math activity cards or 5 science activity cards for the resource box in room 6.
3. Make up a reading game.
4. Make a contribution to the writing resource box using pictures from magazines.
5. Participate in projects (ceiling, wall, bubble, curriculum)

Activities:

Read chapters 1-4, 6-14, 5, 15-16 in Stephens, Workshops, other readings and activities.

Evaluation:

1. A score of 80% or better on an assessment of competencies 1-15A
2. Completion of competencies 1-5B
3. Attendance at 3 workshops
4. Extending activities

Extending Activities:

1. Submit summaries of articles on the open classroom.
2. Visit an open classroom (lots-a-luck).
3. Decorate a resource box for room 6.
4. Bind some articles or pamphlets for display in room 6.
5. Put scrounge material to use in room 6.
6. Take slide pictures of room 6.
7. Read and report on books about open education.
8. Read and report on other than assigned chapters in Stephens.

LEX 406

Introduction to Teaching Strategies

Prerequisite: Behavioral objectives, A-V, resources modules

Estimated time: 3 hours in class, 3 hours outside class

General goal: This module is designed to help persons gain a basic understanding of a variety of teaching strategies.

Competencies to be developed: Upon successful completion of this module the student should be able to:

1. Justify using or not using each of the following teaching strategies based on:
 - a. Their advantages and disadvantages, and
 - b. Knowledge of one's own ability, competency, and philosophy: role playing, case method, small-group techniques, lecture, questioning, debate, and inquiry.
2. The student will be able to formulate higher level questions incorporating lower levels of cognition.
3. Same as #4 on LEX 401.

Activities:

Readings
Workshops on teaching strategies

Evaluation:

1. "Take-home" on competencies No. 1 and No. 2
2. Incorporation of strategies into unit plan (LEX 401)
3. Extending activities

Extending activities: Read in whole or in part and report on:

Crabtree, Charlotte, "Inquiry Approaches: How New and How Valuable," *Social Education*, XXX, No. 7, pp. 523-525.
Demchick, Michael, "How Inquiry May Set the Stage for Learning," *Science Education*, Vol. LIV, No. 1
Kaltsounis, Ted, "What About Inquiry," *Instructor*, LXXX, No. 5, 1971, pp. 49-51.
Massiacas, Byron, *Inquiry in the Social Studies*, McGraw-Hill, 1966.
Massiacas and Zevin, *Creative Encounters in the Classroom*, Wiley, 1967.

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Anderson, Robert, Teaching in a World of Changes, Harcourt, 1968.
Oliva, Peter, The Secondary School Today, International Textbook,
1968.

Others suggested by Professors Catone and Smith.

LEX 407

Planning Instruction - Instructional Objectives

Prerequisite: Communications in the Classroom

Estimated time: 6 hours

Operational objective: The student will be provided with the experiences necessary to plan instruction, both short range and long range, utilizing the current thinking, research, and techniques.

Competencies to be developed:

1. The student will be able to identify and to construct valid objectives.
2. The student will construct a plan of instruction for one week.
3. Two daily lesson plans coordinated with competency 2 will be constructed utilizing the recommended forms, theory, and acceptable methodology.
4. The student will be able to recognize and to differentiate the values of various teaching techniques such as lecture, role playing demonstration, group discussion, individualized instruction, laboratory experiences, self-learning and values development experiences.

Activities:

lecture
demonstrations
discussions
planning game
reading

Evaluation of student:

1. High level of experience must be evident in required plans from competencies 2 and 3.
2. Attendance at two sessions.

Resources:

1. Using Instructional Objectives in Teaching, by D. Cecil Clark
2. Planning an Instructional Sequence, by Popham and Baker
3. Establishing Instructional Goals, Popham and Baker
4. Preparing Instructional Objectives, Robert F. Mager
5. Effective Teaching Strategies, by Muriel Gerhard
6. Professors Smith and Catone
7. Readings in Elementary Ed, Haas, Cooper, Wiles

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Extending Activities:

1. Complete the "mini-book" Preparing Instructional Objectives by Mager.
2. Take the standard "Self-Test" by Mager and repeat until your grade is 90% or better.
3. Read in Wotule or in part resource book No. 5.
4. The Central Purpose of American Education, Educational Policies Commission, resource No. 7.
5. Forecast for the 70's, Shane and Shane, Resource
6. B. F. Skinner: Educations Efficiency Expert, Resource No. 7. Arrange to tutor a child for 3 hours in an area where there is a diagnosed deficiency. Prepare an instructional sequence involving a pre-test and a post-test which definitely proves that the deficiency existed and the learning experiences provided by you either improved or eliminated the problem. All instruction must be planned and executed utilizing the behavioral outcomes approach and complete reports are to be submitted to Professor Smith on or before November 8.

LEX 408

Evaluation of the Open Classroom (Elective)

Prerequisite: Behavioral Objectives

Estimated time: 4 hours on tour, 1 hour outside of class

General goal: This module is designed to help students gain a basic understanding of how evaluation is accomplished in the open classroom.

Competencies to be developed: Upon successful completion of this module the student should be able to:

1. List several ways evaluation is accomplished in the open classroom.
2. Determine the purpose(s) for evaluation in the open classroom.

Resources: Stephens, L. A Teacher's Guide to Open Education, Chapter 5.

Activity: Visiting an open school, reading

Evaluation:

1. Prepare a list of evaluative methods in the open classroom from observation and interviews from teachers and administrators.
2. Explain the purpose(s) for evaluation in the open classroom from interviews with teachers and administrators.

Special LEX

Evaluation Module - 432

Prerequisite: LEX 400 through 413

Estimated time: 2 hours in class

General goal: Develop an evaluation system for Ed. 432.

Competencies to be developed: Each member will contribute through committee work or through committee leadership to a finished product which could be used as a total system of evaluation in the course Ed. 432.

Activities: Professors Catone and Smith will act as consultants and initial leaders in organizing committees to develop the system.

Evaluation: The composite finished evaluation system will be evaluated by each class member utilizing the established purposes of an evaluation program and also utilizing the desirable characteristics as such a system.

LEX 409

Introduction to Educational Literature (Elective)

Prerequisite: None

Estimated time: 1/2 hour per week

General goals: This module is designed to help persons (1) become acquainted with various educational journals, periodicals, and magazines, (2) update knowledge of various educational issues and trends, and (3) develop a positive attitude toward professional publications.

Competencies to be developed: After this module, a person should be able to:

1. List several publications which are useful to teachers for professional improvement.
2. Articulate several viewpoints about educational issues and trends.
3. Articulate a viewpoint toward the usefulness of professional publications.

Resources: Publications such as:

Journal of Chemical Education
Journal for Research in Mathematics Education
Arithmetic Teacher
Teacher
Change
Childhood Education
Education Digest
Harvard Educational Review
Today's Education
Early Years
Learning
Media and Methods
Journal of Research and Development
Theory Into Practice
American Education
The Physics Teacher
High School Journal
Journal of Educational Psychology
Journal of Research in Music Education
Mathematics Teacher
Nation's Schools
Peabody Journal of Education

Research in Education
Review of Educational Research
Teachers College Record

Activities:

Read articles
Report on article on a 4 x 6 card
Discussions with instructors

Evaluation:

1. Reading publications weekly and submitting a summary of at least one article on a 4 x 6 card.
2. Articulating in the discussion what was learned and what attitudes were developed.

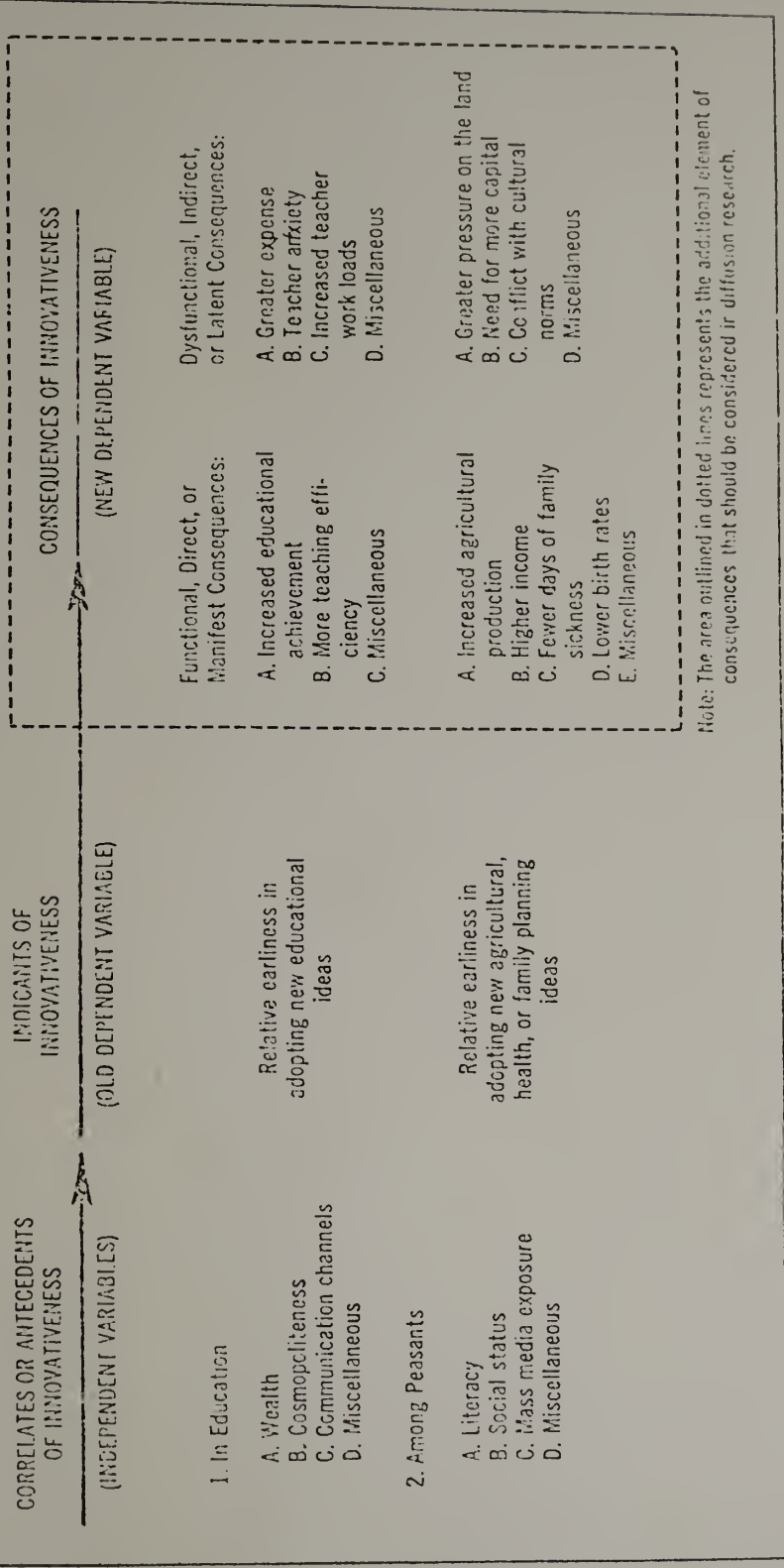
Extending Activities:

1. Write your own journal about happenings in the Department and in the schools.
2. Write critical reviews of some articles.
3. Write critical reviews of the publications.
4. Submit an article to a journal.

APPENDIX B

Figure 11-1

A new model for studying change in education and among peasants.



APPENDIX C

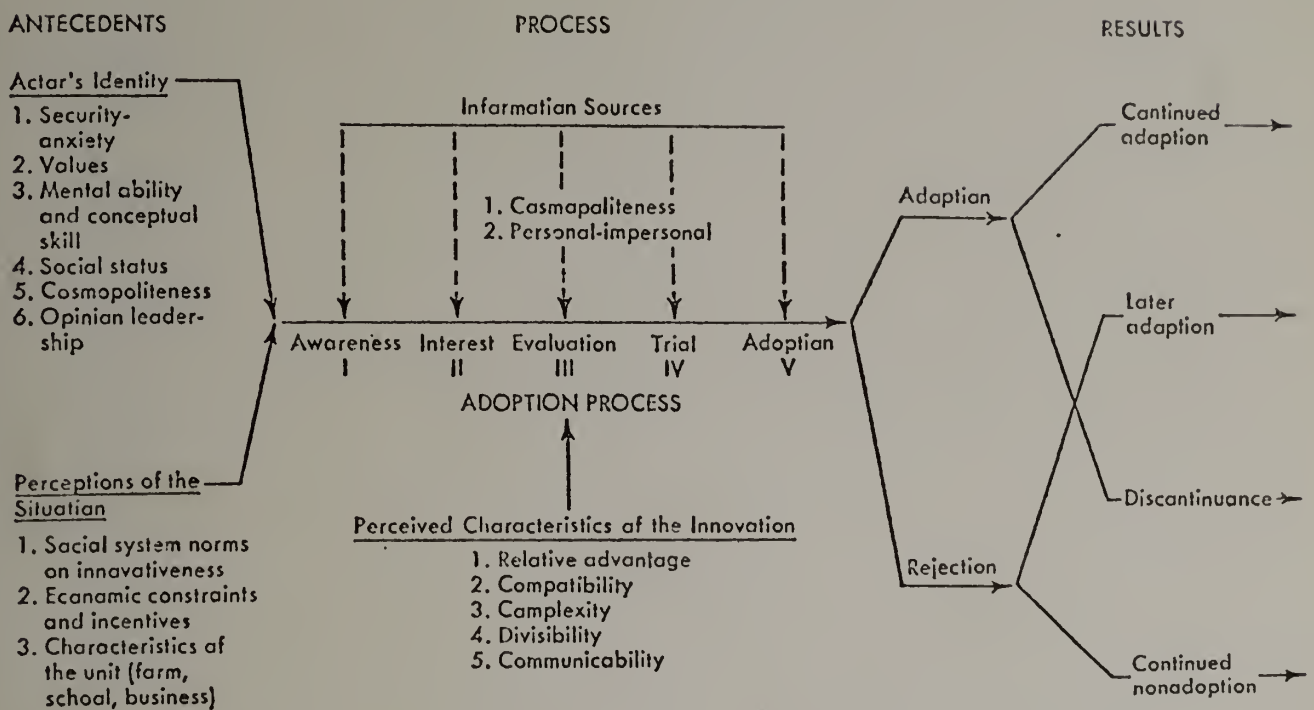


FIGURE 11-1. PARADIGM OF THE ADOPTION OF AN INNOVATION BY AN INDIVIDUAL WITHIN A SOCIAL SYSTEM

APPENDIX D

Data Collection Sheet for Ed. 432
Methods of Education

Code Number _____ Date _____

Directions: After reading the syllabus and listening to the explanation of the class, please complete the following questionnaire. Results will be treated as confidential information.

1. Age: _____ 2. Sex: (circle one) M. F.
3. Class: (circle one) 1976 1977 1978 1979 graduate
Other _____
4. Program: _____ Elementary
_____ Secondary (teaching field) _____

- | | |
|--------------------|---|
| Points
Assigned | 5. When did you enter the Department? (please check) |
| (5) ² | _____ 1st semester of my freshman year
_____ 2nd semester of my freshman year |
| (4) ² | _____ 1st semester of my sophomore year
_____ 2nd semester of my sophomore year |
| (3) ² | _____ 1st semester of my junior year
_____ 2nd semester of my junior year |
| (2) ² | _____ 1st semester of my senior year
_____ 2nd semester of my senior year |
| 1 | _____ I'm not in the Department, but hope to be accepted
* _____ I'm taking the course as an elective
* _____ I'm taking the course as a M.A.T. student
* _____ I'm taking the course for certification
* _____ other |
| | 6. If you are a member of the Corps, state your rank. _____ |
| | 7. What was your Q.P.A. as of June 1975? _____ |
| | 8. List extracurricular activities in which you regularly participate:

_____ |

* Since time of entry into the Department is a measure of commitment, interviews with M.A.T. students, students taking the course for certification or as an elective could reveal time of commitment and points assigned when that determination is made.

Answer the following as explained in the first half of the class:

10. When did you first hear about modules?
- 1 _____ a. Today
 (2)² _____ b. 1-2 months ago
 (3)² _____ c. 3-5 months ago
 (4)² _____ d. 6 months ago
 (5)² _____ e. _____ months ago
11. When did you first hear about competency-based courses?
- 1 _____ a. Today
 (2)² _____ b. 1-2 months ago
 (3)² _____ c. 3-5 months ago
 (4)² _____ d. 6 months ago
 (5)² _____ e. _____ months ago
12. Have you ever taken a competency-based course like this one?
- (2)² _____ Yes
 0 _____ No
 If yes, give the title and a brief description of the course.
13. Have you ever taken a modular course before?
- (2)² _____ Yes
 0 _____ No
 If yes, please describe the course.
14. Have you ever had the opportunity to initiate your own learning experiences in a course? If yes, briefly describe.
- (2)² _____ Yes
 0 _____ No
15. After hearing the explanation of the course, do you expect to have different learning experiences in this course?
- (2)² _____ Yes
 0 _____ No

APPENDIX E

IMPORTANT:

- (1) Place your check-marks in the middle of spaces, not on the boundaries:

THIS	NOT THIS
: : : X :	: : :X

- (2) Be sure you check every scale for every concept - do not omit any.
- (3) Never put more than one check-mark on a single scale.

Sometimes you may feel as though you've had the same item before on the test. This will not be the case, so do not look back and forth through the items. Do not try to remember how you checked similar items earlier in the test. Make each item a separate and independent judgment. Work at fairly high speed through this test. Do not worry or puzzle over individual items. It is your first impressions, the immediate "feelings" about the items, that we want. On the other hand, please do not be careless, because we want your true impressions.

Competencies

complete	:	:	:	:	:	:	incomplete
good	:	:	:	:	:	:	bad
untimely	:	:	:	:	:	:	timely
meaningful	:	:	:	:	:	:	meaningless
traditional	:	:	:	:	:	:	innovative
unimportant	:	:	:	:	:	:	important
constrained	:	:	:	:	:	:	free
active	:	:	:	:	:	:	passive
complex	:	:	:	:	:	:	simple
useless	:	:	:	:	:	:	useful
confusing	:	:	:	:	:	:	clear
helpful	:	:	:	:	:	:	harmful
worthless	:	:	:	:	:	:	valuable
ineffective	:	:	:	:	:	:	effective
organized	:	:	:	:	:	:	chaotic
closed	:	:	:	:	:	:	open

APPENDIX F

Sociometry Exercise

Code Number _____

Date _____

Directions: Below are five questions which will help to determine relationships among individuals in the class. Please answer each one honestly. The information will be kept confidential and unless you reveal it yourself, no one in this class will know what choices you made. I will share this technique with you during the module on "Classroom Evaluation." I'm sure you'll find it a valuable tool when you teach.

1. In making assignments for group work when a task has to be completed, with whom would you prefer to be grouped?

1st choice _____

2nd choice _____

3rd choice _____

Is there anyone with whom you would not like to work? Indicate below:

2. With whom have you talked about modules, competencies, and/or extending self-initiating activities (other than Professors Smith and Catone)?

1st choice _____

2nd choice _____

3rd choice _____

3. With whom have you talked about the class in general (other than Professors Smith and Catone):

1st choice _____

2nd choice _____

3rd choice _____

4. With whom have you talked outside this class concerning modules, competencies, and/or self-initiating learning activities?

-2-

5. With whom in this class do you regularly associate on a social basis?
