A STUDY TO DETERMINE SELECTED DEMOGRAPHIC CHARACTERISTICS OF HIGH SCHOOL TEACHERS IDENTIFIED AS INNOVATORS

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This is to certify that the

thesis entitled

A STUDY TO DETERMINE SELECTED DEMOGRAPHIC CHARACTERISTICS OF HIGH SCHOOL TEACHERS IDENTIFIED AS INNOVATORS

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ABSTRACT

A STUDY TO DETERMINE SELECTED DEMOGRAPHIC CHARACTERISTICS OF HIGH SCHOOL TEACHERS IDENTIFIED AS INNOVATORS

By

Jack Willsey

The purpose of this study was to determine if a relationship exists between selected demographic characteristics and innovativeness in high school teachers. Innovative teachers were those identified as such by their colleagues, using the criteria developed for this study. In considering the list of characteristics, nine hypotheses were formed around twelve variables. These variables were: age; years of teaching; years of teaching on the present high school staff; number of school systems taught in; number of quarter hours beyond the highest degree earned; recency of the last class taken; sex; subject taught; undergraduate majors and minors; whether or not the respondent was working toward an advanced degree; and, if a Master's Degree had been earned, whether it was in education or a subject matter field.

The nine null hypotheses were:

H 1: There is no difference in age between teachers identified as high innovators and teachers identified as low innovators.

H 2: There is no difference in the number of years of teaching experience between teachers identified as high innovators and teachers identified as low innovators.

H 3: There is no difference in the number of years as a teacher on the present high school staff between teachers identified as high innovators and teachers identified as low innovators.

H 4: There is no difference in the number of school systems previously taught in between teachers identified as high innovators and teachers identified as low innovators.

H 5: There is no difference in the length of time since the last class was taken between teachers identified as high innovators and teachers identified as low innovators.

H 6: There is no difference in innovativeness between male and female teachers.

H 7: There is no difference in subject matter taught between teachers identified as high innovators and teachers identified as low innovators.

H 8: There is no difference in innovativeness between teachers who have continued their education beyond the Baccalaureate Degree in pursuit of a higher degree and teachers who have not continued beyond the Baccalaureate Degree.

H 9: There is no difference in innovativeness between teachers who have earned a Master's Degree in Education and teachers who have earned a Master's Degree in a teaching field.

The population for this study consisted of all high school teachers in the Lower Peninsula of Michigan in high schools with professional staffs numbering between twenty-five and forty teachers. For purposes of drawing a sample, Michigan was divided into four regions. Three schools were then randomly selected from each region.

Two instruments were used to gather the data: a Teacher Data Sheet, designed for this study, and a modified Q-sort. Upon completion of the Q-sort, a mean teacher innovativeness score was computed for each teacher. Computation of such a score is recognized as a deviation from regular Q-sort procedures, which do not produce a score. This departure was necessary to provide a basis for ranking all teachers. The score obtained is a reflection of the number of times an individual teacher was identified as innovative by all other teachers included in the study at that school.

Because the variables noted were of two rather distinct types, two statistical procedures were used in the analysis. For the quantitative variables, multivariate analysis of variance was used. Analysis of the data in this study did not produce results that allowed rejection of the five null hypotheses tested by this procedure.

The other variables were qualitative and a Chi-square test of association was used in their analysis. The tabled Chi-square values derived were not large enough to reject the null hypothesis for the four hypotheses tested.

The following conclusions were drawn from the results of this study: as far as the demographic characteristics considered in this study are concerned, no distinction can be made between high innovative and low innovative teachers; teachers who scored the highest on the innovativeness scale were teachers concerned with the students and the effect the educational program was having on them as evidenced by informal conversation with the researcher; and teachers appear to be able to identify innovative colleagues using a list of prepared criteria.

A STUDY TO DETERMINE SELECTED DEMOGRAPHIC CHARACTERISTICS OF HIGH SCHOOL TEACHERS IDENTIFIED AS INNOVATORS

By

Jack Willsey

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To Dad who wanted me to be;

For Mom who knew I could;

And Sanda, who made it possible.

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CHAPTER I

THE PROBLEM AND ITS SETTING

Background and Setting

An investigation of the professional journals of the last decade indicates there has been much consideration given to educational innovations. The breadth and depth of educational innovations is apparently limitless. It can extend from a single teacher's use of a particular time period, through the cooperative efforts of separate school districts to offer a unified summer program, and beyond.

Many of the studies dealing with innovations center around the administrative staff or school district characteristics, and do not deal directly with the innovations themselves. A great deal of time is given to explaining the role of various levels of the administration in fostering, facilitating, and finalizing innovative programs. Some studies have attempted to sketch the innovative school administrator, his professional characteristics,[1,2] and

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[1]John Childs, "A Study of the Belief Systems of Administrators and Teachers in Innovative and Non-Innovative School Districts" (unpublished Ph.D. dissertation, Michigan State University, 1965).

[2]Allen Klingenberg, A Study of Selected Administrative Behaviors Among Administrators From Innovative and

various facets of the role he plays in the innovative process.[1] Almost equal to the attention given to delineating administrators and their role is that given to describing the characteristics of the school or school district. Such studies have ranged from the organizational climate of the central administrative office[2] to the size of the school district and the per pupil expenditures.[3,4]

One factor many of these studies seem to lack is consideration of one of the most important people in the educational scene--the classroom teacher.[5] If there has

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Non-Innovative Public School Districts (Lansing, Mich.: Michigan Department of Education, 1967).

[1]Harold Sargent, "A Test of Motivational Appeals Judged Effective by Chief School Administrators to Induce Teacher Acceptance of Educational Innovation" (unpublished Ed.D. dissertation, Pennsylvania State University, 1965).

[2]Larry Hughes, "The Organizational Climate Found in Central Administrative Offices of Selected Highly Innovative and Non-Innovative School Districts in the State of Ohio" (unpublished Ph.D. dissertation, The Ohio State University, 1965).

[3]Jan Jacobs, "Leadership, Size, and Wealth as Related to Curricular Innovations in the Junior High Schools" (unpublished Ph.D. dissertation, University of Michigan, 1965).

[4]Thomas Kendig, "An Analysis of the Relationships of Certain Educational Conditions to Curriculum Breadth and Innovation in Selected Pennsylvania School Systems" (unpublished Ed.D. dissertation, Pennsylvania State University, 1965).

[5]Robert Fox and Ronald Lippitt, "The Innovation of Classroom Mental Health Practices," in Innovation in Education, ed. by Matthew Miles (New York: Teachers College Press, 1964), p. 271ff.

been a great deal of time and effort expended to explore the school building, district, and administration, there has been an almost conspicuous lack of attention focused on the teachers, who are involved with developing innovative programs, or who may participate in their implementation.

If teachers are going to be encouraged to innovate, and if the implementation of their innovations is a desired and worthwhile goal, it is necessary to know more about the teachers who may be the initial innovators, or who may be inextricably linked to the success or failure of administratively originated innovations.

Purpose of the Study

The purpose of this study is to determine if teachers identified as innovative share any common demographic characteristics. The characteristics will include: age, sex, educational and experiential background.

Statement of Hypotheses

The following hypotheses form the basis of this study:

H 1: Teachers identified as innovative will have taught in more than one school system.

H 2: Teachers identified as innovative will have had more years teaching experience than those not identified as innovative.

H 3: Teachers identified as innovative will have taught longer on the present high school staff than those not identified as innovative.

These three hypotheses are all related to experience in the field of education as a factor affecting a teacher's inclination to be innovative. The literature review in Chapter II will present in more detail the relative importance researchers have given this particular factor and its influence on innovative behavior in a teacher.

H 4: Teachers identified as innovative will have continued their education beyond the Baccalaureate Degree.

H 5: Teachers identified as innovative possessing a Master's Degree will have earned it in education rather than a subject matter teaching field.

H 6: Teachers identified as innovative will be found proportionately in all subject matter areas.

H 7: Teachers identified as innovative will have been enrolled in a class more recently.

Preparation for teaching, both pre-service and in-service, is another possible facotr when considering innovative behavior in teachers. Hypotheses 4 - 7 identify some specific areas that may influence this behavior.

H 8: Teachers identified as innovative will be found in all age categories.

As will be pointed out in Chapter II, age is a matter of great concern where innovators are concerned, and because of this a decision was made to include this factor in the study.

H 9: Teachers identified as innovative will be proportionately of both sexes.

Although there is little related research on this particular item, it was considered an important part of the study.

The review of related literature in Chapter II will show there is little consensus on the demographic characteristics of innovative teachers, and little attempt has been made to determine empirically what these characteristics might be. That there is still a measurable time lag[1] between the development of a useful educational practice or theory and its adoption evidences a need to know more about innovative teachers. The knowledge that the failure of some innovative practices can be attributed to teachers' attitudes and behaviors[2] only increases the urgency.

If education is to continue to be an important influence in our society then teachers must be able to adjust to the rapidly changing nature of society and its needs.

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[1]G. Ernest Anderson, "Estimated Time for Accepting Educational Ideas: 30 Years," The Nations Schools, LXXVIII (December, 1966), 50.

[2]Edward Nussel and Mildred Johnson, "Who Obstructs Innovation?" Journal of Secondary Education, XVIV (January, 1969), 3-11.

The need for innovative educational practices has never been more acute, and it is possible that adoption of educational innovations can be hastened by innovative teachers staffing innovative schools. But people cannot be ordered to innovate, in a true sense of the word, for innovation implies change and a willingness to move along untried pathways. The possibilities of failure and misunderstanding are always great when new grounds are being traversed. This fact is frequently the reason why it is easier to employ a teaching style that does not involve risks.

Some teachers, however, will, and do, engage in the risky business of educational innovation, and some administrators are looking more and more for this characteristic in members of their teaching staffs. The innovative person who proceeds in a thoughtful, vigorous manner does so not because of some preprogrammed formula; he probably does so because of the type of person he really is. Knowledge of some of the characteristics that would distinguish that type of person, such as a group of demographic characteristics, could help in their identification.

As far as the characteristics of innovative teachers are concerned, there seems to be little agreement on the effect of any one characteristic on this aspect of behavior. Rogers[1] was able to identify some characteristics associated

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[1]Everett Rogers, Diffusion of Innovations (Ill.: Free Press of Glencoe, 1962).

with innovative behavior, but his works are concerned with innovators from a variety of fields other than education. A similar identification has not been made for teachers alone.

Teaching experience, type of pre-service and in-service education, and age have all been rated important by some writers and downgraded by others when considering innovative behavior in teachers. Perhaps the pertinent questions are: Is it a multiplicity of characteristics, which may differ from teacher to teacher, that is necessary for any one teacher to be innovative? Or are there some characteristics of a demographic nature shared by all innovative teachers? If such a commonality does exist it needs to be discovered.

Importance of the Study

If there are some characteristics that distinguish the innovative teacher, knowledge of them could be invaluable to school administrators. It was reported by Overly[1] that the major reason for abandonment of curriculum innovations was teacher opposition to the continuance of the practice. Assuming not all teachers are opposed to the practice, a strategy might be developed that will increase

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[1]Donald Overly, "Comparative Analysis of North Central Accredited Indiana Secondary School in Relation to Educational Innovations" (unpublished Ed.D. dissertation, Indiana University, 1968).

the possibility of success. When an administrative decision is made to proceed with an innovative practice, it would be desirable to be able to select by empirically proven methods teachers most amenable to working with, and furthering, the innovative practice.

Indiscriminate selection of teachers to be involved in an administratively originated innovative practice probably lowers the possibility of success. With the increasing amount of criticism being levelled at schools such a gamble is unthinkable. Being able to select teachers for initial inclusion in an innovative practice, and then broadening the base of support should raise the possibility of success, improve the quality of the educational offering and lessen the amount of criticism being directed at schools.

Knowledge that there are characteristics which distinguish innovative teachers could also benefit colleges and universities. Awareness of the existence of such a distinction could indicate areas of professional education that need to be added, strengthened, or modified; it could indicate the relationship between the recentness of course work and innovative behavior; and, it could indicate the desirability of further research to determine the relationship of this list of characteristics to other personality characteristics, and the possible effects such a relationship might have.

The implication that there may be some common characteristics that could identify innovative teachers, and

the implications such an existence has for pre-service and in-service use is too great to be overlooked any longer. Jenkins[1] found three variables that distinguish innovative from non-innovative teachers, but these variables, general intellectual preparedness, originality, and ideational fluency, are difficult to define and additional work is necessary to define these distinguishing characteristics in more easily understood terms.

Procedures

To determine if innovative teachers can be identified by a list of demographic characteristics the following procedures will be carried out:

1. Selection of sample high schools for inclusion in the study.
2. Completion of teacher data sheets by the teachers.
3. A Q-sort by teachers in each of the high schools to identify those persons they describe as innovative.
4. Analysis of the data.

The population for this study consists of all high school teachers in the Lower Peninsula of Michigan in

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[1]John Jenkins, "A Study of the Characteristics Associated with Innovative Behavior in Teachers" (unpublished Ph.D. dissertation, University of Miami, 1967).

schools with a professional staff numbering between twenty-five and forty persons. There are eighty-seven schools of this size in the Lower Peninsula. For purposes of drawing a sample Michigan was divided into four regions. The north-south dividing line was highways US 27 and 127, the east-west dividing line was Michigan Highway 20. Using a table of random numbers three schools were chosen from each region.

Permission was then secured from the superintendent and principal to spend a day, or whatever time was necessary, at the school conducting the investigation. Prior to this date a cover letter was given to each teacher explaining the purpose of the study and briefly outlining the procedures to be followed.[1]

This same method was employed during a pilot study[2] to provide a basis for evaluating the data gathering procedures. None of the teachers questioned during the pilot study found any of the survey questions offensive or objectionable, so it was felt teachers could fill the data sheets out immediately prior to the Q-sort. Since there was no direct relation between the survey sheet and the Q-sort, doing both consecutively would not appear to contaminate results of either one.

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[1] A more detailed description of the procedures will be found in Chapter III.

[2] See Chapter III for a description of the pilot study.

Limitations

The following limitations are recognized and noted for this investigation:

1. The investigation is restricted to high schools with a teaching staff ranging from twenty-five to forty professional members.
2. The study is limited to teachers who have taught at least one year in the building of their present assignment.
3. The study is restricted to teachers with a minimum teaching assignment of three classes per day in the high school building.
4. In this study only the high school teachers were surveyed.
5. The selection procedures used may be a limiting factor from the standpoint that no justification was asked for, or given, by respondents, of their choice of innovative teachers.

Definition of Terms

To avoid misunderstanding, the following definition is offered for the term innovation as used in this study. This term and definition is not particularly unique, nor is it being used in a different context, but to focus it in a particular fashion the following is offered. Innovation is:

> a deliberate, novel specific change, which is thought to be more efficacious in accomplishing goals. It seems

> helpful to consider innovations as being willed and planned for, rather than occurring haphazardly.[1]

The innovative teacher is the teacher involved with this change. The source of the innovation is not a factor for consideration in this study, it is, rather, the innovative actions of the teachers that is being considered. As a complement to this, a practice which has been accepted in one school may be in the innovative stage in a second school.

While this innovative process may involve both teachers and administrators, it may be manifest in the actions of only one or the other.

Organization of the Study

Chapter I has dealt with the background, purpose, and need of the investigation. In Chapter II a review of the pertinent literature will be presented. Chapter III contains a more detailed explanation of the procedures followed. Chapter IV includes the findings and results of the investigation, and Chapter V deals with a summary, conclusions, and recommendations.

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[1]Matthew Miles, Innovation to Education (New York: Teachers College Press, 1964), p. 14.

CHAPTER II

REVIEW OF RELATED LITERATURE

The purpose of this chapter is to discuss the literature which has a bearing on the various aspects of this investigation. The hypotheses formulated suggested the review be divided into two parts: the teachers involved in the innovative process and their personal characteristics, and a discussion of the literature dealing with desirable or preferred characteristics in teachers to allay suspicions or fears that the innovative characteristic in teachers was being valued above all other characteristics.

In discussing the problem of identifying good teachers, Ryans makes the distinction between assessment and evaluation:

> In assessing a characteristic of a teacher, we are trying to estimate the extent to which that defined characteristic is manifest by the teacher . . . [evaluation] has to do with judgement relating to the "goodness" of teacher behavior, judgement that should be derived from assessments of clearly defined observable teacher characteristics considered in light of agreed-upon educational objectives and the expectancies of individuals or groups with respect to teacher behavior.[1]

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[1]David Ryans, "Teacher Behavior Can Be Evaluated," in The Evaluation of Teaching, ed. by Jane Hill and Betty Humphry (Washington, D.C., 1967), p. 50.

Inasmuch as other writers did not appear to make this distinction, this review does not concentrate exclusively on either evaluation or assessment. The purpose of this study is to determine whether or not the characteristic, innovation, is present and identifiable; it is not intended as a value judgement in either case.

Knowing the background of the person searching for information about a teacher's abilities is a factor Kerlinger reports on in several studies:[1,2]

> To ask a judge to tell what an effective teacher is like requires, for an understandable answer, knowledge of the judges basic educational orientation and knowledge of the underlying criteria (factors) he is using in making the judgements.[3]

Brown reached a very similar conclusion and stated that understanding what is meant when someone says, "This is a good teacher" or, "This is a poor teacher" requires an understanding of the values and position of the person

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[1]Fred Kerlinger, "Attitudes Toward Education and Perception of Teacher Characteristics: A Q Study," American Educational Research Journal, III (May, 1968), 159-68.

[2]Fred Kerlinger, "The First--and Second--Order Structures of Attitudes Toward Education," American Educational Research Journal, IV (May, 1967), 191-206.

[3]Fred Kerlinger, "The Factor Structure and Content of Perception of Desirable Characteristics of Teachers," Educational and Psychological Measurement, XXVII (Autumn, 1967), 643-56.

making the judgements.[1] Brown also contends that we must know something of the teacher's values too, and that if we do

> we are able to explore more adequately the relative positions of the judge and the teacher and the possible relationships and interactions affecting judgements of the teacher's effectiveness.[2]

The difficulty in reaching any decisive conclusions about evaluating teachers is compounded by the fact that an analysis of the evaluation forms used to evaluate teaching and/or teachers indicates as many as five major categories of evaluations may be included: (1) personal characteristics; (2) professional qualifications; (3) instructional efficiency; (4) staff relationships; and, (5) community relationships.[3]

Del Popolo may have summed up the problem when he wrote

> It is believed that there is no single teacher personality pattern superior to all others, but rather there are several that are felt to be desirable.[4]

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[1]Bob Brown, "Bringing Philosophy Into the Study of Teacher Effectiveness," Journal of Teacher Education, XVII (Spring, 1966), 35-40.

[2]Ibid., p. 40.

[3]Guy Wagner, "Identifying Components of Good Teaching," Education, LXXXIX (February, 1969), 280-85.

[4]Joseph Del Popolo, "Teacher Personality: A Concern of Teacher Education," Peabody Journal of Education, XLIII (July, 1965), 50-55.

Teachers in the Innovative Process

Not all writers and researchers are convinced teachers occupy a strategic position in the innovative process. Most of the writings critical of the teachers role, are aimed primarily at teachers as the source of innovations[1] or at teachers as controllers[2] and disseminator/sharers[3] of innovation. Due to the bureaucratic structure of today's secondary schools such a critical look at the role of the teacher could not be left out of a review of the literature. As Klingenberg noted: "research indicates administrators are control elements in deciding whether new practices should be used."[4]

There are indications from other research that suggests this same bureaucracy, if not actually working against the administration in the development and implementation of

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[1]Robert Pickering, "Change and the Elementary and Secondary Education Act," in Fostering and Reinforcing Innovative Behavior in Select School Personnel, ed. by David Smith, Monograph of Selected Papers presented at Two Institutes (Tucson, 1966), p. 4.

[2]Allen Klingenberg, A Study of Selected Administrative Behaviors Among Administrators From Innovative and Non-Innovative Public School Districts (Lansing, Mich.: Michigan Department of Education, 1967), p. 17.

[3]Pickering, "Change and the Elementary and Secondary Education Act."

[4]Klingenberg, A Study of Selected Administrative Behaviors Among Administrators From Innovative and Non-Innovative Public School Districts.

innovations, at least tends to negate their control over innovative teachers and the introduction of new practices. Corl reported on a study, conducted by the Institute for Social Research at the University of Michigan, which identified 300 innovative practices, in five schools, which were unknown to any one but the teacher who identified the practice.[1] This would seem to support the contention that a teacher's isolation and autonomy "suggest that the teacher is in a key position to exert the major amount of influence on the fate of the innovation."[2]

A study by Pellegrin reported on ten existing and potential sources of educational innovations. Heading the list as most influential were teachers, with administrators being placed second.[3] Other writings range from those stating the recognized importance of teachers in the innovative process[4] to those identifying teachers as the "key

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[1]Samuel Corl, "The Relationships Between Student Teacher Innovative Behavior and Selected Attitudes, Perceptions and Personality Characteristics" (unpublished Ph.D. dissertation, University of Michigan, 1969).

[2]Edwin Bridges and Larry Reynolds, "Teacher Receptivity to Change," Administrators Notebook, XVI, February, 1968.

[3]Roland Pellegrin, An Analysis of Sources and Processes of Innovation in Education (Eugene, Ore.: Center for the Advanced Study of Educational Administration, 1966).

[4]Gordon MacKenzie, "The Process of Innovation," National Education Association Journal, LVI (May, 1967), 27-31.

variable in education,"[1] or as the most important resource in the school in putting innovations to use.[2] In considering the matter of adoption or rejection of innovations, "Individuals concerned with the problem contend that every major step in education includes the effort and cooperation of the classroom teacher."[3]

Once the concept of teacher importance and involvement in the innovative process is accepted it is possible to deal with the further question of the nature and extent of the involvement. Much of the literature seems to support the premise that the teacher is only a part of the innovation team, albeit an important part, involving teachers and administrators.

> Given administrative support and encouragement teachers can develop islands of creativity within the school.[4]

Lee reported as a similar conclusion, the result of his study of opinions of teachers and administrators, that

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[1]Walter Anker, "What Has Happened to Effective Teaching?" Clearing House, XLI (May, 1967), 527-28.

[2]Robert Slaughter, "Can the Schools Put Innovations to Use?" in The Unfinished Journey: Issues in American Education (New York: The John Day Comapny, 1968), p. 121.

[3]Edward Nussel and Mildred Johnson, "Who Obstructs Innovation?" Journal of Secondary Education, XLIV (January, 1969), 3-11.

[4]Eugene Howard, "How to be Serious About Innovating," Nations Schools, LXXIX (April, 1967), 89-90.

successful innovations are those which have had the support and active involvement of teachers and administrators.[1]

In reporting the results of his study on the effects of flexible scheduling on teachers, students and administrators, Cawelti noted:

> There is wide recognition that innovations have a much better chance of succeeding if teachers as well as administrators have been authentically involved in planning for the change. While some would argue that many of today's educational innovations were introduced via the charismatic administrator, the evidence from this study suggests this is simply not the case.[2]

Griffin and Devlin also noted that when seeking justification for innovating, "it would be far better for teachers and administrators to work as partners."[3]

In separate studies dealing with the implementation of new curricular materials Eye, et al.[4] and Johansen[5]

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[1]William Lee, "A Study of the Educational Opinions of Selected Teachers and Administrators" (unpublished Ph.D. dissertation, Michigan State University, 1967).

[2]Gordon Cawelti, "Does Innovation Make any Difference?" Nations Schools, LXXXII (November, 1968), 60-63.

[3]Gary Griffin and Rev. Joseph Devlin, S.J., "The Teacher Evaluates Innovations," National Education Association Journal, LVI (December, 1967), 26-8.

[4]Glen Eye, et al., Relationship Between Instructional Change and the Extent to Which School Administrators and Teachers Agree on the Location of Responsibilities for Administrative Decisions (Madison, Wisc.: The University of Wisconsin, 1966).

[5]John Johansen, "An Investigation of the Relationships Between Teacher's Perceptions of Authorative Influences in Local Curriculum Decision-Making and Curriculum Implementation" (unpublished Ph.D. dissertation, Northwestern University, 1965).

reported that the more teachers were involved and felt they were influential in curricular decisions the greater the likelihood and incidence of those changes taking effect in the classroom.

Oliver offered a slightly different dimension to the subject of teacher-administrator partnership:

> One of the most significant facts in curriculum making is the discovery that teachers can make contributions to curricular planning. Increasingly larger numbers of administrators are looking to teachers for both ideas and details.[1]

There is mounting evidence of the need for all levels of education to become involved in the innovative process.

Characteristics of Innovative Teachers

Some characteristics of innovators in fields other than classroom teaching are known, and to review the literature on this would be to replicate the work of people like Everett Rogers,[2] Matthew Miles,[3] and Allen Klingenberg.[4]

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[1]Albert Oliver, Curriculum Improvement: A Guide to Problems, Principles, and Procedures (New York: Dodd, Mead, and Company, 1965), p. 53.

[2]Everett Rogers, Bibliography on the Diffusion of Innovations (East Lansing, Mich.: Michigan State University, Department of Communications, 1967).

[3]Miles, Innovation in Education.

[4]Klingenberg, A Study of Selected Administrative Behaviors Among Administrators from Innovative and Non-Innovative Public School Districts.

What seems to be lacking are the characteristics of classroom teachers, and while there may be some similarities between teachers and innovators in other fields

> We are discovering that the innovation and spread of high quality teaching practices is a different process from the spread of new developments in agriculture, medicine, and industry.[1]

One of the most controversial characteristics of innovative teachers is the length of teaching experience. Some writers and practitioners believe that receptivity to change is negatively related to the amount of experience in teaching a person has.

> If one is interested in encouraging any form of innovation, the chances are that he will be most successful if he directs his efforts toward teachers whose years of experience are few. These teachers are the most receptive to changes in role expectations and behavior.[2]

This view is based on indirect evidence from other studies that show more experienced teachers were less concerned about being involved in decision making than were the less experienced teachers.[3]

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[1]Ronald Lippett, et al., "The Teacher as Innovator, Seeker and Sharer of New Practices," in Perspectives on Educational Change, edited by Richard Miller (New York: Appleton-Century-Crofts, 1967), p. 308.

[2]Robert Carson, Keith Goldhammer, and Roland Pellegrin, Teacher Participation in the Community (Eugene, Ore.: Center for the Advanced Study of Educational Administration, 1967), p. 37.

[3]Ibid.

A study by Wiley was more specific about the experience level. He reported that curriculum workers could expect to find teachers with fewer than ten years teaching experience more ready for curriculum change than those with more than ten years of experience.[1] Chesler and Fox may have narrowed the span of years even more by suggesting teachers fresh from college or advanced training may be eager to try new ways upon entering into a teaching situation.[2] Miller approached the subject from another point of view. In listing the factors inhibiting educational change, he placed "the rut of experience" at the top of the scale.[3]

Other writers are less inclined to write off older, more experienced teachers as innovators. In one study, Lippett found what appeared to be an age-background split with regard to teachers involved in innovations. The younger and older teachers appeared to be doing most of the innovating. He concluded this may mean younger teachers, recently out of college, or older teachers who have come

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[1]Frank Wiley, "A Study of Teacher Relationships Considered to be Associated with Readiness and Non-Readiness for Curriculum Change" (unpublished Ed.D. dissertation, University of Missouri, 1965).

[2]Mark Chesler and Robert Fox, "Teacher Peer Relationships and Educational Change," National Education Association Journal, LVI (May, 1967), 25-6.

[3]Richard Miller, Perspectives on Educational Change (New York: Appleton-Century-Crofts, 1967).

back to teaching after raising children are more likely to experiment and to try new ideas.

> It may be that the younger teachers do not know the accepted or understood professional standards and tactics and, therefore, try a number of new things; while older teachers who are bored with doing the same things in the classroom year after year seek out new ideas.[1]

Kochnower reached a somewhat similar conclusion:

> It would also seem wise to involve teachers of varying degrees of experience. More experienced people will provide a background which permits comparison. Newer teachers will be less constrained by tradition and less hampered by inertia.[2]

When John Goodlad, who has a long history of working with educational innovations and innovative teachers, was asked if he found older, more experineced teachers less likely to innovate he replied,

> We can't generalize about the amount of experience or age or what not in regard to innovation. Beginners, for example, try very often to model themselves after people who are already well established. They tend not to innovate, because this would be deviation from established patterns. Sometimes well established, secure people have the freedom within themselves and the strength and the ego to be able to innovate.[3]

Some studies have stated similar conclusions in more definite manner. For example, in those conducted by Bridges

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[1]Lippett, et al., "The Teacher as Innovator, Seeker and Sharer of New Practices," p. 322.

[2]William Kochnower, "Educational Progress or Turmoil?" Educational Forum, XXX (March, 1966), 273-76.

[3]John Goodlad, "Every Teacher Has the Opportunity to Innovate," The Instructor, LXXVII (October, 1967), 30-31.

and Reynolds,[1] Chambliss,[2] and Jenkins[3] experience was not found to be a significant variable in a teacher's involvement in innovations or change.

Another characteristic of innovative teachers that has drawn attention is their peer relationships. In some cases innovators have been greatly influenced by the reaction of other teachers to what they were doing. In an analysis of an elementary school, to show how even minor give-and-take can affect behavior, Smith and Geoffrey reported strong norms in the school against innovative behavior. Teachers new to the school who experimented with teaching procedures were ridiculed by their peers. The newcomers learned quickly to rely upon recitation as their major instructional technique, and not to try new ideas and practices.[4]

Not all innovative teachers will be stopped by negativism from their peers, however. Christiansen reported

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[1]Bridges and Reynolds, "Teacher Receptivity to Change."

[2]E. J. Chambliss, "Attitudes of Teachers Toward Adopting Innovations and the Relationships of These Attitudes to Other Variables" (unpublished Ed.D. dissertation, Texas Technological College, 1968).

[3]Jenkins, "A Study of the Characteristics Associated with Innovative Behavior in Teachers."

[4]Louis Smith and W. Geoffrey, The Complexities of an Urban Classroom (New York: Holt, Rinehart, and Winston, 1967).

that experienced teachers in a high innovative category are less influenced by their peers than are the teachers in the lower innovative categories.[1]

Pickering,[2] and Rogers,[3] in different studies, reached the conclusion that innovators disregard the opinion of their peers.

A third characteristic or factor of innovative teachers that has been investigated and commented on is their preparation, both pre-service and in-service. Peterman gathered data from sixteen suburban high schools and found that teachers with a higher frequency of participation in in-service programs have a higher number of innovations in their classrooms than those with lower frequencies.[4] In a study designed to discover the effectiveness of a particular in-service program, Good found that all seventeen teachers involved reported using some educational practices

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[1]James Edward Christiansen, "The Adoption of Educational Innovations Among Teachers of Vocational Agriculture" (unpublished Ph.D. dissertation, Ohio State University, 1965).

[2]Pickering, "Change and the Elementary and Secondary Education Act."

[3]Everett Rogers, "What are Innovators Like?" Theory Into Practice, II, No. 5 (December, 1963).

[4]Lloyd Peterman, "The Relationship of In-Service Education to the Innovativeness of the Classroom Teacher in Selected Public Secondary Schools in Michigan" (unpublished Ph.D. dissertation, University of Michigan, 1966).

not used before, and eleven of the seventeen increased their use of desirable practices.[1] This would seem to indicate that in-service education can promote innovative behavior.

In a study of pre-service training and ideational fluency, True found that knowledge accumulated through a training program did not appear to affect the number of ideas an individual could generate; however, initial ability determined the extent to which an individual could benefit from the training. With respect to initial ability, he reported that the aptitude to produce a large number of ideas did not seem to be related to vocabulary, reading, mathematics, English, or speech skills.[2]

Symonds wrote about a similar aspect of the results of preparation:

> Methods and procedures learned during college preparation may influence teaching superficially but they do not determine the nature of the relation of a teacher to his pupils or the teachers basic attitude toward teaching.[3]

There are many other characteristics that have been associated with innovative teachers but often there is

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[1]Vera Good, "An Examination of an In-Service Education Operation to Determine its Potential for Effecting Change in Teaching Practices" (unpublished Ed.D. dissertation, Columbia University, 1964).

[2]G. Herbert True, "Creativity as a Function of Idea Fluency, Practiceability, and Specific Training" (unpublished Ph.D. dissertation, State University of Iowa, 1956).

[3]Percival Symonds, "Teaching as a Function of the Teacher's Personality," Journal of Teacher Education, V (1954), 79-83.

little agreement as to the effect a particular characteristic may have. Rogers states that innovators are generally younger than others,[1] but Goodlad,[2] Lippett et al.,[3] and Bridges and Reynolds[4] claim age is not a significant variable. Lippett noted the various characteristics associated with innovative teachers:

> There are forces within each teacher which make him more or less open to new classroom practices. Some of these are personality characteristics such as attitudes, values and general openness; others are a function of background and training, such as awareness of current professional developments, grade level or subject specialization, age and family commitments.[5]

One of the first considerations that should be given to a discussion of teacher characteristics is the relative importance of those characteristics, and who will be judging, evaluating, or assessing them. So it is with innovative behavior in teachers. It is only one characteristic that may or may not be deemed desirable.

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[1]Rogers, Bibliography on the Diffusion of Innovations.

[2]Goodlad, "Every Teacher Has the Opportunity to Innovate."

[3]Lippett, et al., "The Teacher as Innovator, Seeker and Sharer of New Practices."

[4]Bridges and Reynolds, "Teacher Receptivity to Change."

[5]Lippett, et al., "The Teacher as Innovator, Seeker and Sharer of New Practices," p. 310.

Summary

Although there may be people who play a more visible role in the realm of educational innovation, or whose role may make it possible to reach and affect more people with their innovations, there is a growing body of research giving recognition to the importance of the classroom teacher in the innovative process. The most recurrent theme is that innovation is often a team enterprise, involving an innovator-teacher and sympathetic administrator, or an innovator-administrator and an adopting teacher. The most successful and far reaching innovations recognize the importance of both positions.

CHAPTER III

DESIGN OF THE STUDY

One of the crucial elements of many studies, and certainly of this one, is the procedure used to gather the data. The nature of this investigation was such that one of the crucial areas was the method used to identify innovative teachers. Another concern was whether or not the procedures would work in actual practice. The method used to identify innovative teachers, the pilot study conducted to field test the data gathering procedures, the steps used in the collection of the data, the source of the data, a description of the instruments used, and the methods of data analysis are described in order.

Identification of Innovative Teachers

In Jenkins' study dealing with innovative behavior in teachers,[1] nine criteria were developed to be used in identifying innovative teachers. Those nine criteria were:

1. He/she is constantly searching for new ways of doing what he/she must do anyway.

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[1]Jenkins, "A Study of the Characteristics Associated with Innovative Behavior in Teachers."

2. He/she expresses a willingness and desire to participate in programs that are labelled "experimental."
3. He/she is willing to try things out regardless of the likely outcome.
4. He/she enjoys uncertainty and encourages his/her students to enjoy uncertainty also.
5. He/she frequently diverges from the norm and goes off in new directions when it seems appropriate to do so.
6. He/she works beyond any prescribed time period or work schedule.
7. He/she uses a variety of approaches in teaching and adjusts his/her teaching to the task being undertaken and the students being taught.
8. He/she exhibits a positive attitude toward teaching and toward students.
9. He/she solves his/her teaching problems with imagination.

For this study, four of the criteria, numbers 2, 4, 5, and 9, were used with only a minor revision, consisting of elimination of the second his/her designation. A fifth criterion, number 1, was included after changing the ending to read "what must be done." This change was made to avoid any suggestion of resignation on the part of the teacher that certain tasks may be distasteful, but must be done.

Jenkins' criterion three was not used because it was felt it may indicate a negative perseverance to the extent a teacher would follow through on a plan even when unpleasant or highly questionable results were indicated as being the likely outcome. Criterion six was eliminated to avoid any conflicts with teacher organizations that had negotiated strict time clauses. Item seven was felt to be repetitious when taken in context with the other criteria, particularly number one. Criterion eight was not included because this concept seemed to be implicit in many of the criteria that would be used.

To this revised list of criteria to be used in this study, a sixth criterion was added to give the dimension of concern for the effects of a new program on the entire school system, as opposed to concern for only a single school building. This became criterion four in the revised list. The criteria used to identify innovative teachers, for purposes of this study were presented to teachers in the following form:

1. He/she expresses a willingness and desire to participate in programs that are labelled "experimental."
2. He/she frequently diverges from the norm and goes off in new directions when it seems appropriate to do so.
3. He/she enjoys uncertainty and encourages students to enjoy uncertainty also.

4. He/she is concerned with the far reaching effects of his/her methods and techniques on the entire school system.
5. He/she solves teaching problems with imagination.
6. He/she is constantly searching for new ways of doing what must be done.

The criteria and the Q-sort procedures were then field tested in a pilot study.

The Pilot Study

Three reasons affected the choice of a particular local school as the site for a pilot study. First, there was a personal acquaintance with both the Superintendent and the High School Principal; second, the school was geographically close, and in the event unusual problems were encountered that would necessitate a return visit, time and distance would not be a compounding factor; third, there were twenty-nine teachers listed on the high school roster, which put it within the range of schools chosen for this study. Contact was made with the administrators and an appointment was made to discuss the details of the pilot study and to set a date for gathering the needed information.

At the subsequently arranged faculty meeting, the purpose of the survey instrument, the Q-sort procedures,[1]

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[1]See page 40.

and the pilot study were explained to the teachers and they were asked to cooperate. It was explained that the information gathered would be confidential, but no one need participate if it was felt the study violated their personal principles. No attempt was made to prevent the counsellors, librarians, or first year teachers from filling out a data sheet.

On a following visit, teachers were asked to go through the Q-sort procedures. The faculty lounge was chosen as the operational site because most of the teachers would normally visit that room at some time during the day. Teachers were asked to do the Q-sort no more than two at one time to avoid confusion. Two days were required to administer the Q-sort to the twenty-two teachers involved who met the requirements established for the study.

The major problem observed in the pilot study was the hesitancy of the investigator to seek out teachers to take the Q-sort. This was the primary reason a return visit was necessary. The two major changes the pilot study indicated were elimination of a letter to the teacher's bargaining group explaining the study, and having the Teacher Data Sheet filled out at a faculty meeting.

The proposed letter to the teachers' group was eliminated because of the high degree of cooperation on the part of the teachers, most of whom first learned of the study at the faculty meeting, and because it was felt in

smaller systems there would be a closer working relationship between faculty and administration, removing some of the tensions that might demand a communication of this sort. It was also decided to have teachers fill out the Teacher Data Sheet immediately prior to doing the Q-sort. This would eliminate one visit to each school, would lessen the chance of antagonizing teachers by adding time to faculty meetings, and would allow greater flexibility in scheduling schools for the data collection procedures.

Steps Used in the Collection of the Data

The first step in data collection was the decision to use schools with between twenty-five and forty teachers on the staff. Schools of this size were chosen because this size school would be large enough to offer a comprehensive and diversified curriculum, but small enough to allow staff members from various departments to become familiar with the total school staff and be acquainted with the entire school program. A listing of all schools in Michigan was obtained[1] and from this was distilled the list of schools suitable for inclusion in the study. There were eighty-seven schools of this particular size in the Lower Peninsula of Michigan.

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[1] The Michigan Education Director and Buyer's Guide, Michigan Education Directory, Lansing, Michigan, 1969.

The next step in the collection of the data was to divide the Lower Peninsula of Michigan into four regions. Such a division would prevent drawing a sample of schools clustered around and influenced by a single college or university or a large metropolitan area, and would provide the widest possible geographical spread. The selection of dividing lines was made to provide each geographical region with a metropolitan area and a college or university if possible. Geographical size of the regions was not a primary consideration. The north-south dividing line was highways US 27-127, the east-west dividing line was Michigan Highway 21. The map in Figure 3-1 shows the geographical division achieved for this study. Table 3-1 shows the number of schools and teachers for each region.

The schools in each region were numbered and listed. Working from a table of random numbers[1] six schools from

TABLE 3-1.--Total number of schools in each geographic region and the number of teachers included from selected schools.

Region	1	2	3	4	Totals
Number of schools	23	23	21	20	87
Number of teachers in selected schools	63	68	75	65	271

[1]William L. Hays, Statistics (New York: Holt, Rinehart and Winston, Inc., 1963).

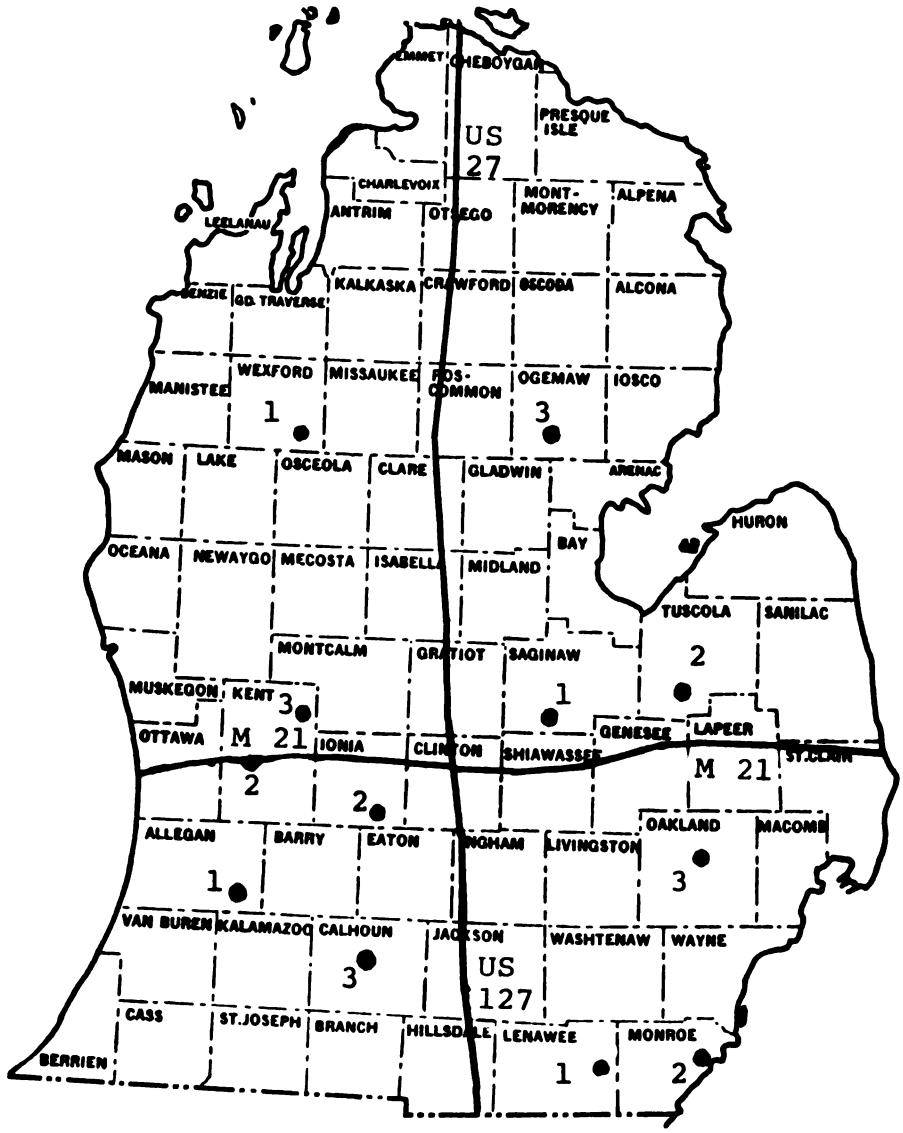

Figure 3-1.--The geographic division of the state for purposes of drawing a sample.

each region were selected. The first three schools in each region were to be the schools used and the second three were to provide substitutes if that became necessary. The inclusion of a substitute school will be covered in the section dealing with the source of the data.

Once the schools were identified, a letter[1] was sent to the superintendent outlining the nature of the study and asking for permission to conduct the study in the high school. Included was a statement that the researcher would follow-up the letter with a telephone call to make an appointment with the superintendent, and if possible, later with the principal of the high school, to discuss the study and answer any questions that might arise.

The interviews that followed the telephone calls did not follow any particular pattern as far as administrators in attendance was concerned. In four systems the letter had been referred directly to the high school principal after the superintendent read it and approved of the study; three superintendents indicated they wished to discuss the study with the investigator, and after their questions were answered the matter was turned over to the principal. In two schools the principal was out of the district on the date the superintendent indicated he wished to discuss the study, and after having the procedures

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[1]See Appendix.

explained, assurances were given that the principal would be informed of the procedures by the superintendent's office, and that a telephone contact could finalize permission to conduct the study. In two instances the superintendent and principal were both in attendance, and in the final instance the matter was turned over to an assistant superintendent. These discussions with the administrators took place over a two-week period of time.

In the ten school districts where the principal was contacted personally a date was arranged for a return visit to gather the data. Copies of an introductory letter[1] were left with the principal for distribution to the teachers shortly before the return visit. The superintendent received these letters in the other two schools, to provide the same continuity in the distribution of these introductory letters to the teachers in the high school buildings. Sufficient copies were left to provide distribution to the entire staff, with the principal to use his discretion in the matter of informing non-participating staff members. In three cases this step of the procedure (passing out letters) was not carried out, but announcements over the public address system or personal contact by the principal on the day of the visit were used as substitutes.

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[1]See Appendix.

At one of these conferences with administrators information was presented that made the selection of a substitute school desirable. The district was a recently consolidated, geographically large one, in a predominately rural area. In this district, the high school was split into two distinct groups: the ninth and tenth grades met in one location, and the eleventh and twelfth grades met at another site several miles away. The entire high school staff met only infrequently and for brief periods of time. Because of this split and separation, and the nature of the study, it was mutually agreed that selection of another school might be advisable. The school that was first on the list of substitutes for that region was contacted and the same procedures as above were followed.

Source of the Data

The data used in this study were gathered from teachers in twelve schools throughout the Lower Peninsula of Michigan. The schools were selected using area random sampling procedures. The map in Figure 3-1 indicates the approximate geographical location of the twelve school districts.

The type of community served by these schools ranged from predominately rural in nature to urban schools adjacent to metropolitan areas. Some of the districts are relatively new, having been created as a result of recent reorganization. Other schools have been in existence a

much longer time, dating back to the original creation of a high school to serve that particular community. At least two of the schools were created within the last ten years to serve growing urban areas around large cities. Table 3-2 indicates the number of teachers included for each of twelve subject matter areas.

The teachers in the study were those who have completed at least one year of teaching on the present high school staff. Only people with primary teaching contact with students were included, and this contact time had to amount to a minimum of three classes per day in the high school.

Instruments Used

The two instruments used in this study were the Q-sort for identifying innovative teachers, and the Teacher Data Sheet. A two pile initial sort was used in the Q-sort procedures to lessen apprehension on the part of participants. It was emphasized that the descriptive characteristics, noted in the selection criteria, were regarded as favorable characteristics or attributes.

Upon completion of the Q-sort, by all respondents in a school, a mean teacher innovativeness score was computed for each teacher. The following steps were utilized to arrive at this score, which is recognized as a deviation from normal Q-sort procedures, because normally these procedures produce no score:

TABLE 3-2.--Numbers of teachers surveyed by subject area.

	Subject	Geographic Region				Total
1.	Lang. Arts	12	7	14	12	45
2.	Soc. Sci.	9	13	14	7	43
3.	Science	5	6	10	9	30
4.	Math	5	7	6	7	25
5.	For. Lang.	3	3	2	2	10
6.	Business	5	6	9	5	25
7.	Agric.	1	1	--	1	3
8.	Ind. Arts	5	9	7	5	26
9.	Music	1	--	1	--	2
10.	Home Econ.	3	4	2	2	11
12.	Arts/Crafts	3	3	2	2	10
12.	Phys. Ed.	4	5	4	4	17
13.	Combination[a]	7	4	3	9	23
	TOTAL	63	68	75	65	271

[a]Item 13 (Combination) is used to designate instances of teachers having class in more than one of the twelve listed subject matter areas.

1. Following the directions given each participant, the first step for the respondent was to divide the deck of cards (containing the names and teaching assignments of the involved teachers) into two piles. Pile A consisted of the teachers the respondent felt met the majority of the six criteria; pile B contained those

teachers not meeting the criteria, or those teachers not known well enough by the respondent to enable the respondent to make a valid judgement. No further use was made of pile B because this study was not concerned with the degree to which teachers did not meet the criteria.

2. The next step was a re-sort of pile A into three subgroups to describe the degree to which each of the teachers in pile A met the listed criteria. As this re-sorting was completed by each teacher, a tally was made, by the researcher, of which teachers were placed in each pile. This tally is summarized on the tally sheets in the Appendix.

3. When the Q-sort was completed by all the responding teachers a score was assigned to each of the three subgroups: +3 for the highest degree; +2 for the lesser degree; and +1 for the least degree. The tallies for each category were added up and combined, giving a total score. This score was changed to a percentage, using as a base the number of teachers that had taken part in the Q-sort procedures.

For example: Teacher A in school 1 was placed in the least group six times, in the lesser group twice, and in the highest group once. Eleven respondents placed teacher A in pile B, for which no score at all was given. The total score for this teacher: 6 + 4 + 3 = 13; 13 divided by 20 (the total number of teachers doing the

Q-sort) = 21%. The 21 per cent was then used as a basis for determining into which group the teacher would be placed: the high innovative group--50 per cent or higher, or the low innovative group--less than 50 per cent.

Each teacher, whether or not he had actually gone through the Q-sort procedures himself, was placed in pile A at least once. This indicated that every teacher was perceived as meeting a majority of the criteria for innovativeness by at least one teacher. Table 4-1 shows the breakdown of teachers, according to the high innovator-low innovator categories.

The Teacher Data Sheet was designed for this investigation to provide the information necessary to test the hypotheses stated in Chapter I. Some information was available about the teachers from another research source.[1] This allowed omission of questions related to age and sex. Confirmation of information from the Teacher Data Sheet was also made possible by using this information.

Three sources of information were then used to identify individual teachers: (1) the Teacher Data Sheet, filled out by the teachers; information from the previously noted additional research source; and (3) the teachers schedules, as provided by the school district. Using these

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[1]Supplied by Dr. Stanley Hecker, Department of Administration and Higher Education, Michigan State University, East Lansing, Michigan.

sources of information it was possible to identify individual teacher data sheets for the purpose of putting them in rank order for analysis.

Methods of Data Analysis

The data were first transferred from the questionnaires and tally sheets to mechanically sorted cards. These cards were then fed into an IBM 3600 computer. The Finn[1] program for multivariate analysis of variance was used to analyze the qualitative data, and a routine nucross program was used in a Chi-square analysis of the quantitative data.

The researcher had established specific limits to eliminate chance error. The selection of a specific rejection region was dependent upon certain practical aspects of the study--sample, size, and circumstances of the effect of particular levels of significance. The level of significance fixes the relative number of chance outcomes the researcher is willing to interpret mistakenly as real effects in the study. It was for this reason that the .05 level of significance was chosen.

Summary

This chapter explains the procedures used in collecting the data for this study. The first step was an

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[1]Multivariate Analysis of Variance, Programmed by Jeremy Finn, State University of New York at Buffalo.

adaptation of Jenkins' criteria for identifying innovative teachers. A field test of all procedures to be followed in the study was conducted. Upon completion and analysis of this field study, the full investigation was undertaken.

To insure geographical balance of selected schools, the state was divided into four regions. Schools with teaching staffs numbering between twenty-five and forty teachers were then listed for each region and from this list twelve schools, three per region, were chosen for inclusion.

Contact was made with the school administration, permission was received to conduct the study, and on the agreed-upon date teachers were interviewed. The interview consisted of filling out a Teacher Data Sheet and going through a Q-sort to identify innovative teachers.

After the data were gathered it was subjected to a multivariate analysis of variance for analysis of the qualitative data, and a Chi-square analysis of the quantitative data. In Chapter IV an analysis of those data will be presented.

CHAPTER IV

ANALYSIS OF THE DATA

The procedures used in analyzing the data are of prime importance in judging the value of a study such as this. For this reason the most powerful statistical procedures available were used in the data analysis. The nature of the data indicated two types of procedures; each is recognized for its validity.

The Problem Restated

As stated in Chapter I, the purpose of this study was to determine if a relationship exists between a list of selected demographic characteristics and innovativeness in teachers. In considering the list of characteristics, nine hypotheses were formed around twelve variables. These variables were: age; years of teaching; years taught on the present high school staff; the number of school systems taught in; the number of quarter hours beyond the highest degree earned; the recency of the last class taken; sex; subject taught; undergraduate majors and minors; whether or not the respondent was working toward an advanced degree;

and, if a Master's Degree had been earned, whether it was in education or a subject matter field.

The nine null hypotheses were:

H 1: There is no difference in age between teachers identified as high innovators and teachers identified as low innovators.

H 2: There is no difference in the number of years of teaching experience between teachers identified as high innovators and teachers identified as low innovators.

H 3: There is no difference in the number of years as a teacher on the present high school staff between teachers identified as high innovators and teachers identified as low innovators.

H 4: There is no difference in the number of school systems previously taught in between teachers identified as high innovators and teachers identified as low innovators.

H 5: There is no difference in the length of time since the last class was taken between teachers identified as high innovators and teachers identified as low innovators.

H 6: There is no difference in innovativeness between male and female teachers.

H 7: There is no difference in subject matter taught between teachers identified as high

innovators and teachers identified as low innovators.

H 8: There is no difference in innovativeness between teachers who have continued their education beyond the Baccalaureate Degree in pursuit of a higher degree and teachers who have not continued beyond the Baccalaureate Degree.

H 9: There is no difference in innovativeness between teachers who have earned a Master's Degree in Education and teachers who have earned a Master's Degree in a subject matter field.

Upon completion of the Q-sort by all teachers a mean teacher score was computed for each teacher. Computation of such a score is recognized as a deviation from regular Q-sort procedures, which do not produce a mean score. This departure, as noted in Chapter III, was necessary to provide a basis for ranking all teachers. The score obtained is a reflection of the number of times an individual teacher was identified as innovative by all the other teachers included in the study at that school.

Using this score teachers were then divided into two groups--those identified as high innovators, as indicated by a score of 50 per cent or higher, and those identified as low innovators, as indicated by a score of less

than 50 per cent. Table 4-1 shows the number of teachers in each group.

TABLE 4-1.--Numbers of teachers identified as high innovators and low innovators.

Area	1	2	3	4	Total	%
High Innov.	21	21	20	21	83	30.6
Low Innov.	42	47	55	44	188	69.4
TOTALS	63	68	75	65	271	100.0

Examination of the demographic variables indicated the need for two types of analysis procedures. One group of variables were variables of a quantitative nature that could be analyzed by multivariate analysis of variance. These included the following variables: age, years in teaching, years taught on the present high school staff, the total number of school systems taught in, the number of quarter hours beyond the highest degree held, and the recency of the last class taken.

The second group of variables were qualitative and could be analyzed using the Chi-square test of association. These variables were: sex; subject taught; undergraduate majors and minors; whether or not the respondent was working toward an advance degree; and, if a Master's Degree had been earned, whether it was in education or a subject matter teaching field.

The following sections deal with the treatment of these two groups of variables.

Analysis of the Quantitative Data

The first group of variables to be analyzed were those of a quantitative nature. Included in this group were age, number of years in teaching, number of years on the present high school staff, total number of school systems taught in, number of quarter hours earned beyond the highest degree held, and the recency of the last class taken. To determine if there was a relationship between these seven quantitative variables and the variable of innovativeness, a multivariate analysis of variance, using the Finn[1] program, was computed.

Multivariate analysis of variance was used because it provides for the computation of an overall probability level for a set of dependent variables. Composite F ratios and univariate F ratios are achieved simultaneously. This procedure allows the researcher to go beyond the mere statement that differences do or do not exist between the groups and to determine their relative contributions. The use of multivariate analysis of variance was deemed appropriate because of the multivariate nature of the variables involved in the study.

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[1]Finn, Multivariate Analysis of Variance.

Table 4-2 includes the summary data on this multivariate probability.

TABLE 4-2.--Multivariate probability of selected variables.[a]

F-Ratio for Multivariate Test of Equality of Mean Vectors	0.6320
D.F. +7 and 263	Probability less than 0.7826

[a]Variables tested are: age, number of years in teaching, number of years on the present high school staff, total number of school systems taught in, number of quarter hours earned beyond the highest degree held, and the recency of the last class taken.

The hypotheses tested in this part of the data analysis were:

H 1: There is no difference in age between teachers identified as high innovators and teachers identified as low innovators.

H 2: There is no difference in the number of years of teaching experience between teachers identified as high innovators and teachers identified as low innovators.

H 3: There is no difference in the number of years as a teacher on the present high school staff between teachers identified as high innovators and teachers identified as low innovators.

H 4: There is no difference in the number of school systems previously taught in between teachers identified as high innovators and teachers identified as low innovators.

H 5: There is no difference in the length of time since the last class was taken between teachers identified as high innovators and teachers identified as low innovators.

Using the .05 level of significance, a probability of 0.7286 indicates there is no relationship between the group of seven quantitative variables and innovativeness. The null hypothesis is not rejected in each instance.

Table 4-3 presents a breakdown of the analysis by variables and indicates the probability factor for each of the variables involved in this analysis. It is recognized that these alpha levels are actually too small, having been deflated by the statistical procedures used, but even these levels are large enough to indicate there is no significance on any of the variables taken as a group or taken individually. Considered individually the variables with the least influence on innovativeness are age, total number of years in teaching, number of years on the present high school staff, total number of school systems taught in, and the number of quarter hours earned beyond the Baccalaureate Degree. The two areas that might have the greatest effect on innovativeness were the number of hours earned beyond the Master's Degree, and the recency of the last class taken.

TABLE 4-3.--The probability of high and low innovators having the same characteristics as determined by analysis of seven selected variables.

	Variable	Univariate F	Probability Less Than
1.	Age	0.1845	0.7004
2.	Years in Teaching	0.0570	0.8115
3.	Years on Present Staff	0.2398	0.6248
4.	Number of Schools	0.0570	0.8116
5.	Term Hours Beyond BA	0.1784	0.6723
6.	Term Hours Beyond MA	1.6078	0.2059
7.	Recency of Last Class Taken	1.0905	0.2973

Analysis of the Qualitative Data

The second group of variables to be considered in this study were: sex, subject taught, undergraduate majors and minors, whether or not the respondent was working toward an advanced degree, and, if a Master's Degree had been earned, whether it was in education or a subject matter field. Because these variables were qualitative the Chi-square test of association was used.

There were four hypotheses to be tested relating to these variables. They were:

H 6: There is no difference in innovativeness between male and female teachers.

H 7: There is no difference in subject matter taught between teachers identified as high innovators and teachers identified as low innovators.

H 8: There is no difference in innovativeness between teachers who have continued their education beyond the Baccalaureate Degree in pursuit of a higher degree and teachers who have not continued beyond the Baccalaureate Degree.

H 9: There is no difference in innovativeness between teachers who have earned a Master's Degree in Education and teachers who have earned a Master's Degree in a subject matter field.

Table 4-4 presents the summary data for the four hypotheses involved.[1]

While the Chi-square values were not large enough to reject the null for any hypotheses tested, it should be recognized that the small number of degrees of freedom would make it difficult to reject the null hypothesis. The tabled Chi-square values for .05 and .01 are given to demonstrate just how far the results were from the significant values.

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[1]Hypotheses were tested using the NUCROS routine program available at the Michigan State University Computer Laboratory.

TABLE 4-4.--Chi-square analysis of variables related to innovativeness.

	Variable	Computed Chi-square Value	df	Tabled Values At	
1.	Sex	3.123	1	.05	.01
2.	Subject Taught	29.553	12	5.22	3.57
3.	Undergraduate Major	28.687	12	5.22	3.57
4.	Undergraduate Minor	10.675	12	5.22	3.57
5.	Working on Advanced Degree	0.363	1	.003	.00015
6.	MA in Education	2.239	1	.003	.00015
7.	MA in Subject Matter	0.286	1	.003	.00015

Summary

This chapter has presented an analysis of the data gathered from the survey instruments used in this study. The two instruments were a Teacher Data Sheet, designed for this study, and a Q-sort procedure used to identify innovative teachers.

The study was designed to gather information on twelve variables and to test the relationship of those variables to innovativeness. The variables of interest were: age, years in teaching, number of years on the present high school staff, total number of school systems taught in, the number of quarter hours beyond the highest degree held, the recency of the last class taken, sex,

subject taught, undergraduate majors and minors, whether or not the respondent was working toward an advanced degree, and if a Master's Degree had been earned, whether it was in education or a subject matter field.

This list of variables was the basis of nine hypotheses to be tested. Briefly stated the hypotheses were:

There is no difference between teachers identified as high innovators and low innovators as far as:

1. age
2. number of years of teaching experience
3. number of years as a teacher on the present high school staff
4. number of school systems previously taught in
5. length of time since the last class was taken
6. sex
7. subject matter taught
8. working toward an advanced degree
9. having a Master's in Education or subject matter field

are concerned.

Because the variables noted were of two rather distinct types, two statistical procedures were used in the analysis. For the quantitative variables multivariate analysis of variance was used with the level of significance

set at .05. The resultant probability of 0.7286 was not significant and the five null hypotheses tested were not rejected. This indicates there is no relationship between these variables and innovativeness.

The other variables were qualitative and a Chi-square test for association was used in their analysis. The tabled Chi-square values derived were not large enough to reject the null hypothesis for the four hypotheses tested, indicating here too, no relationship between the variables and innovativeness.

For the nine null hypotheses tested to determine the relationship of twelve demographic characteristic to innovativeness, the figures were not large enough to reject the null for any of the hypotheses.

CHAPTER V

SUMMARY AND CONCLUSIONS

This chapter is a summary of the study from its inception through the interpretation of the data. A number of specific recommendations for possible action and future study will also be presented.

Summary

This study was designed to gather empirical evidence to determine whether there are some demographic characteristics that distinguish between teachers identified as high innovators and teachers identified as low innovators. The study developed from a desire to determine if innovative teachers in different schools had similar characteristics and from a desire to provide a better process for administrators to identify the innovative teachers.

Part of the problem of trying to decide who is the most innovative teacher, or who will operate best in an innovative setting, is that much of the empirical research has been centered on parts of the innovative process other than that of the person most often directly involved in the innovation--the classroom teacher. The role of other

elements, or persons, involved in the innovative process, such as the administrative staff, school boards, and school district size and financial capability, have been well documented. The type of person who makes the most innovative teacher in such a setting, or in any setting, lacks such careful scrutiny.

The problem on which this study has centered is whether or not there are selected demographic characteristics which distinguish highly innovative teachers. The judges of who is an innovative teacher for this study were other teachers working in the same building and under the same circumstances.

Design

It was decided that schools with between twenty-five and forty teachers would be the best source of the data necessary to test the hypotheses under consideration in this study. Schools of this size were chosen on the a priori basis of having greater opportunity for communication between the various departments comprising the school and also having the size necessary to offer a complete academic program.

Following the decision on the size of the school was the decision to divide the Lower Peninsula of Michigan into four regions to insure as wide a geographic representation as possible in the study. The regions were not of equal geographic size, but there were approximately the

same number of schools of the desired size in each region. An additional factor taken into consideration when making the geographic division was the desire to avoid drawing a sample of schools clustered around a large university or metropolitan area.

Two instruments were used to gather the data for the study--a Teacher Data Sheet and a Q-sort of identifying innovative teachers. These instruments were administered to selected teachers in three schools randomly selected within each of the four regions of the state. The teachers selected were those who had taught at least one year on the high school staff. An innovativeness score was determined for each teacher using a modified Q-sort with the teachers in each school. Using this score, two groups of teachers, high innovators and low innovators, were formed.

The data gathered were then analyzed using multivariate analysis of variance for the quantitative data and chi-square test of association for the qualitative data.

Limitations of the Study

One of the first recognized limitations of this study is that it deals only with high school teachers. In some instances this designation included grades 9-12, in others grades 10-12. This variation was the result of local designations for the various levels of education. No attempt was made to exclude teachers in the lower grade level (9), because in most instances the schedules of

teachers involved also included some teaching in the upper grade levels.

The criteria used to identify the innovative teacher must also be taken into consideration. These criteria are not considered as either the only or the best criteria available to determine innovativeness. However, the fact that some of these criteria have been used before,[1] and that respondents in this study were able to use them to identify a particular group of teachers seems to lend some support to their use as one of many possible ways of identifying a group of innovative teachers.

The size of the schools selected for inclusion in the study can also be considered a limitation. The a priori basis for selecting schools of this size, which involved interdepartmental communication and knowledge of total school program, and completeness of the academic offering should be given some consideration.

Another limiting factor was the condition that had to be met before a teacher was included in the study. In general this condition was that the teacher must have taught in the building at least one year. The second part was that the teacher must have a schedule that included teaching at least three hours in the high school. The

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[1]Jenkins, "A Study of the Characteristics Associated with Innovative Behavior in Teachers."

effect of the first limitation, at least one year on the staff, may have been to exclude from consideration innovative persons who moved, either by their choice or because of pressure at their previous school. The number of first-year teachers in each of the schools included was small enough, however, that it was felt this restriction would have little, if any, effect on the results of the study.

Sampling procedures used in selecting schools may have created a limiting factor for the study. Although division of the state preceded the listing and numbering of schools within the four regions, without such a division an entirely different distribution of schools would probably have occurred.

In spite of these limitstions it is felt the study was broad enough to provide a good basis for examination of the hypotheses.

Analysis of the Survey Instrument Data

Examination of the data analysis indicates the selected items included in this study as demographic characteristics cannot be used to distinguish between high and low innovative teachers. The low probability obtained in the multivariate analysis of variance, and the failure to obtain a significant chi-square value on the test for association indicated that the null hypothesis of no significant difference between the two groups

could not be rejected for any of the nine hypotheses tested.

Of the six quantitative variables, the two which came closest to significance in affecting innovativeness were the number of quarter hours earned beyond the highest degree held and the recency of the last class taken. The variables least likely to affect innovativeness were age, total number of years in teaching, the number of years on the present high school staff, and the total number of school districts taught in.

Observations

One of the first observations to make, regarding this study, is the conclusion, unsupported by the data and procedures of the study, that there are innovative teachers on every high school staff. It should be noted and emphasized, however, that there are no absolute standards for determining what an innovative teacher is. The methods used in this study forced the identification of an innovative teacher within each school included, but there is no reason to assume that an innovator in school A would be perceived as an innovator in school B.

In the appraisal of the researcher, as a professional visiting the schools to collect data, the schools included in this study ranged from very progressive/innovative to conservative/traditional. The most innovative appearing high school was organized on a flexible

schedule, modular time unit basis. This plan called for team teaching, small group discussions, and a great deal of apparent student freedom. The opposite end of the scale was a school that seemed very dominated by the superintendent, and that was organized in a very traditional manner. In this particular school the administration made all the decisions, regarding every apparent phase of the school program, even to the design of the class ring purchased by the students. But, on every high school staff, regardless of where the school was located on the philosophic scale, there were teachers who were identified by their colleagues as innovators.

If the two schools described above represent the extremes, the majority of the schools included would fall close to the center of the scale. In the majority of the schools there were many examples of both types of educational philosophies. A very noticeable condition in these schools was the willingness of the administrators to allow teachers to try new ideas, and to encourage teachers to seek out different ways of improving the educational program.

The fact that the teachers on every high school staff were able to identify other teachers as innovators, using the same criteria in each case, would seem to indicate these criteria have some validity when used to identify innovative teachers. That the teachers so

identified were involved in people centered programs adds weight to the value of these criteria when used to identify innovative teachers. A research project involving students using the procedures to identify a group of teachers could add another dimension to the validity of these criteria.

One uncertainty faced when considering this study was whether teachers could perform the most crucial task in the study--the identification of the innovative teacher. With the completion of the study this uncertainty is removed for this investigator.

Conclusions

The following conclusion can be drawn from the statistical analysis of the results of this study: as far as the demographic characteristics considered (age, years of teaching, years taught on the present high school staff, the number of school systems taught in, the number of quarter hours beyond the highest degree earned, the recency of the last class taken, sex, subject taught, undergraduate majors and minors, whether or not the respondent was working toward an advanced degree, and if a Master's Degree had been earned whether it was in education or a subject matter field) are concerned, no distinction can be made between high innovative teachers and low innovative teachers.

An additional conclusion drawn from the results of the study is that the teachers who scored the highest

on the innovativeness scale were teachers concerned with the students and the effect the educational program was having on them. Their expressed concerns, in conversations with the researcher and with other teachers during the data collecting, were not so much with the process of the program they were involved with, as it was with how it affected the students exposed to it. The concern most frequently expressed to the researcher, of these highly rated teachers, involved developing a program that would appeal to more students and that would involve more students in a meaningful learning activity.

A final conclusion is that if there are innovative teachers on every school staff, one of the best ways to identify them is to ask the other teachers who they are. At some point in size, however, a consideration would have to be given to breaking the search down into a form of departmentalization. In schools of the size used in this study there was a great deal of idea interchange between the members of different departments. In a larger school such broad communication, between the members of various departments, may not exist. Lack of this type of communication may necessitate limiting the search for innovative teachers to the members of a particular department, or by some other method.

Recommendations

In view of the conclusions and observations of this study, a recommendation is made to replicate the study removing the size limitation placed on schools to be included. Inclusion of schools of varying size may produce different results. The possibility exists that in smaller schools the closeness of the staff relations may inhibit many teachers from making even the slightest of unkind, uncomplementary, or derogatory statements, or judgments.

A recommendation is also made that a study be conducted to determine the concerns of innovative teachers in regard to the effect their program was having on the students. Such a study may have to take into consideration the perceptions of many people: teachers, students, and administrators to mention a few, but it could prove to be a valuable addition when considering innovative programs and teachers, and the effects these programs and teachers are having.

A further recommendation would be a study to measure the attitude, with respect to trying new methods, developing new programs, or being involved in new programs, of teachers identified as innovators. If innovators cannot be identified by demographic characteristics, then perhaps a study related to attitudes and other modes of behavior, and innovativeness, would reveal a relationship.

A last recommendation would deal with the characteristics of innovative teachers within a particular academic discipline. It is possible that teachers within a given discipline form guidelines for evaluating people within that discipline and have difficulty fitting teachers of other subjects into that frame of reference. A study of the teachers in one subject area might avoid this conflict.

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APPENDIX

October, 1971

Mr. Samuel Somebody, Supt.
Somewhere Public Schools
Sometown, Michigan

Dear Mr. Somebody:

There is presently a controversy over whether teaching styles can be identified by certain teacher characteristics. I am presently engaged in a study to determine if the teaching style labelled "innovative" is associated with the teacher characteristics dealing with educational and experiential background. The results of this study should be useful to many administrators and teacher education institutions.

To determine the existence of this possible relationship it is necessary to survey a large number of high school teachers. This survey is a two-step process: (1) filling out a Teacher Data Sheet, concerned with the characteristics mentioned above; and (2) completion of a Q-sort, in which teachers separate a deck of cards with teachers names and assignments into three piles according to criteria developed for this study. Completion of both items, by teachers, should take less than ten minutes and should not interfere with teaching responsibilities.

I will contact you by telephone sometime during the next few days to arrange an appointment to discuss the possibilities of including the high school teachers on your staff in the study. If inclusion meets with your approval I would also like to speak with the High School Principal about the study and the procedures to be followed.

Respectfully,

Jack Willsey
2225 Luwanna Drive
Lansing, Michigan

DIRECTIONS FOR THE Q-SORT FOR

IDENTIFYING GROUPS

A. Listed below are characteristics associated with some teachers. Read the characteristics carefully and proceed to Section B.

1. He/she expresses a willingness and desire to participate in programs that are labelled "experimental."
2. He/she frequently diverges from the norm and goes off in new directions when it seems appropriate to do so.
3. He/she enjoys uncertainty and encourages students to enjoy uncertainty also.
4. He/she is concerned with the far reaching effects of his/her methods and techniques on the entire school system.
5. He/she solves teaching problems with imagination.
6. He/she is constantly searching for new ways of doing what must be done.

B. Using the stack of 3 x 5 cards with the names and teaching assignments of all members of the faculty, sort the cards into two piles.

1. Cards of the teachers you believe meet all or most of the listed characteristics.

2. Cards for teachers you believe: (a) meet few or none of the listed characteristics, or (b) who do not know well enough to make a valid judgement.

C. Resort pile one into three additional subgroups to describe the degree to which each of the teachers in this group meets the established characteristics.
   1. Highest degree
   2. To a lesser degree
   3. To the least degree.

TEACHER DATA SHEET

1. Code _____

2. What subject or subjects are you teaching? _____

   _____

3. What subject do you prefer to teach? _____

4. How many years have you been a teacher? _____

5. How many years have you taught in your present building? _____

6. In how many other school systems have you served as a full time teacher? _____

7. What was your undergraduate major(s)? _____

   Minors? _____

8. Are you now enrolled in an advanced degree program?

   _____ Yes _____ No

9. If you now hold a Master's Degree is it in:

   _____ Education: _____ Subject matter (Hist., Eng., etc.)

10. Indicate the number and type (semester, term) of graduate hours you have earned beyond your highest degree:

    _____ Beyond Bachelor's _____ Beyond 6 year degree or Specialist

    _____ Beyond Master's

11. When did you complete your last class (month and year)? _____

TABLE A-1.--Correlation matrix.

	Age	Years as a Teacher	Years on Staff	Number Other Systems	Hours Beyond BA	Hours Beyond MA	Recency of Last Class Taken
1. Age	1.0000						
2. Years as a Teacher	0.8163	1.0000					
3. Years on Staff	0.6045	0.7131	1.0000				
4. Number Other Systems	0.4765	0.4083	0.1994	1.0000			
5. Hours Beyond BA	0.0598	0.0414	0.1063	0.1442	1.0000		
6. Hours Beyond MA	0.2108	0.1806	0.1868	0.1618	-0.2814	1.0000	
7. Recency of Last Class Taken	0.5345	0.5708	0.6399	0.3324	0.0620	0.1109	1.0000

TABLE A-2.--Regional distribution of sex of teachers included.

Sex	Region				Totals
	1	2	3	4	
Male	41	48	52	45	186
Female	22	20	23	20	85
TOTALS	63	68	75	65	271

TABLE A-3.--Regional distribution of age of teachers included.

Age	Region				Totals
	1	2	3	4	
23 - 27	16	18	17	24	75
28 - 32	15	17	15	6	53
33 - 37	8	7	12	12	39
38 - 42	10	8	4	7	30
43 - 47	3	6	9	5	23
48 - 52	3	5	6	3	17
53 - 57	5	2	3	2	12
58 - 62	2	3	5	3	13
63 - 67	1	2	3	3	9
TOTALS	63	68	75	65	271

TABLE A-4.--Regional distribution of number of years in teaching and number of years on the present staff.

Number of Years	Region 1		2		3		4		Totals	
	1[a]	2[b]	1	2	1	2	1	2	1	2
2 - 6	22	25	27	35	25	33	30	42	104	135
7 - 11	21	20	13	13	21	19	13	5	68	57
12 - 16	5	3	12	10	17	11	8	6	42	30
17 - 21	7	3	13	3	7	2	4	6	31	14
22 - 26	2	4	1	--	2	2	4	3	9	9
27 - 31	4	1	1	--	1	1	1	--	7	2
32 - 36	1	--	--	--	1	--	3	--	5	--
37 - 41	1	--	--	--	1	--	2	--	4	--
42 - 46	--	--	1	1	--	--	--	--	1	--
TOTALS	63	57	68	62	75	68	65	62	271	248[c]

[a]1 = years in teaching.

[b]2 = years on present staff.

[c]Totals for #2 are less than 271 because partial data were gathered on absent teachers.

TABLE A-5.--Regional distribution of subjects taught.

Subject	Region				Totals
	1	2	3	4	
1. Lang. Arts	12	7	14	12	45
2. Soc. Sci.	9	13	14	7	43
3. Science	5	6	10	9	30
4. Math	5	7	6	7	25
5. For. Lang.	3	3	2	2	10
6. Bus. Educ.	5	6	9	5	25
7. Agric.	1	1	-	1	3
8. Ind. Arts	5	9	7	5	26
9. Music	1	-	1	-	2
10. Home Econ.	3	4	2	2	11
11. Art	3	3	2	2	10
12. Health/P.E.	4	5	4	4	17
13. Combination	7	4	3	9	23
					271

TABLE A-6.--Regional distribution of respondents with a Master's Degree in Education or a Master's Degree in a subject matter field and those working toward an advance degree.

Education	Region				Totals
	1	2	3	4	
Master's in Education	16	16	16	4	52
Master's in Subject Field	9	13	8	10	40
Working Toward Advance Degree	15	19	23	23	80

TABLE A-7.--Regional distribution of number of quarter hours earned beyond highest degree held by respondent.[a]

Number of Hours	Region 1		Region 2		Region 3		Region 4		Totals	
	1[a]	2[b]	1	2	1	2	1	2	1	2
0	28	41	30	46	28	58	21	53	107	198
1 - 5	9	6	2	5	--	1	4	2	15	14
6 - 10	2	2	11	1	6	6	4	3	23	12
11 - 15	4	5	11	4	11	1	6	2	32	12
16 - 20	7	--	5	1	11	--	9	--	32	1
21 - 25	1	1	2	2	3	--	5	--	11	3
26 - 30	2	1	1	3	6	--	1	1	10	5
31 - 35	3	--	--	1	--	2	7	1	10	4
36 - 40	2	--	1	--	2	--	--	--	5	--
41 - Over	3	--	4	--	2	--	5	--	14	--

[a]1 = Bachelor's Degree.

[b]2 = Master's Degree.

TABLE A-8.--Regional distribution of recency of the last class for respondents.

Recency	Region				Totals
	1	2	3	4	
Presently Enrolled	21	21	20	22	84
1 year	12	15	11	14	52
2 years	4	10	14	8	36
3 - 5 years	12	11	11	11	44
6 - 9 years	2	2	7	4	15
10 years or more	5	4	5	3	17

TABLE A-9.--Tally sheet for School 1.

Teacher	Item			Total Choices	Score	%	Rank
	Least	Lesser	Highest				
A	6	2	1	9	15	25	15
B	1	7	10	18	45	75	2
C	1	9	9	19	46	77	1
D	5	10	3	18	34	57	6
E	2	7	10	18	38	63	4
F	0	1	0	1	2	3	20
G	0	0	1	1	3	5	19
H	1	5	7	13	32	53	8
I	3	6	4	13	25	42	11
J	1	9	3	13	28	47	9
K	0	4	0	4	8	13	18
L	3	6	6	15	33	55	7
M	1	9	2	12	25	42	11
N	8	4	1	13	19	32	14
O	2	6	3	11	23	38	12
P	2	5	5	12	27	45	10
Q	3	3	0	6	9	15	17
R	2	5	0	7	12	20	16
S	1	4	9	14	36	60	5
T	3	3	0	6	9	15	17
U	4	5	2	11	20	33	13
V	3	6	8	17	39	65	3

TABLE A-10.--Tally sheet for School 2.

Teacher	Item			Total Choices	Score	%	Rank
	Least	Lesser	Highest				
A	1	2	1	4	8	17	12
B	1	1	2	4	9	19	11
C	4	5	1	10	17	35	6
D	4	4	1	9	15	31	8
E	3	2	2	7	13	27	10
F	4	2	2	8	14	29	9
G	1	1	0	2	3	6	14
H	1	6	1	7	16	33	7
I	4	0	0	4	4	8	13
J	1	6	5	12	28	58	2
K	2	1	0	3	4	8	13
L	1	6	2	9	19	40	4
M	0	1	0	1	2	4	15
N	0	4	9	13	35	73	1
O	2	2	3	7	15	31	8
P	1	7	4	13	25	52	3
Q	3	5	2	10	19	40	4
R	2	5	2	9	18	38	5
S	0	3	1	4	9	19	11

TABLE A-11.--Tally sheet for School 3.

Teacher	Item			Total Choices	Score	%	Rank
	Least	Lesser	Highest				
A	1	2	5	8	20	33	12
B	2	3	4	9	20	33	12
C	2	4	2	8	16	27	15
D	1	6	7	14	34	57	6
E	1	8	5	14	32	53	8
F	1	1	2	4	9	15	18
G	5	3	8	16	35	58	5
H	2	5	5	12	27	45	10
I	1	0	4	5	13	22	17
J	2	4	3	9	19	32	13
K	0	7	11	18	47	78	2
L	1	6	6	13	31	52	9
M	1	5	1	7	14	23	16
N	2	5	2	9	18	30	14
O	1	3	2	6	13	22	17
P	3	4	11	18	44	73	3
Q	2	5	7	14	33	55	7
R	0	0	18	18	54	90	1
S	1	4	3	8	18	30	14
T	1	4	3	8	18	30	14
U	1	4	5	15	39	65	4
V	1	5	4	10	23	38	11

TABLE A-12.--Tally sheet for School 4.

Teacher	Item			Total Choices	Score	%	Rank
	Least	Lesser	Highest				
A	3	9	5	17	36	55	6
B	4	8	8	20	44	67	3
C	2	5	2	9	18	27	17
D	2	5	5	12	27	41	12
E	3	4	10	17	41	62	4
F	4	6	5	15	31	47	10
G	0	4	15	19	53	80	1
H	4	5	3	12	23	35	14
I	0	10	8	18	44	67	3
J	3	7	8	18	39	59	5
K	4	5	2	11	20	30	15
L	0	2	1	3	7	10	20
M	5	4	2	11	19	29	16
N	4	4	6	14	30	45	11
O	2	5	4	11	24	36	13
P	4	8	4	16	32	48	9
Q	1	1	8	10	27	41	12
R	2	5	9	14	35	53	7
S	1	8	6	15	35	53	7
T	2	1	4	7	16	24	19
U	2	4	3	9	19	29	16
V	1	8	11	19	50	76	2
W	2	3	3	8	17	26	18

TABLE A-13.--Tally sheet for School 5.

Teacher	Item			Total Choices	Score	%	Rank
	Least	Lesser	Highest				
A	1	0	0	1	1	2	24
B	2	1	1	4	7	11	22
C	2	8	9	19	45	71	5
D	2	10	8	20	46	73	4
E	1	9	10	20	49	78	2
F	3	5	0	8	13	21	18
G	3	6	5	14	30	48	8
H	3	0	0	3	3	5	23
I	3	3	0	6	9	14	21
J	1	8	3	12	26	41	10
K	0	5	15	20	55	87	1
L	3	3	1	7	12	19	19
M	2	7	1	10	19	30	13
N	2	9	8	19	44	70	6
O	1	8	10	19	47	75	3
P	3	4	0	7	11	17	20
Q	5	3	2	10	17	27	15
R	1	5	0	6	11	17	20
S	4	9	2	15	28	44	9
T	2	5	4	11	24	38	11
U	2	12	4	18	38	60	7
V	4	6	0	11	18	29	14
W	3	4	1	8	14	22	17

TABLE A-13.--Continued

Teacher	Item			Total Choices	Score	%	Rank
	Least	Lesser	Highest				
X	3	3	4	10	21	33	12
Y	2	7	0	9	16	25	16
Z	2	6	11	20	47	75	3

TABLE A-14.--Tally sheet for School 6.

Teacher	Item			Total Choices	Score	%	Rank
	Least	Lesser	Highest				
A	2	7	3	12	25	44	7
B	2	5	3	10	21	37	8
C	3	3	1	7	12	21	12
D	2	0	0	2	2	4	16
E	2	2	10	14	36	63	3
F	2	6	1	9	17	30	10
G	2	3	6	11	26	46	6
H	1	3	1	5	10	18	13
I	0	2	17	19	55	96	1
J	0	5	2	7	16	28	11
K	6	3	3	12	21	37	8
L	1	7	2	10	21	37	8
M	5	6	5	16	32	56	4
N	3	3	3	9	18	32	9
O	3	2	3	8	16	28	11
P	4	4	5	13	27	47	5
Q	0	6	12	18	48	84	2
R	0	1	1	2	5	9	15
S	3	0	2	5	9	16	14

TABLE A-15.--Tally sheet for School 7.

Teacher	Item			Total Choices	Score	%	Rank
	Least	Lesser	Highest				
A	10	1	2	13	18	26	13
B	4	3	3	10	19	28	12
C	4	6	3	13	25	36	9
D	3	3	2	8	15	22	16
E	4	5	4	13	26	38	8
F	2	4	6	12	28	41	7
G	2	7	6	16	36	52	4
H	3	6	1	10	18	26	13
I	1	7	7	15	36	52	4
J	1	1	4	6	15	22	16
K	4	5	4	13	26	38	8
L	3	5	7	15	34	49	5
M	4	10	6	20	45	65	3
N	1	7	10	18	45	65	3
O	4	3	2	9	16	23	15
P	4	5	5	14	29	42	6
Q	6	4	1	11	17	25	14
R	1	2	0	3	5	7	18
S	3	4	3	10	20	29	11
T	4	6	2	12	22	32	10
U	1	3	0	4	7	10	17
V	0	5	5	10	25	39	9
W	0	2	20	22	64	93	1
X	0	7	12	19	50	72	2

TABLE A-16.--Tally sheet for School 8.

Teacher	Item			Total Choices	Score	%	Rank
	Least	Lesser	Highest				
A	1	5	3	9	20	39	12
B	1	4	1	6	12	24	16
C	4	8	7	19	44	86	3
D	0	5	11	16	43	84	4
E	1	5	6	12	29	57	7
F	2	2	3	7	15	29	15
G	2	4	0	6	10	20	17
H	2	7	1	10	17	33	13
I	0	1	16	17	50	98	1
J	0	2	15	17	49	96	2
K	1	1	0	2	3	6	19
L	2	4	0	6	10	20	16
M	0	6	3	9	21	41	11
N	0	1	0	1	2	4	20
O	1	3	6	10	25	49	9
P	1	3	0	4	7	14	18
Q	1	5	7	13	32	63	6
R	3	8	1	12	22	43	10
S	0	9	6	15	36	71	5
T	0	10	2	12	26	51	8
U	1	8	0	9	17	33	13
V	2	4	2	8	16	31	14

TABLE A-17.--Tally sheet for School 9.

Teacher	Item			Total Choices	Score	%	Rank
	Least	Lesser	Highest				
A	1	7	12	20	51	59	3
B	2	7	7	16	37	43	10
C	1	8	9	18	44	51	5
D	3	7	2	12	23	27	16
E	3	11	9	23	52	60	2
F	4	6	5	15	31	36	12
G	3	5	1	9	16	18	18
H	3	2	0	5	7	8	21
I	2	9	5	16	35	40	11
J	1	3	10	14	37	43	10
K	3	8	2	13	25	29	15
L	2	5	1	8	15	17	19
M	3	4	7	13	32	37	12
N	2	10	7	19	43	49	6
O	3	3	5	11	14	16	20
P	1	8	11	20	50	57	4
Q	2	6	10	18	44	51	5
R	1	8	13	22	56	64	1
S	4	3	3	10	19	21	17
T	3	7	7	17	38	44	9
U	4	8	2	14	26	30	14
V	4	5	3	12	23	27	16
W	0	13	6	19	44	51	5

TABLE A-17.--Continued

Teacher	Item			Total Choices	Score	%	Rank
	Least	Lesser	Highest				
X	4	12	3	19	37	43	10
Y	1	10	6	17	39	45	8
Z	1	3	8	12	31	36	13
AA	2	6	9	17	41	47	7
BB	1	8	9	18	44	51	5
CC	3	0	1	4	6	7	22

TABLE A-18.--Tally sheet for School 10.

Teacher	Item			Total Choices	Score	%	Rank
	Least	Lesser	Highest				
A	3	4	1	8	14	19	18
B	3	10	3	16	32	44	7
C	5	4	1	10	16	22	17
D	2	13	1	16	31	43	8
E	2	2	15	19	51	71	1
F	3	6	5	14	30	42	9
G	2	8	9	19	45	63	3
H	5	9	1	15	26	36	11
I	2	10	3	15	31	43	6
J	1	3	14	18	49	68	2
K	0	0	1	1	3	4	22
L	4	7	1	12	21	29	13
M	5	8	0	13	21	29	13
N	3	9	1	13	24	33	12
O	3	6	1	10	18	25	16
P	2	6	2	10	20	28	14
Q	1	2	2	5	11	15	19
R	1	7	6	14	33	46	6
S	1	3	0	4	7	10	21
T	4	12	3	19	37	51	5
U	1	7	9	18	40	56	4
V	4	5	5	14	29	40	10
W	3	6	2	11	19	26	15

TABLE A-18.--Continued

Teacher	Item			Total Choices	Score	%	Rank
	Least	Lesser	Highest				
X	2	3	1	6	11	15	19
Y	4	2	0	6	8	11	20
Z	3	9	4	16	33	46	6

TABLE A-19.--Tally sheet for School 11.

Teacher	Item			Total Choices	Score	%	Rank
	Least	Lesser	Highest				
A	0	3	3	6	15	26	11
B	3	3	7	13	30	53	4
C	3	6	1	10	18	32	9
D	2	7	2	11	24	42	7
E	1	5	7	13	32	56	2
F	5	4	4	13	25	44	6
G	1	5	6	12	29	51	5
H	5	8	3	16	30	53	4
I	3	4	6	13	29	51	5
J	2	5	4	11	24	42	7
K	2	6	6	14	32	56	2
L	1	7	5	13	30	53	4
M	3	1	0	3	5	9	12
N	2	7	1	10	19	33	8
O	4	3	2	9	16	28	10
P	3	9	3	15	30	53	4
Q	2	5	7	12	29	51	5
R	2	9	6	17	38	67	1

TABLE A-20.--Tally sheet for School 12.

Teacher	Item			Total Choices	Score	%	Rank
	Least	Lesser	Highest				
A	1	5	6	12	29	48	7
B	2	3	4	9	20	33	11
C	3	8	6	17	37	60	3
D	3	9	2	14	27	45	8
E	1	9	7	17	40	67	2
F	0	7	9	16	41	68	1
G	3	1	10	14	35	58	4
H	3	8	2	13	25	42	10
I	4	3	0	7	10	17	18
J	2	5	2	9	18	30	13
K	6	3	1	10	15	25	16
L	4	3	3	10	19	32	12
M	5	3	0	8	11	18	17
N	4	6	5	15	31	52	6
O	1	2	1	4	8	13	20
P	3	0	2	5	9	15	19
Q	3	4	2	9	17	28	14
R	1	6	1	8	16	27	15
S	3	0	2	5	9	15	19
T	2	5	2	14	33	55	5
U	3	7	3	13	26	43	9