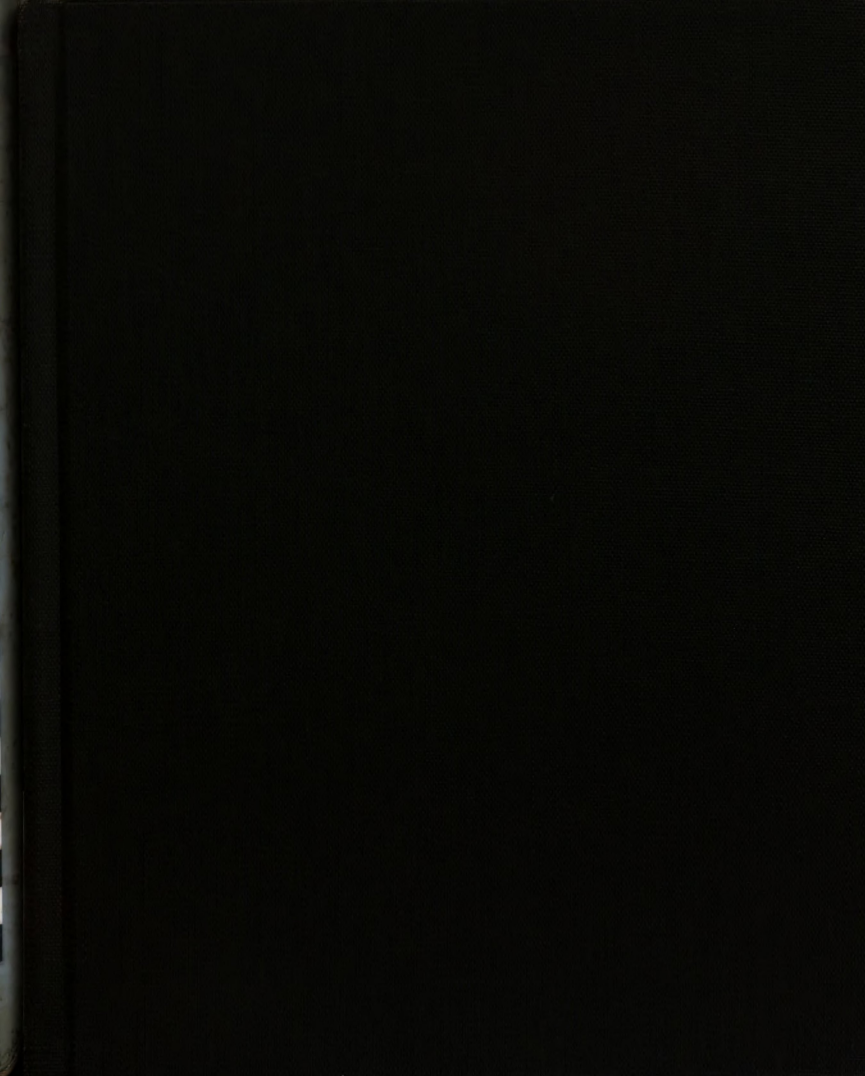






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thesis entitled

STUDENT ENROLLMENT DECLINE:  
A MODEL FOR DETERMINING IMPLICATIONS  
FOR STAFFING AND STAFF DEVELOPMENT  
IN THE PUBLIC SCHOOLS

presented by

Howard T. Heitzeg

has been accepted towards fulfillment  
of the requirements for

Ph.D. degree in Education

Charles A. Blackburn

Major professor

Date May 4, 1973

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A MODEL FOR DETERMINING IMPLICATIONS  
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By

Howard T. Heitzeg

A DISSERTATION

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ABSTRACT

STUDENT ENROLLMENT DECLINE:  
A MODEL FOR DETERMINING IMPLICATIONS  
FOR STAFFING AND STAFF DEVELOPMENT  
IN THE PUBLIC SCHOOLS

By

Howard T. Heitzeg

The Problem

The purpose of this study was to develop and test a model for determining the impact of declining student enrollments upon staff development in the public schools.

A Method

A survey was administered to a stratified random sample of teaching staff in a large suburban school district to determine their formal, professional-growth activities over a year of time. The subjects in the sample indicated the number of and amount of time spent in three kinds of formal, professional-growth activities. They were: college courses, inservice education workshops sponsored by the school district, and attendance at professional conferences.

These data were summarized for each of the twelve degree level age groupings included in the study, and were subjected to an analysis of variance routine to determine any differential behavior of staff according to their age, differential behavior of staff according to their degree level status and for any interaction between age and degree level status.

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## The Results

It was found that there was a statistically significant difference (.001) between teacher participation in formal, professional-growth activities by age. Additionally, it was found that there was a statistically significant difference (.001) of teacher participation in formal, professional-growth activities according to degree level status. There was no evidence found to support that there was an interaction between age and degree level status relative to participation in formal, professional-growth activities.

A system was developed to project the propensity for formal, professional-growth activities for future staffs. It was found that there will probably be a decline in staff participation in the defined activities paralleling the decline in student enrollments in the school district under study.

## Conclusions

Analysis of the findings indicated that:

1. Younger staff members have a higher level of formal, professional-growth activity than their older counterparts.
2. Generally, teachers at higher degree levels tend to participate in more formal, professional-growth activities than their counterparts at a lower degree status; however, those teachers at the MA and BA + 40 level participate less or have a lower formal, professional-growth activity level than any other degree level group.
3. There is no evidence of a systematic interaction between age of teachers and their level of degree attainment; however, if the MA only and BA + 40 group had been eliminated from the sample, it appears

as though there may have been an interaction effect.

4. There is a wide variance of participation in formal, professional-growth activities depending upon the teachers age level and degree status. The very lowest level of participation was for those people with the lowest degrees and who are in the oldest age category.

5. The declining student enrollments in the school district under study will contribute to a reduction of the formal, professional-growth activities of this staff in future years. The major reason for the reduction is that as the staff gets older it will tend to assume the behaviors of those people in those age groups (lower activity level) and there will not be the addition of younger staff members who are the most active, to offset this decline.

#### Implications of the Findings and Conclusions

A model has been developed and validated to project some of the potential impacts of student enrollment decline upon the public educational institution.

The findings and conclusions of this study clearly imply that the vitality of the educational institution in a declining enrollment era will decrease unless ways are found by educational decision makers to offset some of the reduced tendency of staff to participate in formal, professional-growth activities.

## ACKNOWLEDGMENTS

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## CHAPTER I

### THE PROBLEM

#### Statement of the Problem

##### The Context of the Problem

The mindset of the American populace is toward growth and expansion. We, as members of the American society, are oriented toward "bigger and better", "expansion" and "growth" in general. The result of two hundred years of expansionistic thinking has brought about a society unprepared for "reduction" and "decline" in certain sectors. We are ill prepared, simply because the thought that growth will end has never crossed anyone's mind, or if it has, the concept was not entertained at length.

The educational community, enjoying decades of immigration, baby booms, and increasing years of education for all citizens, has given little consideration to a leveling off or a decline in the demand for educational services. Since many educators felt that ignorance was the incurable ill of society, decision makers appropriated greater and greater amounts of society's resources to schooling. Few foresaw the revolution of the American family structure and the resultant decline of numbers of children--children who have been the primary clients for the educator's skills.

Though it is valid to say that ignorance still exists, and the

resources of society need to be appropriated toward reducing illiteracy, the specter of declining school enrollments is now a reality to which educators must reconcile themselves and their public. Educators may have to direct their attention to other audiences to find consumers of their skills. Preschool children and undereducated adults are two such groups.

It is critical that some examination of severity and the extent of student decline be done. The National Center for Educational Statistics (1976) forecasts approximately a one percent per-year student-enrollment decline between 1976 and the early 1980's. Sometime in the early or middle 1980's, this trend will begin to level off or reverse itself; not because there is a forecasted increase in the birth rate during those years, but because there will be greater numbers of females in their childbearing years (ages 18-34) during that time.

The Michigan Department of Health (1975) does not foresee this leveling off or reversal of the population-declining trend in Michigan. The forecast is for approximately 400,000 fewer school aged children in 1990 as compared to 1975 (2,800,000 to 2,400,000). On the surface, these two forecasts appear to be somewhat in conflict. This probably is not the case, since most of the leveling off or slight increase in numbers of school-age children in the middle 1980's will probably take place in the so-called sun-belt states or sun-belt regions of the United States. In these areas there are, even at present, increased student enrollments in the schools, due to migration.

The most prestigious forecasting literature from the Census Bureau of the U.S. Department of Commerce, the Center for Educational

Statistics, and the Michigan Department of Health seems to substantiate that most school districts in the nation, as well as in Michigan, will have a rather severe decline in the enrollment of K-12 students between 1977 and 1990. For Oakland County, Michigan and the school district under study (1977), these declines probably will be 70,000 and 4,000 students, respectively. This decline will represent between 25 percent and 30 percent of the present student population!

It appears, from these data, that it is probably safe to infer that dealing with the problems resulting from fewer students is now, and will be, a major issue for school districts for at least another decade.

The impact of enrollment decline can be divided into at least three major categories that all school districts are going to have to deal with: the psychological, the financial, and the educational impact of fewer students.

Carol Epstein (1976) of the National School Public Relations Association writes: "Decline is a decidedly negative word in the mental vocabulary of most Americans." The optimism that goes with growth is going to be replaced with the pessimism that often accompanies decline. She sees the educational institutions as having gone through three phases in the United States.

The first phase she describes as dynamic growth characterized by self-confidence and expansion: "The institution can solve any problem it confronts and the impossible only takes a little longer." During this era, schools took on an increasing role, whether it was to produce more scientists to catch us up with the Soviets in the space race, or

to educate people about sex, drugs, driving or the environment. The second phase is one of conflict. The self confidence of "the schools can do anything" is replaced with self-doubt. After the schools had incorporated the "all things to all people" kind of notion, they found they were incapable of solving all of society's problems. The third phase of decline is even more painful than the conflict phase. In a country where "bigger" usually has meant "better," decline is an unfortunate situation. The institution retreats, retrenches and tries to find the level at which it can again produce successfully. But decline is equated with failure in too many minds, both within and without the educational profession. The problems of expansion were much more psychologically positive in the minds of people that dealt with them; problems of building new schools and building curricula were more exciting than dealing with the problems of decline.

Administrators and teachers alike appear, at least initially, to have little heart to deal with the issue of student-enrollment decline. Both groups probably are hoping that, if they ignore the problem, the issue will go away. Of course, educators need not view enrollment decline as a negative issue; there are some positive aspects of fewer students in over-crowded institutions; there are many possibilities for offering better educational programs, more solid institutional structures and improved services. There is the opportunity to throw off any number of unworkable, unnecessary and ineffective elements of schooling and retain only the best. Declining enrollments, again, offer educators an opportunity to improve their services.

The financial impact, like the psychological impact, too has

many facets. Most immediate and most obvious is that in a school system which receives finances from the state legislature based upon the numbers of students enrolled, fewer students mean fewer dollars for the educational program.

What is doubly threatening about this phenomenon of "fewer dollars" is that there is not a one-to-one ratio between the loss of student population and the reduction of expenses. For example; the loss of one student in Michigan means approximately \$1,000 less money for the educational program. At the same time, that student does not take \$1,000 in expenses with him when he leaves the school district; such things as heat, water, lights, administrative staff, and even the teaching staff continue, though the student is no longer there. If a classroom of thirty students disappears from the school district and a teacher is eliminated, the approximate \$30,000 in income that is lost because of the decline of students is significantly greater than any related to the salary savings from the elimination of one teacher. Employment practices dictate that the seniority system shall prevail in eliminating teaching staff. This means the lowest paid teacher, the one with the least experience, is the one to be eliminated. Therefore, the savings is much less than the decline in income.

The financial impact of declining enrollment goes beyond the immediate school budget to the financial impact on the community. Marbrook (1977) in Administrative Leadership Publications, cites several examples of financial impact on the community due to declining enrollment. One most often of concern to the community is the effect declining enrollment has on local-property values, if and when a school

is closed. Many people buy homes in an area because of the proximity to their elementary school. If that school is closed, what is the impact going to be on property values? Declining enrollments mean increasing numbers of people in the community who are childless or whose children have grown; these community members will probably resist anything but tax relief, once that enrollment drops.

The impact on educational programs caused by declining enrollments will have many aspects to it. The most immediate effect will probably be the reduction in the number of program options for each student. Unless careful planning is initiated, those innovative electives, which may have made a school system outstanding and attractive, will be the first to go when there is a pinching of pennies in order to balance the budget. The data from a survey conducted by the National School Public Relations Association (Epstein 1976) appears to support this possibility:

If the children go and then the money goes, can the educational program be far behind? More than 20 school districts reported cutting staff and/or programs as a first step in dealing with declining enrollment. Several more stated that it is no longer possible to maintain the level of per-pupil expenditures called for in previous budgets. When 'something's gotta give,' that 'something' is usually classroom teachers or specialists and programs most likely to be categorized as 'frills' - an athletic program here, an instrumental music course there, advanced courses in math or science in one district, reading clinics or foreign language programs for elementary pupils in another.

Fiscal conservatism settles gloomily over once-innovative school boards.

The declining student-enrollments literature is fraught with such things as methods for making projections; how to close a school;

how to involve the public in closing a school; how to maintain your present schools without closing them through re-organization; how to develop a policy for closing a school, and how to develop policies for laying off teaching staff in the face of declining enrollments and other related issues.

There is a dearth of discussion regarding the proposition that "fewer students mean fewer low-seniority teachers." There are few studies which address the impact aging staff may, or could have, upon the educational program in schools. The report of the Committee on the Cost of Education (1974) on the demographic influences on school enrollments alludes to this problem. The report argues that the changing demography of students may bring about a changing demography of teachers. More specifically, the staff may well age, reducing the influx of new ideas into the school organization. The report further argues that more attention should be given to the determination of goals and expectations and development of inservice-education programs designed to achieve these goals in the school institution.

There is little doubt that if fewer students are going to mean fewer teachers, those teachers surviving staff reductions will be the teachers with the most seniority. Presumably, the school institution will lose the impact of those most recently trained to teach. It is assumed that the influx of newly trained teachers has a positive impact upon the educational institution. It appears it will be necessary for schools to develop alternative ways to fill whatever revitalization role the newly trained had upon the staff as a whole.

### Importance of the Problem

The result of fewer children entering school has been reduction, in most cases, of school staff members in those schools where the decline has taken place. This is the most immediate and obvious result of the school-enrollment decline. Consideration must be given to the less obvious impact of the declining enrollment and staff reductions if educators are going to plan adequately for the changes resulting from the shift of a growing institution to an institution facing an ebb of students and staff. Educational institutions in the last quarter of the 20th century will have to change their focus from dealing with growth to dealing with decline and its special problems. It is imperative that educators now investigate the impact of declining student enrollments upon the school curricula. Such studies will reveal to educational planners the impact of these phenomenon. It will then be possible to design approaches to aid in offsetting negative results.

A major implication of the forecasted decline is the "stagnation" of staff. It would appear, in the face of an overall decline in enrollments, most school districts would be hiring few, if any, new staff members, thereby allowing the positions of those who leave to go unfilled as compensation for fewer students.

Professional, however, are not in agreement as to the impact declining student populations will have on staffing. The Institute for Development of Educational Activities (1975 IDEA) reports that some authorities feel student-teacher ratios will drop and staffing will remain constant, while student numbers decline. Others feel the

"dollar squeeze" caused by per-pupil state funding will drive pupil-teacher ratios higher. Still others feel the teachers' groups will fight so strongly for teaching positions that the present ratios will be maintained.

It is difficult to speculate whether the ratios will increase, but it is certain that they can only decrease to a certain level. It is difficult, however, to infer a trend other than "fewer students, fewer teachers," though the declining trends may not perfectly parallel each other.

The per-pupil costs of operating a twenty-student classroom, compared to a thirty-student classroom, are 50 percent higher. If, for example, two teachers are both making \$20,000 annually and they are assigned to twenty and thirty students respectively, the per-pupil costs in the twenty-student room are \$1,000, while the per-pupil costs in the thirty-student room are \$667. This simple example does not take into account the difference in administrative, maintenance, utility, or other costs of operation.

This, of course, is an economic argument and does not take into account the educational advantage that may occur as a result of smaller class sizes. School districts, in spite of the increased per-pupil costs, probably will reduce class sizes as enrollments decline, because of the wide-spread belief that smaller classes offer educational advantages to students.

Schools, it appears, will lose the impact that the newly trained have upon the institution's program and atmosphere. It is not clear exactly what this impact is, but it may be inferred that recently

trained teachers bring new and often innovative ideas with them. The interaction of the "new" staff members with the seniority employees perhaps brings about a hybridization of ideas that might not otherwise have occurred.

However, in a declining-enrollment era, the seniority staff members are not going to concentrate on interacting with new staff members to solve educational problems. Their attention may be turned to their own job security. Maslow (1962) regarded the individual's ability to reach self-actualization to be dependent upon his/her satisfaction of a hierarchical list of needs.

All people need to feel secure in their "persons"; they must have their basic needs of food and shelter satisfied before they can concentrate on the needs of a group. Perhaps the "threat" of loss of employment for many employees will prevent them from operating at a level which will work for the good of the institution. For example, perhaps some valued employees will give up hope of maintaining their present jobs and concentrate on retraining themselves for other professions. They will use the energies they might have used productively at the educational institution in a "secure era," to obtain a new career outside of education.

It appears that, at the very time when creative thought and innovation are going to be required of the individuals and the institution, planners and staff alike may be threatened by the phenomenon of declining enrollments and consequent loss of jobs. The insecurity could result in a retrenching to a survival mode of operation, placing an even greater burden on the educational institution.

The decline of student enrollments and resultant reduction of school staffs tend to reduce, if not stop altogether, the forces of infusion of new staff members. The school institution then will become increasingly dependent upon resources within itself and its staff members to maintain its vitality.

#### Significance of the Study

Many school districts have faced the problems accompanied by radical change in student enrollments. Many more will face these problems in the years ahead. The activities of this study will lead to the construction of a model to anticipate change--not only change in the numbers of students and staff but change in the composition and probable behavior of a school staff relative to professional-growth activities.

The model will provide educational planners and decision makers with a means for gathering comparison data required to anticipate the probable direction of change in school staffs resulting from enrollment decline. Armed with this kind of knowledge, planners may construct programs for maintaining the vitality of the organization. For example, the school district may have to devise new approaches for providing incentives to staffs to continue their professional growth.

#### Purpose of the Study

The major product of this study will be a model for examining school staffs' formal, professional-growth activities in relation to their age and degree status. This model can serve as a basis for

making inferences regarding the impact of declining enrollments upon the composition of teaching staffs and the school curriculum.

#### Questions to be Answered by the Study

The following list contains the questions of interest for this study:

1. Do teaching-staff members, grouped by age and degree level, behave differently relative to their participation in formal, professional-growth activities?
2. Which group(s) of teaching-staff members are the most active in formal, professional-growth activities?
3. Will projected, school-teaching staffs have the same propensity for participation in formal, professional-growth activities as the present one?

#### Hypotheses to be Tested

Participation in professional activities - null hypothesis tested:

1. There will be no difference between age groups relative to their participation in formal, professional-growth activities.
2. There will be no difference between college-degree level groups relative to their participation in formal, professional-growth activities.
3. There will be no interaction between age groups and college-degree level groups relative to their participation in formal, professional-growth activities.

### Supplementary Planned Analysis

An analysis of projected, future staffs will be made to answer question three above: Will projected, school-teaching staffs have the same propensity for participation in formal, professional-growth activities as the present one?

### Definition of Terms

#### Formal, Professional-Growth Activity

The primary avenues of professional growth available to teachers are: college-credit classes, district-sponsored inservice education, and participation in professional conferences and workshops. It is recognized that teaching staffs increase their skills and knowledge about their profession through interaction with other staffs, and the reading of journals and other individual activities. However, formal activities leading to skill and knowledge development of teaching staffs are generally confined to the three kinds of activities listed above. The formal activities are unique in another way: they are presently the primary modes used by school district planners to structure the professional-growth activities of the teaching staff to bring about major change in school curriculum.

There appears to be no practical way to differentiate between the quality of the three formal, professional-growth activities. There are two possible ways to examine quality; inter-activity quality and intra-activity quality. A comparison of inter-activity quality implies a question such as this: Are college courses generally more beneficial

than inservice workshops? With the large variety of institutions and individuals offering both kinds of activities, there really is no fair way to make a generalization. Intra-activity quality implies a question such as this: Are some college courses better than others? Probably yes, but here again, generalities are difficult; what may be excellent for one person, in a particular time and space, may be very poor for another. For the reasons outlined here, this variable will be the basic unit and will be applied according to the schedule displayed in Table 1.1.

TABLE 1.1  
Computation of Formal, Professional-Growth Activity

---



---

|                            |   |                                          |
|----------------------------|---|------------------------------------------|
| 1 Semester Graduate Credit | = | 15 Hours                                 |
| 1 Term Graduate Credit     | = | 10 Hours                                 |
| 1 Inservice Education Day  | = | Actual Hours From<br>Employee Time Sheet |
| 1 Conference Day           | = | 6 Hours                                  |

---

The hours spent in graduate-school classes are very close approximations to the requirements of institutions of higher education. The inservice-education hours are nearly exact, but the conference day is difficult to justify empirically. However, inspection of programs from organizations providing these kinds of activities causes the investigator to fix upon the six-hour figure as typical.

### Staff Formal, Professional-Growth Activity Index

This is an index generated for the total school staff. It is a composite of the formal, professional-growth activity calculated for each member of the staff.

### Teaching Staff

For purposes of this study, teachers have been grouped into three age groups: 22-34; 35-47; 48-65 inclusively.

Any grouping that can be made is somewhat arbitrary; however, these groupings do allow for the clustering of individuals who are at different points in their professional, educational careers. The youngest group comprises approximately 50 percent of the total staff; they are developing their careers, and are upwardly mobile, developing leaders. The middle group comprises approximately 30 percent of the total staff. The individuals in this group probably are well established in their positions and have better-defined professional goals than the younger group. Members of the oldest group have most of their careers behind them. They probably are more inclined to use their experiences to formulate their classroom practices, than to seek information externally. This group comprises approximately 20 percent of the total staff.

### Teacher Degree Groups

For purposes of this study, teachers have been grouped by college-degree level: Bachelor of Arts only; Bachelor of Arts with 20 additional semester hours; Master of Arts or Bachelor of Arts with 40

additional semester hours; Master of Arts with at least 15 additional semester hours.

The four degree-level groupings selected for differentiation in the study are somewhat arbitrary, but are convenient ways of differentiating staff along a continuum of graduate-graining experience.

The BA category includes individuals who are working toward a higher salary status and those who have ceased to aspire to a higher level. The BA + 20 is a point at which teachers receive additional salary for their graduate work. This group includes individuals who are working toward an MA and those who have ceased their efforts at this point. The MA level is the next point at which teachers receive additional salary for their graduate training, in the district under study. This group includes those who are working toward levels beyond the MA and those who have terminated their formal, graduate training. The MA+ group includes those who have attained at least 15 semester hours beyond the MA level. This group includes individuals who are aspiring toward a higher level and those who have terminated their formal, graduate training.

#### Student-Population Projections

Student populations for the district under study have been generated using the method described in Appendix A.

#### Staff Population Projections

Staff populations for the district under study have been generated using present student-teacher ratios based upon the method

described in Chapter III.

### Assumptions and Limitations

#### Assumptions

The following assumptions have been made in designing this study:

- A. Formal, professional-growth among teaching staffs is chiefly a function of inservice education, college credit courses, and professional conferences.
- B. Future student-teacher ratios will be similar to those now in existence in the school district.
- C. Teaching staff grow in knowledge and skill through informal interaction with peers as well as through self initiated programs of professional development.
- D. Staff members of similar age and degree status will behave similarly, relative to formal, professional-growth activities.
- E. Future teacher-hiring policies in the school district will reflect those used now.
- F. Teaching staffs will remain in the district until mandatory retirement age.
- G. There is a positive, but imperfect, relationship between formal, professional-growth activity and program quality.

### Limitations

The following limitations have been recognized in this study:

- A. Teaching staffs may grow in professional skills in ways other than the formal avenues measured in this study.
- B. The forecasts for professional-staff composition have been made upon present, student-teacher ratios.
- C. The formal, professional-growth activities may not be developmental in nature.
- D. The formal, professional-growth activity data are for a single calendar year and may not be typical of all years.

### Site of the Study

A large (17,600 students, 831 teaching staff) suburban school district was selected to be the subject of this study. The school district is located in Oakland County and is part of the southeast Michigan metropolitan area.

The district can be considered typical in the State of Michigan from several standpoints. The student-achievement test scores on the Michigan Educational Assessment Program have paralleled the state averages during the nine years of the assessment program. The ages of teaching-staff members range from 22 years to 65 years old. The teaching staff has a median age of 34 years; no single age comprises more than 7.8 percent of the entire group (the distribution of the entire group by age can be found in Appendix C). The student population recently has peaked and the district has begun to experience a slight

enrollment decline. The decline in student enrollments is forecasted to become much more severe in future years.

The subject of this study must soon face the issues raised by declining school enrollments; therefore, the data will be particularly applicable to that community. Since the school district has demographic characteristics in common with many Michigan districts, the findings will be applicable beyond the confines of the subject of this study.

#### Summary of Procedures Used in this Study

##### Data Collection

A stratified, random sample of three age-groups was drawn from the school district's teaching staff. The sample was further stratified by the years of education among staff members. The teaching staff was grouped in ages 22-34, 35-47, and 48-65. Additionally, teachers were grouped by college degrees--bachelors degree only, bachelors and 20 graduate hours, masters degree, and masters and 15 or more additional semester hours.

The dependent variable was generated through a survey of the sample to determine:

1. Credit hours of college courses during the past year.
2. Hours of inservice education during the past year.
3. Professional conferences and workshops attended during the past year.

The three items were collapsed into the single, formal, professional-growth activity variable by determining the total number of hours spent in the formal, professional-growth activities.

### Data Analysis

A three x four analysis of variance technique was used to determine the differential effects age (Hypothesis I) and education (Hypothesis II) have on formal, professional-growth activities. Further, the data were analyzed to determine if there is any interaction (Hypothesis III) between age and education, with regard to formal, professional-growth. The Statistical Package for the Social Sciences (SPSS) data-analysis programs were used for all analyses. The programs were authored by Norman Nie of the University of Chicago (1976).

### Supplementary Planned Analysis

Hypothesis I through III yielded information regarding the formal, professional-growth activities of groups within the teaching staff. Since a school staff is an ever-changing group, it would be useful to develop a means for projecting the composition of future staffs relative to their formal, professional-growth activities.

Questions to be Addressed by the Analysis. Will projected, school-teaching staffs have the same propensity for participating in formal, professional-growth activities as the staff under study?

Analysis. Adding the appropriate years to each staff member's age, a new, district teaching population was constructed for a projection year. Those reaching age 65 in a projection were to be replaced in the population by a 25 year old with a Bachelor of Arts degree. The age and degree level represents the typical, new employee, based on past hiring practices. Similarly, as enrollment declines, the least-experienced teachers are dropped by a fixed ratio. The present staff was assigned a professional-growth factor from the mean in their category (i.e., 35-47 with MA). This quantity was multiplied by the number in the category. Finally, a sum of all the products was divided by the total number of staff members yielding a Staff Formal, Professional-Growth Index for the present staff. Repetition of the foregoing technique for the forecasted staffs for 1981-82 and 1986-87 yielded Staff Professional-Growth Indices for those years as well. The data were inspected for changes in the propensity of the Formal, Professional-Growth Index of future staffs.

### Overview of Chapters II-V

#### Chapter II

An extensive review of the literature related to the major issues addressed by this study will be contained in Chapter II. The discussion will focus on three major areas related to the study.

Student Enrollment Projections. The literature related to methods of projecting student enrollments in K-12 school districts is reviewed. Particular attention is paid to the reliability and error of the estimates of various methods, and especially to the technique used in this study.

Staff Development. The literature related to the development and renewal of public-school staffs is reviewed. The discussion is focused on the three professional-development activities used as dependent variables in this study; school district inservice education, professional conferences, and graduate training.

Institutional Renewal. Literature related to the impact of declining students and staff upon the education institution is reviewed. Those factors related to the behavior of staff in an era of constricting programs is given special attention.

### Chapter III

The methods used for collecting the data and the technique for analyzing the data relative to each hypothesis is presented. The technique for projecting student enrollment will be relegated to an appendix. Though the projection technique is critical to the study, it is secondary to the focus.

#### Chapter IV

The results of the analysis described in Chapter III are reported in Chapter IV. Each of the hypotheses tested will be listed and the data from each calculation are reported with the conclusions.

#### Chapter V

The implications of the findings in Chapter IV are discussed in Chapter V. The researcher synthesizes the findings of the study with those findings reported in Chapter II. Special attention is paid to inferences regarding the future directions of educational-renewal programs and the probable outcomes of renewal efforts.

## CHAPTER II

### REVIEW OF THE LITERATURE

The literature pertaining to three distinct topics is reviewed here. Though the topics are somewhat disparate, they coalesce into a single focus in this research. Enrollment-forecasting techniques are reviewed because the projected decline of student enrollments and the ramification of this decline are central to the study. Approaches to inservice education and their effectiveness are reviewed to help gain insight into ways an educational institution can revitalize its members. The impact of decline on the educational institution and its members (employees and clients) is reviewed to gain an understanding of what the institution might anticipate during the constriction process.

#### Accuracy of Student Enrollment Forecasting

The Michigan Department of Education (1977) is forecasting a steady decline in student enrollment in Michigan schools through 1990. The department's projections for 1981 represent a decline of two-hundred thousand K-12 pupils in the state from the 1976 figure of 1,992,415 students. This will represent a 10 percent reduction in public-school enrollment over the five-year period from 1976 to 1981.

The Michigan Department of Education (MDE) points out that, though there will be a general decline in enrollment over the 1976 to 1981 period, the decline will not be uniform throughout the state. The range of change in student population is from an increase of 17 percent in Livingston County to a decrease of 18 percent in Wayne County. The MDE states that: "This decline (student enrollment) is projected to continue until the early 1990's." The department makes no number forecasts beyond 1981.

The U.S. Department of Commerce (1976) also is predicting a decline in K-12 enrollments over the same period of time (1976 to 1981). The national student population is forecasted to decline from 48,700,000 in 1976 to 45,000,000 in 1981. This represents a decline of 7 percent in the student population during this five-year span. The enrollment decline in the nation is not uniform, according to the Department of Commerce. Some states such as Michigan are decreasing faster than other states. Some states such as Arizona are actually increasing in enrollment, due to inward migration from other states.

Just as the rate of decline is not uniform for all geographical areas, the rate of student decline differs by age group. According to the MDE, the elementary schools "have lost significant numbers," while secondary schools "will lose one-fifth of their enrollment during the decade of 1975-1984."

The Department of Commerce projects a decline of 2,800,000 secondary students and a decline of 800,000 elementary students from 1976 to 1982.

The accuracy of student-enrollment forecasts should be examined.

There is little doubt that the forecasts for five years are extremely accurate, since "everyone who is going to be attending school for the next five years is already on earth." Even though population counts may have slight errors, the trend for the immediate future is clear. Not so definite is the trend after that. The number of children born (birth rate) is dependent on the number of children women in child-bearing years actually are bearing (fertility rate), and the number of women in their child-bearing years.

The U.S. Department of Commerce is predicting an increase in births, due to an increase in the number of women in their child-bearing years. Even though the number of children per woman "has decreased from 3.2 to 1.9," the large number of women in their peak child-bearing years will cause the number of actual births to increase for a time. For example, the U.S. Department of Commerce reports that the number of females, ages 20 to 24, rose from 9,314,000 to 9,748,000 between 1974 and 1976.

The most recent data on births, reported by Robert Reinhold (1977), indicates that births increased for the last one-half of 1976 and for the first one-quarter of 1977. Even with slight increases, the American fertility rate remains one of the lowest in the world, and stands at a little more than one-half what it was at its peak.

The reasons for the decline in the birth rate are many. According to the National School Board Association, the invention of reliable and cheap methods of birth control has been a major contributor, but there have been other factors.

Declining birthrates give credence to the conclusion that society's values regarding size of family and

age-at-marriage are changing. In making projections for future years, demographics take into account several factors: women are marrying later and the average age at first marriage today (1976) is 21, whereas in 1959 and before it was 20. Similarly, in 1974, 40 percent of the women aged 20-24 were unmarried, compared to 28 percent in 1960. Marriage delay and child-bearing delay or reduction may be (partially) attributed to an increase in women attending college; in 1972 there were three times as many as in 1960. Similarly, increased career opportunities for women may effect the number of children born.

### Summary

The national and Michigan projections indicated there will be a steady decline in the numbers of K-12 students for at least the next five years. The forecasts probably are accurate, since all children who will be in school five years from the present have been born and counted. The only question is: "Where will they attend school"? Migration patterns may cause some areas to increase in enrollment, while other areas experience severe decline in school enrollment. The projections for small geographical areas are subject to greater error than those made for the nation or a state as a whole. The governmental agency projections beyond 1982 should be viewed as less accurate than the near projections, since these are based upon children yet to be born. These forecasts are intertwined with a complex analysis of human aspirations and values which might exist in the future.

### Approaches to Professional Growth

A major premise of this study is that the educational institution has three primary methods for bringing about formal, professional-growth

among teachers: college courses, professional conferences and workshops, and locally sponsored, inservice education programs. Though it is argued that teaching staffs do increase their skills through interactions with other staffs and by reading journals, these activities are generally beyond the control of the institution.

The three avenues of professional growth are widely accepted by educators throughout the nation. Every state requires, or is in the process of requiring, graduate training for a teacher to receive continuing or permanent licensure. States such as Michigan have considered increasing the graduate-school credit requirements for teachers to maintain certification.

#### Professional Growth in Legal, Medical and Funeral Professions

The faith in graduate education, inservice education, and professional conferences to maintain and increase skills is not limited to professional education. The legal profession requires "units" of "professional-skill improvement" credit in Minnesota, Wisconsin, and in California. Many other states, including Michigan, have a voluntary program of professional growth or are considering requiring professional-growth activity to maintain licensure (Anderson, 1977). The medical profession is at a similar status. In Michigan, physicians must complete fifty hours of "continuing medical education" annually to maintain licensure (Department of Licensing and Regulations 1976). The funeral directors through the "academy of professional funeral service practice" (1976) have a nation-wide, voluntary-certification program.

The medical, legal, and funeral professions grant professional

growth credit for the three kinds of activities identified in this study. Only the funeral profession offers credit for activities other than graduate education-credit for inservice education sponsored by a single local institution or consortium of institutions, or for attendance at professional conferences. In some instances, funeral directors may receive credit for community-service activities.

#### Impact of Professional Growth Activities Upon Performance

The principle that professionals grow in skill through the formal, professional-growth modes utilized in this study enjoys wide acceptance within and across professions. Though this principle is an assumption of this study, the literature was reviewed to test the empirical validity of the principle.

Conference Attendance. Teachers in South Dakota (Betz, 1977) felt inservice workshops conducted on college campuses were of greater value than two other modes surveyed in this study. Betz's data also revealed that the most frequent activity of this group was attendance at conferences or conventions.

The consumers', in this case the teachers', subjective evaluation of the effectiveness of an activity is an important element in the evaluation of the activity; however, the congruence of perception and its real impact on professional performance may not be perfect.

Unfortunately, there is little data in the literature to support the notion that conference attendance has a significant impact on professional performance. Conference-evaluation techniques are wholly

dependent on measurement of the gain of knowledge or attitude change of the receivers. The inference is then made that if the conference has met its attitudinal change or knowledge-increase goals, this will translate into "better" professional practice. The reliance upon professional conferences as an effective means for increasing professionals' skills is grounded in the following: If the participant subjectively indicates the conference is of value, or has objectively changed an attitude or grown in knowledge, the participant will return to the job and perform at a higher level. The literature contained no information that showed an actual correspondence between job performance and conference experiences. This is not to suggest there is no relationship, but to point out the absence of data to demonstrate it.

Graduate School and Inservice Workshop Attendance. The relationship between graduate-school attendance, inservice education and job performance is better grounded by empirical study. A dissertation-abstract search revealed twelve recent studies dealing with the effects which various inservice programs had upon teacher-classroom performance. Probably the most recent and definitive study on the impact of inservice education upon classroom performance was conducted by the National Council of States on Inservice Education (1977). The study reveals that inservice education can have a high, positive impact on teacher performance and skill, but the extent of the impact is more dependent upon subtler variables than a total view of inservice education reveals. To show that inservice education effectiveness is a complex question, some of the more important findings in the study are listed below:

1. Inservice programs in schools and on college campuses are equally capable of affecting teacher behavior, but the school settings tend to be capable of influencing more complex, behavior changes in teachers.
2. Teacher attitudes are more likely to be influenced in school-based than in college-based inservice programs, though there is no clear cut dichotomy.
3. Minicourses sponsored either by colleges or schools tend to emphasize the development and application of specific teaching skills with a corresponding lower emphasis on beliefs, values, concepts and information objectives. Minicourses have a high rate of success in achieving the specific, skill objectives.
4. No medium of instruction is broadly inappropriate or distinctly inferior in the accomplishment of the objectives of inservice education.
5. Video and audio taping are effective means of influencing teacher behavior in classroom-management skills.
6. Studies of inservice programs that make specific mention of a book or books as a medium of instruction report a high degree of program effectiveness.
7. Training in the use of an observation system, such as Interaction Analysis, is effective in changing a teacher's capacity to perform certain verbal operations, but it is relatively ineffective in influencing teacher attitude and pupil behavior.
8. School-based programs in which teachers participate as helpers and planners of inservice activities tend to have greater success in accomplishing their objectives than do programs which are conducted by college or other outside personnel, without the assistance of teachers.
9. School-based programs in which supervisors or administrators serve as helpers and planners tend to be more successful in accomplishing their objectives than do programs which are conducted by college or other outside personnel, without the assistance of supervisors or administrators.

10. School-based programs conducted by supervisors and/or administrators have a record of effectiveness which exceeds that of school-based programs that involved college or other outside personnel.
11. School-based, inservice programs that emphasize self-instruction by teachers have a strong record of effectiveness.
12. Objectives of inservice education which deal with changing teacher's concepts or enlarging the teacher's store of information have a high rate of realization; objectives dealing with overt teaching behaviors are less often realized; and objectives involving changes in teacher attitudes or values are least often realized.
13. The success rate of inservice education programs is substantially higher when change in teaching behavior is the criterion, rather than when subsequent change in pupil behavior is the criterion.
14. Inservice-education programs which have differentiated training experiences for different teachers (that is, "individualized") are more likely to accomplish their objectives than are programs that have common activities for all participants.
15. Inservice education programs that place the teacher in active roles (constructing and generating materials, ideas and behaviors) are more likely to accomplish their goals than are programs in which the teacher is expected to store up ideas and behavior prescriptions not of his or her own making.
16. Inservice education programs that emphasize demonstrations, supervised trials and feedback are more likely to accomplish their goals than are programs in which the teacher is expected to store up ideas and behavior prescriptions for a future time.
17. Inservice education programs in which teachers share and provide mutual assistance to each other are more likely to accomplish their objectives than are programs in which each teacher does separate work.
18. Teachers are more likely to benefit from inservice-education activities that are linked to a general effort of the school than they are from "single-shot" programs that are not part of a general staff development plan.

19. Teachers are more likely to benefit from inservice programs in which they can choose goals and activities for themselves, as contrasted with programs in which the goals and activities are pre-planned.
20. Self-initiated and self-directed training activities are seldom used in inservice education programs, but this pattern is associated with successful accomplishment of program goals.

Clearly the "how" and "what" of inservice education influences its effectiveness. Teacher involvement in planning and conducting the programs seems to be a recurring theme throughout the conclusions.

The effects of graduate-school education, as opposed to inservice education, are not clearly separated in the literature. Graduate-school education probably is the special case of inservice education making it possible to make many of the same conclusions about graduate education as the literature reveals about inservice education in general. That is, it can be effective in altering job performance, if it is carried out in a specific manner. Here again, involvement of the inservice participants is probably the key to the effectiveness the program will have upon the teachers' job performance.

### Summary

The premise that professional conferences, inservice education, and graduate-school education lead to improved job performance is widely accepted across professions. The literature indicates that the premise probably is warranted, at least for graduate education and inservice education. The fact that there is little data to support the conclusion that there is a relationship between professional conference attendance and job performance is more likely due to the difficulty of conducting such research and not necessarily to a real lack in a relationship.

### The Constricting Education Institution

The declining enrollments will cause the educational institution to constrict its' operation over time. The constriction will have an impact upon how facilities are utilized, upon community attitudes toward the way constriction takes place, and the way staff approaches the task of educating children. How this constriction takes place and what effects the process has upon these elements will ultimately effect the quality of teaching-learning process in the schools. The experiences of other organizations in similar situations are explored here to gain insights into what may be expected.

#### Facility Use

The decline in elementary and secondary school enrollments has resulted in school districts going through phases of changing their facility usage. According to the National School Public Relations Association (Epstein 1976), many schools are overcrowded and welcome the decrease in students. The student decline has enabled districts to allocate space to programs which could not be accommodated in previous years. Special reading instructors have a room to teach in, instead of the hallway. Music, art, and other supplementary programs have been allocated a "home base" from which to conduct instruction.

The expansion of programs previously lacking space can only take place to a point. Eventually, the school system reaches a point where it can no longer justify the expense of maintaining space that is under-utilized.

Craig Currie, Superintendent of Mercer Island (Washington) Schools, is quoted by the National School Public Relations Association (Epstein 1976) as saying, "Closing schools is usually considered the most drastic action that can be taken to solve the problem of surplus space". Currie says there are many steps that can be taken to utilize this space by non-school programs which will keep the building open and reduce the cost of building operation for the school district. School districts successfully have utilized surplus space by running Montessori programs on a tuition basis, conducting senior citizen lunch programs, instituting branches of public libraries, implementing alternative-education programs, and conducting day care and adult-education programs.

School districts that have experienced severe decline reach a point where the excess of space outstrips their ability to use it for expanded programming and community use. This is the point at which school facilities are closed.

#### Impact of Declining Enrollments Upon Community

When facilities are finally closed, the impact upon the community is most dramatic. The Salt Lake City School District (1976) found the community reaction to closing schools "volatile." Board of education members were elected on a "no school closures" platform and the superintendent found citizens were concerned about the property values in their community, "threatened by change," and had little or no understanding of the situation faced by the schools. The superintendent's successor designed an approach to overcome the concerns and lack of knowledge on the part of the community, through organization of

citizens' committees to make direct recommendations to the school board.

It was through the process outlined below that the Salt Lake City Schools were able to address community outcry and bring about the necessary closing of school facilities.

- Step 1. Establish a comprehensive citizen's committee to study the problem and make recommendations to the board of education.
  - a. Provide assistance to the committee.
  - b. Have them operate under a specific charge.
  - c. Set a date for the final report. Do not extend the time.
  - d. Make the report public at the same time it is given to the board of education.
- Step 2. Hold public meetings to discuss the report, to develop tentative solutions and to receive additional information.
  - a. Discuss implications of conflict on school district.
  - b. Present the problem-solving process to public.
  - c. Give and receive information.
  - d. Record all information presented at public hearings.
- Step 3. Develop tentative solutions and modify them if necessary.
- Step 4. Present final solutions at a general public meeting.
- Step 5. Take action at an official board of education meeting.
- Step 6. Implement board of education decisions.

A citizens' committee needs about a year to develop options and make recommendations. It is chosen by nominations from the PTA and a broad range of citizens' groups, from which the board then selects about 30 members. The committee is provided with some general alternatives, but the specific details emanate from the committee itself. Its report is mailed to some 200 influential persons in the city and to the media. Another year is spent on public hearings, at the end of which the board makes its decision. The district implements the decision in the next school year.

The Salt Lake City problem and solution is typical of large school districts faced with declining enrollments. Some other school

districts faced with unique, but similar, situations documented in the literature are Monroe County (Indiana) School District (1976), Great Neck (New York) School District (1976), and Montgomery County (Maryland) School District (1976).

#### Impact of Declining Enrollments Upon School Staff

Declining enrollments usually mean fewer staff; once staff are reduced those remaining become "entrenched" and "conservative" in outlook. Meyhew (1974) observed the behavior of managers in declining industries and summarized his findings:

Declining industries seem to possess common characteristics. When an industry is expanding, managers and administrators are younger because of promotion and mobility possibilities produced through expansion. As growth slows, managers and administrators tend to age and incumbents tend to remain in positions longer. Long tenure in a position, especially in times of dwindling resources, tends to produce lower morale, some cynicism, and considerable doubt as to the essential worthwhileness of the enterprise. Still, incumbents guard their positions tenaciously, for they are faced with an oversupply of qualified, or at least credentialed, administrators. As is true of so many segments of the trained labor market, the process by which administrators are produced is not controlled soon enough, or fast enough, or hard enough to avoid serious over-production.

With management creativity in remission, how will teaching staff react? First, the seniority system for reducing teaching staff is a source of concern for many. Garver (1977) worries that the increased age of the teaching staff, due to reverse seniority, not only increases costs to the district but "may have severe implications on the ultimate quality of the school systems' programs." Schultz (1976) also worried that the loss of influx of newly trained teachers in the schools would

result in the "loss of new ideas." Nolte (1976) is so concerned about the loss of quality teaching due to reverse seniority lay-off that he urges schools to develop legal, lay-off plans, based upon teacher competence. Failing the development of a system to lay-off the least competent first, Nolte suggests that a major priority for schools is to find ways to increase the teaching skills of the aging staff.

### Summary

It appears from the preceding discussion that the student in a declining enrollment atmosphere will find him/herself in a school that is less crowded, perhaps has more learning options, is staffed by older teachers and principals (who may be worried about losing their jobs), and perhaps has fewer children per classroom. The student may see his/her local school closed, and he/she will be transported further from home for an education. It may also be true that since teachers are older and further away from their college training, they may be less skilled than staffs of the past. Will the student learn as much under these conditions as he/she would have if enrollments had continued at previous levels?

If the expansion of programs offers the student more opportunity to develop varied talents, then the student may gain as a result of enrollment decline. These gains, however, could be offset if aging teachers do not maintain their skills, or if retrenching managers fail to organize for program quality.

Summary

The literature states that kindergarten through twelfth grade school enrollments will decline in the United States for the foreseeable future. The decline in enrollments will be experienced by most but not all school districts due to unequal migration within the nation.

The educational profession will be increasingly dependent upon professional development programs in an era of declining enrollments. The literature revealed the education as well as other professions depended upon college courses, inservice educational, and professional conferences as a means of providing developmental activities for its members. There is strong evidence to demonstrate an increased level of job performance for participants in inservice workshops under certain conditions. The data can support college course effectiveness if it is inferred that they are the special case of inservice education. The literature review failed to uncover evidence that conference attendance contributed to job performance.

The era of student enrollment decline will bring about a constriction of the educational institution. This constriction will free some facilities to be used to enrich the educational program. A severe decline in student enrollment may require the closing of some facilities; this act will have severe repercussions in the community unless dealt with very carefully. During the constriction, employee morale probably will ebb and unless management organizes well for the decline, the ebb of teacher morale may have a negative impact upon the teaching-learning process.

CHAPTER III  
METHODS AND PROCEDURES

Design

Description of the Population

The sample for this study was selected from the population of 831 teachers on the staff of a large suburban school district in Oakland County, Michigan, during the 1976-77 school year. The distribution of the population by age and degree is displayed in Table 3.1.

TABLE 3.1  
Distribution of Teachers by Age and Degree

| Degree Level  | Age 22-34 | Age 35-47 | Age 48-65 | Total |
|---------------|-----------|-----------|-----------|-------|
| BA            | 143       | 54        | 39        | 236   |
| BA + 20       | 118       | 45        | 27        | 190   |
| BA + 40 or MA | 102       | 139       | 55        | 296   |
| MA + 15 to 30 | 24        | 52        | 33        | 109   |
| TOTAL         | 387       | 290       | 154       | 831   |

The student population for the district in this study was 17,600 for the 1976-77 school year. The educational achievement of the students in the district under study tends to be typical of Michigan and the nation; mean scores on the Michigan Education Assessment Program have been near or at the state mean for the past nine years. District student-achievement scores on the nationally normed, Comprehensive Test of Basic Skills show these young people are near or at the national mean for the reading, mathematics, and language-arts subtests.

### Sample Selection

Teachers were selected at random from each of the degree-level/age cells displayed in Table 3.1. The proportion of the teachers chosen from each cell was adjusted so there would be at least twenty but no more than thirty-five teachers selected from the twelve different cells.<sup>1</sup> This was done to keep the number in each of the cells relatively equal, thereby satisfying a requirement of the analysis-of-variance routine used to analyze the data. Displayed in Table 3.2 are the number of teachers included in the sample in each cell. (The specific breakdown of ages and degree levels are found in Appendix C.)

TABLE 3.2  
Sample Size of Degree Level/Age Categories

| Degree Level  | Age 22-34 | Age 35-47 | Age 48-65 | Total |
|---------------|-----------|-----------|-----------|-------|
| BA            | 20        | 27        | 20        | 67    |
| BA + 20       | 20        | 22        | 27        | 69    |
| BA + 40 or MA | 20        | 23        | 28        | 71    |
| MA + 15 to 30 | 24        | 26        | 33        | 83    |
| TOTAL         | 84        | 98        | 108       | 290   |

A total sample of 304 teachers was originally drawn, but data were available only from the 290 subjects represented in Table 3.2.

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This resulted in a disproportionate sample of the population. Since the purpose of this phase of the study is to determine behavior of staff with particular characteristics and no attempt was made to infer these behaviors to the general population, the procedure is appropriate.

Thirty-five percent of the total staff is represented by the sample. The fourteen teachers eliminated from the original sample were excluded for the following reasons: Eight refused to participate, five were on leave for serious illness, and one was sequestered with a federal jury. Ninety-five percent of the original sample agreed to participate and provide data for this study.

#### Description of the Sample

Table 3.3 displays the male-to-female breakdown of the sample; Table 3.4 displays the teaching assignments of the sample.

TABLE 3.3

Summary Characteristics  
of the Sample: Sex of Teacher

| Sex    | Member |
|--------|--------|
| Male   | 108    |
| Female | 182    |
| TOTAL  | 290    |

TABLE 3.4

Summary Characteristics of the Sample:  
Teaching Assignment

| Title                                        | N   |
|----------------------------------------------|-----|
| Elementary Classroom Teacher                 | 125 |
| Secondary Classroom Teacher                  | 88  |
| Elementary Remedial Reading Teacher          | 8   |
| Cooperative Education Coordinator            | 5   |
| Curriculum Consultant                        | 1   |
| Secondary School Counselor                   | 3   |
| Elementary School Music Teacher              | 12  |
| Elementary School Physical Education Teacher | 9   |
| Secondary School Librarian                   | 5   |
| School Psychologist                          | 3   |
| School Social Worker                         | 9   |
| Special Education Teacher                    | 19  |
| Speech Therapist                             | 3   |

Survey Procedure

Each of the 304 subjects was sent a written survey asking him/her to supply information regarding formal, professional-growth activities during the past twelve months. Two hundred ninety or 95 percent of the sample returned the survey, or supplied the information verbally via the telephone. The respondents' information was keypunched onto data cards so the information could be analyzed with the aid of an electronic computer. A copy of the survey form is displayed in Appendix B.

Survey Instrument

The survey instrument contained four questions aimed at obtaining data to compile the formal, professional-growth activities for the teaching staff. Teachers were asked to list the number of college

courses taken, days spent at professional conferences, and hours spent in teacher-in-service education. The time span for these activities was from June 1, 1976 to May 31, 1977.

The reliability of teacher responses to the questionnaire was verified by a follow-up interview. Twenty questionnaires were selected at random by the investigator; each of the twenty respondents was told his/her questionnaire had been lost, and that he/she should respond to the questions again. Nineteen of the respondents to the second inquiry gave the same response as they did initially. One subject refused to respond to the second inquiry. The consistent responses from the first to the second inquiry support the conclusion that the information was reliably gathered.

#### Treatment of the Data

The data from the teacher survey was placed on data-processing cards and the information was converted to hours of formal, professional-growth activity, according to the schedule displayed in Table 3.5.

TABLE 3.5

Conversion Rate of Survey Data to Hours  
of Formal, Professional-Growth Activity

| Type of Activity         | Hourly Conversion Rate                             |
|--------------------------|----------------------------------------------------|
| Semester graduate credit | 15 hours per credit                                |
| Term graduate credit     | 10 hours per credit                                |
| Inservice education      | 1 hour per hour reported                           |
| Professional conference  | 6 hours per day (prorated<br>on portions reported) |

A total formal, professional-growth activity variable was computed from the converted data. The range of activity for individuals was from a low of zero to a high of 628. Table 3.6 displays the frequencies of professional-growth activities for the staff.

TABLE 3.6

Professional-Growth Activities  
For the Sample Population

| Index   | Frequency | Percent of Total |
|---------|-----------|------------------|
| 0       | 61        | 21.0             |
| 1-10    | 31        | 10.7             |
| 11-20   | 39        | 13.8             |
| 21-30   | 29        | 10.0             |
| 31-40   | 18        | 6.2              |
| 41-50   | 15        | 5.2              |
| 51-100  | 29        | 10.0             |
| 101-200 | 40        | 13.8             |
| 201-300 | 18        | 6.2              |
| 301+    | 9         | 3.1              |

### Validity of the Formal, Professional-Growth Activity Variable

The validity of computation of the formal, professional-growth variable was investigated. In conducting the investigation, each of the separate components was examined to discover differences in behavior, relative to degree level and age. Preliminary examination of the data, for example, revealed that younger teachers and teachers with higher degrees take more college courses. Also, teachers with higher degrees tend to attend more educational conferences. These data tend to support the concept of a formal, professional-growth activity variable since it appears the source of formal, professional-growth varies by age, group, and degree level, and is not centered upon any single activity. A composite of the activities appears to be a more valid method for examining teachers' behavior than any single activity.

The analyses displayed in Tables 3.7 through 3.9 show that teachers do not differ by age, relative to their conference attendance and inservice-education attendance, but that younger people enroll in more college courses.

TABLE 3.7

College Attendance to Age Group Comparison  
(Hours of Attendance)

| Group      | Mean | S.D.  |
|------------|------|-------|
| Ages 22-34 | 84.5 | 116.3 |
| Ages 35-47 | 30.9 | 72.1  |
| Ages 48-65 | 18.5 | 50.1  |

| Analysis of Variance            |            |      |             |       |
|---------------------------------|------------|------|-------------|-------|
| Source                          | Sum Square | D.F. | Mean Square | F     |
| Between groups                  | 223262     | 2    | 111631      | 16.89 |
| Alpha = .00001      Significant |            |      |             |       |

TABLE 3.8

Professional Conference Attendance  
to Age Group Comparisons

| Group      | Mean | S.D. |
|------------|------|------|
| Ages 22-34 | 12.9 | 21.8 |
| Ages 35-47 | 9.1  | 12.9 |
| Ages 48-65 | 12.3 | 16.2 |

| Analysis of Variance          |             |      |             |       |
|-------------------------------|-------------|------|-------------|-------|
| Source                        | Sum Squares | D.F. | Mean Square | F     |
| Between groups                | 815         | 2    | 408         | 1.394 |
| Alpha = .2499 Not Significant |             |      |             |       |

TABLE 3.9

## Inservice Education Attendance to Age Group Comparison

| Group      | Mean | S.D. |
|------------|------|------|
| Ages 22-34 | 13.6 | 24.4 |
| Ages 35-47 | 13.9 | 37.5 |
| Ages 48-65 | 11.6 | 17.2 |

## Analysis of Variance

| Source         | Sum Squares | D.F. | Mean Square | F    |
|----------------|-------------|------|-------------|------|
| Between groups | 350         | 2    | 165         | .218 |

Alpha = .80 Not Significant

Tables 3.10 through 3.12 show that teachers do not differ in their inservice-education attendance by their college-degree level, but the group with the most college training attends more conferences than the other two groups. Additionally, those with the most formal college training tend to continue to enroll in more college courses.

TABLE 3.10

## College Attendance to Degree Level Comparison

| Group         | Mean | S.D.  |
|---------------|------|-------|
| BA            | 33.8 | 68.8  |
| BA + 20       | 49.7 | 94.2  |
| MA            | 20.4 | 55.4  |
| Ma + 15 to 30 | 60.1 | 105.9 |

## Analysis of Variance

| Source         | Sum Squares | D.F. | Mean Square | F     |
|----------------|-------------|------|-------------|-------|
| Between groups | 69227       | 3    | 2375        | 3.219 |

Alpha = .023 Significant

TABLE 3.11

Professional Conference Attendance To  
Degree Level Comparison

| Group         | Mean | S.D. |
|---------------|------|------|
| BA            | 6.0  | 9.6  |
| BA + 20       | 8.9  | 11.6 |
| MA            | 8.0  | 11.0 |
| MA + 15 to 30 | 20.6 | 24.9 |

Analysis of Variance

| Source         | Sum Squares | D.F. | Mean Square | F     |
|----------------|-------------|------|-------------|-------|
| Between groups | 10201       | 3    | 3400        | 13.04 |

Alpha = .00001 Significant

TABLE 3.12

Inservice Education To  
Degree Level Comparison

| Group         | Mean | S.D. |
|---------------|------|------|
| BA            | 10.9 | 18.9 |
| BA + 20       | 12.0 | 17.4 |
| MA            | 9.4  | 15.3 |
| MA + 15 to 30 | 18.3 | 43.2 |

Analysis of Variance

| Source         | Sum Squares | D.F. | Mean Square | F    |
|----------------|-------------|------|-------------|------|
| Between groups | 3564        | 3    | 1188        | 1.59 |

Alpha = .19 Not Significant

College courses make up almost two-thirds of the proportion of the formal, professional-growth variable computed for the sample population. Table 3.13 shows the proportion of the total formal, professional-growth activities accounted for by each of the three formal activities.

TABLE 3.13

Proportion of the Parts to the Total  
Formal, Professional-Growth Activity Variable

| Activity            | Percent of Total FPGA |
|---------------------|-----------------------|
| College             | 63.6                  |
| Inservice Education | 19.5                  |
| Conferences         | 16.9                  |

### Testable Hypothesis

#### Hypothesis I

Null hypothesis: There is no difference between teacher age-groups, relative to their participation in formal, professional-growth activities.

$$H: \mu_1 = \mu_2 = \mu_3$$

Legend:  $\mu$  represents the Mean formal, professional-growth activity.

Alternative hypothesis: There is a difference between teacher age groups, relative to their participation in formal, professional-growth activities.

$$H_1: \mu_1 \neq \mu_2 \neq \mu_3$$

Analysis: A one-way analysis of variance procedure was used to compare the mean scores of the sample groups. The null hypothesis was rejected if the computed alpha  $\leq$  .05.

### Hypothesis II

Null hypothesis: There is no difference between teacher-degree groups, relative to their participation in formal, professional-growth activities.

$$H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4$$

Legend:  $\mu$  represents the formal, professional-growth activity population mean for each of the four teacher degree groups.

Alternative hypothesis: There is a difference between teacher-degree groups, relative to their participation in formal, professional-growth activities.

$$H_1: \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4$$

Analysis: A one-way analysis of variance procedure was used to compare the mean scores of the teacher groups.

The null hypothesis was rejected if the computed alpha  $\leq .05$ .

### Hypothesis III

Null hypothesis: There is no interaction between age of teachers and degree levels of teachers, relative to their formal, professional-growth activities.

$$H_0: A \times B = 0$$

Legend: "A" symbolizes teacher age; "X" symbolizes interaction; "B" symbolizes teacher degree status; and "0" represents the level of interaction between age and degree level.

Alternative hypothesis: There is interaction between age of teachers and degree levels of teachers relative to their formal, professional-growth activities.

$$H_1: A \times B \neq 0$$

Analysis: A three by four analysis of variance procedure was used to determine the interaction between level and age as it affects participation in formal, professional-growth activities of teachers. The null hypothesis was rejected if the computed alpha  $\leq$  .05.

### Supplementary Planned Analysis

#### Question to be Investigated

Will the projected school staffs (1981-82 and 1986-87) have the same propensity for participation in formal, professional-growth activities as the present staff?

#### Analysis

Computation of the Staff Formal, Professional-Growth Activity Index: a Staff Formal, Professional-Growth Activity Index was computed for the present staff by applying the formal, professional-growth activity quantity discovered in the sample analysis to each individual in the twelve degree level/age categories. The final Staff Formal, Professional-Growth Activity Index was computed by dividing the sum of all individual activities by the total number of staff. An estimate of the Staff Formal, Professional-Growth Activity Index of the future staff was computed in the following way.

1. Age each staff member the appropriate number of years. For those who reach age 65 replace them in the staff with a 25 year old at the BA + 20 level. An investigation into the personnel records revealed that this is the typical level for a new employee.

2. Historically teachers change their degree level status at the rate shown in Table 3.14; therefore, staff members in each category will be randomly assigned higher degree level status according to the annual rate counted in personnel records.

TABLE 3.14

Annual Rate of Degree Level Status Change

| Degree Level  | Percent Rate of Change |
|---------------|------------------------|
| BA            | 3.0%                   |
| BA + 20       | 5.0%                   |
| BA + 40 or MA | 1.1%                   |
| MA + 15 to 30 | 0.3%                   |

3. Reduce staff by 1 individual for every 50 students lost to the district. The forecasted student decline over the 10 years of this staff projection will average 300 per year. The actual pupil teacher ratio for the 1976-77 school year was 26 to 1. The 50 figure was selected as a conservative estimate of the decline in staff paralleling the student enrollment decline.
4. Once the calculations in steps 1-3 are completed for the two forecasted years, the procedure for calculating the Staff Formal, Professional-Growth Activity Index was applied to both staffs.

The three Index computations were inspected for changes and trends of changes for future years. Although a statistical analysis could be applied to the data, such a procedure might imply a greater precision in predicting the behavior of future staff members than really exists.

Summary

A compilation of teachers' formal, professional-growth activities was collected from a sample of 290 staff members in the school district selected for study. The sample was stratified by three age levels and four college degree levels.

The data were organized to test three hypothesis and one planned investigation. The analysis of variance technique was used to analyze the data related to the three hypothesis. The intent of the study was to discover any differences in formal, professional-growth activities between the age groups and college degree levels of the sample group.

CHAPTER IV  
PRESENTATION AND ANALYSIS OF THE DATA

The results of the data collection and the analyzation procedures described in Chapter III are presented here. Each of the hypotheses appears, together with a statement specifying the outcome of the statistical procedure used to test the hypothesis. When appropriate, tables of data are presented to support the written conclusions.

Hypothesis I

Hypothesis tested: There is no difference between teacher age groups relative to their participation in formal, professional-growth activities.

$$H_0: \mu_1 = \mu_2 = \mu_3$$

The results of the analysis procedure shows that there is a 99.9% probability that at least two of the mean scores from the sample population are different from each other; therefore, Hypothesis I is rejected. The data displayed in Table 4.1 further show a linear trend between age and formal, professional-growth activities; younger teachers most active and older teachers least active.

TABLE 4.1

Analysis of Variance: Formal,  
Professional-Growth Activities  
of Three Teacher Age Groups

| Group      | Mean   | S.D.   |
|------------|--------|--------|
| Ages 22-34 | 111.00 | 130.55 |
| Ages 35-47 | 53.94  | 85.62  |
| Ages 48-65 | 42.33  | 65.44  |

Analysis of Variance

| Source         | Sum Squares | D.F. | Mean Square | F     |
|----------------|-------------|------|-------------|-------|
| Between groups | 244842.29   | 2    | 122421.14   | 13.60 |

Computed alpha = .00001 significant beyond the apriori selected  
alpha = .05.

Hypothesis II

Hypothesis tested: There is no difference between teacher degree groups relative to their participation in formal, professional-growth activities.

$$H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4$$

The results of the analysis of variance procedure show that there is a 99.9% probability that at least two of the mean scores from the sample population are different from each other; therefore, Hypothesis II is rejected. The data displayed in Table 4.2 show little evidence of a linear relationship between the degree achievement continuum and formal, professional-growth activities in the sample group. The teachers with the highest mean formal, professional-growth activity are the teachers who have achieved the highest college degree level.

TABLE 4.2

Analysis of Variance: Formal,  
Professional-Growth Activity of Four  
Teacher Degree Groups

| Group         | Mean  | S.D.   |
|---------------|-------|--------|
| BA            | 50.66 | 82.08  |
| BA + 20       | 70.71 | 96.68  |
| BA + 40 or MA | 37.87 | 63.26  |
| MA + 15 to 30 | 99.04 | 126.11 |

| Analysis of Variance |             |      |             |       |
|----------------------|-------------|------|-------------|-------|
| Source               | Sum Squares | D.F. | Mean Square | F     |
| Between groups       | 164051.86   | 3    | 54683.95    | 5.896 |

Computed alpha = .0007 significant beyond the apriori selected  
alpha = .05

### Hypothesis III

Hypothesis tested: Formal, professional-growth activities do not vary according to the age of teacher interacting with the degree level of the teacher.

$$H_0: A \times B = 0$$

The results of the analysis procedure show that there is a 52.6% probability that the formal, professional-growth activity of teachers interact by age and degree level status; therefore, Hypothesis III is not rejected. The experiment has failed to show an interaction effect between teacher age level and teacher degree level. The data supporting this conclusion are displayed in Table 4.3.

TABLE 4.3

| Three by Four Way Analysis of Variance Between Teacher Age<br>and Degree Level with Formal, Professional-Growth<br>Activity as Criterion Variable |            |      |             |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------------|------|-------------|--------|
| Source of Variation                                                                                                                               | Sum Square | D.F. | Mean Square | F      |
| Main Effects                                                                                                                                      | 413416.31  | 5    | 82683.25    | 9.6911 |
| Age                                                                                                                                               | 237617.50  | 2    | 118808.75   | 13.92  |
| Degree                                                                                                                                            | 175391.56  | 3    | 58463.85    | 6.85   |
| Two-way interactions                                                                                                                              |            |      |             |        |
| Age by degree                                                                                                                                     | 43957.83   | 6    | 7326.31     | .86    |
| Computed alpha for interaction = .526 not significant beyond the<br>apriori selected alpha = .05                                                  |            |      |             |        |

Though the test of Hypothesis III failed to show any interaction between age and degree level on the criterion variable the data displayed in Table 4.4 are revealing of some information. The least active group is the older teacher at the BA level; the most active is the younger most "degreed" group. The tendency is toward less activity with age at all degree levels. The oldest group at the MA + 15 to 30 are more active than their younger counterparts at the BA + 40 or MA level.

A further inspection of Table 4.4 reveals that there is something unique about the "BA + 40 or MA" group. Without that group, there would be a consistent increase in formal, professional-growth activities by degree increase and a consistent decline in formal, professional-growth activities by age increase.

TABLE 4.4

Formal, Professional-Growth Activities  
of Teachers by Age and Degree Level in Hours

| Degree Level  | Age 22-34 | Age 35-47 | Age 48-65 |
|---------------|-----------|-----------|-----------|
| BA            | 110.7     | 30.1      | 18.4      |
| BA + 20       | 102.0     | 77.6      | 42.0      |
| BA + 40 or MA | 61.8      | 26.7      | 29.9      |
| MA + 15 to 30 | 159.8     | 82.7      | 67.7      |

Supplementary Planned Analysis

Question investigated: Will projected school staffs have the same propensity for participation in formal, professional-growth activities as the present staff?

The results of the analysis procedures show that there will be a change in the propensity to participate in formal, professional-growth activities by both the 1981-82 staff and the 1986-87 staff. Table 4.5 shows the probable Staff Formal, Professional-Growth Activity Index for each of the projected school staffs as well as the Staff Formal, Professional-Growth Activity Index for the staff as it existed during the 1976-77 school year.

TABLE 4.5

Staff Formal, Professional-Growth Activity  
Index for 1976-77, 1981-82, and  
1986-87 School Staffs in Hours

| SFPGI 1976-77 | SFPGI 1981-82 | SFPGI 1986-87 |
|---------------|---------------|---------------|
| 68.59         | 55.81         | 44.18         |

The data in Table 4.5 show that there probably will be a decline in the number of formal, professional-growth activity hours in which the "typical" staff member will be engaged.

The decline expressed in percent will be 18% from 1976 to 1981 and 20% from 1981 to 1987. The ten year decline will be 35%.

An inspection of the data from Hypothesis I (effects of age upon participation in formal, professional-growth activity) indicates that the primary cause of this forecasted decline in activity is due to few young (most active) teachers entering the staff in the forecast years. The effects of fewer young people entering the staff are not offset by an increase in the degree levels (high degree level most active from Hypothesis II) of staff members.

The data presented in Table 4.6 serve to dramatize the effects that enrollment decline will have upon the teaching staffs composition in the absence of intervening variables. It should be pointed out that this simulation only demonstrated what "may be" the situation in future years not what "must be"!

TABLE 4.6  
Distribution of Teaching Staff Members  
by Age and Degree Level

|               | Age 22-34 |      | Age 35-47 |      | Age 48-65 |      | Totals |       |
|---------------|-----------|------|-----------|------|-----------|------|--------|-------|
|               | N         | %    | N         | %    | N         | %    | N      | %     |
| BA            | (110.7)*  |      | (30.1)    |      | (18.4)    |      |        |       |
| 1976 - 77     | 143       | 17.2 | 54        | 6.5  | 39        | 4.7  | 236    | 18.4  |
| 1981 - 82     | 11        | 1.4  | 21        | 2.6  | 20        | 2.5  | 52     | 6.5   |
| 1986 - 87     | 0         | 0    | 0         | 0    | 8         | 1.1  | 8      | 1.1   |
| BA + 20       | (102.0)   |      | (77.6)    |      | (42.0)    |      |        |       |
| 1976 - 77     | 118       | 14.2 | 45        | 5.4  | 27        | 3.3  | 190    | 22.9  |
| 1981 - 82     | 94        | 11.8 | 137       | 17.2 | 29        | 3.7  | 260    | 32.7  |
| 1986 - 87     | 7         | .9   | 146       | 19.1 | 45        | 5.9  | 198    | 25.9  |
| BA + 40 or MA | ( 61.8)   |      | (26.7)    |      | (29.9)    |      |        |       |
| 1976 - 77     | 102       | 12.3 | 139       | 16.7 | 55        | 6.6  | 296    | 35.6  |
| 1981 - 82     | 59        | 7.4  | 160       | 20.2 | 101       | 12.7 | 320    | 40.3  |
| 1986 - 87     | 1         | .1   | 184       | 24.2 | 151       | 19.8 | 336    | 44.1  |
| MA + 15 to 30 | (159.8)   |      | (82.7)    |      | (67.7)    |      |        |       |
| 1976 - 77     | 24        | 2.9  | 52        | 6.3  | 33        | 3.9  | 109    | 13.1  |
| 1981 - 82     | 15        | 1.9  | 71        | 8.9  | 77        | 9.7  | 163    | 20.5  |
| 1986 - 87     | 0         | 0    | 130       | 17.1 | 90        | 11.8 | 220    | 28.9  |
| TOTALS        |           |      |           |      |           |      |        |       |
| 1976 - 77     | 387       | 46.6 | 290       | 34.9 | 154       | 18.5 | 831    | 100.0 |
| 1981 - 82     | 179       | 22.5 | 389       | 48.9 | 227       | 28.6 | 795    | 100.0 |
| 1986 - 87     | 8         | 1.0  | 460       | 60.4 | 294       | 38.6 | 762    | 100.0 |

\* Numbers in parentheses represent the mean formal, professional-growth activity for the category.

Summary

Formal, professional-growth activity declines with age and increases with degree level status. The analysis further reveals that the two phenomena apparently act independently from each other. The decline due to age is unaffected by the increase due to degree level status.

The supplementary analysis revealed that the two phenomena probably will act together to bring about a decline in formal, professional-growth activities of future staffs of the school district under study.

## CHAPTER V

### SUMMARY AND CONCLUSIONS

The purpose of this study was to develop and test a model for determining the impact of declining student enrollments upon staff development in the public schools.

A survey was administered to a stratified random sample of teaching staff in a large suburban school district to determine their formal, professional-growth activities over a year of time. The sample was broken down into twelve different age and college degree level groups. The purpose of the breakdown was to determine if there were any differences in teachers formal, professional-growth activities according to their age or according to their degree level status. The survey was designed to ascertain the formal, professional-growth activities of the members of the sample. The subjects in the sample indicated the number of and amount of time spent in three kinds of formal, professional-growth activities. They were: college courses, inservice education workshops sponsored by the school district, and attendance at professional conferences.

These data were summarized into means and standard deviations for each of the twelve degree level age groupings in the study and subjected to an analysis of variance routine to determine any differential behavior of staff according to their age, differential behavior

of staff according to their degree level status and for any interaction between age and degree level status. It was found that there was a statistically significant difference (.001) between teachers' participation in teachers' professional growth activities by age. Additionally, it was found that there was a statistically significant difference (.001) of teacher participation in formal, professional-growth activities according to degree level status. Finally, there was no evidence found to support that there was an interaction between age and degree level status relative to participation in formal, professional-growth activities.

#### Summary of Tested Hypothesis

| Null Hypothesis Tested:                                                                                                                | Level of Significance |
|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| There is no difference between teacher age group relative to their participation and formal, professional-growth activities.           | .00001                |
| There is no difference between teacher degree group relative to their participation in formal, professional-growth activities.         | .0007                 |
| Formal, professional-growth activities do not vary according to the age of the teacher interacting to the degree level of the teacher. | Not Significant       |

Displayed in Table 5.1 are the teacher age groups and degree level groups used in the study as well as the mean number of the professional-growth activity hours for each of the groups under study.

TABLE 5.1

Formal, Professional-Growth Activities  
of Teachers by Age and Degree Level in Hours

| Degree Level  | Age 22-34 | Age 35-47 | Age 48-65 |
|---------------|-----------|-----------|-----------|
| BA            | 110.7     | 30.1      | 18.4      |
| BA + 20       | 102.0     | 77.6      | 42.0      |
| BA + 40 or MA | 61.8      | 26.7      | 29.9      |
| MA + 15 to 30 | 159.8     | 82.7      | 67.7      |

Following the hypothesis testing, a model was then developed to forecast the behavior of future staff relative to the formal, professional-growth activity. A five and ten year projection was made by adding the appropriate number of years to the age of each staff member and adding degree levels at the rate of attainment from historical reference. Staffs were reduced by one for every 50 students that was projected to be lost over the two periods of time. Each staff member in the projected staffs was then assigned the formal, professional-growth activity level for the categories that were discovered in Table 5.1.

Following the assignment of the formal, professional-growth activity quantity to the present and the projected staffs, a Staff Professional-Growth Activity Index was computed by summing the probable professional-growth activities divided by the number of staff members on each of the years in question. It was found that the formal, professional-growth activities of the staffs of the two projected years will decline from the staff formal, professional-growth activity of the base line staff.

Table 5.2 displays the data from the application of the model for projecting Staff Professional-Growth Activities in the study.

TABLE 5.2

Staff Formal, Professional-Growth Index  
for 1976-77, 1981-82, and 1986-87  
School Staffs in Hours

| SFPGI 1976-77 | SFPGI 1981-82 | SFPGI 1986-87 |
|---------------|---------------|---------------|
| 68.59         | 55.81         | 44.18         |

In conducting a study of the validity of the use of the three activities together as opposed to separating them into their individual components of college courses, inservice education workshops, and professional conferences, it was discovered that younger teachers and teachers with higher degrees take more college courses. Also, teachers with higher degrees tend to attend more education conferences than those with lower degrees. At the same time there was no difference among teachers of various age levels relative to their attendance at inservice education programs. An investigation was also conducted into the source or the proportion of the formal activity that comprises each component of the formal, professional-growth activity variable. It was found that college attendance accounted for almost 64 percent of the formal, professional-growth activity variable with inservice education programs accounting for nearly 20 percent and professional conferences accounting for 17 percent.

The finding that 64 percent of formal, professional-growth activity is due to graduate school attendance may appear to lessen the

importance of the discovery that there is a decline in professional-growth activity with age since older employees tend to have completed their formal education.

One possible conclusion is that older employees' lower level of formal, professional-growth activities is due solely to a reduced level of graduate school attendance. The data, however, do not support this conclusion. The data show that there is a trend toward reduced levels of conference attendance and inservice attendance for the oldest group of employees as well. The data do reveal that the void in formal, professional-growth activities created by a reduction in graduate school attendance for older staff members is not being filled by an increase in other activities.

### Conclusions

Analysis of the findings indicated that:

1. Younger staff members have a higher level of formal, professional-growth activity than their older counterparts. Since they differ little from their older counterparts relative to conference attendance and inservice education attendance it is probably due to their high level of college course participation.

2. Teachers at higher degree levels tend to participate in more formal, professional-growth activities than their counterparts at a lower degree status. Since there is no difference in their inservice education participation, this trend is probably due to the higher level of college training participation and the higher level of professional

conference participation by those with higher college degrees. There is one exception to this trend. Those people at the MA and BA + 40 level participate less or have a lower formal, professional-growth activity level than any other degree level group.

3. There is no systematic interaction between teachers by their age and their level of degree attainment; however, if the MA only and BA + 40 group had been eliminated from the sample, it appears as though there may have been an interaction effect.

4. There is a wide variance of participation in formal, professional-growth activities depending upon the teachers' age level and degree status. The very lowest level of participation was for those people with the lowest degrees and in the oldest age category. The people with bachelors only who were 48 years and older had an average formal, professional-growth activity level of 18.4 hours. Teachers with an MA + 15 and above and between 22 and 34 years of age had an activity level of 159.8 hours.

5. The declining student enrollments in the school district under study will cause a reduction of the formal, professional-growth activities of this staff in future years. The major reason for the reduction is that as the staff gets older it will tend to assume the behaviors of those people in those age groups (lower activity level) and there will not be addition of younger staff members, that are the most active, to offset this decline.

6. The major source of formal, professional-growth activities for the school district staff under study is college courses (accounts for approximately two-thirds of all of the formal, professional-growth activities of this staff).

### Implications of the Findings and Conclusions

A model has been developed and validated to project the impact of student enrollment decline upon the public educational institution.

The components of the model are:

1. Student enrollment projection methods.
2. Staff projection methods.
3. A method of assessing the Staff Formal, Professional-Growth Activity Index.
4. A method of generalizing the Staff Formal, Professional-Growth Activity Index to an existing staff and projecting it to staffs in the future.

The implications of such a study will be specific to the school institution to which it is applied; however, the findings and conclusions for this study can be inferred to other school districts to the extent that the demographic characteristics of the community, students, and staffs match those of the school district under study. Findings of this and other related studies imply that the school institutions in a declining enrollment era will constrict and become more conservative and probably less skilled in solving student learning problems and the problems of the institution itself. This phenomenon is chiefly due to a shift of the teaching population from younger, more active to older, less active professionals.

The impact upon the client or student in this kind of situation is unclear from the data. On the one hand, the student will have older and less recently trained teachers to impart skills. This implies

some kind of negative impact especially if the assumption that professional-growth activities are linked to teacher skill maintenance is accepted. On the other hand, the student may experience fewer other students in the classroom thus competing with fewer of his peers for the teacher's attention. Possibly, there will be more opportunity to participate in alternative programs due to the increased amount of space in the school buildings.

The findings and conclusions of this study clearly imply that the vitality of the educational institution will decline unless ways are found by educational decision makers to offset some of the negative impacts of the enrollment decline. The findings of this study indicate that older staff members are less inclined to participate in formal, professional-growth activities than are their younger counterparts. One way of offsetting the impact of the aging of staffs and consequent reduction in formal, professional-growth activity participation of the whole staff is to find ways to offer incentives for older staff members to retire, thus increasing the influx of the younger staff members into the institution. Another way is to eliminate the seniority system for staff layoffs when student enrollment decline takes place.

If schools were to implement a program of vigorous evaluation and maintaining the most skilled teachers and reducing the least skilled teachers at whatever age level the impact would be muted somewhat.

The findings of this study imply that whenever possible, school districts should employ staff members with higher degree levels, since

they tend to be more professionally active than those on the lower steps of the salary schedule. The data indicate that this alternative should be approached with caution since there appears to be something unique operating with the group categorized at the MA or BA + 40 level. Teachers in this category have the lowest level of activity for all degree groups at comparable age levels except at the very oldest. Still another way of offsetting the negative impact is to motivate staffs into higher levels of professional-growth activity. This approach has been explored very little in the literature.

The literature indicates that the most effective means of in-service training are those programs that are designed for a specific purpose and have involved the recipient of the training in the planning of the training. This study found that two-thirds of the professional-growth activities of the teachers in this school district were attributable to college courses. Perhaps the graduate school courses could be better coordinated among the universities and the consumer. These staff members could be impacted positively if there was cooperative planning between the local school district and the higher education institutions. At present, the teacher salary schedule rewards obtaining higher degrees and getting older. The highest paid teacher employees in most school districts are those that are the oldest and those that have the most degrees. Findings of this study would indicate that the premise of the salary schedule may be true only for increased degree status. Teachers are generally more professionally active, and by inference better teachers, when they achieve higher

degree level status; however, there is no evidence to support that getting older, by itself, increases a teacher skill level. If only formal activities are considered, it appears from the data that teachers, in fact, become relatively less skilled with time. Such an inference must be made with caution since the data only reveal the level of "Formal Activity" of teaching staff. An assumption of this study is that professional educators do grow in knowledge and skill in addition to the formal activities reflected in the professional development factor. There certainly are opportunities for educators to increase their skill and knowledge in the professional environment in which they work. They engage other staff in conversations; they may observe other teachers; educators often are evaluated by a supervisor. These are a few of the ways that educators may "informally grow" in professional skills.

It probably is reasonable to assume that one goal of formal education should be to increase the individual's reliance upon himself for his learning. There is a point where an individual should be able to recognize his learning needs and pursue those needs without the benefit of formal schooling. One of the conclusions from a study of inservice education conducted by the National Council of States on Inservice Education (1977) supports the value of self-initiated activities.

Self-initiated or self-directed training activities are seldom used in inservice education programs, but this pattern is associated with successful accomplishment of program goals.

It is important to note that these findings indicate what

"might be" not what "must be." The implications listed here are issues that the educational institutions facing enrollment declines should deal with in order to offset a general decrease in the formal, professional-growth activities of their staffs and possible loss of quality in their educational programs.

### Implications for Further Study

#### Formal, Professional-Growth Activities and Teaching Quality

It has been cited before in this study that there is a prevalent assumption among professional educators that an increase in formal, professional-growth activities will bring about an increase in the quality of job performance. This assumption is made not only in the teaching professions but other professions as well, such as the legal and medical professions. The literature revealed that there was only an established link between formal, professional-growth activity when it was directed at a specific task and the recipient was involved in planning for this task. This does not mean that the other kinds of professional-growth activities, college courses and conference activities, were not related to teacher and student performance; only that there had not been any well established links. Further study should be directed toward firmly establishing the links, if indeed there are any, between college course attendance and conference attendance in effecting the teacher performance and quality of student learning.

### Differential Effects of Professional-Growth Activity Upon the Different Teaching Assignments

A further investigation should be made into various levels of professional-growth activities. This study explored the behavior of teachers relative to formal, professional-growth activities by their age and degree level status. This, of course, has just been a beginning. There is a myriad of other combinations that should be studied that could possibly reveal some insights into the staff development needs of the school districts. An expansion of this model could include the differential behavior of teachers in participation in formal, professional-growth activities by their teaching assignments, sex, race, and other characteristics that may appear to be critical to a specific population.

### Motivation for Participation in Formal, Professional-Growth Activities

This study has been descriptive in nature. The data only reveal the present status of staffs propensity to participate in formal, professional-growth activities. The study reveals little relative to the motivations for participation. Why, for example, do some employees rise almost immediately to the highest degree status while others choose to remain where they began throughout their careers? Gaining insight into the motivation for participation may help educational planners develop programs to increase the constructive growth activities of low level participants.

### Summary of Suggested Topics for Further Study

The following study topics would aid in answering the questions and resolving issues raised by this study:

1. Establish linkages (or confirm the lack of) between formal, professional-growth activities and teacher skill and student learning. This is especially critical in the areas of graduate school attendance and professional conference attendance.
2. A certain differential behavior relative to formal, professional-growth activities in categories other than age and degree level status. Other variables such as sex, teaching assignment, length of service and quality of undergraduate training may be important in forecasting formal, professional-growth activity.
3. Study the motivation for higher achievement of staff. This kind of information will be especially useful if it reveals observable qualities that can be identified before the teacher is employed. In addition, these kinds of studies may help planners design different incentives into salary schedules and adopt different management techniques.
4. The replication of this study in other school districts to discover if this teaching staff is unique in the frequency of participation in formal, professional-growth activities. Further, it will be useful to discover if there are major variations of activity levels of staffs' working in school districts with different demographic characteristics.

These kinds of studies could result in a school district being able to identify very clearly the areas of highest inservice educational needs and, in cooperation with institutions and organizations involved in teacher education, be able to design programs that meet the specific needs of specific groups of individuals in the institution. With the implementation of such kinds of effective programs, the school institution will be able to mute many of the negative aspects of the reduction of professional-growth activities of an aging school staff.

### Reflections Upon the Study

The findings and conclusions of this study raise some questions regarding how school districts can interpret them. The findings show that school districts cannot continue to depend on college courses for the formal, professional-growth of staff unless new incentives are found to motivate older staff to enroll.

It appears that schools are faced with at least three alternatives. School districts may offer more money on the salary schedule to staff who enroll in college courses; of course, staff presently receive extra salary for completing graduate school programs. This approach, it appears, will have doubtful results. Schools could prevail upon the state certification agencies to require teachers to enroll periodically in graduate school courses to maintain their certification. This probably would increase attendance but the actual outcome would be in doubt since research shows that the most effective inservice is concentrated in direction and the recipients are involved in the planning. A third alternative is to increase inservice education offerings either planned and conducted by the local district or planned and conducted in conjunction with a graduate school of education. This kind of approach is promising from the aspect that the recipients of the training could focus upon specific needs of the school district staff.

It is interesting to reflect upon the phenomenon of high formal growth involvement by those staff who had achieved the highest degree status. Their formal, professional-growth activity exceeded the

activity of those of a similar age in all cases. The question is: Is the phenomenon due to the fact that their experiences in achieving this status makes them continue to participate at a high level through their careers or are people that reach this status the kinds of individuals who would be active without respect to the intervening experiences of graduate school?

There is another group of individuals who show an exceptionally low level of participation that is of particular interest. Teachers at the MA only or BA + 40 level must have displayed a high activity rate at one point in their lives but the data show that they have a comparatively low level of activity once they reach this status. What motivates some to reduce or stop their formal, professional-growth activities while others continue to aspire to higher degree level status and maintenance of a high level of activity? The phenomenon of some being "inspired" to higher activity levels and higher degree achievement while others are not, cannot be attributed solely to the graduate school experience alone. There must be other variables operating to contribute to this phenomenon. A clarification of the variables that contribute to this apparent behavior will aid planners in taking this factor into account when they are designing formal, professional-growth activity programs for staffs. The absence of concrete data to support the proposition that graduate school education is a viable means of increasing the effectiveness of teacher performance may be more than a research "oversight". Graduate school education may, for some teachers, be a mere charade of professional development. Many may be going through the motions of "credit gathering" to gain a higher

salary level without really achieving an increase of skills. Graduate schools of education should closely evaluate offerings to assure that the course content has a high probability of making a real contribution to the professional development of the participants in the courses.

The data presented in Table 4.6 are disturbing. The data show that the teaching staff in the district selected for this study are going to be well "schooled" and "aging". The data are the result of a simulation and therefore cannot be considered more than a "best guess" of what will really be the situation. Though the data are a result of a simulation, it is important that educators and the public examine carefully what "might be"; a preparedness for the simulated probability, shown by the data, could diminish the potential negative impact of the loss of youthful professionals in the educational institution. More importantly, educational planners must find ways to motivate vital staff members back into the professional mainstream as it is presently known.

The era of declining student enrollments has been greeted by the educational community with a wave of pessimism. If the institution is going to survive and continue to serve as a vital role in society, it must quickly heed the advice of those who have thought this issue through carefully. Declining enrollments mean the disappearance of overcrowded facilities; the possibility of re-evaluation of programs and operations, retaining only the best; declining enrollments offer educators an opportunity to improve their services to the students they face, if educators will "act" rather than "react".

## APPENDIX A

## METHOD OF PROJECTING STUDENT ENROLLMENT

## INSTRUCTION FOR ESTIMATING MEMBERSHIP

This table is to be used as a worksheet to project the membership of the school district for a period of five years based on the actual membership trends experienced in the district over the current and five immediately preceding years. When the forecast of future membership is prepared with the use of this worksheet, the following procedure should be observed:

Step 1. If a pre-school census' is taken enter the actual census and membership figures on the lines entitled "Number" for the current year and each of the five immediately preceding years (Cols. 3-8). Such census will give the most accurate enrollment prediction.

Step 2. Calculate for the known period (five preceding years plus the current year) the percent of survival for each age group to the next age group the following year; the percent of survival for the "4 years" group to kindergarten the following year; and the percent of survival for each age group to the next grade group the following year.

Example: If in the fifth preceding year there were 42 children in the census group "Under 1 Year", and in the fourth preceding year there were 51 children in the census group "1 Year", the percent of survival for the "1 Year" group would be 51 divided by 42, or 121.4 percent. If in the first preceding year there were 50 children in the census group "4 Years"; and in the current year there were 60 pupils enrolled in kindergarten; the percent of survival for the kindergarten group would be 60 divided by 50, or 120.0 percent.

Step 3. Determine the average percent of survival for each age and grade group for the entire known period and enter this average for each of the future years (cols. 9-13) on the line entitled "% Survival."

Example: If the percent survival for the 3rd grade for the known years were 99.2, 102.5, 101.4, 104.6, and 98.9; the average percent survival to be entered in cols. 9-13 would be 101.3.

## **APPENDICES**

## **APPENDIX A**

### **METHOD OF PROJECTING STUDENT ENROLLMENT**

- Step 4. Project the membership of the district for five years by multiplying the number of children in an age or grade group, beginning with the last known year (current year, col. 8), by the average percent of survival for the next age or grade group..

Example: If in the current year there were 44 pupils in the 5th grade; and if the average percent of survival between the 5th and 6th grades were 116.5; by multiplying 44 times 1.165 we would estimate that there would be 51 pupils in the 6th grade in the first future year.

- Step 5. Add the actual and estimated membership for each year in grades K-6, 7-9, 10-12, and K-12, and enter the totals in the proper blanks.

#### Birth-Kindergarten Relationship

If pre-school age census data are not available it is possible to estimate future kindergarten enrollment by studying the historical relationship between the number of births to residents of the county (these statistics available from County or State Health Department) in one year and kindergarten enrollment 5 years later. For example: I 2,000 children were born to residents in 1961 in the county and in 1966-67 the district enrolled 200 pupils in kindergarten (10%) and this relationship (10%) persisted, 1962 vs. 1967-68, 1963 vs. 1968-69, etc. then it could be estimated that 10% of the 1972 births would enter kindergarten in the district in 1977-78.

This method is based on a five year arithmetic mean survival history as outlined on the attachment. From the raw data shown on the completed chart several conclusions may be made.

1. If your enrollment shows a slow but steady decline in kindergarten enrollment but with an essentially static enrollment in higher grades the conclusion would be that your district is not materially affected by either in or out migration and that a reasonably accurate forecast may be made on the basis of survival percentage above.
2. If your enrollment shows an influx of new students in the higher grades with a declining kindergarten enrollment the conclusion is that your district is experiencing an in-migration offsetting for the present the effects of kindergarten decline.

3. If your enrollment shows a decline in enrollment in the higher grades as well as a declining kindergarten enrollment the conclusion is that your district is experiencing an out-migration magnifying for the present the effects of kindergarten decline.

If your district falls into category (1) continued decline may be expected as the children of the low birth years progress through the grades. If family planning stabilizes at the Zero Population Growth rate of 2.1 children per family you may then predict a residual enrollment, all other factors remaining constant.

If your district falls into category (2) you may expect a stable enrollment and possibly an increase in the immediate future. Additional research should be done to determine the magnitude and expected duration of the in-migration.

If your district falls into category (3) you may expect an accelerated rate of enrollment decline in the immediate future.

This procedure, adopted from the Michigan Department of Education publication, POPULATION AND YOU (1975) was used to complete the forecasts on the table.

### ESTIMATE OF MEMBERSHIP Based on Actual Membership Trends

[illegible]

TABLE A.2

WATERFORD SCHOOL DISTRICT  
ENROLLMENT HISTORY AND PROJECTIONS

|               | 1971  | 72-73 | 73-74 | 74-75 | 75-76 | 76-77 | 77-78 | 78-79 | 79-80 | 80-81 | 81-82 |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| K             | 1257  | 1221  | 1199  | 1210  | 1280  | 1184  | 1088  | 1045  | 1027  | 1014  | 1000  |
| 1             | 1268  | 1222  | 1182  | 1149  | 1162  | 1241  | 1143  | 1051  | 1009  | 992   | 979   |
| 2             | 1420  | 1230  | 1180  | 1142  | 1148  | 1195  | 1224  | 1127  | 1036  | 994   | 978   |
| 3             | 1331  | 1400  | 1217  | 1171  | 1141  | 1139  | 1185  | 1214  | 1118  | 1028  | 986   |
| 4             | 1450  | 1340  | 1344  | 1199  | 1215  | 1156  | 1140  | 1186  | 1215  | 1119  | 1029  |
| 5             | 1451  | 1468  | 1349  | 1325  | 1202  | 1234  | 1161  | 1145  | 1191  | 1221  | 1124  |
| 6             | 1462  | 1442  | 1455  | 1326  | 1333  | 1197  | 1226  | 1154  | 1138  | 1184  | 1214  |
| TOTAL         | 9639  | 9323  | 8926  | 8522  | 8481  | 8346  | 8167  | 7922  | 7734  | 7552  | 7310  |
| 7             | 1398  | 1461  | 1442  | 1478  | 1313  | 1332  | 1208  | 1227  | 1155  | 1139  | 1185  |
| 8             | 1454  | 1398  | 1443  | 1448  | 1450  | 1281  | 1318  | 1196  | 1214  | 1143  | 1127  |
| 9             | 1529  | 1433  | 1364  | 1433  | 1440  | 1422  | 1263  | 1299  | 1179  | 1197  | 1127  |
| TOTAL         | 4381  | 4292  | 4249  | 4359  | 4203  | 4035  | 3789  | 3722  | 3548  | 3479  | 3439  |
| 10            | 1462  | 1524  | 1434  | 1438  | 1492  | 1476  | 1457  | 1294  | 1331  | 1208  | 1227  |
| 11            | 1323  | 1344  | 1426  | 1336  | 1370  | 1433  | 1387  | 1370  | 1216  | 1251  | 1136  |
| 12            | 1116  | 1200  | 1182  | 1273  | 1227  | 1181  | 1278  | 1237  | 1222  | 1085  | 1116  |
| TOTAL         | 3901  | 4068  | 4042  | 4047  | 4089  | 4090  | 4122  | 3901  | 3769  | 3544  | 3479  |
| TOTAL         | 17921 | 17683 | 17217 | 16928 | 16773 | 16471 | 16078 | 15545 | 15051 | 14575 | 14228 |
| SP. ED.       |       |       |       |       |       | 649   | 649   | 649   | 649   | 649   | 649   |
| ADULT ED.     |       |       |       |       |       | 480   | 480   | 480   | 480   | 480   | 480   |
| OTHER ENROL'T |       |       |       |       |       | 61    | 61    | 61    | 61    | 61    | 61    |
| TOTAL         | 18571 | 18371 | 17951 | 17811 | 17896 | 17661 | 17268 | 16735 | 16241 | 15765 | 15418 |

## **APPENDIX B**

### **SURVEY INSTRUMENT**

## APPENDIX B

## SURVEY INSTRUMENT

Teacher Professional Activity Questionnaire  
WATERFORD SCHOOL DISTRICT  
June 1977

The Research and Evaluation Office is assessing the professional growth activities of the Waterford staff. In order to get a picture of the total staff we are asking some individuals to answer three questions about their professional activities during the past year. Please answer the three questions listed below and return the questionnaire to the Research and Evaluation Office as soon as possible.

If you have any questions on how to respond, please call Howard Heitzeg at 666-4000 Extension 74 or Mrs. Shireman at the same number. We will be happy to take your answers to the questions over the telephone.

Thank you for helping us; the results of the survey will be published in an issue of Curriculum Cues in the fall.

\* \* \* \* \*

How many graduate college credits have you earned during the past 12 months?

\_\_\_\_\_ term credits

\_\_\_\_\_ semester credits

How many days have you spent attending professional educational conferences outside the school district during the past 12 months?

\_\_\_\_\_ days

The school district offers paid teacher inservice education workshops during the summer months and during evenings and weekends during the school year. How many hours have you participated in these kinds of workshops during the past 12 months? (Do not include release time workshops offered during the regular school day).

\_\_\_\_\_ hours

## **APPENDIX C**

### **FREQUENCY DISTRIBUTION OF STAFF MEMBERS INCLUDED IN THE STUDY BY AGE AND GRADUATE DEGREE STATUS**

## APPENDIX C

FREQUENCY DISTRIBUTION OF STAFF MEMBERS  
INCLUDED IN THE STUDY BY AGE  
AND GRADUATE DEGREE STATUS

## BA DEGREE

| Age   | Frequency | Relative Frequency (Pct) |
|-------|-----------|--------------------------|
| 22    | 4         | 1.7                      |
| 23    | 9         | 3.8                      |
| 24    | 18        | 7.6                      |
| 25    | 17        | 7.2                      |
| 26    | 10        | 4.2                      |
| 27    | 12        | 5.1                      |
| 28    | 16        | 6.8                      |
| 29    | 22        | 9.3                      |
| 30    | 13        | 5.5                      |
| 31    | 7         | 3.0                      |
| 32    | 7         | 3.0                      |
| 33    | 8         | 3.4                      |
| 34    | 7         | 3.0                      |
| 35    | 10        | 4.2                      |
| 36    | 5         | 2.1                      |
| 37    | 4         | 1.7                      |
| 38    | 3         | 1.3                      |
| 39    | 5         | 2.1                      |
| 40    | 3         | 1.3                      |
| 41    | 5         | 2.1                      |
| 42    | 6         | 2.5                      |
| 43    | 2         | 0.8                      |
| 45    | 1         | 0.4                      |
| 46    | 3         | 1.3                      |
| 47    | 5         | 2.1                      |
| 48    | 1         | 0.4                      |
| 49    | 7         | 3.0                      |
| 50    | 2         | 0.8                      |
| 51    | 2         | 0.8                      |
| 52    | 1         | 0.4                      |
| 53    | 3         | 1.3                      |
| 54    | 6         | 2.5                      |
| 55    | 2         | 0.8                      |
| 58    | 1         | 0.4                      |
| 59    | 5         | 2.1                      |
| 61    | 1         | 0.4                      |
| 62    | 1         | 0.4                      |
| 63    | 1         | 0.4                      |
| 64    | 1         | 0.4                      |
| TOTAL | 236       | 100.0                    |

## APPENDIX C

FREQUENCY DISTRIBUTION OF STAFF MEMBERS  
INCLUDED IN THE STUDY BY AGE  
AND GRADUATE DEGREE STATUS

## BA DEGREE + 20

| Age   | Frequency | Relative Frequency (Pct) |
|-------|-----------|--------------------------|
| 23    | 1         | 0.5                      |
| 24    | 2         | 1.1                      |
| 25    | 9         | 4.7                      |
| 26    | 13        | 6.8                      |
| 27    | 17        | 8.9                      |
| 28    | 23        | 12.1                     |
| 29    | 15        | 7.9                      |
| 30    | 13        | 6.8                      |
| 31    | 14        | 7.4                      |
| 32    | 4         | 2.1                      |
| 33    | 7         | 3.7                      |
| 34    | 9         | 4.7                      |
| 35    | 1         | 0.5                      |
| 36    | 6         | 3.2                      |
| 37    | 3         | 1.6                      |
| 38    | 3         | 1.6                      |
| 39    | 4         | 2.1                      |
| 40    | 5         | 2.6                      |
| 41    | 1         | 0.5                      |
| 42    | 3         | 1.6                      |
| 43    | 4         | 2.1                      |
| 44    | 2         | 1.1                      |
| 45    | 1         | 0.5                      |
| 46    | 3         | 1.6                      |
| 47    | 4         | 2.1                      |
| 48    | 4         | 2.1                      |
| 49    | 4         | 2.1                      |
| 50    | 2         | 1.1                      |
| 51    | 3         | 1.6                      |
| 52    | 3         | 1.6                      |
| 56    | 3         | 1.6                      |
| 58    | 1         | 0.5                      |
| 59    | 1         | 0.5                      |
| 60    | 1         | 0.5                      |
| 61    | 1         | 0.5                      |
| TOTAL | 190       | 100.0                    |

## APPENDIX C

FREQUENCY DISTRIBUTION OF STAFF MEMBERS  
INCLUDED IN THE STUDY BY AGE  
AND GRADUATE DEGREE STATUS

BA DEGREE + 40

| Age   | Frequency | Relative Frequency (Pct) |
|-------|-----------|--------------------------|
| 26    | 1         | 2.6                      |
| 28    | 4         | 10.5                     |
| 29    | 2         | 5.3                      |
| 34    | 3         | 7.9                      |
| 35    | 2         | 5.3                      |
| 37    | 1         | 2.6                      |
| 38    | 3         | 7.9                      |
| 39    | 1         | 2.6                      |
| 40    | 2         | 5.3                      |
| 41    | 2         | 5.3                      |
| 42    | 1         | 2.6                      |
| 43    | 2         | 5.3                      |
| 44    | 4         | 10.5                     |
| 45    | 2         | 5.3                      |
| 48    | 1         | 2.6                      |
| 48    | 1         | 2.6                      |
| 53    | 2         | 5.3                      |
| 55    | 2         | 5.3                      |
| 56    | 1         | 2.6                      |
| 59    | 1         | 2.6                      |
| TOTAL | 38        | 100.0                    |

## APPENDIX C

FREQUENCY DISTRIBUTION OF STAFF MEMBERS  
INCLUDED IN THE STUDY BY AGE  
AND GRADUATE DEGREE STATUS

## MA DEGREE

| Age   | Frequency | Relative Frequency (Pct) |
|-------|-----------|--------------------------|
| 25    | 4         | 1.6                      |
| 26    | 6         | 2.3                      |
| 27    | 5         | 1.9                      |
| 28    | 12        | 4.7                      |
| 29    | 25        | 9.7                      |
| 30    | 15        | 5.8                      |
| 31    | 10        | 3.9                      |
| 32    | 9         | 3.5                      |
| 33    | 9         | 3.5                      |
| 34    | 13        | 5.1                      |
| 35    | 14        | 5.4                      |
| 36    | 10        | 3.9                      |
| 37    | 7         | 2.7                      |
| 38    | 5         | 1.9                      |
| 39    | 15        | 5.8                      |
| 40    | 7         | 2.7                      |
| 41    | 5         | 1.9                      |
| 42    | 10        | 3.9                      |
| 43    | 8         | 3.1                      |
| 44    | 5         | 1.9                      |
| 45    | 11        | 4.3                      |
| 46    | 6         | 2.3                      |
| 47    | 4         | 1.6                      |
| 48    | 5         | 1.9                      |
| 49    | 7         | 2.7                      |
| 50    | 3         | 1.2                      |
| 51    | 5         | 1.9                      |
| 52    | 7         | 2.7                      |
| 54    | 6         | 2.3                      |
| 55    | 3         | 1.2                      |
| 56    | 2         | 0.8                      |
| 58    | 2         | 0.8                      |
| 59    | 1         | 0.4                      |
| 61    | 1         | 0.4                      |
| TOTAL | 257       | 100.0                    |

## APPENDIX C

FREQUENCY DISTRIBUTION OF STAFF MEMBERS  
INCLUDED IN THE STUDY BY AGE  
AND GRADUATE DEGREE STATUS

MA DEGREE + 15

| Age   | Frequency | Relative Frequency (Pct) |
|-------|-----------|--------------------------|
| 26    | 1         | 2.1                      |
| 28    | 3         | 6.4                      |
| 29    | 1         | 2.1                      |
| 30    | 4         | 8.5                      |
| 32    | 2         | 4.3                      |
| 33    | 1         | 2.1                      |
| 34    | 5         | 10.6                     |
| 35    | 4         | 8.5                      |
| 36    | 2         | 4.3                      |
| 37    | 1         | 2.1                      |
| 38    | 2         | 4.3                      |
| 40    | 1         | 2.1                      |
| 41    | 2         | 4.3                      |
| 42    | 1         | 2.1                      |
| 43    | 1         | 2.1                      |
| 45    | 4         | 8.5                      |
| 47    | 2         | 4.3                      |
| 48    | 2         | 4.3                      |
| 49    | 1         | 2.1                      |
| 50    | 1         | 2.1                      |
| 51    | 2         | 4.3                      |
| 55    | 1         | 2.1                      |
| 59    | 1         | 2.1                      |
| 60    | 1         | 2.1                      |
| 61    | 1         | 2.1                      |
| TOTAL | 47        | 100.0                    |

## APPENDIX C

FREQUENCY DISTRIBUTION OF STAFF MEMBERS  
INCLUDED IN THE STUDY BY AGE  
AND GRADUATE DEGREE STATUS

MA DEGREE + 30

| Age   | Frequency | Relative Frequency (Pct) |
|-------|-----------|--------------------------|
| 28    | 1         | 1.6                      |
| 29    | 1         | 1.6                      |
| 30    | 3         | 4.9                      |
| 31    | 1         | 1.6                      |
| 32    | 1         | 1.6                      |
| 33    | 5         | 8.2                      |
| 35    | 1         | 1.6                      |
| 36    | 3         | 4.9                      |
| 37    | 2         | 3.3                      |
| 38    | 3         | 4.9                      |
| 39    | 2         | 3.3                      |
| 40    | 1         | 1.6                      |
| 41    | 1         | 1.6                      |
| 43    | 3         | 4.9                      |
| 44    | 3         | 4.9                      |
| 45    | 5         | 8.2                      |
| 46    | 4         | 6.6                      |
| 47    | 1         | 1.6                      |
| 48    | 2         | 3.3                      |
| 49    | 4         | 6.6                      |
| 50    | 2         | 3.3                      |
| 51    | 3         | 4.9                      |
| 52    | 2         | 3.3                      |
| 54    | 1         | 1.6                      |
| 55    | 1         | 1.6                      |
| 56    | 1         | 1.6                      |
| 59    | 1         | 1.6                      |
| 61    | 1         | 1.6                      |
| 63    | 1         | 1.6                      |
| 64    | 1         | 1.6                      |
| TOTAL | 61        | 100.0                    |

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