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## **Influence of Quality of Worklife Variables on the Retention and Career Satisfaction of Science and Mathematics Teachers**

Jerry D. Barker  
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I am submitting herewith a dissertation written by Jerry D. Barker entitled "Influence of Quality of Worklife Variables on the Retention and Career Satisfaction of Science and Mathematics Teachers." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Education.

A. Paul Wishart, Major Professor

We have read this dissertation and recommend its acceptance:

James Camponetti, John Ray, Schuyler Huck

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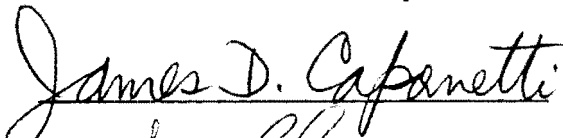

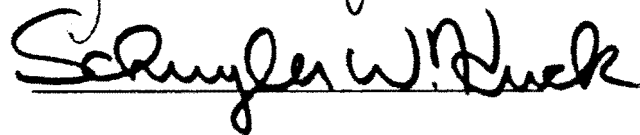
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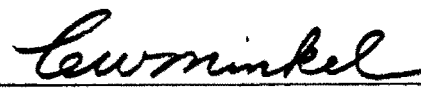
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INFLUENCE OF QUALITY OF WORKLIFE VARIABLES ON THE  
RETENTION AND CAREER SATISFACTION OF  
SCIENCE AND MATHEMATICS TEACHERS

A Dissertation  
Presented for the  
Doctor of Philosophy  
Degree  
The University of Tennessee, Knoxville

Jerry D. Barker

June 1986

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Appreciation is also expressed to Dr. Jerry Bellon, who as Director of the UTK Collaborative Research Project on the Educational Workplace, was instrumental in several important phases of this doctoral work.

## ABSTRACT

Teacher shortages are predicted in all areas of public education. These shortages are already a reality for science and mathematics. The overall purpose of this study was to identify major workplace variables that affect job satisfaction within educational organizations. Once identified these variables were utilized to construct an intervention framework grounded in the principles of the Quality of Worklife (QWL) paradigm. The investigation was designed as a descriptive study utilizing a survey instrument and interviews developed around the QWL model of workplace satisfaction.

The study sample included 479 secondary classroom teachers representing a diverse range of school district types from four states. A quality of worklife index was created for purposes of analysis. Frequencies, correlations and weighted importance and satisfaction values were also calculated.

All major variables (e.g., work load, recognition, inclusion, working conditions) were perceived at relatively high levels of importance by all groups of participants. The QWL variables perceived to be of highest importance were the extrinsic factors of resources, support systems and work load. Those perceived as least important were recognition, inclusion and growth, all intrinsically related to workplace satisfaction. QWL variables viewed at a relatively high level of satisfaction were sense of achievement, resources,

job enrichment and support systems. Areas of least satisfaction included growth, status and formal rewards. Workplace factors perceived as having the highest discrepancy between degree of importance and level of satisfaction were formal rewards and status while least discrepant factors included job enrichment and sense of achievement. Several significant relationships existed between demographic factors representing age, experience, salary, and level of education and the QWL variables of highest concern. Based upon the above findings, a model was developed to integrate aspects of the QWL approach to workplace satisfaction. This model would potentially reduce attrition among classroom teachers representing science, mathematics, and other instructional areas.

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## CHAPTER I

### PURPOSES AND APPROACH

#### I. INTRODUCTION

At present, American education is confronted by serious challenges to its overall worth and to its level of effectiveness. Several reports from educational commissions and task forces have emphasized the problems and limitations that are part of both the educational process and the teaching profession. The report of the National Commission on Excellence in Education (1983) states that:

Our society and its educational institutions seem to have lost sight of the basic purposes of schooling, and of the high expectations and disciplined effort needed to attain them (p. 5).

Publications by the Task Force on Education for Economic Growth support this view in their report, Action for Excellence (1983), stating that:

We must return to basics but the "basics" of the 21st century are not only reading, writing, and arithmetic. They include communication and higher problem-solving skills, and scientific and technological literacy--the thinking tools that allow us to understand the technological world around us (p. 16).

Among the most important problem areas have been the quantity and quality of science instruction promoted throughout public education. Over the past few years, reports from several sources have pointed

to the decline of the level of scientific literacy among both student and nonstudent populations. A collaborative study carried out by the National Science Foundation and Department of Education stressed that individuals within American society are becoming less knowledgeable and less committed to science (National Science Foundation, 1980). This shift in attitude and achievement has caused shortages in many areas of both science and technology. The decreased level of scientific literacy was identified as one of the major areas of concern by the National Commission on Excellence in Education's report, A Nation at Risk: The Imperative for Education Reform (1983). The report cited a steady decline in science achievement scores for 17-year-olds as measured by national assessments of science in 1960, 1973, and 1977. In response to these, as well as other reports, the National Science Board, NSF's policymaking branch, released the publication, Educating America for the 21st Century, (1983), which contained many recommendations. The recommendations included vast and meaningful changes in: student participation, standards of achievement, mechanisms for evaluating achievement, methods and quality of teaching, and content of classes. In addition to these changes, the report also called for programs to improve the retention of qualified science teachers. One of the Commission's specific recommendations was that: Top priority must be placed on retraining, obtaining, and retaining teachers of high quality in mathematics, science, and technology, and providing them with work environments in which they can be effective. As a result

of these reports, it is apparent that not only the quality, but also the quantity of science and mathematics instruction within American education is of great concern to both national and professional organizations.

The focal point for the current crisis in science education is the shortage of qualified science and mathematics teachers. A 1981 survey conducted by the Association for School, College, and University Staffing concluded that the United States is facing a serious shortage of qualified secondary school science teachers. The survey data indicated that 42 states reported shortages of physics, chemistry, earth science, and biology teachers (Akin, 1982). Washington State provides a typical illustration of the problem of decreasing numbers of trained science teachers. Olstad and Beal (1981) found that the number of science teaching graduates in the state of Washington declined by 30% over a recent 5 year period, while the demand for science teachers increased by 35%. They predicted a serious shortage of qualified science teachers in the years ahead. Several studies (Howe & Gerlovich, 1981; Watkins, 1981; Guthrie & Zusman, 1982) in other parts of the country support these findings and predictions.

Information compiled and analyzed by Marcuccio (1983) indicates that the rate of science and math teacher loss is accelerating. She projects that from the 4% reduction between 1980-81, the percentage will increase to a 35% reduction in the science and math teaching force by 1992. As a direct result of the 1982 shortage approximately

32,000 math and science classes could not be scheduled. In order to further stress the seriousness of the reduction in force, Marcuccio states that 640,000 students who wished to enroll in science or mathematics courses were required to take courses in subject areas where no teacher shortage occurred.

The shortage of qualified mathematics and science instructors comes at a time when course requirements in these disciplines are being increased. Marcuccio points out that adding one course in either science or math in U.S. schools would require a 20% increase in faculty or 40,000 more science and mathematics teachers. William W. Turnbull, former Educational Testing Service President, in his testimony before the Senate Economic Committee of Congress concurs with Marcuccio. His information indicated that about one-third of U.S. secondary schools do not offer enough mathematics to qualify their graduates for admission to accredited engineering schools. In addition, he states, fewer than one-third offer physics courses taught by qualified physics teachers (Benderson, 1984).

The shortage of qualified science and math teachers has not only developed due to the reduced number of individuals prepared to teach in these areas, but also because of the attrition of qualified inservice teachers from the profession. A 1982 survey of science teachers shows that 25% of younger faculty members plan to leave teaching and that approximately 5 times as many science and math teachers left their jobs for nonteaching positions as retired from teaching in 1980 (Levin, 1982). Findings in work done by Heyin



(1982) indicate that science teachers, particularly those in the physical sciences, are leaving the classroom in alarming numbers to accept positions in business and industry. Data reported by Sousa (1984) also indicate that science teachers are being lost to business and industry. His study reveals that 41.5% of the New Jersey secondary schools surveyed sustained a loss of science teachers to industrial or business occupations. In addition to the overt loss of these individuals, Sousa reports that 90% of both the public and independent schools in the sample found recruitment of science personnel very difficult.

It is very apparent that the attrition of science and mathematics instructors from the classroom to occupations in business and industry is a phenomenon that is growing. Meanwhile, replacing them becomes increasingly difficult and more schools are being forced to utilize unqualified teachers in science classrooms. This untenable situation has raised much concern not only throughout the educational community but also throughout the industrial/technological complex of this country. If these trends are allowed to continue, the question of whether this nation can successfully meet the science needs of its students and society becomes of paramount importance. In order to begin to address this situation, programs must be developed to reduce the loss of qualified science and math teachers from the classroom.

## II. RETENTION STRATEGIES

There is a major body of research emerging concerning the basic reasons for teacher attrition. This research can be utilized as a focal point in designing programs to help retain science and mathematics teachers. Much of this research centers on the investigation of both intrinsic and extrinsic factors of job satisfaction. Intrinsic factors have been identified as those aspects of job satisfaction that are internally generated by the individual (i.e., sense of achievement and recognition, professional growth). Extrinsic factors include the overt, more traditional rewards associated with employment such as salary and fringe benefits.

Recent studies have indicated that the ability to attract and retain qualified teachers depends not only on extrinsic rewards but also on such factors as organizational conditions of the workplace, opportunities for professional development and the level of intrinsic incentives generated by the job (Rosenholtz, 1984). Additional findings indicate that the intrinsic rewards of the educational workplace outweigh the extrinsic factors. Research conducted supports the basic premise that teachers value the intrinsic, psychic rewards that come from students' academic accomplishments and from confidence in their own ability to help students learn (Bredeson, 1983). Studies completed by Schlechty and Vance (1981) and Chapman (1983) emphasize that important reasons for leaving teaching relate directly to job satisfaction conditions that negatively affect

such areas as professional growth and development, recognition, and interpersonal relationships with colleagues and administrators. These studies do cite extrinsic factors (salary and fringe benefits) as contributing to the teacher attrition problem; however, these factors are generally subordinate to the more intrinsic rewards. Findings by Burno (1981) directly support this observation. In this study teachers were given monthly bonuses in an attempt to retain them in an urban school suffering high turnover rates. This approach proved to have no effect on the attrition rate. Therefore, decisions to leave teaching seem to be tied more closely to intrinsic incentives than to rewards such as salary increases and promotions. Rosenholtz (1984) summarizes much of the teacher job satisfaction research by indicating that the rewards of teaching include sense of achievement, feeling of work efficacy, a sense of professional growth and recognition, support and respect of colleagues and supervisors, humane and comfortable working conditions, and suitable pay and fringe benefits. She stresses that the intrinsic and immediate rewards of teaching are foremost in bringing people into teaching and in keeping teachers in the profession.

It seems clear that if the problem of science and math teacher retention is to be affected, then interventions must be developed and implemented to deal with the level of intrinsic rewards of job satisfaction. In order to design effective compensation and incentive programs, the structure and function of current organizational management models must be examined. At present most educational

organizations function through the scientific management model based on the work of Max Weber and Fredric Taylor (Griffin, 1984). This management model, which functions through a top-down, policy to practice orientation, has done much to develop and sustain current factors of workplace dissatisfaction. The basic hierarchical structure of public schools has in many cases detracted from the establishment of intrinsic rewards of the work environment (Griffin, Barnes, O'Neal, Edwards, Defino, & Hukill, 1983). An appropriate framework that can be utilized to guide the formulation of such job satisfaction intervention projects is provided by the sociotechnical model of organizational management. This management model furnishes an alternative to the scientific management principles that have produced the present hierarchical structure of public education. Through the use of several aspects of the sociotechnical model, many of the intrinsic factors of workplace satisfaction can be improved. The components of the overall sociotechnical model that address these specific intrinsic variables are termed the Quality of Work Life (QWL) management techniques. The QWL approach deals with job satisfaction by positively affecting the intrinsic variables that operate within the workplace. These variables include such factors as recognition, a sense of achievement and professional growth as well as control over aspects of work and the work environment. Through the use of the QWL model, management practices within public education can be altered in order to more effectively improve the intrinsic reward system of the educational workplace. As a direct

result of the improvement of job satisfaction, an increase in the retention of qualified science and mathematics teachers can be realized.

### III. PROBLEM RATIONALE

In view of the severity of the nationwide shortage of math and science teachers, programs must be developed to provide incentives to retain qualified individuals currently teaching science and mathematics. However, these programs must be grounded in effective strategies based upon factors that will have positive impact on incentives. It is vital that the incentive program develop and become implemented based upon variables that are truly important to those individuals actively engaged in teaching. Not only would effective incentive strategies help retain people in the classroom, but they would serve as incentives to bring new people into science and math teaching. Recent work by Chapman and Green (1984) indicates that groups of individuals as defined by their pattern of career development responded to different incentives in formulating their career decisions. They suggest that administrators' efforts to respond to a teacher shortage by trying to retain qualified personnel need to be carefully targeted to those incentives most salient to the particular group. In a study conducted by Olstad and Beal (1981), the majority of individuals (80%) who had left science teaching considered overall job satisfaction as the prime decision factor in leaving the profession. Respondents to the survey

included factors such as lack of prestige or status, inadequate support, lack of growth opportunities, and the feeling of being under-utilized professionally. Salary, though an important decision factor, was found not to be a prime factor relative to career decisions by science and mathematics teachers. Several other research studies support the importance of job or workplace satisfaction as a factor in teacher retention. Studies done by Chapman (1983), Digda (1983), and Spector (1984) stated that conditions related to job satisfaction proved to be very powerful in terms of producing teacher retention.

As indicated by the previous research, the need for job satisfaction appears to be a major factor in determining whether or not a person will remain in a teaching position. Several of the identified satisfaction factors relate directly to the motivational framework contained in the theories of Herzberg and Vroom. Factors such as growth, recognition, sense of achievement and perceived status were either directly or indirectly mentioned by many of the individuals taking part in the previously cited studies. Across several of the studies, hygiene factors were also identified as having important input into job satisfaction. Salary levels, working conditions and scheduling were most often indicated as detracting from job satisfaction. It is clear that attrition from a teaching position is closely linked to the various aspects of workplace satisfaction. The decision by individuals to remain in a teaching position seems to be contingent upon the fulfillment of motivation needs mediated by the hygiene factors of the workplace. Thus,

the individual's perception of the quality of work life is directly indicative of job satisfaction, which in turn has an important influence on career decisions.

Preliminary findings concerning reasons for science and math teacher attrition seem to have been at best rather spurious and inconclusive. Information from these studies has not been collected based upon a clear conceptual foundation, thus making the formulation of valid interventions difficult. Therefore a more concentrated effort to collect data based upon a valid theoretical model is needed. The institution of a more focused investigative approach will enable the construction of a framework that will lead to direct improvements in the quality of worklife for individuals teaching science and mathematics.

The proposed study is designed to generate more specific data relative to the workplace satisfaction needs of science and math teachers. The approach of this study will be through the integration of several motivational frameworks. The theories of Maslow, Herzberg and Vroom will be utilized to focus data collection. Thus, the design of the study will concentrate on the problem of teacher attrition through the quality of worklife paradigm. As a result of the approach, data will be collected that have a high potential to impact upon the workplace factors that hold the greatest importance to science and math professionals. Once the most important factors are identified, interventions with the maximum likelihood of affecting teacher retention can be devised.

#### IV. PROBLEM STATEMENT

In order to address the current science and mathematics teacher attrition problem, information concerning job satisfaction variables is needed. Therefore, the basic purpose of this study is to identify major workplace variables that affect job satisfaction within educational organizations. These specific variables can then be utilized in the construction of an intervention framework grounded in the principles of the Quality of Worklife paradigm that would have the potential to effectively reduce the loss of qualified science and mathematics teachers from the secondary public school classroom.

#### V. RESEARCH QUESTIONS

- 1) What are the basic QWL factors that affect job satisfaction within the educational organization?
- 2) What are the specific QWL factors that hold the most importance for science and mathematics teachers?
- 3) What is the current level of perceived satisfaction relative to the most important QWL factors held by science and mathematics teachers?
- 4) What type of overall QWL model would be useful in predicting possible QWL deficiencies that increase the risk of attrition in the science and mathematics teaching profession?



## VI. METHODOLOGY

This investigation represents a descriptive study utilizing a survey instrument and interviews developed around the QWL (socio-technical) model of workplace satisfaction. Specifically, the study is designed to determine the status of the various QWL variables relative to science and math teacher workplace satisfaction. The study also identifies those QWL variables that hold the highest level of importance concerning the development of workplace satisfaction for the target population.

## VII. SAMPLE

The sample utilized in the study was composed of certified science and mathematics teachers from four states. Included in the study were individuals that teach at the middle school level, as well as the high school level. Socioeconomic levels of the selected schools ranged from average to very affluent. The socioeconomic level was defined by the level of per pupil expenditure. In addition to socioeconomic level, the sample was stratified as to type of school. Institutions representing rural, suburban and urban settings were chosen.

## VIII. DATA COLLECTION STRATEGY

The survey instrument and a prestructured interview were utilized as the data collection devices. Through the use of

both instruments, a larger, more valid amount of data could be collected. The combination of techniques also enhanced the portrayal of the workplace, allowing for a more accurate assessment of the variables under investigation. The interviews were used with a randomly selected subset of respondents to verify the survey responses. They also served in making a more reliable determination of the perceived importance of the various motivation and hygiene variables.

The planned data collection strategy involved site visits by the researcher. Data were collected directly from the participants, allowing opportunities to clarify questions and explain the objectives of the study. This direct method of data collection helped ensure a very high response rate with enhanced accuracy. Through the site visits, a more complete portrayal of the characteristics of each workplace could be obtained. A guide was developed to record pertinent data concerning each school.

## IX. INSTRUMENTS

The instrument utilized was developed through an extensive set of activities.\* Specific variables included as part of the survey instrument were identified through an extensive literature search. The source material used was composed of references

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\*Selected development activities were accomplished in conjunction with an informal research group in the Department of Curriculum and Instruction, UTK, headed by Dr. Jerry J. Bellon.

related to workplace conditions, incentive structures, as well as quality of worklife issues relating to both public and private sector organizations. These references included reports of both qualitative and quantitative research efforts in business and industry as well as in educational organizations. Several of the more important studies have been referenced throughout the literature review.

In addition to job satisfaction and workplace research, ten of the more frequently used job satisfaction surveys were examined. Such instruments as the Minnesota Satisfaction Questionnaire (Elizer and Tziner, 1977), Hoppock's Job Satisfaction Measure (McNichols, Stahl, & Manley, 1978) and Hackman and Oldham's (1974) Job Diagnostic Survey provided information relative to many of the more salient issues concerning workplace satisfaction. As a result of the examination of these studies and instruments, the most frequently occurring variables throughout the literature were compiled and classified. The classification consisted of three basic categories: personal factors, organizational factors, and outside influences. Within each of these general categories further condensation occurred, yielding specific variables concerning important workplace conditions that affect job satisfaction, level of work involvement and the quality of work performance.

As a result of the classification procedure, twelve variables important to the workplace were identified. These factors include: recognition, status, work load, inclusion, resources, work control, formal reward system, achievement, working conditions, job enrichment,

support systems, and growth. Each of these twelve specific variables were utilized in the construction of a preliminary instrument that was pilot tested. The results of the pilot testing were used to make refinements in the survey instrument in order to improve aspects related to its clarity and form.

Upon completion of the adjustments to the survey instrument a semistructured interview guide was constructed. The interview questions were based on the workplace variables addressed by the survey. The interview further probed issues that are concerned with the current status of the workplace conditions. It also provided information to further isolate the important variables affecting the quality of worklife for science and mathematics teachers.

In order to gain more information concerning the specific context for each workplace studied, school profile information was collected. This profile was composed of data concerning specific aspects related to school size, socioeconomic level, racial distribution as well as other information that could aid in describing the workplace.

## X. DATA ANALYSIS

Survey data were analyzed through the use of descriptive statistics. The level and frequency of response for each survey item were utilized to construct a detailed profile of respondents' perceptions relative to the Quality of Worklife variables in each

type of setting. These data were then used to develop an overall profile concerning the workplace variables that hold the most importance for science and mathematics teachers.

Correlations were determined between specific demographic data relative to the sample population and the workplace variables that hold the most importance (e.g., years in teaching compared to level and frequency of specific variables). These correlations served as further input into the overall portrayal of the factors that affect workplace satisfaction.

Data collected through the interview process were subjected to content analysis. Categories for the content analysis were developed through a review of related literature as well as through the use of the major variables that compose the survey instrument. Content analysis of the interview data allowed for both the verification of the survey instrument as well as for clarification of perceptions concerning additional factors that influence workplace satisfaction.

Through the secondary analysis and interpretation of survey responses, correlations, and interview responses, major patterns and trends were identified. These patterns served as a base from which the most important Quality of Worklife variables could be more fully described.

## XI. IMPLICATIONS

In order to address the crisis in science and mathematics education, the attraction and retention of qualified teachers is

of prime importance. Teachers form the core of any program designed to upgrade science and math education. Therefore, it is important to retain professionals of the highest quality in active classroom teaching. Salary incentives alone have proven unsuccessful (Olstad & Beal, 1981; Chapman & Green, 1984).

This study can help to identify important factors of workplace satisfaction that must be addressed if individuals are to be attracted and committed to long range professional careers in the teaching of science and mathematics. The National Science Foundation recognized this key point in two of their most recent Program Announcements (NSF, 1985). This organization emphasizes that if programs to upgrade and train teachers are to be both successful and cost effective, strategies must be developed to deal with workplace satisfaction in order to ensure the long term retention of individuals trained through NSF projects or other agency and university programs.

## CHAPTER II

### QUALITY OF WORK LIFE

The organizational climate of the developed world has been experiencing great change. These changes have been significant and have affected virtually every area of organizational activity. Industry, government, labor, and academe all are experiencing problems caused by this change process. In response to this situation much theoretical and practical work has been done to effectively address organizational problems precipitated by the highly unstable environmental and economic conditions that are caused by change. Throughout many organizations, attempts to deal constructively with new demands have proven to be less than successful in terms of the quality and quantity of productivity. Due to the lack of success of traditional scientific-technical intervention techniques, many organizations are turning to a more humanistic approach to the problems of the workplace (Jenkins, 1983). Organizations have found that the research from the realms of traditional psychology and social psychology as well as actual changes introduced into organizations in the United States and other countries have provided a foundation to support a new and effective approach to the human resource problems of the working environment.

As interest in improving the work environment has grown, work-related attitudes have become increasingly more important

to the managerial strata of an organization. The importance of workplace attitudes and perception has been recognized in popular literature such as Studs Terkel's Working (1972) as well as in governmental task force reports dealing with the aspects of the workplace. Work in America (1980), a government report, emphasizes that workplace problems stem in large measure from the fact that societal change is occurring at a much faster rate than organizational change. As a result of these changes, dissatisfaction and alienation from the workplace are accelerating.

The basic societal forces underlying these changes fall into these three categories. The first, and perhaps the prime contributing force, is the change in the composition of the labor pool. Work force composition has changed in very significant ways over the past 30 years. Women are now a major factor in the employment structure of this country but still earn substantially less than men. In many respects, individuals within the work population are better educated, thus holding different perceptions about what work should be.

Change in work force composition has also occurred due to raising of the mandatory retirement age. Because of the influence of economic and medical factors, more older workers are holding onto their jobs. Attitudes of professional employees throughout the work population indicate that fulfillment and growth on the job are very important satisfaction factors. These educated individuals want more than just salary and benefits; they want a voice in



workplace decisions as well (Howard, 1985). This situation combined with slow economic growth creates particular problems for women and young employees in terms of reduced promotion possibilities. Thus the gap is widening between what people want from the workplace and what is available. Organizations must devise processes to improve job satisfaction without promoting everyone.

The second societal force impacting upon the climate of organizational change relates to national and international economic environments. The overall context within which organizations function is characterized by an increasing scarcity of critical resources, a growing interdependence of countries and industries, basic doubts about the benefits of growth, and occurrence of high inflation rates causing fluctuations in an increasingly competitive environment. In order for organizations to effectively cope with the changes caused by these conditions, new methods of management must be developed to allow for the training for personnel to function with higher levels of responsibility.

A third societal force underlying change comes from the government and the legal establishment's significant interest in the legal rights and entitlements that affect the way management can treat employees. New laws enacted concerning affirmative action, designed in part to address one group's concerns about fairness, have made the issue of fairness salient for all employees. Stein (1983) supports the view that the fairness issue makes treatment of employees in the workplace a matter of public concern, placing new demands on managers and fueling the expectations of employees.

These three basic societal forces have interacted to change the legal and economic environments, thus contributing to the formulation of a relatively stagnant economy, with costs increasing faster than benefits. This overall change structure, set in an environment of scarce resources, has produced dissatisfaction among workers, managers, and professionals. Under these conditions, traditional approaches to the management of organizations must be altered. Workplace satisfaction is no longer a theoretical or academic issue to be debated in isolation. In order to raise the standards of productivity and the effectiveness of organizations, issues affecting the quality of worklife must be addressed.

#### I. QUALITY OF WORK LIFE (QWL)

The quality of work life (QWL) is a relatively new term to describe a framework of workplace intervention processes. The actual beginnings of this approach can be traced back approximately 30 years to changes in the management of workers in the British coal mining industry. In the United States, the term as well as some activities that currently would fit the term, can be traced back at least 10 years. At present, the QWL process is being utilized across broad spectra of workplace situations in many countries throughout the world.

It is important to note that the implementation of these QWL approaches is viewed as a process, not as a program. By their nature, programs have a beginning, a middle, and an end. However,

most successful QWL efforts are treated as ongoing processes that are used to continually assess and adjust specific aspects of the workplace.

The QWL approach to organizational dynamics is a process that is becoming more important as a management strategy in both the public and the private sectors of this country. Skroven (1983), in his work related to QWL, states that a large number of individuals have become awakened to the possibilities for measuring the quality of each person's working life and for pursuing quality as a goal.

Basic QWL processes that impact on improved job satisfaction vary widely according to the needs of individuals and organizations. As a result of this variety, the definition of QWL concepts and practices acquires great diversity. Bowditch (1983) indicates that the most frequently pursued goals that impact the QWL definition are to improve or promote union-management relations, human relations, worker participation in decisions, socio-technical planning, and employee problem-solving groups. Each of these basic goals determines a specific QWL definition that forms the basis for an intervention process.

Although the diversity of QWL goals and definitions is broad, it is important to recognize that the overall QWL process is grounded on several basic beliefs concerning people. These basic unifying assumptions give consistency to the QWL approach and form the foundation for all the intervention processes that organizations implement to improve job satisfaction. Some of these value assumptions include the following:

- People should be treated in the work environment with the dignity and respect they deserve as human beings.
- People support what they help to create.
- People in a work environment prefer to learn and grow with the organization.
- People want to understand how their organization functions and how their individual efforts contribute to the whole.

Through the use of these, as well as other basic assumptions, several definitions of the QWL process have emerged. Robert Guest (1979) contends that the term Quality of Work Life is a general description that relates to an individual's feelings about every dimension of work including economic rewards and benefits, security, working conditions, organizational and interpersonal relationships. Guest treats QWL as a process by which an organization can attempt to access employees' creativity through direct involvement with decisions that affect their working lives. An important characteristic of the QWL process is the emphasis placed on both extrinsic and intrinsic goals. While the extrinsic factors of productivity and efficiency are addressed, the intrinsic aspects of worker perceptions are stressed as having important implications affecting overall organizational goals. Trist (1978) further specifies these intrinsic and extrinsic workplace factors addressed by the QWL process. Extrinsic features of work include fair pay, job security, benefits, safety, health, and due process. Trist's intrinsic factors relate to job variety and challenge, opportunity to learn, autonomy,

recognition, support, meaningful social contributions, and workplace conditions that enable the development of greater skill and enhanced responsibility.

Nadler (1978) holds a slightly different view of the QWL movement. He emphasizes the structural aspects of the process. These structural aspects establish a framework for integrative bargaining where both labor and management work cooperatively in a problem-solving mode. Through this QWL framework, all members of the organization have valid input into the decision process.

The work developed by Lippitt and Rumbey (1977) addresses many of the same points as the work of Trist. These individuals approach the quality of work life from a broad perspective. Their definition of QWL refers to the degree to which work provides an opportunity for an individual to satisfy a wide variety of personal needs. These needs include job security, interaction with others, a sense of personal usefulness, recognized achievement, and the opportunity to improve skills and knowledge.

One of the more useful QWL definitions has been formulated by the American Society of Training and Development (ASTD). This broad-based definition can be easily applied to both private and public organizations. Briefly, this definition views QWL as a process to be utilized by organizations which enables its members at all levels to actively participate in shaping the organization's environment, methods, and outcomes. This value-based process is aimed toward meeting the twin goals of enhanced effectiveness of

the organization and improved quality of life at work for employees (ASTD, 1983). This general approach to QWL emphasizes the importance of a value-based process that must be designed by individuals within the organization to meet specific contextual needs.

Although the QWL concept seems to have many disparate components, there are several important characteristics that link the components together. Koch (1982) synthesizes these commonalities as follows:

- QWL is a broad, comprehensive general concept.
- It is a philosophy with a humanistic value framework.
- It is concerned with traditional items of labor negotiation (i.e., pay, benefits, safety, production, and efficiency).
- It substitutes self-actualizing or "complex man" models for the narrow "economic man" model.
- It is concerned with changing the organization's culture.
- It is concerned with the intrinsic meaning of growth, and autonomy.
- It is concerned with social support.
- It is a process stressing increasing participation and development.
- It is concerned with social contributions and responsibility.
- It is usually a long-term effort (p. 190).

In order to more clearly relate these commonalities directly to the work place, Stein (1983) formulated the following set of fundamental assumptions which are basic to the QWL process:

Control or Autonomy: This aspect assumes the individual has the capacity to affect the work environment through a reasonable amount of freedom of action.

Recognition: This assumption deals with the realization that persons within the workplace are to be treated as individuals as well as contributors.

Inclusion: This premise recognizes the individual's need to be part of a social unit with shared goals and values.

Progress and Development: This aspect of the QWL process assumes that benefits derived from work should include intrinsic rewards from the organization (i.e., challenge, professional development, accomplishment).

Extrinsic Rewards: This component addresses the usual benefits that come from work such as pay, promotion and other highly visible rewards.

Acceptable Working Conditions: This basic premise recognizes the need for a work environment that provides satisfactory standards of space, cleanliness and privacy, as well as adequate material support.

Dignity: This aspect of the QWL process deals with the individual's need to be treated with respect under all circumstances. It is important that problems are resolved in ways that avoid professional embarrassment (p. 18).

Underlying these basic formative assumptions of the QWL process is the essential concept that individuals or groups have the ability to positively influence their work environments, thus increasing the potential for improving organizational effectiveness.

The QWL operational strategies have been formulated from these basic assumptions and designed to affect both the structural

and operational components of an organization. The management structure is impacted by the QWL process through the reorganization of decision making activities. Management involvement does not operate in a hierarchical, top-down manner. Information is considered and decisions are made throughout all the structural levels of the organization. These decisions are guided by an overall framework of goals and objectives generated by the specific purpose and orientation of the organization. For example, implementation of the QWL process within an educational organization would alter the traditional decision making structures at both the building and district levels. Principals and superintendents would be guiding the overall decision process rather than making the specific decisions themselves. This management structure would allow flexibility in response to change as well as increased utilization of the professional capacity of employees. Changes in the structural components of an organization cause basic alterations in the way management operates. Through QWL activities employees are perceived as active, knowledgeable people whose views should be solicited and seriously considered in running the organization. It is from this image that the central QWL theme of participation emerges. QWL activities function on the premise that individuals should be allowed to participate in operational decisions which determine the conditions of their working life. This line of reasoning is particularly persuasive when dealing with professionals such as teachers who have a recognized area of expertise related directly to the overall goals of the educational organization.



The basic QWL process is constructed of three procedural components: diagnosis, intervention and evaluation. All of these components emphasize empirical data collection to ascertain the specific issues to be considered by QWL activities. In-depth empirical knowledge of an organization is central to the diagnosis of needs, the formulation of intervention programs, and the evaluation of program effectiveness. Data concerning employee perceptions relative to workplace issues are vital to the development of a well ordered, effective innovation, such as the QWL process. It is important to determine how employees perceive communication, supervision, role conflict and ambiguity, work overload, work environment, participation, compensation, and professional development. In order for employee perceptions to be understood and acted on, they must be considered in terms of their relationship to the various consequences of work itself. Among the more salient consequences to be considered are employee stress and militancy, family/work conflict, and various facets of job satisfaction. It is clear that the QWL process should be seen as an array of activities which involve all of these issues and consequences. Only interventions based upon a variety of activities are capable of being adapted to the specific needs of a particular organization. It is important to view the QWL process not as a set of generic interventions which can be arbitrarily applied to any organization. A more realistic view of QWL centers on its ability to be adapted to the unique concerns of a given organization.

As a result of the inherent variability of the QWL process, it is difficult to describe exactly what a program of interventions would involve. QWL processes will vary in terms of their uses, the specific type of activity utilized, and their structure (i.e., the degree of employee involvement, and the overall effect on the dynamics of an organization). It is this variability that enables the QWL process to be highly flexible in its adaptability to a wide variety of organizations.

Although the QWL process is highly contextual, there are a variety of commonly utilized strategies and activities that can be included under the rubric of this type of organizational management. These activities include techniques for individual and group participation in decisions, improvement in communication, job redesigning and enrichment, and the establishment of problem solving groups. Several of the specific QWL activities that fall under these categories have been summarized by Cohen-Rosenthal (1983), as follows:

**Quality Circle:** This activity involves employees in worksite-level problem-solving groups. Teams of from five to fifteen individuals from a common work area have responsibility for analyzing and preparing for the next level of management solutions to the problems they face.

**Representative Communication Councils:** This strategy involves the establishment of employee committees that serve as forums for communication.

Semiautonomous or Self-Managed Work Teams: This technique gives groups of employees responsibility for turning out the whole product or task. The group can make its own decisions about the division of labor. Members control the group, may elect their team leader, and may hire and fire.

Problem-Solving Task Forces or Action Teams: This activity creates group involvement in making both recommendations and decisions. They may be investigative, fact-finding, or advisory. They may set their own agenda, but usually their agenda is defined. These groups are usually temporary and composed of employees from across a broad spectrum of the organization.

Parallel Organizations: This strategy builds task forces with their own cross-hierarchical management structure. This group is supervised by and accountable to its own management group (a steering committee), which may be broadly representative. Top management is represented on the steering committee to ensure accountability, resources, and support. This is the essence of a fully developed QWL system: a permanent steering committee with many temporary task forces reporting to it, that responds to issues that arise. Employee development and involvement, and alternatives to upward mobility for challenge and reward, are its goals.

Through these as well as other QWL techniques, organizational problems and needs can be effectively addressed while simultaneously affecting the quality of work life for employees. As a result of the implementation of the QWL process, many of the more serious

workplace issues can be positively affected (i.e., job enrichment, career and professional development, employee retention, and job satisfaction).

All of the various QWL activities and strategies are centered on the basic theme of meaningful employee participation in management. These QWL techniques included within the sociotechnical management model provide methods to manage the complexities of a modern organization. Managers, supervisors and employees should recognize the spectrum of participative possibilities and pick those that best fit the specific organization in terms of its needs, goals, objectives, type of job tasks, as well as the characteristics of its work force.

The successful implementation of the QWL process within the educational organization depends upon the choice of appropriate intervention techniques. These techniques should fit not only the determined needs, but also the characteristics of the job tasks and the workforce. The educational workforce is composed primarily of well educated, rather sophisticated career employees. The job tasks faced by these employees are both complex and intellectual. These tasks require employees to be familiar with electronic equipment such as microcomputers, and biological as well as psychological aspects of student mental and physical development, while at the same time dealing with publicly mandated issues such as accountability and mainstreaming. An employee of the educational organization must recognize multiple causes and effects related to problems encountered in the workplace and develop effective solutions

accordingly. Thus, the workplace environment is very complex and ambiguous, creating overlaps among various job descriptions and responsibilities. Due to the problems and complexities that compose the educational organization, issue of employee workplace satisfaction, stress and compensation become of great importance. Therefore, in view of the problems and intricacies of the educational workplace, a management system able to effectively function in an environment of change is highly desirable. The sociotechnical model of management seems to provide an appropriate vehicle through which to establish an organizational structure that is responsive to the needs of the educational workplace.

The implementation of the sociotechnical model through the use of the QWL process depends upon the accurate portrayal of the needs and perceptions of employees and management. The success of the QWL process centers upon the recognition of the linkage between perceptions and behavior. Therefore, in order to develop a more complete understanding concerning the functioning of the QWL process, a brief examination of its theoretical foundations is required.

## II. QWL: THEORETICAL FOUNDATION

The QWL process is primarily supported by a complex set of interrelated psychological theories. Specifically the work of Maslow, Herzberg, and Vroom have contributed to the development of the QWL movement. As a result of the studies of Brayfield

and Crockett (1955) and further work by Herzberg, Mausner, and Peterson (1957), uncertainty developed concerning the relationship between job satisfaction and motivation. These studies indicated that it could no longer be said with any certainty that high satisfaction leads to high motivation for job performance. Much of this research dealing with satisfaction and performance interrelates with the various theories of motivation that have been formulated.

The most widely utilized of these conceptual models is the theory developed by Abraham Maslow. In his model, Maslow proposes the existence of five levels of human needs. These needs are arranged in a hierarchy, requiring the individual to satisfy the lower-level needs before progressing into higher-level needs (Maslow, 1954). The model indicates that at the lowest stratum needs are physiological in nature, including the need for food and water. According to Maslow, personal effort will be focused on satisfying these lowest level needs first. Once these primary needs are met, individuals will then work toward satisfying the next level in the hierarchy relative to such safety needs as shelter and security. After the fulfillment of safety needs, Maslow theorizes that social needs begin to emerge. He describes this level as the need for "affiliation" and "relatedness." Once individuals have satisfied the needs at this level, they are confronted with esteem needs. This level relates to the desire to become recognized through contributions to groups, organizations, or others who are significant in their lives. In the motivational model developed by Adler (1978), this need has

been equated with the need for power. The highest level of Maslow's model addresses the individual's need for self development which he termed the need for "self-actualization." Several other motivational theorists have given similar constructs such labels as "growth" and the "need for achievement" (Alderfer, 1969).

In brief, Maslow's theory is a model that portrays the individuals as striving to fulfill specific unsatisfied needs in a hierarchical manner, selecting between needs on the basis of their salience. These basic aspects of Maslow's theory directly influenced the work of Fredrick Herzberg.

Herzberg (1966) approaches workplace satisfaction through an analysis of specific job factors that influence an individual's perception of work life. His approach maintains that all humans have two basic types of needs that they seek to fulfill at work as well as in other settings. Herzberg classifies these basic requirements as the need to avoid pain and the need for psychological growth. He contends that both types of needs are gratified to varying degrees depending upon specific job tasks and the work environment. These inputs or job factors are divided into two basic groups: those issues and activities that prevent job dissatisfaction but do not promote employee growth, and those factors that directly promote employee motivation and growth. Herzberg contends that attention to the factors that directly interface with job satisfaction promotes psychological growth. The fulfillment of dissatisfaction factors is a pain avoidance behavior and therefore

does not generate either feelings of satisfaction or motivation to work harder. Herzberg termed the growth-enhancing aspects of work motivation factors and the pain-avoidance aspects hygiene factors.

The motivation factors tend to be intrinsic to the work itself: they render tasks more enjoyable, interesting, and psychologically rewarding. Specific factors associated with this aspect of Herzberg's theory include recognition, responsibility, advancement, achievement, and growth potential. The hygiene factors are generally extrinsic to the work situation, and are associated with the context in which work is performed. These factors include supervision, salary, working conditions, status, job security, interpersonal relations, and organizational policy and administration.

Herzberg's motivation-hygiene theory has formed the basis for several research projects in a variety of business and service organizations. Educational research grounded in this theory tends to support Herzberg's work. Schmidt (1976) found that high school administrators associated motivators with positive job aspects and hygiene with negative job aspects. Additional support comes from the work of Sergiovanni (1976). In a research project dealing with teacher motivation, Sergiovanni found motivation and hygiene factors to be differentiated essentially as predicted by Herzberg's theory.

Herzberg's results are based primarily on interview techniques. The motivation factors and hygiene factors were compiled by asking workers questions about what made them unhappy or dissatisfied



and what made them happy and satisfied. Due to this technique, Herzberg's results have received criticism in that his results may be determined by his methodology. The basis of this criticism has become more clear when the theory was tested by techniques other than interviews. The use of surveys, rating scales, and checklists have yielded mixed results in terms of support for the interview data. Dunnette (1967) found support for the theory while Wernimant (1970) did not. However, the non-interview approach does consistently support the hypothesis that motivation factors are better predictors of job attitudes than are hygiene factors (Armstrong, 1971; Halpern, 1966).

More recently, Oldham and Heckman (1981) in a study of 36 organizations found that aspects of work tasks were very closely related to employees' motivation and satisfaction, thus supporting the overall framework of Herzberg's theory.

The theories of motivation developed by individuals such as Maslow and Herzberg provided the basis for much of the management and organization change that occurred in the 1960s and 1970s. These theories provided a conceptually simple framework to describe behavior. Since they did not consistently predict behavior, social scientists developed more complex models to explain human motivation.

In order to redress the problems of previous motivational theories, Vroom (1964) developed a model that is generally referred to as expectancy theory. Vroom views motivation as drive within individuals to perform particular actions. He contends that all

individuals seek to maximize pleasure and minimize pain. As a result of this behavior, the internal drives of individuals are influenced in intensity and direction by the likely outcomes of their actions. Vroom hypothesizes that the likelihood and desirability of the results of a given action are directly proportional to the drive to perform that action.

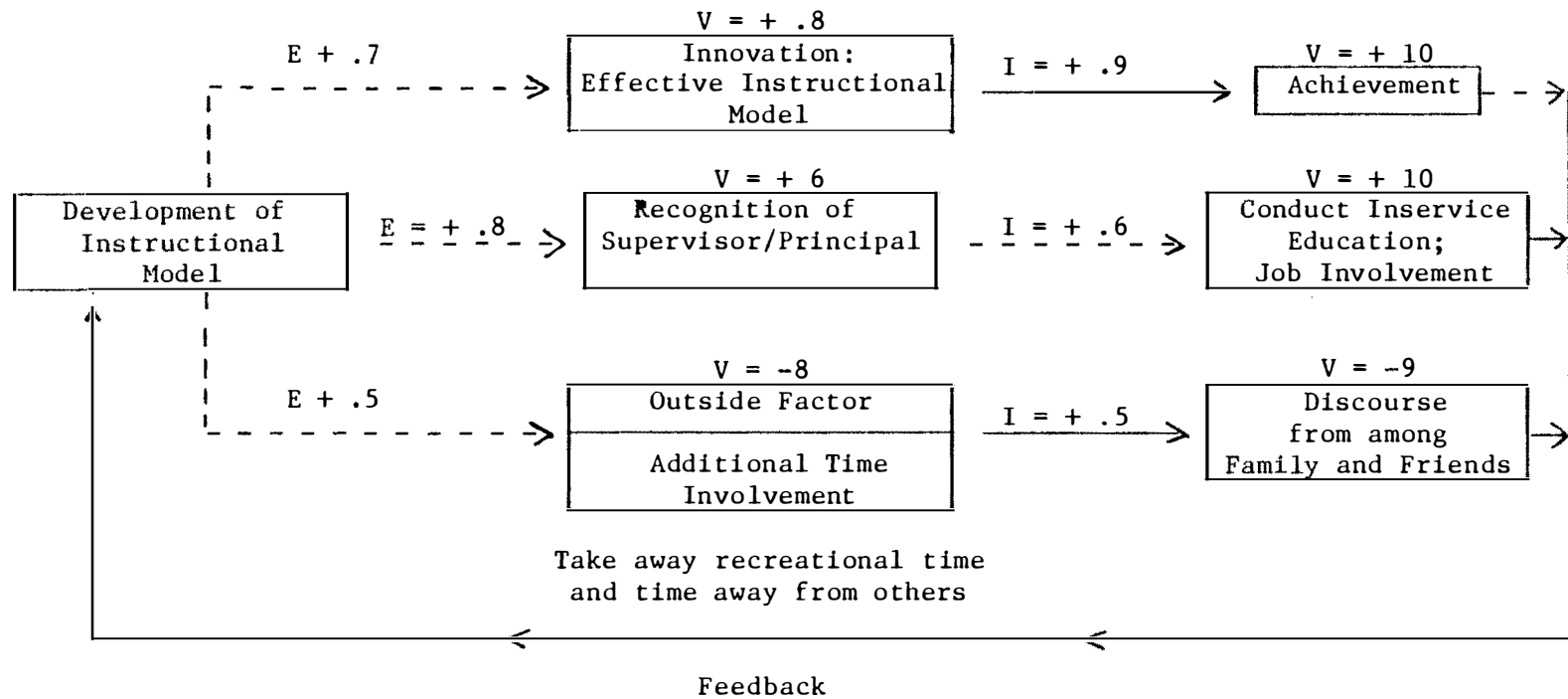
Expectancy theory deals with two basic types of outcomes, direct outcomes, the immediate result of an action, and the indirect outcomes, the consequences of the immediate results of the action. These specific types of outcomes form the foundation for the three basic components of Vroom's theory.

The first major component of the expectancy model deals with an individual's subjective assessment of the probability of certain outcomes. The perceived relationship between direct outcomes and indirect outcomes is termed instrumentality. This component attends more specifically to the performance outcome relationship. Instrumentality, therefore, refers to the subjective link between accomplishing an immediate outcome and the ability to reach other, related goals. The second major component relates to an individual's perception of the likelihood that the desired direct outcome is achievable. This component is termed expectancy and is utilized as an indication of the effort-performance relationship. Thus, expectancy is the extent to which people subjectively link their behavior to an immediate outcome or goal.

Vroom postulates that instrumentality and expectancy can be interrelated to develop a mathematical function. This product provides a measure of the degree of force of motivation present to perform a particular act.

In order to gain a more complete description of individual motivational behavior, the expectancy model also focuses on the attractiveness of possible indirect outcomes. This attractiveness component is termed valence. Valence is a measure of the relative importance of an outcome or goals to the individual. Vroom contends that discovering what is important to particular individuals would aid in motivation and improving job satisfaction. Figure 1 illustrates Vroom's model of the interrelationship of the basic components that comprise his theory.

Expectancy theory has served as the basis for several research studies relative to job satisfaction. In general, findings indicate that the quality of an individual's work is a function of the desirability of the possible outcomes and the utility of work for attaining those outcomes (Hackman & Porter, 1968; Lawler & Porter, 1967; Sheridan, Richards, & Slocum, 1975). Throughout these studies it was determined that the valence-instrumentality function was a predictor of performance and workplace satisfaction for inner-directed individuals (Lawler & Porter, 1967). This finding is supported by the characteristics that compare inner-directed individuals. This type of individual has a strong belief that outcomes can be affected through these other actions, thus creating



I = Instrumentality (Probability)  
 E = Expectancy (Probability)  
 V = Valance (Importance value)  
 (Modified by Barker from Bowditch and Buono, 1981)

Figure 1. Expectancy Motivation Model.

a higher expectancy of success. Due to this basic characteristic inner-directed individuals are more strongly motivated to strive for success.

Research that has been carried out relative to expectancy theory clearly and consistently indicates that individuals select occupations (Mitchell & Knudson, 1973; Wanous, 1972) and specific work tasks (Vroom, 1966) based on the perceived valence of the indirect outcomes as well as the instrumentalities of the various options for affecting these outcomes. Mischel's (1980) research found support for Vroom's principles concerning the educational workplace. His findings indicated high correlations between teachers' satisfaction and their effectiveness as rated by supervisors.

In general, expectancy theory indicates that an individual's choices and actions within the workplace are influenced by both the degree of attractiveness (valence) of the indirect outcomes, and the instrumentality of these choices or actions relative to achieving desirable goals. Thus, Vroom's work provides a base from which to examine the factors that contribute to job satisfaction and motivation.

In order to obtain accurate and predictable data concerning workplace satisfaction and its effect on productivity, both Herzberg's and Vroom's theoretical frameworks should be integrated. This synthesis of the job factors approach and the expectancies approach based on the work of Maslow seems to yield a more valid model for the determination of workplace satisfaction and motivation. Herzberg's

motivation-hygiene factors can be interpreted and applied through Vroom's model which concerns indirect outcomes of an individual's behavior within a job situation. As a result of the framework of expectancy theory, Herzberg's motivation factors are likely to yield a higher valence (to be more attractive) than hygiene factors, therefore exerting more influence on an individual's motivations. The apparent high valence of motivation factors may be due mainly to these factor outcomes being more closely associated with the effort specifically related to the individual. This close association with the individual would, therefore, more closely link these high valence factors with day-to-day expectancies. An example of this interrelationship can be seen in the context of an educational organization. A teacher can more readily expect praise (recognition), a sense of accomplishment (achievement), and the satisfaction of having learned something (growth) as outcomes of investing effort in teaching than expect an improvement in hygiene factors such as an increase in salary or better supervision as indirect outcomes of that expended effort.

A diagram illustrating the synthesis of Maslow's, Herzberg's, and Vroom's models is given in Figure 2 (Silver, 1982). This flow chart indicates that the motivation to perform tasks is affected by the expectancy that a particular outcome can be achieved and by the desirability of that outcome in terms of its indirect effects. Based on past experiences, individuals make subjective estimates of their own expectancies and the attainment of indirect outcomes.

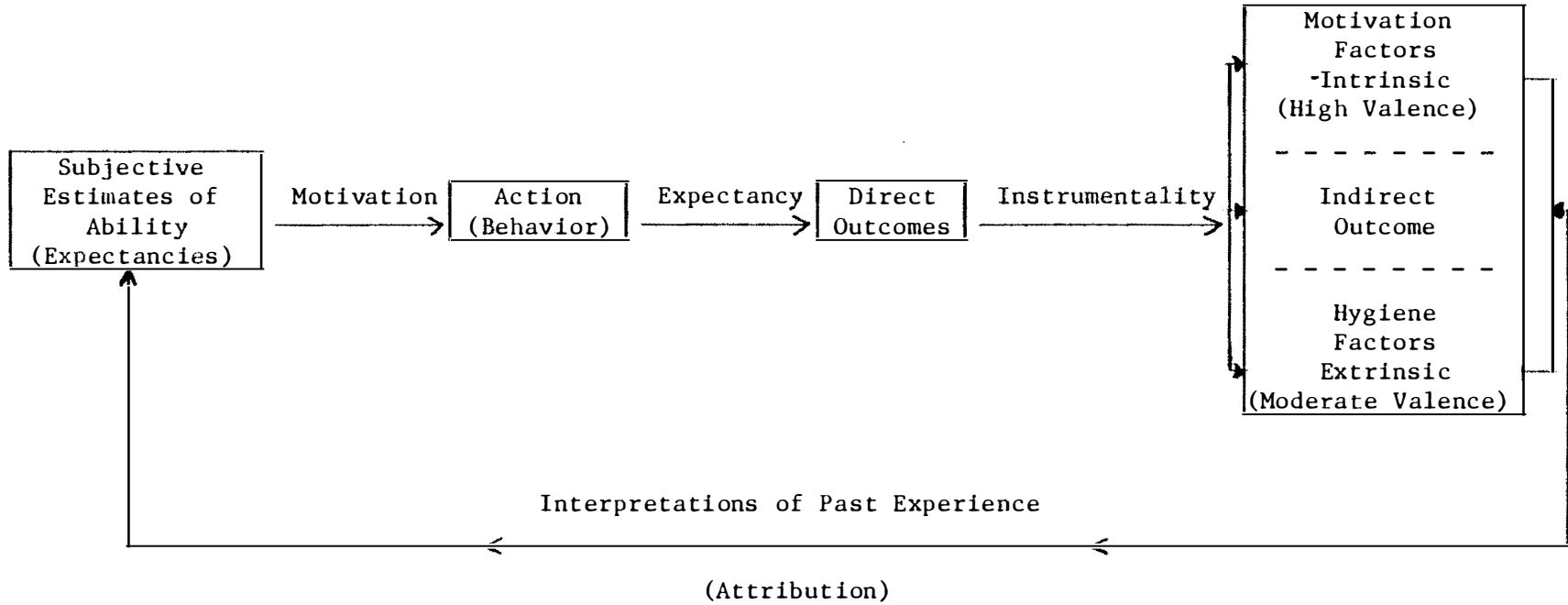


Figure 2. Synthesis of the Motivation-Hygiene (Job Factors) Approach and the Expectancies Approach (Silver, 1982).

These, in turn, affect their motivation to perform future job related tasks (Silver, 1982).

Research to support the appropriateness of the integrated model was completed by several individuals. The study carried out by Mitchell and Albright (1972) indicated a strong relationship among the factors of job satisfaction, effort, quality of performance, and retention. These interrelationships were more closely associated with valence-instrumentality functions for intrinsic motivation factors than with valence-instrumentality values for hygiene factors.

In order to more fully understand the theoretical foundation of the QWL process, two additional considerations must be examined. These additional factors are attribution theory and the concept of extrinsic and intrinsic rewards. Attribution theory is a method of problem solving in which the perceived causal links between antecedent conditions and factors are analyzed in an attempt to account for subsequent observed behavior. Briefly, attribution theory is applied first through the observation of a behavior. The behavior is then judged to be intentional or accidental. If the behavior is judged intentional, then an attempt is made to determine whether the action was caused by a situational factor or by the individual's personality. For example, if behavior for the same employee over different job tasks is similar when other employees' behavior differs for each task, then it is highly reasonable to attribute that person's behavior to personality traits instead of to job related characteristics. Thus, the attribution



model deals with factors that have input into the reasons why a particular individual acted in a certain way. However, when methods for determining and isolating these factors are not completely rational, attributional biases develop. These biases can occur when, for example, a manager thinks an employee's substandard work is an overt attempt to damage the firm. This behavior, therefore, may be attributed to personality traits (spite, anger, or prejudice) rather than situational factors such as inadequate time to do the job well. According to attribution theory, when an organization is experiencing difficulty or individuals are demoralized, available information is analyzed in such a way that an employee's behavior or attitudes are attributed to either personality or situational factors.

The final consideration relative to understanding motivation and its function as part of the QWL process is the concept of extrinsic and intrinsic rewards. Extrinsic rewards are thought of as the more traditional workplace rewards, such as pay, fringe benefits, and working conditions. In contrast, intrinsic rewards are less tangible, such as growth on the job, status, and interest or curiosity. These types of rewards are intimately related to the nature of the work experience while extrinsic rewards are related to the context and material aspects of the work itself.

Although both of these factors seem to have important input into workplace satisfaction, they do not function in an additive or cumulative manner. Research suggests that adding extrinsic

rewards to an already intrinsically rewarding job is redundant and does not necessarily increase an individual's motivation, performance, or satisfaction (Porter & Steers, 1973; Staw, 1976). As a result of the relationship between extrinsic and intrinsic job factors, organizations would benefit by offering jobs that are intrinsically motivating.

### III. SUMMARY

Through the adaptation of principles in the work of Maslow, Herzberg, and Vroom, a unified theory has been developed to support the motivational approach of the quality of worklife paradigm. This overall psychological theory provides the needed foundation to support the development of methods to analyze workplace attitudes. These attitudes have frequently developed from a set of assumptions that employees make concerning direct and indirect outcomes of their efforts. This unstated set of assumptions is frequently at the center of the unfavorable attitudes of employees relative to their organizations. These negative attitudes are often due to unfulfilled expectations related to perceived outcomes within the workplace. This lack of motivation has serious implications for all types of organizations. The advent of the two-career family and higher work-related expectations all mean that the dull, boring job of the past is less likely to be tolerated. Recently individuals have begun to use their affluence to enable them to be more careful in job selection, and many are leaving jobs that are unsatisfying.

One important organizational sector where this pattern appears to be occurring is in the educational community.

As indicated by the previous discussion, there is substantial theoretical foundation for the Quality of Work Life paradigm. This foundation provides a framework that can help give direction to job satisfaction research.

At present the principles of QWL are being utilized in business and industry to identify and improve important factors related to workplace satisfaction. There are as yet very few instances where these principles are being applied to educational organizations. As indicated in the previous sections there is virtually no systematic research to guide the preliminary QWL applications in school settings.

In view of the current crises in science and mathematics teacher attrition, the need for job satisfaction research concerning this population is apparent. Studies of this type would serve to extend knowledge relative to job satisfaction while strengthening the understanding of Quality of Work Life model.

## CHAPTER III

### METHODS AND PROCEDURES

#### I. INTRODUCTION

This study analyzed the major QWL factors that contribute to the job satisfaction of science and mathematics teachers. The study further ascertained how these factors could be utilized in the formulation of a program to effectively reduce attrition of these individuals from the educational organization. The specific research questions developed for this study were:

1. What are the basic QWL factors that affect job satisfaction within the educational organization?
2. What are the specific QWL factors that hold the most importance for science and mathematics teachers?
3. What is the current level of perceived satisfaction relative to the most important QWL factors held by science and mathematics teachers?
4. What type of QWL model would be useful in predicting possible QWL deficiencies that increase the risk of attrition in the science and mathematics teaching profession?

## II. STUDY DESIGN

Due to the preliminary nature of research within this area, the study was designed as a descriptive research project. This desirability relative to the descriptive research approach stems from the diversity offered through the use of this type of investigative strategy. Procedures that fall within the area of descriptive research allow for the analysis and evaluation of data through a variety of vectors. Through the use of both quantitative and qualitative techniques, meaningful data patterns can be identified and explained, yielding valid inferences and conclusions.

The descriptive research approach is not confined to a single methodology of data collection or analysis. In this study surveys and semistructured interviews were utilized to collect data. Analysis procedures relied upon nonparametric statistical methods in addition to more qualitative approaches such as content analysis. Figure 3 gives a flow chart representing the overall procedural framework for the study. Each of the flow chart components is explained in more detail within the body of Chapter II.

## III. INSTRUMENT DEVELOPMENT

In order to more thoroughly investigate specific aspects of each of the proposed research questions, a diversity of analysis procedures was employed. These research strategies included extensive search of literature relative to business and industrial publications

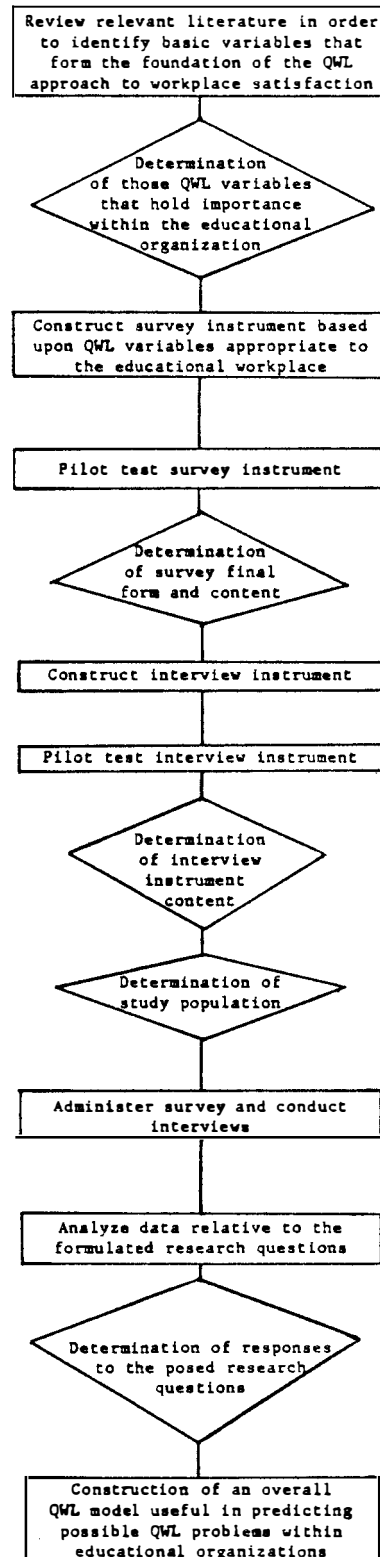


Figure 3. Procedural Flowchart.

as well as pertinent educational documents. As a result of this process an inventory of important QWL variables was constructed. The QWL variables were further considered and adapted to be more relevant to the educational workplace. The variables were then utilized to form the basis for both the survey and interview instruments.

Represented within Table 1 is a summary of studies involving aspects related to the basic workplace variables. These studies detail research efforts that have been made concerning basic aspects of the educational workplace that seem to be directly related to job satisfaction and the quality of worklife.

Aspects of intrinsic as well as extrinsic workplace factors serve, to a large degree, to determine employee job satisfaction. It is therefore important to access information that give valid indications of both the levels of importance and satisfaction concerning those workplace variables. One of the major ways that an organization can begin to gather data on the needs, values, perceptions, and expectations of its employee population is through a carefully constructed survey feedback program. Rather than simply assuming that teachers want more opportunity for growth, involvement in organizational decision making, more material support or even more money, a survey feedback program enables the organization to isolate these factors much more precisely.

The survey instrument utilized to form the basis of this study has been developed through the use of two specific sources

Table 1. Related Research: Major QWL Variables.

Variable Category	Authors	Type of Instrument*	General Description and/or Findings	N
Working Conditions	Faith, M. S., Bredeason, P. V., and Kaster, K. L. (1982)	1	Organizational incentives--hygiene factor, maintenance factor elements extrinsic to the job itself--context in which actual job is performed--work setting, working conditions--dissatisfier.	50
	Herzberg, F., Mausner, B., and Snyderman, B. (1959) also Frase, L. B., Netzel, R. W., and Grant, R. T. (1982)	2	One of the basic job hygiene factors--important primarily as a job dissatisfier.	NA**
	Cooke, R. A., Kornbluh, H., and Abramis, D. S. (1982)	1	Large number reported unpleasant work environment.	200
	Wangberg, E. C. et al. (1982)	1	Found working conditions to be major contributor to dissatisfaction.	255
Resources	Gallup (1984)	1	Lack of public financial support for educational programs.	813
	Ortiz, M. (1984)	4	Incentive program addressed the need for program resources.	NA
	Weaver, T. (1984)	3	Major dissatisfier among teachers (those who leave classroom)--lack of material support.	Analysis of studies
	Fruth, M. S. et al. (1982)	3	Study found that supplies and material important to satisfaction.	50
	Bradford, J. (1980)	3	Lack of supplies was cited as a major factor relating to job dissatisfaction.	80
Sense of Achievement	Harootunian, B. (1980)	3	Regardless of teaching level most teachers defined success in terms of their pupils' behaviors and activities--defined their task as successful when others (usually students) smile, praise, or reward them in some way.	237
	Cruikshank, D. R. (1982)	4	Teacher goals--student success.	NA
	Kaster, K. L. (1984)	3	Personal satisfaction from service and competence as a professional--institutionally dispensed rewards. Most fulfilled by watching children grow.	138



Table 1 (continued).

Variable Category	Authors	Type of Instrument*	General Description and/or Findings	N
Sense of Achievement (continued)	Ortiz, M. (1984)	4	Student achievement an incentive addressed by program.	NA
	Phiha, S. (1982)	1	Main intrinsic reward: Enjoying interactions with the students regardless of the outcomes--also achievement oriented and results; feeling instrumental in students' accomplishments.	30
Recognition	Chapman, D. W., and Hutcheson, S. M. (1981)	1	Teachers who remain in teaching oriented toward recognition and approval of others.	296
	Chapman, D. W. (1983)	1	Recognition actually received from administrators--strong positive relationship to career satisfaction.	2,933 returns mail survey
	Boyer, E. L. (1983)	2	Good teachers should be given adequate recognition and rewards.	NA
	Harootunian, B. (1980)	3	Most teachers define their task as successful when others (usually students) smile, praise, or reward them in some way.	237
	Golaszewski et al. (1984)	1	Lack of recognition added to stress.	73
	Gallup, A. (1980)	1	Outstanding performances go unrewarded.	813
	Glickman, C. D. (1985)	2	School improvement--rewarding capable teachers	NA
	Ortiz, M. (1984)	4	Recognition incorporated into incentive program.	NA
	Sergiovanni, T. S., and Carver, F. (1973)	3	Recognition key factor in motivation of teachers.	NA
	Hawkes, R., and Dedrick, D. (1982)	1	Lack of positive feedback from administration is one of the most important factors relating to teacher stress. Lack of recognition for teacher excellence.	312
	Maddux, C., Henderson, D., and Darby, C. (1980)	1	Lack of administrative appreciation was cited as a major reason for leaving the teaching profession.	900

Table 1 (continued).

Variable Category	Authors	Type of Instrument <sup>a</sup>	General Description and/or Findings	N
Work Load	Pellicer (1984)	1	Top priority concerns expressed by teachers. Excessive clerical work.	5 schools
	Boyer, E. L. (1983)	2	Teachers should have reduced work load--daily teaching and/or 4 regular class sessions. Should be exempt from non-teaching duties, i.e. monitoring halls, lunchrooms and recreation areas (non-instructional duties).	NA
	Golaszewski et al. (1984)	1	Role or work overload direct affect on level of stress.	73
	Litt, M. D., and Turk, D. C. (1985)	1	Too much paper work added to teacher stress.	326
	Darling-Hammond, L., and Wise, A. B. (1983)	2	Bureaucratization, paper work and unprofessional policies are driving teachers away.	NA
	Kaster, K. L. (1984)	1	Rewards--institutionally dispensed--smaller class size and help with paperwork.	138
	Ortiz, M. (1984)	2	Incentive addressed the aspect of work load as part of the program.	NA
	Weaver, T. (1984)	2	Factors that cause dissatisfaction: classroom crowding, non-instructional duties.	Analysis of studies
Support Systems	Pellicer, L. O. (1984)	1	Top priority concerns: job satisfaction, inconsistency of administration in dealing with student discipline problems, lack of parental and community support.	5 schools
	Boyer, E. L. (1983)	2	Teachers should be supported in the maintenance of discipline	NA
	Golaszewski et al. (1984)	1	Group support important factor in reducing stress.	73
	Farber, B. A. (1984)	1	Significant factor in the burnout process is the failure of administrators and parents to provide support and encouragement to teachers.	693
	Litt, M. D., and Turk, D. C. (1985)	1	Dissatisfaction with supervisor support is a major source of concern for teachers--support and interest given by principal major factor in job satisfaction.	326
	English, F. W. (1985)	2	ASCD task force on merit pay and career ladders--schools lack peer support system compared to other professions.	NA
	Gallup, A. (1980)	1	Lack of public support--disinterested parents.	813

Table 1 (continued).

Variable Category	Authors	Type of Instrument*	General Description and/or Findings	N
Support Systems (continued)	Kaater, K. L. (1984)	1	Support from administrators ranked high, but variable of assistance with curriculum and instruction ranked least important within the category (rewards listed by teacher).	138
	Lieberman, A., and Miller, L. (1984)	2	Need involvement in rewards making and participation and support.	NA
	Sparks, G. M. (1983)	4	Teachers improve most in schools where principal was supportive, clear and consistent in communicating school policies.	Synthesis of research
Inclusion	Tye, K. A., and Tye, B. B. (1984)	2	Conditions within schools promote sharing of new knowledge among staff members.	NA
	Cruickshank, D. R. (1984)	4	Teacher goal: maintain positive interpersonal relationships with colleagues; if not fulfilled, dissatisfaction.	NA
	Glickman, C. D. (1985)	2	Teacher isolation is a factor in school improvement.	NA
	Kaater, K. L. (1984)	1	More collegial and collaborative planning to improve instruction.	138
	Ortiz, M. (1984)	4	Communication of ideas throughout faculty addressed by program.	NA
	Lieberman, A., and Miller, L. (1984)	2	Teacher isolation a problem--need to provide collective experiences and activities.	Citation of many studies
	Fruth, M. S. (1982)	3	Isolation as an occupational problem--teachers spend time with other adults.	50
Job Enrichment	Boyer, E. L. (1983)	2	Increase job enrichment--teacher excellence fund--competition grant program to enable teacher to design and carry out professional projects.	NA
	Glickman, C. D. (1985)	2	Factors that inhibit school improvement: lack of professional dialogue--continue to lose teachers until work place becomes "professional."	NA
	Kaater, K. L. (1984)	1	Opportunities to attend meetings and conventions--institutional rewards.	138
	Lowther, M. H. (1984)	1	Job "lock-in"--opportunity for advancement important variable that affects teachers.	206

Table 1 (continued).

Variable Category	Authors	Type of Instrument*	General Description and/or Findings	N
Job Enrichment (continued)	Sergiovanni, T. J., and Carver, F. (1973)	2	Feels that much can be done to increase motivation of teachers; providing advancement opportunities--altering responsibilities among teachers--keying advancement to responsibilities.	NA
Status	Farber, B. A. (1984)	1	The majority of teachers were rarely or ever satisfied with the teachers' standing in today's society.	510
	Litt, M. D., and Turk, D. C. (1985)	1	Low status of teaching profession added to job stress.	326
	Gallup, A. (1980)	1	Low standing of teaching as a profession; teachers leaving.	813
	Lieberman, A., and Miller, L. (1984)	2	Various studies concluded status related to self perception. Teachers at present have precarious status.	NA
	Weaver, T. (1984)	4	Lack of status major dissatisfier among those teachers who leave classroom.	Analysis of studies
	Fraser, L. B., Stetzel, R. W., and Grant, R. T. (1982)	2	Addressed as one of Herzberg's important extrinsic factors to job satisfaction.	NA
	Sweeney, J. (1981)	1	Greatest need deficiency was perceived esteem, the prestige or status teachers feel in their school positions.	1,295
Formal Rewards System	Chapman, D. W., and Hutcheson, S. M. (1981)	1	Indicated salary important determinant of attrition.	296
	Boyer, E. L. (1983)	2	Teacher salaries should be increased 25% below rate of inflation.	NA
	Litt, M. D., and Turk, D. C. (1985)	1	Specific problems caused by inadequate salary caused increased stress.	326
	Gallup, A. (1980)	1	Salary still a major factor and very important.	900
	Kaeter, K. L. (1984)	1	Salary ranked low as a factor for entry to teaching--although a third of men and women were 50% support of family. Among top reasons for leaving profession--ranked lower for those not leaving.	10 schools 138
	Ortiz, M. (1984)	2	Salary incorporated into incentive program.	NA
	Weaver, T. (1984)	2	Salary overwhelmingly top dissatisfier--teachers leaving classroom.	Analysis of studies

Table 1 (continued).

Variable Category	Authors	Type of Instrument*	General Description and/or Findings	N
Formal Rewards System (continued)	Fruth, M. J. (1982)	3	Study indicated that respondents typically did not cite salary and fringe benefits as major sources of job satisfaction--secondary importance in terms of job satisfaction.	50
Work Control	Pellicer, L. O. (1984)	1	Top priority concerns (job satisfaction): inadequate planning time; behavior problems with students; teaching students in regular classrooms who have serious reading problem.	5 schools
	Chapman, D. W., and Hutcheon, S. M. (1981)	1	Teachers who left teaching indicated job autonomy important factor. Also chance to contribute to important decisions.	296
	Boyer, E. L. (1983)	2	Teacher should have more planning and paper work time--60 min/day class preparation and record keeping.	NA
	Tye, K. A., and Tye, B. B. (1984)	3	Teachers feel impotent to affect schoolwide decisions.	
	Golaszewski et al. (1984)	3	Discipline added to stress.	73
	English, F. W. (1985)	2	ASCD task force: teachers are not meaningfully involved in decisions that affect them directly.	NA
	Darling-Hammond, L., and Wise, A. B. (1983)	2	Calls for more peer evaluation in order to give teachers more work control.	NA
	Cruickshank, D. R. (1982)	4	Unfulfilled goal area for teachers: control.	NA
	Gallup, A. (1980)	1	Control of discipline.	900
	Glickman, C. D. (1985)	2	Factors that inhibit school improvement: restricted choice (schedules, curriculum policies), little impact into decision making.	NA
	Kaeter, K. L. (1984)	1	Rewards listed by teachers: more preparation time.	138
	Ortiz, M. (1984)	5	Autonomy in one's work addressed in incentive plan; also the importance of input into decisions.	Tusen Af. schools
	Lieberman, A., and Hiller, L. (1984)	2	Need involvement in decisions.	NA

Table 1 (continued).

Variable Category	Authors	Type of Instrument*	General Description and/or Findings	N
Work Control (continued)	Theirbach, G. L. (1980)	1	Teacher perceived levels of influence in the decision making process were significantly related to level of job satisfaction.	255
Growth	Chapman, D. W., and Lowther, M. A. (1982)	1	Importance assigned to actual accomplishments in learning new things-- positively related.	542
	Farber, B. A. (1984)	1	The large percentage of teachers felt their work did not provide opportunities for personal growth.	510
	Kaster, K. L. (1984)	1	Increased district support of additional education.	138
	Ortiz, M. (1984)	2	Professional development outside school addressed as component of incentive program--also in building staff development. Also incorporated advancement opportunities.	NA
	Lieberman, A., and Miller, L. (1984)	2	Teachers need to be provided experiences that will enable them to grow professionally.	NA
	Sparks, G. M. (1983)	4	Staff development more successful in atmosphere of trust, collegueship and formative evaluation in allowing for teacher growth.	Synthesis of research
	Weaver, T. (1984)	4	Lack of opportunities for growth and promotion major dissatisfiers among those who left teaching.	Analysis of studies
	Fruth, M. S. et al. (1982)	3	Study concluded that personal growth is a powerful incentive for excellent performance in the classroom.	50

\*1 = Likert scale questionnaire.

2 = Research based position paper.

3 = Questionnaire (non-Likert type)

4 = Other research and program evaluation.

\*\*NA = Not applicable.

of information. These sources include findings of previous investigations dealing with teacher job satisfaction as well as previously published instrumentation used to describe the perception of educational organizations.

As a result of this process, 12 variable categories were identified that relate directly to teacher perceptions of the quality of worklife within educational organizations. These variables address aspects of the workplace that are both intrinsic and extrinsic influences on job satisfaction. Extrinsic categories include working conditions, formal rewards, work load, work control, support systems, and program resources. Intrinsic variables that were identified address aspects of achievement, recognition, status, growth, inclusion, and job enrichment. These general variable categories represent the results of both quantitative and qualitative research concerning aspects of teacher stress, job satisfaction, and attrition studies. Specific findings of a representative sample of these studies are presented in Table 1. As indicated by the information contained in Table 1, each of the major variables that compose the survey instrument have been addressed within the context of several research efforts directed specifically at educational organizations.

In addition to the recent research findings that touch on the quality of worklife of professionals within education, several specific instruments that address workplace concerns were examined. These instruments include Hackman and Oldham's (1974) Job Diagnostic

Survey, Teacher Attitude Survey (modified version of the Maslach Burnout Inventory), Farber (1984), Minnesota Satisfaction Questionnaire (Elizur & Tziner, 1977), and Hoppock's Job Satisfaction Measure (McNichols, Stahl, & Manley, 1978).

Through the use of recent research findings as well as the use of specific components of other survey instruments, definitions of the variable categories that comprise the Quality of Worklife Survey were developed. These definitions are presented below:

**Recognition:** Acknowledgment of one's contributions and efforts (e.g., feedback from administrators, colleagues, students, community).

**Inclusion:** Participation as a fully accepted member of a group, with an accompanying sense of belonging experienced (e.g., total faculty, work groups, or individual colleagues).

**Growth:** Opportunities for personal development (renewal), of knowledge, skills, attitudes, and talents.

**Work Control:** Opportunities to control or expand one's work (e.g., involvement in decision affecting all aspects of one's workplace).

**Resources:** The materials, money, people, time, equipment, and other factors which are or may be available in performing one's job.

**Support Systems:** The organizational arrangements which bring resources to bear to deal with specific functions (e.g., psychological services, social services).



Formal Reward System: The contractual provisions for compensating people for their work, including salary, benefits and bonuses.

Working Conditions: The physical surroundings in which employees perform their jobs, including facilities and work space.

Work Load: The nature of assigned instructional and non-instructional duties, with consideration of both scope (e.g., number of contacts, class size) and appropriateness.

Job Enrichment: Opportunities to enhance the quality and variety of one's work through personal initiative, creativity, and leadership.

Sense of Achievement: Feelings of personal reward, confidence, and accomplishment ensuing from student performance, professional contributions, or perceived teaching quality.

Status: The prestige and importance ascribed by members of various groups (e.g., students, community) to a profession or occupation.

Each of the variable categories was subdivided into a series of specific statements in order to increase measurement precision. Respondents rated each statement as to importance and satisfaction on separate four-point scales. Demographic information pertinent to the analysis of responses was also obtained.

#### IV. INTERVIEW INSTRUMENT

A semistructured interview instrument was developed to support and validate the survey responses. Interview questions were

formulated to gain more specific information concerning teacher perceptions of the quality of worklife variables. These questions also served as a validation mechanism to substantiate written responses from the survey population. The instrument (see Appendix A) was composed of 12 questions that were designed to probe various aspects of teacher worklife. These questions were administered to a stratified random sample of the teaching staff at each of the study sites. In each case, the interview sample represented between 30 and 40% of the teaching faculty distributed proportionately across grade levels and subject areas.

## V. PILOT TESTING

Development of the survey instrument was based heavily, as noted above, on the findings of previous research studies. These prior investigations were used to arrive at an initial set of variables likely to influence teachers' perceptions of their workplace conditions. This initial framework was developed by The University of Tennessee, Knoxville, research team conducting an exploratory study of teacher worklife, and used as a basis for the instrumentation utilized in the present study.

During the exploratory or pilot year, the instrument and procedures for administration were extensively tested in five school districts located in four states. The administration process, which utilized a group setting with immediate retrieval of completed instruments by a research member, proved to be a workable procedure.

Respondents completed the survey instrument with virtually no apparent concern over confidentiality or time demand.

Several aspects of the instrument itself were, however, altered as a result of pilot testing. The response format was modified to include two rather than three scales. Those retained were the scales dealing with perceived importance of each item and current level of satisfaction with that aspect of work life. The scale which was omitted asked subjects to select four priority areas for changing their workplace conditions, information found to be essentially obtainable from their other responses. In the revised instrument, too, subjects were asked to respond to several specific statements relative to each general category (e.g., work load and recognition), rather than simply rating the general variables on each scale. This change was made to increase measurement precision, giving a clearer portrayal of the nature of perceived and valued workplace conditions.

One additional change emerging from the pilot testing was the inclusion of two further variable categories: job enrichment and status. These factors were identified through the initial survey and interview results as warranting specific attention in the subsequent data collection process. The revised survey instrument is presented in Appendix A.

## VI. PERCEIVED QUALITY OF WORK LIFE MEASURE

The concept utilized to quantitatively portray the perceived Quality of Work Life (pQWL) has been derived through an adaptation

of the work of Andrews and Withey (1976). Their work developed a conceptual definition for the perceived quality of life. This definition has been adapted to provide a framework through which to develop a mathematical measure of individual as well as group perceptions of the quality of working life.

Definition: The perceived quality of work life (pQWL) is a set of affective beliefs directed toward the totality of variables that comprise the individual's work environment (e.g., formal rewards, sense of achievement, and amount of work control) (p. 297).

Central to this definition of pQWL is "affect," defined by Naylor (1980) as a variable "psychological state, or feeling, and therefore a cognition of pleasure, happiness, well being, or satisfaction" (p. 32). The survey instrument was formulated to operationalize the concept of pQWL.

The QWL survey was designed to determine individual perceptions relative to specific intrinsic and extrinsic factors related to the work environment. Variables utilized as indicators of pQWL include: working conditions, resources, work load, support systems, formal reward systems, work control, inclusion, job enrichment, sense of achievement, recognition, growth, and status. Taken together these workplace variables form the foundation for the assessment of pQWL. It is therefore proposed that these pQWL variables function additively within a specific workplace. This relationship is given by equation 1.

$$\text{Eq. 1. } pQWL = (pQWL:V_1) + (pQWL:V_2) + \dots + (pQWL:V_n)$$

Expressed in summation form,

$$pQWL = \sum_{i=1}^n (pQWL:V_i)$$

where:

pQWL = overall perceived Quality of Work Life

pQWL:V<sub>i</sub> = perceived quality of each of the specific work  
life variables.

#### VII. PERCEIVED QUALITY OF WORKPLACE VARIABLES: (pQWL:V<sub>i</sub>)

Each of the variables that comprise Eq. 1 represents a set of workplace considerations addressed by the survey. For example, the variable termed "working conditions" is a composite built from perceptions concerning three specific aspects related to the physical environment of the work setting. These work environment aspects include adequacy of building facilities, availability of space and quality of maintenance. The perceived importance for each of the components that are a part of the various QWL variables is determined. The degree to which the individual perceives a variable to be of importance is a direct indicator of the level of personal value placed upon that variable (Diener, 1984; Rice et al., 1985). As a result of this concept, the importance values for each of the variables can be computed directly from survey responses. The importance value for each variable is therefore a summation of the level of response to each of the items within the variable category. After an indication of the degree of

importance is ascertained, a determination of the level of perceived satisfaction concerning the state of these variables within the workplace is obtained from the instrument.

The same items that serve to define the variable concerning importance level are also utilized to determine the perceived degree of satisfaction relative to the major workplace variables. The degree of satisfaction is treated as a summation of the level of item responses within each variable category, thus yielding a direct indication of individual or group perception.

In order to portray the  $pQWL:V_i$  for an individual or group, it is necessary to determine the relationship between the degree of importance and the level to which the variable is being satisfied. The term  $pQWL:V_i$  is being defined as a quotient computed by dividing the level of importance by the degree of satisfaction as given in equation 2.

$$\text{Eq. 2: } pQWL:V_i = (I_{V_i}/S_{V_i})$$

Where:

$I_{V_i}$  = sum of importance values within variable category

$S_{V_i}$  = sum of satisfaction values within variable category

$n$  = number of variable categories.

For example, an individual may perceive a variable to be relatively unimportant (an instrument response value of one) while concurrently indicating a high degree of satisfaction in terms of its fulfillment within the workplace (an instrument response

value of four). Through the use of the proposed  $pQWL:V_i$  expression this situation would be portrayed by a low quotient, in this example a value of .25 (1/4). This type of treatment of instrument responses yields a refined discrepancy measure that can be easily interpreted.

The overall pQWL can also be represented for any individual or group of individuals within the workplace. This overall pQWL representation is computed as the quotient of the summed importance values across items divided by the summed satisfaction values across items.

Equation 3 represents the computation procedure to determine this overall value.

$$\text{Equation 3: } pQWL = \frac{I_{V_1} + I_{V_2} \dots I_{V_n}}{S_{V_1} + S_{V_2} \dots S_{V_n}}$$

#### VIII. SAMPLE

The sample utilized within the study consisted of 479 secondary level classroom teachers. These teachers represented the full range of both academic and nonacademic instructional areas. In order to give the study more validity, participant facilities were chosen from various geographic regions and school district types. Six secondary schools from Tennessee, North Carolina, Ohio, and Illinois composed the study sample. These schools were purposely selected due to their involvement in a long term project, as well as to ensure a diversity in terms of socioeconomic base and student population. As a result of the population selection process 154

science and mathematics teachers were identified. These groups of teachers comprised the major subsample of interest. These individuals furnished an important subset of data related specifically to several components of the study.

## IX. DATA ANALYSIS

The data collected as a result of the study were compiled and analyzed through the use of qualitative and quantitative techniques. Qualitative methods were utilized to evaluate the information obtained from related literature. This information was summarized to provide a base for the development of the variable categories that composed the survey. Interview responses were analyzed through the use of content analysis techniques (Krippendorff, 1980). Survey results were analyzed through the use of several quantitative methodologies. All of these techniques functioned to form a network of analysis vectors through which to address the four basic research questions, singly and collectively. A summary of the analysis techniques relative to each specific research question is given below.

Research Question 1: What are the basic QWL factors that affect job satisfaction within the educational organization?

### Data Source

Literature concerning quality of school life, job satisfaction, teacher stress and attrition.

### : Analysis Procedure

Determination of major workplace issues that may have impact on job satisfaction and QWL perceptions. Summary of findings that were directly applicable to the formation of variable categories that composed the QWL survey instrument.



(Data Source)

Responses from the QWL survey instrument administered to the full range of classroom teachers at the study sites.

: (Analysis Procedure)

Computation the frequency of responses relative to the level of importance and level of satisfaction concerning each of the variable categories.

Computation of discrepancies between the perceived level of importance and the level of satisfaction.

Computation of means and standard deviations for the response categories (importance, satisfaction).

Computation of means and standard deviations for discrepancies.

Computation of the pQWL measures for each observation. Calculation of the mean, standard deviation for the pQWL measures relative to school type.

Research Question 2: What are the specific QWL factors

that hold the most importance for science and mathematics teachers?

Data Source

Survey responses from the science and mathematics teacher subset of the study population.

: Analysis Procedure

Computation of frequency of responses relative to the level of importance concerning each of the variable categories.

Calculation of means and standard deviations of responses.

Research Question 3: What is the current level of perceived

satisfaction relative to the specific QWL factors that hold importance for science and mathematics teachers?

Data Source: Analysis Procedure

Survey responses from the science and mathematics teacher subset of the study population.

Computation of frequency of responses relative to the level of satisfaction concerning each of the variable categories.

Calculation of discrepancies between the perceived level of importance and the level of satisfaction for each of the variable categories.

Computation of means and standard deviations for the discrepancies.

Computation of the pQWL measure for each observation.

Calculation of the means, standard deviations for the pQWL measures.

Research Question 4: What type of overall QWL model would be useful in predicting potential QWL deficiencies that increase the risk of attrition of individuals from the science and mathematics teaching profession?

Data Source: Analysis Procedures

Findings and conclusions concerning research questions one, two, and three.

Computation of means, standard deviations of the perception measures.

## CHAPTER IV

### ANALYSIS OF DATA

#### I. INTRODUCTION

The overall purpose of this investigation was to examine the major workplace factors that affect the job satisfaction of classroom teachers. The data presented in this chapter were gathered through site visits. This procedure yielded 479 usable survey instruments and 105 interviews. These data sources were examined relative to the total sample as well as the selected subgroups, science and mathematics teachers. Composition of the sample group reflected a wide range of demographic characteristics. Study participants represented five school districts in four states. The sample was composed of three middle schools and three high schools ranging in size from 500 to 2500 students. The socioeconomic levels, as measured by per pupil expenditure, ranged from \$2,100 to approximately \$5,000 per year. School settings included small town, suburban, and urban environments with enrollment ranging from largely minority to predominantly white.

A descriptive analysis of the response data provided a base from which correlations were calculated. These correlations, combined with frequency and perception index data, formed the foundation of the study. This information was then utilized to develop a

preliminary model of those factors that impact upon perceived job satisfaction within the educational workplace.

## II. SAMPLE CHARACTERISTICS

All individuals directly involved in the study were full-time classroom teachers. The mean years of teaching experience in the sample group was 12.9, with a range of 38 years. The mean number of years that members of the sample had been teaching in their present schools was 9.8, also with a range of 38 years.

Participating teachers represented a full range of academic and nonacademic subject areas taught at the secondary level. As shown in Table 2, study participants exhibited diversity in several other important job related characteristics. These characteristics include level of education, age, tenure status, gender, level of salary, as well as the ability level of students taught. Total numbers of individuals vary in some cases due to nonresponse to particular items.

The major subpopulation of interest was composed of science and mathematics teachers. This subpopulation was described by the same characteristics utilized to portray the total participant population. Tables 3 and 4 contain a summary of the job related characteristics that describe individuals whose major academic responsibility was science or mathematics. The mean numbers of years of teaching experience were 12.2 for science teachers (range = 32) and 12.9 for mathematics teachers (range = 37).

Table 2. Participant Characteristics.

Characteristic	Levels	Number of Individuals	Percent of Sample
Education:	Bachelor's	225	46.9
	Master's	236	49.3
	Ed. Specialist	12	2.5
	Doctorate	4	0.8
Age:	20-29	98	20.9
	30-39	185	38.6
	40-49	114	23.8
	50-59	72	15.0
	60+	8	1.7
Tenure	Yes	381	78.0
	No	98	22.0
Gender:	Male	200	42.6
	Female	279	57.4
Primary Source of Family Income:	Yes	343	71.9
	No	134	28.1
Salary:	Under \$15,000	58	12.1
	\$15,000-\$20,000	82	17.1
	\$20,001-\$25,000	99	20.7
	\$25,001-\$30,000	92	19.2
	\$30,001-\$35,000	60	12.5
	Over \$35,000	88	18.4
Member of Local Teach Organization:	Yes	332	69.4
	No	147	30.6
Student Characteris- tics (major teaching assignment):	Remedial/Low Achievers	146	30.5
	Average Ability	224	46.8
	Advanced/High Ability	109	22.8

Table 3. Science Teacher Characteristics.

Characteristic	Levels	Number of Individuals	Percent of Sample
Education:	Bachelor's	38	48.7
	Master's	36	46.2
	Ed. Specialist	2	2.6
	Doctorate	2	2.6
Age:	20-29	36	46.2
	30-39	36	46.2
	40-49	2	2.6
	50-59	2	2.6
	60+	2	2.6
Tenure	Yes	64	82.1
	No	14	17.9
Gender:	Male	42	55.3
	Female	36	44.7
Primary Source of Family Income:	Yes	58	74.4
	No	20	25.6
Salary:	Under \$15,000	8	10.3
	\$15,000-\$20,000	16	20.5
	\$20,001-\$25,000	20	25.6
	\$25,001-\$30,000	10	12.8
	\$30,001-\$35,000	6	7.7
	Over \$35,000	18	23.1
Member of Local Teach Organization:	Yes	58	74.4
	No	20	25.6
Student Characteris- tics (major teaching assignment):	Remedial/Low Achievers	12	15.4
	Average Ability	38	48.7
	Advanced/High Ability	28	35.9

Table 4. Mathematics Teacher Characteristics.

Characteristic	Levels	Number of Individuals	Percent of Sample
Education:	Bachelor's	34	44.7
	Master's	40	52.6
	Ed. Specialist	2	2.6
	Doctorate	0	0.0
Age:	20-29	14	18.4
	30-39	40	52.6
	40-49	10	13.2
	50-59	10	13.2
	60+	2	2.6
Tenure	Yes	58	78.4
	No	16	21.6
Gender:	Male	28	35.1
	Female	48	64.9
Primary Source of Family Income:	Yes	54	73.0
	No	22	27.0
Salary:	Under \$15,000	8	10.5
	\$15,000-\$20,000	12	15.8
	\$20,001-\$25,000	22	28.9
	\$25,001-\$30,000	14	18.4
	\$30,001-\$35,000	10	13.2
	Over \$35,000	10	13.2
Member of Local Teach Organization:	Yes	60	79.0
	No	20	21.0
Student Characteris- tics (major teaching assignment):	Remedial/Low Achievers	20	26.3
	Average Ability	32	42.1
	Advanced/High Ability	24	31.6

In terms of years in their present schools, the mean for science teachers was 9.5 years (range = 30) and for mathematics teachers 8.7 years (range = 27).

### III. FACTORS IMPORTANT TO JOB SATISFACTION

The first research question asked: What are the basic QWL factors that affect job satisfaction within the educational organization? This section presents findings concerning that major focus of the investigation. As indicated in Chapters II and III, a number of studies have addressed specific facets of the quality of work life. A summary of 36 of the more recent of these studies is presented in Chapter III. The findings of these studies indicate a definite concern expressed by individuals within educational organizations about workplace factors that are directly related to the 12 key QWL variables utilized as a base for the present study. These major QWL variables include: working conditions, resources, work load, support systems, formal reward system, work control, inclusion, job enrichment, sense of achievement, recognition, growth, and status. Although prior studies have addressed various aspects related to these key variables, they have failed to give an indication of the relative importance of these variables to individuals within the educational workplace.

In order to examine more fully the perceived importance of these 12 variables, 490 secondary classroom teachers, representing 6 school districts, were asked to complete the instrument. This



procedure yielded 479 usable instruments (98% completion rate). The results in terms of frequencies of responses are summarized in Table 5. As indicated by response frequencies, virtually all the major QWL variables were considered important to very important by a high percentage of the respondents. This table summarizes the frequencies computed on the basis of responses to each of the items that serve to define the variable. Table 5 also gives the mean percentage of respondents across all variable items who perceived the category as important or very important.

As analysis of Table 5 reveals, all but a few items that comprise the instrument were perceived as important or very important to the quality of the workplace. Among the specific items reflecting a general perception of workplace unimportance (at least 15% of the respondents indicating unimportant or little importance) were:

- Distribution of non-instructional duties (23.4%)
- Community organizations' support of school programs (16.7%)
- Availability of monetary incentives (19.8%)
- Satisfaction derived from professional contributions (30.0%)
- Opportunities for leadership roles with the school system (20.6%)
- Opportunities for advancement within the school system (19.7%)

In order to determine the relative importance of each major variable category to the overall perception of workplace quality,

Table 5. Response Percentages, Means, and Standard Deviations for Item Importance: Total Sample.

CATEGORY		Unimportant (1)	Little Important (2)	Important (3)	Very Important (4)	Response Mean	Response Standard Deviation
SCHOOL LIFE FACTORS							
Working Conditions	1. Adequacy of the building facilities	3.8	0.8	44.7	50.3	3.51	.556
	2. Availability of needed work space	0.8	0.4	45.3	53.5	3.51	.556
	3. Quality of maintenance	0.4	0.8	52.3	44.5	3.43	.536
Resources	4. Availability of needed materials	0.0	0.4	28.4	71.2	3.71	.464
	5. Availability of equipment	0.4	0.4	36.7	62.4	3.61	.521
	6. Level of financial support for programs	0.4	1.3	37.6	60.8	3.59	.541
Work Load	7. Number of student contacts per day	0.8	4.2	34.0	60.9	3.55	.618
	8. Class size	1.3	1.7	23.4	73.7	3.69	.567
	9. Provision for planning time	0.0	0.8	32.2	67.0	3.66	.491
	10. Distribution of non-instructional duties	1.7	21.5	40.5	36.3	3.11	.796
	11. Instructional work assignments related to expertise	0.0	3.8	41.6	54.7	3.51	.571
Support Systems	12. Administrative support for: discipline instructional process and procedures	0.8	1.7	11.5	86.0	3.83	.417
	new ideas (e.g. curriculum, teaching strategies)	0.0	4.4	27.4	68.3	3.64	.565
		0.0	3.6	36.5	59.9	3.56	.564
	13. Community organizations support of school programs	2.1	14.6	51.9	31.3	3.13	.727
	14. Parental support of school activities and programs	0.8	4.2	43.0	51.9	3.46	.619
Formal Rewards System	15. Level of salary	0.0	3.9	30.3	65.8	3.62	.562
	16. Level of benefits	0.4	4.4	27.9	67.3	3.62	.591
	17. Availability of monetary incentives	3.4	16.4	36.9	43.4	3.20	.832
	18. Opportunities for promotion	3.3	18.6	40.7	37.4	3.12	.825
Work Control	19. Opportunity to: participate in school-wide decisions	1.3	9.2	56.4	33.2	3.22	.655
	affect departmental decisions	0.0	3.3	48.0	48.6	3.45	.562
	make decisions regarding student discipline	0.8	5.6	46.9	46.6	3.39	.634
	make decisions regarding instructional methods	1.3	2.9	37.6	58.3	3.53	.619
	make decisions regarding course content	0.8	2.1	28.6	58.5	3.55	.583

Table 5 (continued).

CATEGORY	SCHOOL LIFE FACTORS	Unimportant (1)	Little Importance (2)	Important (3)	Very Important (4)	Response Mean	Response Standard Deviation
Inclusion	20. Sense of personal involvement in: faculty work activities	1.7	11.5	63.5	23.4	3.09	.639
	decision making process	0.4	5.9	62.6	31.1	3.24	.572
	day to day interactions with staff members	1.3	6.3	55.7	36.7	3.28	.635
	21. Willingness of staff to include new staff	1.3	4.6	51.6	42.6	3.36	.629
	22. Sense of mutual trust: with colleagues	0.4	2.5	38.8	58.3	3.55	.569
	with administrative staff	0.0	1.3	35.3	63.3	3.63	.533
Job Enrichment	23. Opportunity to: use own best abilities	0.0	0.8	27.1	72.0	3.71	.471
	initiate new and creative ideas	0.0	0.8	34.2	64.9	3.64	.497
	assume leadership roles	0.4	8.9	51.9	38.6	3.29	.641
	24. Opportunity for a variety of work experiences	0.8	9.4	55.9	33.8	3.23	.644
Sense of Achievement	25. Personal reward when students perform well	0.0	6.3	31.3	62.4	3.56	.610
	26. Confidence felt in quality of teaching	0.4	0.0	24.4	75.2	3.74	.465
	27. Satisfaction derived from professional contributions (e.g., prof. organ., forums, articles, projects)	5.9	24.8	50.3	18.9	2.82	.802
Recognition	28. Appreciation expressed by students	0.4	8.1	51.6	39.9	3.31	.634
	29. Attention by administrators for quality of work	0.4	2.9	45.3	51.4	3.48	.578
	30. Peer approval and support for contributions	1.3	7.1	50.5	41.1	3.32	.659
	31. Commendations from parents/community members	1.7	11.1	55.5	31.7	3.17	.682
Growth	32. Opportunity to develop own best skills, abilities, talents	0.0	0.8	43.8	55.3	3.54	.515
	33. Opportunities for: leadership roles within the school system	1.7	18.9	53.7	25.7	3.03	.717
	advancement within the school system	3.3	16.1	53.4	27.1	3.04	.752
Status	34. Satisfaction with status of teaching as a profession						
	as perceived by students	0.0	5.2	48.6	46.1	3.41	.589
	as perceived by colleagues	0.0	4.2	46.9	48.9	3.45	.576
	as perceived by parents and community	0.0	5.9	45.1	49.1	3.43	.603
	35. Personal satisfaction with prestige of teaching as a profession	0.4	2.9	28.6	68.1	3.64	.560

a comparison among these major variables was required. However, the varying numbers of items that compose each variable category make direct comparison among major variables difficult. Therefore, a variable category weighting system was developed to aid in the more uniform portrayal and interpretation of each of the major survey areas. Each response possibility of the Likert scale was assigned a numerical value, with unimportant = 1, little importance = 2, important = 3 and very important = 4. The individual category items can therefore be portrayed as the sum of the response values indicating the level of perceived importance. However, due to the unequal numbers of items that compose each major category, the item totals for each category can not be directly compared. Thus, each variable category was assigned a weighting factor. This factor placed all the basic variables on a numerical scale between 0 and 48. A resultant value of 0 for a category indicated complete unimportance, while a rating of very important was indicated by a value of 48. Table 6 contains the results of these computations for all the major variable categories.

As can be seen from Table 6, most major variables were very similar in terms of perceived importance as portrayed by the mean values. Resources, work load and support systems received the highest perception of workplace importance, while the categories related to recognition and growth received the lowest importance ratings. It is interesting to note that the perceived level of importance among all major categories fell within a relatively narrow range (5.13).

Table 6. Weighted Importance Values: Total Sample.

Variable Category	$\bar{X}$	SD
Working Conditions	41.59	5.88
Resources	43.62	4.89
Work Load	42.08	4.99
Support Systems	42.28	4.98
Formal Rewards System	40.69	6.78
Work Control	41.13	5.37
Inclusion	40.28	4.95
Job Enrichment	41.61	5.23
Sense of Achievement	41.61	5.23
Recognition	39.82	5.94
Growth	38.49	6.15
Status	41.79	5.68

N = 479; possible importance values 0 to 48.

#### IV. QWL FACTORS IMPORTANT TO SCIENCE AND MATHEMATICS TEACHERS

The second research question pertained to the determination of QWL factors perceived by science and mathematics teachers as important to their workplace satisfaction. Findings are presented in this section relative to just science teachers and then mathematics teachers in the sample. Table 7 contains a summary of the response frequencies relative to the perceived importance of each item included in the survey instrument. Data represented in the table indicate that the majority of survey items were perceived as either important or very important to the quality of work life. However, several items received a moderate number of responses indicating a relative lack of importance attributed to these potential influences on work place quality. Items receiving a frequency response of more than 15% in the categories of unimportant or of little importance include:

- Distribution of non-instructional duties
- Community organization's support of school programs
- Opportunity to participate in school-wide decisions
- Opportunity for leadership roles within the school system
- Opportunity for advancement within the school system
- Satisfaction derived from professional contributions
- Opportunities for promotion

As portrayed in Table 8, the weighted importance values computed for the subgroup of science teachers conformed to a

Table 7. Science Teachers' Response Percentages, Means, and Standard Deviations for Item Importance: Total Sample.

CATEGORY		Unimportant (1)	Little Importance (2)	Important (3)	Very Important (4)	Response Mean	Response Standard Deviation
SCHOOL LIFE FACTORS							
Working Conditions	1. Adequacy of the building facilities	10.3	0.0	35.9	53.9	3.61	.490
	2. Availability of needed work space	2.6	0.0	38.5	58.9	3.54	.638
	3. Quality of maintenance	0.0	2.6	56.4	41.0	3.38	.570
Resources	4. Availability of needed materials	0.0	0.0	30.8	69.2	3.69	.465
	5. Availability of equipment	0.0	0.0	41.0	58.9	3.59	.495
	6. Level of financial support for programs	0.0	0.0	28.2	71.8	3.72	.453
Work Load	7. Number of student contacts per day	0.0	0.0	38.5	61.5	3.62	.490
	8. Class size	2.6	0.0	23.1	74.4	3.69	.610
	9. Provision for planning time	0.0	0.0	30.8	69.2	3.69	.465
	10. Distribution of non-instructional duties	2.6	23.1	38.5	35.9	3.08	.834
	11. Instructional work assignments related to expertise	0.0	7.7	38.5	53.9	3.46	.638
Support Systems	12. Administrative support for: discipline	0.0	7.7	12.8	79.5	3.72	.601
	instructional process	0.0	2.6	33.3	64.1	3.02	.580
	and procedures	0.0	2.6	43.6	53.9	3.51	.552
	13. Community organizations support of school programs	2.5	12.8	53.9	30.8	3.13	.727
	14. Parental support of school activities and programs	0.0	10.3	51.3	38.5	3.28	.643
Formal Rewards System	15. Level of salary	0.0	7.7	28.2	64.1	3.56	.636
	16. Level of benefits	2.6	5.1	23.1	69.2	3.59	.711
	17. Availability of monetary incentives	2.6	17.9	48.7	30.8	3.08	.769
	18. Opportunities for promotion	10.3	15.4	38.5	35.9	3.00	.967
Work Control	19. Opportunity to: participate in school-wide decisions	2.6	15.4	56.4	25.6	3.05	.719
	affect departmental decisions	0.0	5.1	58.9	35.9	3.31	.565
	make decisions regarding student discipline	0.0	7.7	51.3	41.0	3.33	.617
	make decisions regarding instructional methods	0.0	0.0	38.5	61.5	3.62	.490
	make decisions regarding course content	0.0	5.1	41.0	53.9	3.49	.597

Table 7 (continued).

CATEGORY	SCHOOL LIFE FACTORS	Unimportant (1)	Little Importance (2)	Important (3)	Very Important (4)	Response Mean	Response Standard Deviation
Inclusion	20. Sense of personal involvement in: faculty work activities	2.6	10.3	66.7	20.5	3.05	.643
	decision making process	2.6	5.1	71.8	20.5	3.10	.594
	day to day interactions with staff members	0.0	10.3	66.7	23.1	3.13	.567
	21. Willingness of staff to include new staff	0.0	7.7	61.5	30.8	3.23	.579
	22. Sense of mutual trust: with colleagues	0.0	2.6	43.6	53.9	3.51	.552
	with administrative staff	1.3	2.6	44.9	51.3	3.54	.678
Job Enrichment	23. Opportunity to: use own best abilities	0.0	0.0	35.9	64.1	3.64	.483
	initiate new and creative ideas	0.0	0.0	41.0	58.9	3.59	.495
	assume leadership roles	0.0	10.3	53.9	35.9	3.26	.633
	24. Opportunity for a variety of work experiences	0.0	7.7	66.7	25.6	3.18	.582
Sense of Achievement	25. Personal reward when students perform well	0.0	12.8	30.8	56.4	3.44	.713
	26. Confidence felt in quality of teaching	0.0	0.0	28.2	71.8	3.72	.453
	27. Satisfaction derived from professional contributions (a.g., prof. organ., forums, articles, projects)	5.1	17.9	48.7	28.2	3.00	.822
Recognition	28. Appreciation expressed by students	0.0	7.7	66.7	25.6	3.18	.552
	29. Attention by administrators for quality of work	0.0	7.7	51.3	41.0	3.33	.617
	30. Peer approval and support for contributions	2.6	10.3	53.9	33.3	3.18	.716
	31. Commendations from parents/community members	0.0	12.8	61.5	25.6	3.13	.611
Growth	32. Opportunity to develop own best skills, abilities, talents	0.0	0.0	53.9	46.1	3.46	.502
	33. Opportunities for: leadership roles within the school system	2.6	12.8	56.4	28.2	3.10	.713
	advancement within the school system	5.1	15.4	56.4	23.1	2.97	.772
Status	34. Satisfaction with status of teaching as a profession						
	as perceived by students	0.0	5.1	51.3	43.6	3.38	.586
	as perceived by colleagues	0.0	2.6	52.6	44.7	3.42	.548
	as perceived by parents and community	0.0	10.3	43.6	46.2	3.36	.664
	35. Personal satisfaction with prestige of teaching as a profession	0.0	2.6	25.6	71.8	3.69	.517



Table 8. Weighted Importance Values: Science Teachers.

Variable Category	$\bar{X}$	SD
Working Conditions	41.03	6.93
Resources	44.00	4.37
Work Load	42.09	5.09
Support Systems	41.42	5.44
Formal Rewards System	39.69	7.44
Work Control	40.31	5.02
Inclusion	39.13	4.86
Job Enrichment	41.00	5.04
Sense of Achievement	40.62	5.51
Recognition	38.46	5.51
Growth	38.15	5.89
Status	41.53	5.57

N = 78; possible importance values 0 to 48.

relatively narrow range of mean values (range = 5.9). The variable category related to resources was perceived as most important to workplace quality (44.0) while the growth variable was selected as having the least workplace impact (38.15).

Mathematics teachers formed the second subgroup of concern. Table 9 contains a summary of the response frequencies given by 76 mathematics teachers. Data in the table represent the response percentages and the mean levels of response as well as the response standard deviations. This information indicates that the majority of instrument items was considered important or very important to workplace quality. In contrast to the general perception of importance, several specific items were considered relatively unimportant. Items receiving a frequency response of more than 15% in the categories of unimportant or of little importance included:

- Adequacy of the building facilities
- Distribution of non-instructional duties
- Community organizations' support of school programs
- Availability of monetary incentives
- Opportunities for promotion
- Opportunities to participate in school-wide decisions
- Sense of personal involvement in faculty work activities
- Satisfaction derived from professional contributions
- Opportunities for advancement within the school system
- Opportunities for leadership roles within the school system

Table 9. Mathematics Teachers' Response Percentages, Means, and Standard Deviations for Item Importance: Total Sample.

CATEGORY		Unimportant (1)	Little Importance (2)	Important (3)	Very Important (4)	Response Mean	Response Standard Deviation
SCHOOL LIFE FACTORS							
Working Conditions	1. Adequacy of the building facilities	8.9	6.3	42.4	42.4	3.45	.719
	2. Availability of needed work space	2.6	0.0	50.0	47.4	3.42	.638
	3. Quality of maintenance	0.0	2.6	55.3	42.1	3.39	.544
Resources	4. Availability of needed materials	0.0	0.0	26.3	73.7	3.74	.443
	5. Availability of equipment	2.6	2.6	28.9	65.8	3.58	.628
	6. Level of financial support for programs	2.6	2.6	39.5	55.3	3.47	.682
Work Load	7. Number of student contacts per day	0.0	7.9	31.6	60.5	3.53	.642
	8. Class size	0.0	0.0	26.3	73.7	3.74	.443
	9. Provision for planning time	0.0	2.6	28.9	68.4	3.66	.530
	10. Distribution of non-instructional duties	0.0	23.7	42.1	34.2	3.11	.759
	11. Instructional work assignments related to expertise	0.0	5.3	26.3	68.4	3.63	.585
Support Systems	12. Administrative support for: discipline instructional process and procedures	2.6	0.0	15.8	81.6	3.76	.586
	new ideas (e.g. curriculum, teaching strategies)	0.0	7.9	34.2	57.9	3.50	.643
	13. Community organizations support of school programs	0.0	5.3	39.5	55.3	3.50	.600
	14. Parental support of school activities and programs	5.3	23.7	44.7	26.3	2.92	.845
Formal Rewards System	15. Level of salary	2.6	2.6	39.5	55.3	3.47	.683
	16. Level of benefits	0.0	2.6	31.6	65.8	3.63	.538
	17. Availability of monetary incentives	0.0	5.3	26.3	68.4	3.63	.585
	18. Opportunities for promotion	2.6	15.8	34.2	47.4	3.26	.822
Work Control	19. Opportunities for promotion	5.3	15.8	34.2	44.7	3.18	.890
	19. Opportunity to: participate in school-wide decisions	2.6	13.2	50.0	34.2	3.16	.749
	affect departmental decisions	0.0	2.6	44.7	52.6	3.50	.554
	make decisions regarding student discipline	2.6	5.3	36.8	55.3	3.45	.719
	make decisions regarding instructional methods	2.6	0.0	31.6	65.8	3.61	.634
	make decisions regarding course content	0.0	0.0	36.8	63.2	3.63	.486

Table 9 (continued).

CATEGORY	SCHOOL LIFE FACTORS	Unimportant (1)	Little Importance (2)	Important (3)	Very Important (4)	Response Mean	Response Standard Deviation
Inclusion	20. Sense of personal involvement in: faculty work activities	5.3	13.2	60.5	21.0	2.97	.748
	decision making process	0.0	7.9	65.8	26.3	3.18	.539
	day to day interactions with staff members	2.6	5.3	52.6	39.5	3.29	.689
	21. Willingness of staff to include new staff	0.0	0.0	52.6	47.4	3.47	.503
	22. Sense of mutual trust: with colleagues	0.0	2.6	36.8	60.5	3.58	.548
	with administrative staff	0.0	0.0	34.2	65.8	3.66	.478
Job Enrichment	23. Opportunity to: use own best abilities	0.0	2.6	23.7	73.7	3.71	.512
	initiate new and creative ideas	0.0	0.0	42.1	57.9	3.58	.497
	assume leadership roles	0.0	10.5	68.4	21.1	3.11	.556
	24. Opportunity for a variety of work experiences	2.6	5.3	68.4	23.7	3.13	.618
Sense of Achievement	25. Personal reward when students perform well	0.0	2.6	34.2	63.2	3.61	.544
	26. Confidence felt in quality of teaching	2.6	0.0	18.4	78.9	3.74	.597
	27. Satisfaction derived from professional contributions (e.g., prof. organ., forums, articles, projects)	7.9	18.4	55.3	18.4	2.84	.817
Recognition	28. Appreciation expressed by students	0.0	7.9	50.0	42.1	3.34	.623
	29. Attention by administrators for quality of work	0.0	2.6	50.0	47.4	3.45	.551
	30. Peer approval and support for contributions	0.0	13.2	44.7	42.1	3.29	.689
	31. Commendations from parents/community members	2.6	0.0	63.2	34.2	3.29	.607
Growth	32. Opportunity to develop own best skills, abilities, talents	0.0	0.0	39.5	60.5	3.61	.492
	33. Opportunities for: leadership roles within the school system	0.0	21.1	52.6	26.3	3.05	.691
	advancement within the school system	2.6	15.8	55.3	26.3	3.05	.728
Status	34. Satisfaction with status of teaching as a profession						
	as perceived by students	0.0	0.0	34.2	65.8	3.66	.478
	as perceived by colleagues	0.0	5.3	28.9	65.8	3.61	.591
	as perceived by parents and community	0.0	5.3	28.9	65.8	3.61	.591
	35. Personal satisfaction with prestige of teaching as a profession	0.0	5.3	18.4	76.3	3.71	.561

Table 10 depicts the weighted importance values computed for the subgroup of mathematics teachers. Results conformed to a relatively narrow range of mean values (range = 4.9). The variable category related to status was perceived as most important to workplace quality (43.74), while the growth variable was perceived as having the least workplace importance (38.84).

#### V. SATISFACTION LEVELS AMONG TOTAL SAMPLE AND SUBGROUPS

Determination of the current level of perceived satisfaction relative to those QWL factors regarded by sample members as important represented the third research question. In order to address this aspect of the investigation, the survey instrument not only determined the perceived importance of the items that compose each variable category, but also identified the perceived level to which each item was being satisfied within the workplace context. In this section, reported satisfaction levels are portrayed.

Total sample and subgroup response frequencies, means, and standard deviations are summarized in Tables 11, 12, and 13. Percentages of frequency response to each level of satisfaction were classified into the response categories of very poor, poor, good, and very good. In addition, each response category was assigned a numeric value in order to allow for the computation of an item response mean and standard deviation (i.e., very poor = 1; poor = 2; good = 3; very good = 4).

Table 10. Weighted Importance Values: Mathematics Teachers.

Variable Category	$\bar{X}$	SD
Working Conditions	40.42	7.08
Resources	43.16	5.78
Work Load	42.38	4.23
Support Systems	41.18	5.64
Formal Rewards System	41.13	7.19
Work Control	41.62	5.55
Inclusion	40.32	4.27
Job Enrichment	40.58	4.42
Sense of Achievement	40.74	4.88
Recognition	40.11	5.60
Growth	38.84	6.12
Status	43.74	5.57

N = 76; possible importance values 0 to 48.

Table 11. Total Sample Response Percentages, Means, and Standard Deviations for Item Satisfaction.

CATEGORY		Very Poor (1)	Poor (2)	Good (3)	Very Good (4)	Response Means	Response Standard Deviations
SCHOOL LIFE FACTORS							
Working Conditions	1. Adequacy of the building facilities	5.6	15.9	56.2	21.9	2.95	.715
	2. Availability of needed work space	6.5	30.5	45.1	18.2	2.75	.822
	3. Quality of maintenance	4.8	26.9	55.9	12.3	2.76	.726
Resources	4. Availability of needed materials	1.3	15.7	51.8	31.3	3.13	.709
	5. Availability of equipment	1.7	18.9	55.5	29.9	3.13	.691
	6. Level of financial support for programs	3.3	15.9	52.4	28.4	3.06	.758
Work Load	7. Number of student contacts per day	3.9	21.3	60.9	13.8	2.85	.698
	8. Class size	7.7	30.7	46.4	15.2	2.69	.821
	9. Provision for planning time	2.7	24.8	50.9	21.5	2.91	.752
	10. Distribution of non-instructional duties	10.7	27.8	50.7	10.9	2.62	.817
	11. Instructional work assignments related to expertise	2.9	14.2	58.0	24.8	3.05	.711
Support Systems	12. Administrative support for: discipline instructional process and procedures new ideas (e.g. curriculum, teaching strategies)	5.2	16.5	40.9	37.4	3.10	.859
		1.7	12.7	58.9	26.7	3.10	.672
		4.2	18.9	57.8	18.9	2.92	.736
	13. Community organizations support of school programs	5.0	26.1	57.8	11.1	2.75	.714
	14. Parental support of school activities and programs	8.9	21.3	55.1	14.6	2.75	.811
Formal Rewards System	15. Level of salary	15.5	25.5	51.4	7.7	2.51	.845
	16. Level of benefits	13.4	25.2	50.7	10.7	2.59	.852
	17. Availability of monetary incentives	27.9	38.4	29.0	4.6	2.10	.863
	18. Opportunities for promotion	26.3	42.2	27.8	3.8	2.09	.827
Work Control	19. Opportunity to: participate in school-wide decisions	12.9	37.4	47.6	2.1	2.39	.734
	affect departmental decisions	4.6	24.1	54.9	16.4	2.83	.749
	make decisions regarding student discipline	5.9	20.3	59.9	13.9	2.82	.738
	make decisions regarding instructional methods	2.5	7.5	59.1	30.9	3.18	.672
	make decisions regarding course content	3.3	11.7	53.9	31.1	3.13	.739

Table 11 (continued).

CATEGORY		SCHOOL LIFE FACTORS	Very Poor (1)	Poor (2)	Good (3)	Very Good (4)	Response Means	Response Standard Deviations
Inclusion	20.	Sense of personal involvement in: faculty work activities	3.4	20.1	68.3	8.2	2.81	.619
		decision making process	10.0	28.2	57.2	4.6	2.56	.734
		day to day interactions with staff members	8.4	22.9	54.3	14.5	2.75	.804
	21.	Willingness of staff to include new staff	5.0	15.0	55.7	24.2	2.99	.771
	22.	Sense of mutual trust: with colleagues	5.4	22.1	53.9	18.6	2.86	.778
		with administrative staff	7.7	26.1	48.9	17.3	2.76	.828
Job Enrichment	23.	Opportunity to: use own best abilities	3.8	13.4	52.2	30.7	3.09	.763
		initiate new and creative ideas	2.5	13.8	52.8	30.9	3.12	.730
		assume leadership roles	2.5	24.6	56.9	15.9	2.86	.698
	24.	Opportunity for a variety of work experiences	7.5	31.9	49.1	11.5	2.65	.781
Sense of Achievement	25.	Personal reward when students perform well	2.5	15.0	53.2	29.2	3.09	.732
	26.	Confidence felt in quality of teaching	0.4	7.9	56.4	35.3	3.27	.616
	27.	Satisfaction derived from professional contributions (e.g., prof. organ., forums, articles, projects)	5.9	27.6	55.5	11.1	2.72	.736
Recognition	28.	Appreciation expressed by students	7.1	26.1	53.2	13.6	2.73	.781
	29.	Attention by administrators for quality of work	15.2	34.0	39.7	11.1	2.46	.881
	30.	Peer approval and support for contributions	5.4	24.8	56.4	13.4	2.78	.742
	31.	Commendations from parents/community members	11.7	38.4	39.5	10.4	2.49	.833
Growth	32.	Opportunity to develop own best skills, abilities, talents	2.9	19.6	57.4	20.0	2.95	.715
	33.	Opportunities for: leadership roles within the school system	6.7	40.7	46.1	6.5	2.52	.717
		advancement within the school system	20.0	43.8	31.3	4.8	2.21	.815
Status	34.	Satisfaction with status of teaching as a profession						
		as perceived by students	12.5	39.0	41.1	7.3	2.43	.802
		as perceived by colleagues	4.2	26.9	60.7	8.1	2.73	.667
		as perceived by parents and community	11.5	45.7	38.2	4.6	2.36	.744
	35.	Personal satisfaction with prestige of teaching as a profession	13.4	32.8	39.0	14.8	2.55	.901



Table 12. Science Teachers' Response Percentages, Means, and Standard Deviations for Item Satisfaction.

CATEGORY		SCHOOL LIFE FACTORS	Very Poor (1)	Poor (2)	Good (3)	Very Good (4)	Response Means	Response Standard Deviations
							X	SD
Working Conditions	1.	Adequacy of the building facilities	15.3	15.4	51.3	17.9	2.74	.874
	2.	Availability of needed work space	15.4	33.3	30.8	20.5	2.56	.988
	3.	Quality of maintenance	2.6	28.2	53.9	15.4	2.82	.716
Resources	4.	Availability of needed materials	2.6	20.5	43.6	33.3	3.08	.802
	5.	Availability of equipment	2.6	10.3	58.9	28.2	3.13	.691
	6.	Level of financial support for programs	5.1	15.4	41.0	38.5	3.13	.858
Work Load	7.	Number of student contacts per day	10.3	23.1	48.7	17.9	2.74	.874
	8.	Class size	10.3	33.3	30.8	25.6	2.12	.966
	9.	Provision for planning time	5.1	33.3	38.5	23.1	2.13	.958
	10.	Distribution of non-instructional duties	7.7	23.1	48.7	20.5	2.12	.849
	11.	Instructional work assignments related to expertise	2.6	5.1	64.1	28.2	3.18	.639
Support Systems	12.	Administrative support for: discipline instructional process and procedures	2.6	10.3	51.3	35.9	3.21	.727
		new ideas (e.g. curriculum, teaching strategies)	2.6	5.1	56.4	35.9	3.26	.673
	13.	Community organizations support of school programs	5.1	10.3	58.9	25.6	3.05	.754
	14.	Parental support of school activities and programs	7.7	10.3	61.5	20.5	2.95	.788
Formal Rewards System	15.	Level of salary	12.8	5.1	56.4	25.6	2.95	.910
	16.	Level of benefits	15.4	23.1	53.9	7.7	2.55	.848
	17.	Availability of monetary incentives	12.8	25.6	46.2	15.4	2.64	.897
	18.	Opportunities for promotion	17.9	46.2	30.8	5.1	2.68	.805
Work Control	19.	Opportunity to: participate in school-wide decisions	30.8	46.2	20.5	2.6	1.95	.788
		affect departmental decisions	7.7	35.9	53.9	2.6	1.51	.679
		make decisions regarding student discipline	5.1	20.5	48.7	25.6	2.95	.820
		make decisions regarding instructional methods	2.6	12.8	69.2	15.4	2.97	.624
		make decisions regarding course content	0.0	7.7	56.4	35.9	3.28	.601
			2.6	5.1	46.2	46.2	3.36	.702

Table 12 (continued).

		Very Poor (1)	Poor (2)	Good (3)	Very Good (4)	Response Means	Response Standard Deviations
CATEGORY	SCHOOL LIFE FACTORS					X	SD
Inclusion	20. Sense of personal involvement in: faculty work activities	2.6	20.5	69.2	7.7	2.82	.597
	decision making process	10.3	20.2	58.9	2.6	2.54	.715
	day to day interactions with staff members	15.4	15.4	58.9	10.3	2.64	.868
	21. Willingness of staff to include new staff	5.1	20.5	41.0	33.3	3.03	.868
	22. Sense of mutual trust: with colleagues	7.7	12.8	51.3	28.2	3.00	.853
	with administrative staff	5.1	17.9	53.9	23.1	2.95	.788
Job Enrichment	23. Opportunity to: use own best abilities	2.6	7.7	48.7	41.0	3.28	.719
	initiate new and creative ideas	2.6	7.7	46.2	43.6	3.31	.726
	assume leadership roles	5.1	10.3	58.9	25.6	3.05	.754
	24. Opportunity for a variety of work experiences	10.3	25.6	48.7	15.4	2.69	.857
Sense of Achievement	25. Personal reward when students perform well	2.6	10.3	48.7	38.5	3.23	.737
	26. Confidence felt in quality of teaching	0.0	7.7	48.7	43.6	3.36	.624
	27. Satisfaction derived from professional contributions (e.g., prof. organ., forums, articles, projects)	5.1	28.2	41.0	25.6	2.87	.858
	Recognition						
Recognition	28. Appreciation expressed by students	2.6	23.1	58.9	15.4	2.87	.691
	29. Attention by administrators for quality of work	7.7	30.8	38.5	23.1	2.77	.896
	30. Peer approval and support for contributions	5.1	15.4	61.5	17.9	2.92	.734
	31. Commendations from parents/community members	5.1	48.7	33.3	12.8	2.54	.784
Growth	32. Opportunity to develop own best skills, abilities, talents	0.0	25.6	51.3	23.1	2.97	.702
	33. Opportunities for: leadership roles within the school system	15.4	23.1	56.4	5.1	2.51	.818
	advancement within the school system	23.1	41.0	30.8	5.1	2.18	.849
Status	34. Satisfaction with status of teaching as a profession						
	as perceived by students	10.3	43.6	35.9	10.3	2.46	.817
	as perceived by colleagues	2.6	30.8	56.4	10.3	2.74	.673
	as perceived by parents and community	12.8	41.0	38.5	7.7	2.41	.813
	35. Personal satisfaction with prestige of teaching as a profession	15.4	35.9	43.6	5.1	2.38	.810

Table 13. Mathematics Teachers' Response Percentages, Means, and Standard Deviations for Item Satisfaction.

CATEGORY		SCHOOL LIFE FACTORS	Very Poor (1)	Poor (2)	Good (3)	Very Good (4)	Response Means X	Response Standard Deviations SD
Working Conditions	1.	Adequacy of the building facilities	5.3	13.2	60.5	21.1	2.92	.744
	2.	Availability of needed work space	0.0	15.8	63.2	21.1	3.05	.609
	3.	Quality of maintenance	2.6	18.4	63.2	16.8	2.92	.669
Resources	4.	Availability of needed materials	0.0	18.4	60.5	21.1	3.03	.632
	5.	Availability of equipment	0.0	18.4	55.3	26.3	3.08	.669
	6.	Level of financial support for programs	2.6	15.8	60.5	21.1	3.00	.693
Work Load	7.	Number of student contacts per day	5.3	15.8	60.5	18.4	2.92	.744
	8.	Class size	5.3	18.9	47.4	18.4	2.79	.805
	9.	Provision for planning time	2.6	18.4	57.9	21.1	2.97	.711
	10.	Distribution of non-instructional duties	7.9	15.8	65.8	10.5	2.79	.736
	11.	Instructional work assignments related to expertise	5.3	18.4	55.3	21.1	2.92	.779
Support Systems	12.	Administrative support for: discipline	2.6	21.1	50.0	26.3	3.00	.766
		instructional process	0.0	13.2	57.9	28.9	3.16	.634
		and procedures	0.0	18.4	60.5	21.1	3.03	.632
	13.	Community organizations support of school programs	5.3	28.9	55.3	10.5	2.71	.727
	14.	Parental support of school activities and programs	7.9	21.1	63.2	7.9	2.71	.727
Formal Rewards System	15.	Level of salary	15.8	28.9	44.7	10.5	2.50	.887
	16.	Level of benefits	21.1	10.5	50.0	18.4	2.66	1.014
	17.	Availability of monetary incentives	31.6	34.2	31.6	2.6	2.05	.862
	18.	Opportunities for promotion	28.9	36.8	28.9	5.3	2.11	.888
Work Control	19.	Opportunity to: participate in school-wide decisions	15.8	36.8	47.4	0.0	2.32	.734
		affect departmental decisions	2.7	29.7	56.8	10.8	2.76	.679
		make decisions regarding student discipline	2.6	28.9	55.3	13.2	2.79	.699
		make decisions regarding instructional methods	0.0	10.5	50.0	39.5	3.29	.649
		make decisions regarding course content	0.0	21.1	52.6	26.3	3.05	.691

Table 13 (continued).

		Very Poor (1)	Poor (2)	Good (3)	Very Good (4)	Response Means	Response Standard Deviations
CATEGORY	SCHOOL LIFE FACTORS					X	SD
Inclusion	20. Sense of personal involvement in: faculty work activities	0.0	23.7	68.4	7.9	2.84	.543
	decision making process	5.3	26.3	65.8	2.6	2.66	.623
	day to day interactions with staff members	2.7	32.4	45.9	18.9	2.81	.771
	21. Willingness of staff to include new staff	13.2	15.8	44.7	26.3	2.84	.967
	22. Sense of mutual trust: with colleagues	5.3	21.1	50.0	23.7	2.92	.813
	with administrative staff	2.6	28.9	55.3	13.2	2.79	.699
Job Enrichment	23. Opportunity to: use own best abilities	5.3	18.4	57.9	18.4	2.89	.759
	initiate new and creative ideas	2.6	7.9	68.4	21.1	3.08	.627
	assume leadership roles	2.6	23.7	65.8	7.9	2.79	.618
	24. Opportunity for a variety of work experiences	2.6	34.2	50.0	13.2	2.74	.719
Sense of Achievement	25. Personal reward when students perform well	2.6	18.4	57.9	21.1	2.97	.711
	26. Confidence felt in quality of teaching	0.0	10.5	47.4	42.1	3.32	.657
	27. Satisfaction derived from professional contributions (e.g., prof. organ., forums, articles, projects)	5.3	28.9	60.5	5.3	2.66	.664
	28. Appreciation expressed by students	10.5	7.9	71.1	10.5	2.82	.761
Recognition	29. Attention by administrators for quality of work	21.1	28.9	47.4	2.6	2.32	.836
	30. Peer approval and support for contributions	10.5	15.8	65.8	7.9	2.71	.763
	31. Commendations from parents/community members	15.8	34.2	42.1	7.9	2.42	.853
	32. Opportunity to develop own best skills, abilities, talents	7.9	15.8	55.3	21.1	2.89	.826
Growth	33. Opportunities for: leadership roles within the school system	7.9	44.7	47.4	0.0	2.39	.634
	advancement within the school system	15.8	47.4	34.2	2.6	2.34	.746
Status	34. Satisfaction with status of teaching as a profession						
	as perceived by students	15.8	23.7	50.0	10.5	2.56	.845
	as perceived by colleagues	7.9	21.1	60.5	10.5	2.74	.755
	as perceived by parents and community	15.8	34.2	47.4	2.6	2.37	.780
	35. Personal satisfaction with prestige of teaching as a profession	15.8	39.5	31.6	13.2	2.42	.913

As Table 11 indicates, areas of total sample response with high levels of perceived satisfaction (at least 85% of responses ranging from good to very good) included:

- Availability of equipment
- Administrative support for instructional processes and procedures
- Opportunity to make decisions regarding instructional methods
- Opportunity to make decisions regarding course content
- Confidence felt in quality of teaching

Several major variable categories received a high percentage of poor to very poor responses relative to levels of perceived satisfaction. Items that compose variable areas related to formal rewards, recognition, growth and status were perceived to have the highest levels of dissatisfaction. Other variable categories containing items that indicate a relatively high level of dissatisfaction were working conditions, work load, support systems, and inclusion. In addition to these categories, several major variables contained a single item of rather high dissatisfaction. These areas include work control, job enrichment and sense of achievement.

In order to compare as well as classify major variable categories, a weighted satisfaction value was computed in the same manner as for the previously presented importance values (see Appendix B). These values allow for the direct comparison of the perceived satisfaction levels of each variable category on an equivalent basis, and are reported in Tables 14, 15, and 16.

Table 14. Weighted Satisfaction Values: Total Sample.

Variable Category	$\bar{X}$	SD
Working Conditions	33.88	7.22
Resources	37.30	7.49
Work Load	33.88	6.37
Support Systems	35.11	6.12
Formal Rewards System	27.84	7.91
Work Control	34.43	6.05
Inclusion	33.48	6.11
Job Enrichment	35.18	7.10
Sense of Achievement	36.30	5.84
Recognition	31.38	7.07
Growth	30.71	7.05
Status	30.22	7.04

N = 479; possible satisfaction values 0 to 48.

Table 15. Weighted Satisfaction Values: Science Teachers.

Variable Category	$\bar{X}$	SD
Working Conditions	32.92	8.08
Resources	37.33	8.42
Work Load	34.22	6.91
Support Systems	36.98	5.76
Formal Rewards System	28.08	7.87
Work Control	36.18	5.45
Inclusion	33.95	6.63
Job Enrichment	37.00	7.12
Sense of Achievement	37.85	6.69
Recognition	33.31	7.09
Growth	30.67	8.02
Status	30.00	7.39

N = 78; possible satisfaction values 0 to 48.

Table 16. Weighted Satisfaction Values: Mathematics Teachers.

Variable Category	$\bar{X}$	SD
Working Conditions	35.79	5.46
Resources	36.42	6.96
Work Load	34.55	6.38
Support Systems	35.05	5.47
Formal Rewards System	27.95	8.71
Work Control	33.99	5.26
Inclusion	33.84	5.45
Job Enrichment	34.50	6.49
Sense of Achievement	35.80	5.69
Recognition	30.79	6.41
Growth	30.11	7.37
Status	30.24	7.34

N = 76; possible satisfaction values 0 to 48.



Table 14 summarizes in particular the weighted satisfaction values for each of the major variable categories as perceived by the total sample of classroom teachers. Formal rewards system was the variable receiving the lowest satisfaction value relative to the other major variable categories. The category receiving the highest relative level of satisfaction was the variable dealing with resources. The range of satisfaction values among the 12 variable categories was 9.5, indicating a more diversified perception than for weighted importance values (Table 6, page 81).

Responses by the subsample of science teachers are recorded in Table 12 (page 93). Percentages related to the level of responses, means, and response standard deviations appear in the table. Response frequencies indicate that the highest levels of perceived satisfaction occurred concerning the following items:

- Availability of equipment
- Instructional work assignments related to expertise
- Administrative support for discipline
- Administrative support for instructional processes and procedures
- Administrative support for new ideas
- Opportunity to make decisions regarding student discipline
- Opportunity to make decisions regarding instructional methods
- Opportunity to make decisions regarding course content
- Opportunity to initiate new and creative ideas
- Opportunity to assume leadership roles

- Confidence felt in quality of teaching
- Opportunity to use own best abilities

Several major variable categories received a high percentage of poor to very poor responses relative to level of perceived satisfaction. Items that compose variable areas related to formal rewards system, recognition, and status were perceived to have the highest levels of dissatisfaction. Other variable categories containing items that indicate a relatively high level of dissatisfaction were work load and growth. In addition to these categories several major variables contained a single item of rather high dissatisfaction. These areas include work conditions, work control, job enrichment, and sense of achievement.

Table 15 summarizes the weighted satisfaction values by variable category for science teachers. Formal rewards system was the variable receiving the lowest satisfaction value relative to the other major variable categories. The category reported as having the highest relative level of satisfaction was the variable associated with sense of achievement. The range of satisfaction values among the 12 variable categories was 9.8, indicating a more diversified perception than for weighted importance values for this subgroup of the total sample.

The workplace satisfaction as perceived by mathematics teachers was high for only five specific items within the major variable categories (Table 13, page 95). Response frequencies indicate that these items include:

- Availability of needed work space
- Administrative support for instructional process and procedures
- Opportunity to make decisions regarding instructional methods
- Opportunity to initiate new and creative ideas
- Confidence felt in quality of teaching

In contrast, several major variable categories received a high percentage of poor to very poor responses relative to levels of perceived satisfaction. Categories containing the most items perceived to be poorly satisfied were formal rewards system and status. Major variables containing at least two specific items perceived to be at a low level of satisfaction include recognition and growth. The major variable categories of work load, support systems, inclusion, job enrichment and sense of achievement all contain one item indicating a poor level of satisfaction.

The means and standard deviations of the weighted satisfaction values for the major variable categories are summarized in Table 16. As with the subgroup of science teachers and the total sample, mathematics teachers gave formal rewards system the lowest relative rating of satisfaction among the 12 variables.

## VI. COMPARATIVE ANALYSES OF IMPORTANCE AND SATISFACTION LEVELS

In order to portray the discrepancies that exist between the importance of a variable category and the level of perceived

satisfaction, an index for the perceived quality of worklife was developed as explained in Chapter III. This index value estimates the amount of discrepancy that exists relative to each category. It also allows for comparison among variable categories on an equivalent basis. The computation for this perceived quality of worklife index is given by the formula:

$$pQWL:V_i = (I_{V_i}/S_{V_i})$$

where:

$V_i$  = a specific variable category.

$I_{V_i}$  = sum of importance responses for each of the items composing the category.

$S_{V_i}$  = sum of satisfaction responses for each of the items composing the category.

$pQWL:V_i$  = perceived quality of worklife index for any given variable category.

The quotient derived from this operation ranges from .25 to 4 depending upon the size and direction of the discrepancy. A value of 4 indicates a variable was judged to be very important and very poorly satisfied, while a value of .25 indicates that a variable is perceived to be unimportant but is being satisfied at a very high level. A relative balance is represented by a quotient of 1, indicating the variable category is being wholistically satisfied at a level comparable to its importance.

The discrepancy index was developed to portray relationships between the level of indicated importance and the degree of satisfaction by variable category. Rather than quantify specific perceptual differences at the item level, the index is utilized only as a general portrayal of the variable as judged by the respondents' ratings of the items that define that overall category. Therefore, the index values would serve to indicate both potential problem areas and areas of strength related to workplace issues and conditions.

In order for specific action to be taken to improve workplace satisfaction, item responses within each of the more discrepant variable categories should be examined. Attention to specific item responses should also be given in the case of those variable categories that have discrepancy indices approaching one. As the index approaches unity, at least two possibilities exist. The respondent may have given a bipolar categorical response (i.e., low importance-low satisfaction on one item contrasted to high importance-high satisfaction on another item), or there may have been a homogeneous importance-satisfaction response pattern to items in that category.

Computations including the mean, standard deviation, and range of pQWL for the total sample are presented in Table 17. The variable categories generating the highest pQWL values were formal rewards systems, status and recognition. Those variables indicating slightly smaller discrepancies between importance and

Table 17. Selected Descriptive Statistics Concerning Total Sample Index Values.

<u>Workplace Category</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Minimum Value</u>	<u>Maximum Value</u>	<u>Range</u>
Working Conditions	1.31	.447	.31	4.00	3.69
Resources	1.23	.354	.50	3.00	2.50
Work Load	1.30	.368	.60	3.33	2.73
Support Systems	1.25	.305	.53	2.50	1.97
Formal Reward Systems	1.65	.755	.58	4.00	3.42
Work Control	1.24	.347	.59	4.00	3.41
Inclusion	1.26	.348	.46	3.29	2.83
Job Enrichment	1.25	.405	.73	4.00	3.27
Sense of Achievement	1.14	.227	.70	2.20	1.50
Recognition	1.36	.468	.58	3.75	3.17
Growth	1.34	.495	.56	4.00	3.44
Status	1.49	.523	.69	4.00	3.31

N = 479; possible index values .25 to 4.00.

level of satisfaction were growth, working conditions, and work load. Variable categories that show the least discrepant condition were sense of achievement, resources, and work control. It is important to note that all variables indicate a discrepant condition between the degree of importance and the level of satisfaction within the workplace.

The pQWL index values were also calculated for the subgroup representing science teachers (Table 18). Index values for the 12 variable categories indicated a discrepant condition between perceived levels of importance and satisfaction. Variables highest in terms of the pQWL index were formal rewards systems, status, working conditions and growth. Several variables indicated relatively low discrepancies. Sense of achievement, work control, support systems and job enrichment possessed index values approaching equilibrium.

Index values calculated for the subgroup of mathematics teachers are presented in Table 19. This table also summarizes several statistics including mean, standard deviation, and range information. Variables indicating the most importance-satisfaction discrepancy were formal rewards systems, status, recognition, and growth. Those categories having the lowest index values include working conditions and sense of achievement. Again, it should be emphasized that all major variables generated index values indicating a perceived discrepancy between levels of importance and satisfaction.

Table 18. Science Teacher Index Values.

Workplace Category	Mean	Standard Deviation	Minimum Value	Maximum Value	Range
Working Conditions	1.37	.584	.31	4.00	3.69
Resources	1.26	.398	.90	2.75	1.85
Work Load	1.30	.440	.69	3.33	2.65
Support Systems	1.15	.294	.69	2.38	1.69
Formal Reward Systems	1.59	.732	.58	4.00	3.42
Work Control	1.14	.251	.75	2.00	1.25
Inclusion	1.22	.433	.67	3.29	2.62
Job Enrichment	1.16	.335	.83	2.50	1.67
Sense of Achievement	1.10	.240	.73	1.83	1.11
Recognition	1.21	.344	.73	2.33	1.60
Growth	1.36	.530	.56	3.00	2.44
Status	1.50	.490	.87	3.20	2.30

N = 78; possible index values .25 to 4.00.



Table 19. Math Teacher Index Values.

Workplace Category	Mean	Standard Deviation	Minimum Value	Maximum Value	Range
Working Conditions	1.17	.311	.56	2.00	1.44
Resources	1.24	.331	.50	2.00	1.50
Work Load	1.29	.365	.88	2.50	1.63
Support Systems	1.21	.290	.53	2.00	1.47
Formal Reward Systems	1.17	.902	.71	4.00	3.29
Work Control	1.25	.270	.59	2.00	1.41
Inclusion	1.22	.254	.95	2.18	1.23
Job Enrichment	1.22	.290	.86	2.14	1.29
Sense of Achievement	1.16	.224	.80	1.83	1.03
Recognition	1.41	.530	.75	3.25	2.50
Growth	1.40	.527	.78	3.00	2.22
Status	1.61	.732	.69	4.00	3.31

N = 76; possible index values .25 to 4.00.

As a means of shedding further light on the nature of the relationship between workplace factors' importance and satisfaction, additional statistical analyses were conducted. Spearman correlation coefficients were calculated involving pertinent demographic data and frequency responses concerning variable item importance and satisfaction, as well as pQWL indexes. These correlations were computed and analyzed for the total sample and for both subgroups of interest, science and mathematics teachers. Due to the descriptive and exploratory nature of the study, an alpha level of .10 was selected as the desired level of significance.

Findings from these analyses reveal that correlations involving total sample responses concerning the importance and satisfaction of specific variable items were in most cases moderate to low (Tables 20-25). However, it should be noted that many of these item correlations were significant ( $p < .10$ ). It is also important to consider that several of the correlations associating item satisfaction with salary and years of experience were low to moderate as well as significant ( $r_s > .20$ ,  $p < .10$ ).

The magnitudes of the correlations calculated for the science and mathematics teacher subgroups were considerably different from those of the total sample. The correlation coefficients generated from a comparison of importance and satisfaction responses with specific demographic data were in general much higher (Tables 26 and 27). Tables 26 and 27 summarize the highest correlation coefficients for science and mathematics teachers' demographic data as compared to their importance and satisfaction responses.

Table 20. Significant Spearman Correlations: Total Sample Importance Frequencies by Demographic Variables.

CATEGORY		Years Experience	Years in School	Education	Age	Income Source	Salary
SCHOOL LIFE FACTORS							
Working Conditions	1. Adequacy of the building facilities						.10
	2. Availability of needed work space	.10	.08				.19
	3. Quality of maintenance					.10	
Resources	4. Availability of needed materials						
	5. Availability of equipment	-.12	-.11	-.13	-.08		-.11
	6. Level of financial support for programs						
Work Load	7. Number of student contacts per day			-.08		.13	-.11
	8. Class size	-.17	-.12	-.19	-.13	.18	-.19
	9. Provision for planning time	.10				.12	
	10. Distribution of non-instructional duties	.13	.13		.13		
	11. Instructional work assignments related to expertise	.10	.08			.12	.11
Support Systems	12. Administrative support for: discipline instructional process and procedures		-.10	-.09	-.14		
	new ideas (e.g. curriculum, teaching strategies)	-.09	.09	-.09		-.13	
	13. Community organizations support of school programs	-.10		-.11		-.10	
	14. Parental support of school activities and programs				-.07		-.11
Formal Rewards System	15. Level of salary						.13
	16. Level of benefits					-.10	
	17. Availability of monetary incentives			-.08		-.09	
	18. Opportunities for promotion	-.10		-.13			-.09
Work Control	19. Opportunity to: participate in school-wide decisions affect departmental decisions					.08	.11
	make decisions regarding student discipline	-.13	-.09	-.18	-.15		-.13
	make decisions regarding instructional methods						.08
	make decisions regarding course content	.07					.17

Table 20 (continued).

CATEGORY	SCHOOL LIFE FACTORS	Years Experience	Years in School	Education	Age	Income Source	Salary
Inclusion	20. Sense of personal involvement in: faculty work activities decision making process day to day interactions with staff members				.10	-.08	
	21. Willingness of staff to include new staff		-.08	-.10		-.08	-.09
	22. Sense of mutual trust: with colleagues with administrative staff			-.12	-.14	.09	
					-.10		
Job Enrichment	23. Opportunity to: use own best abilities initiate new and creative ideas assume leadership roles		-.08	-.08			.08
	24. Opportunity for a variety of work experiences	-.14		-.08			
Sense of Achievement	25. Personal reward when students perform well			-.09			
	26. Confidence felt in quality of teaching	-.10		-.11	-.10		-.09
	27. Satisfaction derived from professional contributions (e.g., prof. organ., forums, articles, projects)		.09		-.15		
Recognition	28. Appreciation expressed by students	-.08			-.13		
	29. Attention by administrators for quality of work				-.09		
	30. Peer approval and support for contributions	-.08					.08
	31. Commendations from parents/community members				-.08		
Growth	32. Opportunity to develop own best skills, abilities, talents						
	33. Opportunities for: leadership roles within the school system advancement within the school system		.11		.08	-.14	.12 .08
Status	34. Satisfaction with status of teaching as a profession as perceived by students			-.13			
	as perceived by colleagues			-.14		-.08	
	as perceived by parents and community			-.17			
	35. Personal satisfaction with prestige of teaching as a profession		-.07	-.15	-.13		

Table 21. Significant Spearman Correlations: Total Sample Satisfaction Frequencies by Demographic Variables.

		Years Experience	Experience in School	Education	Age	Income Source	Salary
CATEGORY	SCHOOL LIFE FACTORS						
Working Conditions	1. Adequacy of the building facilities	.13					
	2. Availability of needed work space		-.08				-.16
	3. Quality of maintenance						.09
Resources	4. Availability of needed materials	.21	.16	.14	.12		.29
	5. Availability of equipment	.10	.09		.08		.19
	6. Level of financial support for programs	.16	.11	.15			.35
Work Load	7. Number of student contacts per day			.09			.12
	8. Class size						
	9. Provision for planning time	.10			.10	-.10	.08
	10. Distribution of non-instructional duties						
	11. Instructional work assignments related to expertise	.08					
Support Systems	12. Administrative support for: discipline instructional process and procedures new ideas (e.g. curriculum, teaching strategies)	.08		.10		.08	.26
		.10			.11		
		.11			.09		
	13. Community organizations support of school programs				.09	-.10	.18
Formal Rewards System	14. Parental support of school activities and programs	.07		.13	.08		.26
	15. Level of salary	.12	.11	.25	.15	.12	.43
	16. Level of benefits			.10			.23
	17. Availability of monetary incentives						.11
Work Control	18. Opportunities for promotion						.11
	19. Opportunity to: participate in school-wide decisions		-.08				
	affect departmental decisions	.08					
	make decisions regarding student discipline	-.11	-.13				
	make decisions regarding instructional methods			.11	-.10		.12
	make decisions regarding course content		.08	.08			.24

Table 21 (continued).

		Years Experience	Experience in School	Education	Age	Income Source	Salary
CATEGORY	SCHOOL LIFE FACTORS						
Inclusion	20. Sense of personal involvement in: faculty work activities decision making process day to day interactions with staff members			.08	.09		.15
	21. Willingness of staff to include new staff	.11			.14		
	22. Sense of mutual trust: with colleagues with administrative staff		-.08	.11	.08		.09
	23. Opportunity to: use own best abilities initiate new and creative ideas assume leadership roles						
Job Enrichment	24. Opportunity for a variety of work experiences	.10			.12		.10
Sense of Achievement	25. Personal reward when students perform well	.08	.11		.13		.10
	26. Confidence felt in quality of teaching	.12			.11		.10
	27. Satisfaction derived from professional contributions (e.g., prof. organ., forums, articles, projects)						.12
Recognition	28. Appreciation expressed by students	.23	.22	.24	.31	-.10	.28
	29. Attention by administrators for quality of work		-.08	-.09	.09		-.19
	30. Peer approval and support for contributions	.13	.09		.21		.11
	31. Commendations from parents/community members	.15	.12	.18	.28	-.10	.23
Growth	32. Opportunity to develop own best skills, abilities, talents			.10	.11	.10	
	33. Opportunities for: leadership roles within the school system advancement within the school system	.09				-.10	.12 .16
Status	34. Satisfaction with status of teaching as a profession as perceived by students as perceived by colleagues as perceived by parents and community					-.09	.09 .10 .15
	35. Personal satisfaction with prestige of teaching as a profession						.15

Table 22. Significant Spearman Correlations: Science Teacher Importance Frequencies by Demographic Variables.

CATEGORY	SCHOOL LIFE FACTORS	Years Experience	Experience in School	Education	Age	Income Source	Salary
Working Conditions	1. Adequacy of the building facilities				-.34		.24
	2. Availability of needed work space	.27	.23			-.21	.38
	3. Quality of maintenance		.23		-.21		.27
Resources	4. Availability of needed materials				-.22		
	5. Availability of equipment	-.24	-.28	-.20	-.38		
	6. Level of financial support for programs				-.48		
Work Load	7. Number of student contacts per day			-.20			
	8. Class size			-.35			-.19
	9. Provision for planning time				-.33		
	10. Distribution of non-instructional duties					-.31	.19
	11. Instructional work assignments related to expertise	.21					.34
Support Systems	12. Administrative support for: discipline instructional process and procedures new ideas (e.g. curriculum, teaching strategies)		.23	-.24 -.19 -.27	-.50 -.25 -.23		
	13. Community organizations support of school programs						
	14. Parental support of school activities and programs			-.21	-.27		
Formal Rewards System	15. Level of salary				-.34		.30
	16. Level of benefits		.19		-.20	-.23	.24
	17. Availability of monetary incentives			-.23	-.23		
	18. Opportunities for promotion			-.29		-.24	
Work Control	19. Opportunity to: participate in school-wide decisions affect departmental decisions make decisions regarding student discipline make decisions regarding instructional methods make decisions regarding course content						.25
					-.19		
				-.22	-.22	-.20	
					-.19	.22	
					-.19		.28

Table 22 (continued).

CATEGORY	SCHOOL LIFE FACTORS	Years Experience	Experience in School	Education	Age	Income Source	Salary
Inclusion	20. Sense of personal involvement in: faculty work activities			-.26			
	decision making process			-.23			
	day to day interactions with staff members						
	21. Willingness of staff to include new staff				-.23	-.44	
	22. Sense of mutual trust: with colleagues		.36			-.42	.25
Job Enrichment	with administrative staff				-.29		
	23. Opportunity to: use own best abilities			-.40	-.29	-.30	
	initiate new and creative ideas	-.23			-.31	-.23	
	assume leadership roles		.30			-.34	
Sense of Achievement	24. Opportunity for a variety of work experiences	-.20		-.34	-.22	-.20	
	25. Personal reward when students perform well					-.20	
	26. Confidence felt in quality of teaching				-.19		
	27. Satisfaction derived from professional contributions (e.g., prof. organ., forums, articles, projects)		.35			-.29	
Recognition	28. Appreciation expressed by students			.19		-.20	
	29. Attention by administrators for quality of work			-.22	-.33		
	30. Peer approval and support for contributions				-.22		
	31. Commendations from parents/community members		.20				
Growth	32. Opportunity to develop own best skills, abilities, talents	-.39	-.21	-.22	-.23		-.29
	33. Opportunities for: leadership roles within the school system		.31				
	advancement within the school system		.21			-.29	
Status	34. Satisfaction with status of teaching as a profession						
	as perceived by students						
	as perceived by colleagues			.23	-.25		
	as perceived by parents and community						
	35. Personal satisfaction with prestige of teaching as a profession			-.24	-.41		



Table 23. Significant Spearman Correlations: Mathematics Teacher Importance Frequencies by Demographic Variables.

		Years Experience	Experience in School	Education	Age	Income Source	Salary
CATEGORY	SCHOOL LIFE FACTORS						
Working Conditions	1. Adequacy of the building facilities	.25			.32		.21
	2. Availability of needed work space	.29			.29		.32
	3. Quality of maintenance	.21					
Resources	4. Availability of needed materials		-.25			.20	
	5. Availability of equipment						
	6. Level of financial support for programs		-.23				-.31
Work Load	7. Number of student contacts per day	-.23	-.28		-.36	.19	-.32
	8. Class size	-.26			-.29	.20	-.34
	9. Provision for planning time	.24				.26	
	10. Distribution of non-instructional duties						-.25
	11. Instructional work assignments related to expertise				-.22		
Support Systems	12. Administrative support for: discipline instructional process and procedures new ideas (e.g. curriculum, teaching strategies)	.25		-.28		-.23 -.22	-.24
	13. Community organizations support of school programs						-.19
	14. Parental support of school activities and programs						
Formal Rewards System	15. Level of salary						.21
	16. Level of benefits		-.29				
	17. Availability of monetary incentives						
	18. Opportunities for promotion						
Work Control	19. Opportunity to: participate in school-wide decisions affect departmental decisions make decisions regarding student discipline make decisions regarding instructional methods make decisions regarding course content			-.22 -.37			-.24
		.26				.30	.23
		.28					

Table 23 (continued).

CATEGORY		SCHOOL LIFE FACTORS	Years Experience	Experience in School	Education	Age	Income Source	Salary
Inclusion	20. Sense of personal involvement in: faculty work activities decision making process day to day interactions with staff members		-.20		-.36		-.22	-.30
			-.30		-.28	-.38		-.43
				-.19	-.19		.20	
	21. Willingness of staff to include new staff 22. Sense of mutual trust: with colleagues with administrative staff			-.22	-.23			
				-.30	-.42	-.27		-.28
					-.23	-.22	.29	
Job Enrichment	23. Opportunity to: use own best abilities initiate new and creative ideas assume leadership roles			-.22			.21	
				-.31			.25	
				.25				
Sense of Achievement	24. Opportunity for a variety of work experiences 25. Personal reward when students perform well 26. Confidence felt in quality of teaching 27. Satisfaction derived from professional contributions (e.g., prof. organ., forums, articles, projects)				-.23			
			-.22		-.21		-.33	
Recognition	28. Appreciation expressed by students 29. Attention by administrators for quality of work 30. Peer approval and support for contributions 31. Commendations from parents/community members					-.23	.23	
			-.23			-.26		-.20
			-.28		-.24			
			-.43	-.21	-.19	-.53		-.37
Growth	32. Opportunity to develop own best skills, abilities, talents 33. Opportunities for: leadership roles within the school system advancement within the school system							
Status	34. Satisfaction with status of teaching as a profession as perceived by students as perceived by colleagues as perceived by parents and community			.45				
					-.21			
				.40				
	35. Personal satisfaction with prestige of teaching as a profession							

Table 24. Significant Spearman Correlations: Science Teacher Satisfaction Frequencies by Demographic Variables.

CATEGORY	SCHOOL LIFE FACTORS	Years Experience	Experience in School	Education	Age	Income Source	Salary
Working Conditions	1. Adequacy of the building facilities			-.35			-.37
	2. Availability of needed work space			-.34			-.37
	3. Quality of maintenance						
Resources	4. Availability of needed materials	.31		.19			.43
	5. Availability of equipment						.25
	6. Level of financial support for programs	.25		.21			.48
Work Load	7. Number of student contacts per day			.25			.22
	8. Class size						.19
	9. Provision for planning time	.30	.32	.19		-.21	.24
	10. Distribution of non-instructional duties					-.32	
	11. Instructional work assignments related to expertise	.20				.20	.19
Support Systems	12. Administrative support for: discipline instructional process and procedures new ideas (e.g. curriculum, teaching strategies)		.21	-.30			
			.19				
	13. Community organizations support of school programs		.21			-.21	
	14. Parental support of school activities and programs						.32
Formal Rewards System	15. Level of salary			.42			.35
	16. Level of benefits			.27			.29
	17. Availability of monetary incentives						
	18. Opportunities for promotion						
Work Control	19. Opportunity to: participate in school-wide decisions affect departmental decisions make decisions regarding student discipline make decisions regarding instructional methods make decisions regarding course content					-.20	
		.26	.26				.22
			-.19	-.25			
		.21	.27	.29			.29
							.34

Table 24 (continued).

CATEGORY		SCHOOL LIFE FACTORS	Years Experience	Experience in School	Education	Age	Income Source	Salary
Inclusion	20.	Sense of personal involvement in: faculty work activities	.25	.32		.19	-.26	
		decision making process	.33	.30	.29			
		day to day interactions with staff members						
	21.	Willingness of staff to include new staff						-.19
	22.	Sense of mutual trust: with colleagues						
		with administrative staff	.25					
Job Enrichment	23.	Opportunity to: use own best abilities	-.20		-.23	-.24		
		initiate new and creative ideas				-.32		
		assume leadership roles	.25	.33				.30
	24.	Opportunity for a variety of work experiences				-.19		
Sense of Achievement	25.	Personal reward when students perform well	.20	.27		.24	-.22	.22
	26.	Confidence felt in quality of teaching						
	27.	Satisfaction derived from professional contributions (e.g., prof. organ., forums, articles, projects)	.21	.31			-.22	.25
Recognition	28.	Appreciation expressed by students	.21	.24		.21	-.26	
	29.	Attention by administrators for quality of work	.19					
	30.	Peer approval and support for contributions						
	31.	Commendations from parents/community members						.20
Growth	32.	Opportunity to develop own best skills, abilities, talents					.19	
	33.	Opportunities for: leadership roles within the school system	.24	.27			-.20	
		advancement within the school system	.32	.31				.29
Status	34.	Satisfaction with status of teaching as a profession						
		as perceived by students	.22	.25				.33
		as perceived by colleagues					-.27	.20
		as perceived by parents and community		.27				.41
	35.	Personal satisfaction with prestige of teaching as a profession		.25				.29

Table 25. Significant Spearman Correlations: Mathematics Teacher Satisfaction Frequencies by Demographic Variables.

CATEGORY		SCHOOL LIFE FACTORS	Years Experience	Experience in School	Education	Age	Income Source	Salary
Working Conditions	1.	Adequacy of the building facilities						
	2.	Availability of needed work space						-.20
	3.	Quality of maintenance						
Resources	4.	Availability of needed materials						.22
	5.	Availability of equipment					-.34	
	6.	Level of financial support for programs				.27		.35
Work Load	7.	Number of student contacts per day						
	8.	Class size						
	9.	Provision for planning time		-.21				
	10.	Distribution of non-instructional duties		-.19	.22			.25
	11.	Instructional work assignments related to expertise		-.29				
Support Systems	12.	Administrative support for: discipline instructional process and procedures new ideas (e.g. curriculum, teaching strategies)		-.22				.26
	13.	Community organizations support of school programs	-.36			-.22	-.29	
	14.	Parental support of school activities and programs	-.26	-.23		-.20		
Formal Rewards System	15.	Level of salary			.22	.31		.44
	16.	Level of benefits				.20		.20
	17.	Availability of monetary incentives						
	18.	Opportunities for promotion	-.22					
Work Control	19.	Opportunity to: participate in school-wide decisions	-.22	-.30	-.21			
		affect departmental decisions						
		make decisions regarding student discipline	-.44	-.39		-.31	-.20	-.23
		make decisions regarding instructional methods	-.29	-.21		-.45		
		make decisions regarding course content	-.25			-.27		

Table 25 (continued).

CATEGORY	SCHOOL LIFE FACTORS	Years Experience	Experience in School	Education	Age	Income Source	Salary
Inclusion	20. Sense of personal involvement in: faculty work activities	-.24	-.28	-.23	-.23		
	decision making process	-.29		-.40			-.22
	day to day interactions with staff members	.28	-.28	.33		.22	.30
	21. Willingness of staff to include new staff		-.20		.27		
	22. Sense of mutual trust: with colleagues						
	with administrative staff				.30		
Job Enrichment	23. Opportunity to: use own best abilities		-.23	.26			.29
	initiate new and creative ideas						.38
	assume leadership roles			.20			.30
	24. Opportunity for a variety of work experiences						.25
Sense of Achievement	25. Personal reward when students perform well				-.24		
	26. Confidence felt in quality of teaching		-.27		-.21		
	27. Satisfaction derived from professional contributions (e.g., prof. organ., forums, articles, projects)						
Recognition	28. Appreciation expressed by students						
	29. Attention by administrators for quality of work		-.21				
	30. Peer approval and support for contributions						
	31. Commendations from parents/community members					-.28	
Growth	32. Opportunity to develop own best skills, abilities, talents			.20			.21
	33. Opportunities for: leadership roles within the school system					-.25	.23
	advancement within the school system			.35			.29
Status	34. Satisfaction with status of teaching as a profession						
	as perceived by students	-.22			-.36		
	as perceived by colleagues		-.20				
	as perceived by parents and community	-.26	-.23		-.36		
	35. Personal satisfaction with prestige of teaching as a profession						.19

Table 26. Items with Highest Spearman Correlations between Importance Values and Demographic Variables among Science and Mathematics Teachers.

Demographic Variable	Science Teachers			Mathematics Teachers		
	Variable Category	Item Number	Correlation Direction	Variable Category	Item Number	Correlation Direction
Years of Experience	Growth	32	-	Inclusion	20B	-
				Recognition	31	-
Years in the School	Inclusion	22B	+	Inclusion	22	-
	Job Enrichment	23C	+	Job Enrichment	23B	-
	Sense of Achievement	27	+	Status	34A	+
	Growth	33A	+	Status	34C	+
Education	Work Load	8	-	Work Control	19C	-
	Job Enrichment	23A	-	Work Load	7	-
	Job Enrichment	24	-	Work Load	8	-
Age	Working Conditions	1	-	Working Conditions	1	+
	Resources	5	-	Work Load	7	-
	Resources	6	-	Work Load	8	-
	Work Load	9	-	Inclusion	20B	-
	Support Systems	12A	-	Recognition	31	-
	Formal Rewards System	15	-			
	Job Enrichment	23B	-			
	Recognition	29	-			
Primary Source of Income	Status	35	-			
	Work Load	10	-	Work Control	19C	+
	Support Systems	12C	-	Sense of Achievement	27	-
	Inclusion	21	-			
	Inclusion	22	-			
	Job Enrichment	23A	-			
	Job Enrichment	23C	-			

Table 26 (continued).

Demographic Variable	Science Teachers			Mathematics Teachers		
	Variable Category	Item Number	Correlation Direction	Variable Category	Item Number	Correlation Direction
Salary	Work Conditions	2	+	Work Conditions	2	+
	Work Load	11	+	Resources	6	-
	Formal Rewards System	15	+	Work Load	7	-
				Work Load	8	-
				Inclusion	20A	-
				Inclusion	20B	-
				Recognition	31	-

Highest correlations =  $|r_s| > .30$



Table 27. Items with Highest Spearman Correlations between Satisfaction Values and Demographic Variables among Science and Mathematics Teachers.

Demographic Variable	Science Teachers			Mathematics Teachers		
	Variable Category	Item Number	Correlation Direction	Variable Category	Item Number	Correlation Direction
Years of Experience	Resources	4	+	Support Systems	13	-
	Work Load	9	+	Work Control	19C	-
	Inclusion	20B	+			
	Growth	33B	+			
Years in School	Work Load	9	+	Work Control	19A	-
	Inclusion	20A	+	Work Control	19C	-
	Inclusion	20B	+			
	Job Enrichment	23C	+			
	Sense of Achievement	27	+			
	Growth	33B	+			
Education	Working Conditions	1	-	Inclusion	20B	-
	Working Conditions	2	-	Inclusion	20C	+
	Support Systems	12	-	Growth	33B	+
	Formal Rewards System	15	+			
Age	Job Enrichment	23B	-	Formal Rewards System	15	+
				Work Control	19C	-
				Work Control	19D	-
				Inclusion	22B	+
				Status	34A	-
				Status	34C	-
Primary Source of Income	Work Load	10	-	Resources	5	-

Table 27 (continued).

Demographic Variable	Science Teachers			Mathematics Teachers		
	Variable Category	Item Number	Correlation Direction	Variable Category	Item Number	Correlation Direction
Salary	Work Conditions	1	-	Resources	6	+
	Working Conditions	2	-	Formal Rewards System	15	+
	Resources	4	+	Inclusion	20C	+
	Support Systems	14	+	Job Enrichment	23B	+
	Formal Rewards System	15	+	Job Enrichment	23C	+
	Work Control	19B	+			
	Job Enrichment	23C	+			
	Status	34A	+			
	Status	34C	+			

Highest correlations =  $|r_s| \geq .30$

A further step in the statistical analysis of results involved the weighted importance and satisfaction values described previously. Weighted importance values for each of the 12 major variable categories were correlated with specific demographic data. The use of these equivalent values enables comparison across major variable categories. Table 28 contains the Spearman correlation coefficients reflecting total sample weighted importance values compared to years of experience, years in the school, education level, age, primary source of income, and salary. Although several of the coefficients were determined to be significant ( $p < .10$ ), the magnitudes of these correlations were relatively low.

The correlations for the weighted satisfaction values relative to the total sample were, for the most part, also rather low (Table 29). However, several coefficients did indicate the existence of a moderate relationship. These correlations include: age with recognition (.32,  $p < .0001$ ) and salary with resources (.33,  $p < .0001$ ), support systems (.24,  $p < .0001$ ), and formal rewards systems (.29,  $p < .0001$ ).

Spearman correlations involving the major subgroups of the study, science and mathematics teachers, were on the whole much larger than for the total sample. Tables 30-33 summarize the significant correlations involving the weighted importance and satisfaction values compared to selected demographic variables.

A final step in the treatment of data concerning importance-satisfaction relationships involved the pQWL index described earlier

Table 28. Significant Spearman Correlations of Demographic Variables with Weighted Importance Values for Major Variable Categories: Total Sample.

	Years of Experience	Years in the School	Level of Education	Age	Primary Income Source	Salary
Working Conditions						.10
Resources		-.09	-.09			
Work Load					.13	
Support Systems	-.09		-.10			
Formal Rewards System			-.08		-.11	
Work Control						
Inclusion			-.10			
Job Enrichment	-.11	-.08	-.08			.08
Sense of Achievement		.08	-.08		-.08	
Recognition				-.11		
Growth		.08			-.09	.10
Status			-.18	-.08		

N = 479; Significant correlations =  $p < .10$ .

Table 29. Significant Spearman Correlations of Demographic Variables with Weighted Satisfaction Values for Major Variable Categories: Total Sample.

	Years of Experience	Years in the School	Level of Education	Age	Primary Income Source	Salary
Working Conditions	.13					
Resources	.18	.15	.13	.09		.33
Work Load	.08			.08		.07
Support Systems	.12			.14		.24
Formal Rewards System			.12			.29
Work Control						.11
Inclusion	.10			.14		.13
Job Enrichment	.08			.08		.09
Sense of Achievement	.09	.08		.11		.15
Recognition	.20	.12	.13	.32	-.08	.17
Growth	.07			.08		.15
Status						.17

N = 479; Significant correlations =  $p < .10$ .

Table 30. Significant Spearman Correlations of Demographic Variables with Weighted Importance Values for Major Variable Categories: Science Teachers.

	Years of Experience	Years in the School	Level of Education	Age	Primary Income Source	Salary
Working Conditions				-.34		.24
Resources				-.46		
Work Load				-.22		.21
Support Systems			-.22	-.31	-.21	
Formal Rewards System				-.28	-.24	
Work Control				-.20		
Inclusion					-.38	
Job Enrichment			-.26	-.28	-.34	
Sense of Achievement		.30			-.24	
Recognition				-.29	-.18	
Growth		.19		-.18		
Status				-.30		

N = 78; Significant correlations =  $p < .10$ .

Table 31. Significant Spearman Correlations of Demographic Variables with Weighted Satisfaction Values for Major Variable Categories: Science Teachers.

	Years of Experience	Years in the School	Level of Education	Age	Primary Income Source	Salary
Working Conditions			-.35			-.37
Resources	.27		.22			.47
Work Load			.27			.25
Support Systems		.26				.18
Formal Rewards System			.29			.26
Work Control	.20	.24				.27
Inclusion						
Job Enrichment				-.26		
Sense of Achievement		.25				.18
Recognition						
Growth	.30	.30				.22
Status		.31				.41

N = 78; Significant correlations =  $p < .10$ .

Table 32. Significant Spearman Correlations of Demographic Variables with Weighted Importance Values for Major Variable Categories: Mathematics Teachers.

	Years of Experience	Years in the School	Level of Education	Age	Primary Income Source	Salary
Working Conditions	.25			.32		.21
Resources		-.24				-.24
Work Load		-.20		-.23	.27	-.27
Support Systems					-.17	
Formal Rewards System		-.18		-.19		
Work Control			-.18		.18	
Inclusion		-.18	-.43			-.32
Job Enrichment		-.27				
Sense of Achievement		.22			-.18	
Recognition				-.34		-.21
Growth						
Status		.34				

N = 76; Significant correlations =  $p < .10$ .



Table 33. Significant Spearman Correlations of Demographic Variables with Weighted Satisfaction Values for Major Variable Categories: Mathematics Teachers

	Years of Experience	Years in the School	Level of Education	Age	Primary Income Source	Salary
Working Conditions						
Resources						.27
Work Load		-.30				
Support Systems						
Formal Rewards System						.25
Work Control	-.36	-.32	-.27	-.36		-.22
Inclusion		-.31				
Job Enrichment			.23			.36
Sense of Achievement		-.20				
Recognition				.25		
Growth			.25			.29
Status		-.30		-.30		

N = 76; Significant correlations =  $p < .10$ .

in this section. The degree of discrepancy between variable importance and level of satisfaction is indicated by the size of the pQWL index. This index aids in a clear portrayal of perceived discrepancies across all major variables. Therefore, it seems helpful to the understanding of workplace satisfaction to investigate the relationship between these index values and selected demographic variables. Table 34 summarizes the significant correlation coefficients for the total sample. Most correlations were small, with the exception of: resources with salary ( $-.32, p < .0001$ ); support systems with salary ( $-.26, p < .0001$ ); formal rewards system with salary ( $-.23, p < .0001$ ); and recognition with level of education ( $-.32, p < .0001$ ). It is also interesting to note that almost all significant correlations were negative.

Table 35 presents the significant correlation results for the subgroup of science teachers. As indicated in the table, several of the coefficients reflect a moderate or in some cases relatively strong relationship between workplace and demographic variables. As with the correlations computed for the total sample, the significant coefficients for science teachers were primarily negative.

Significant Spearman correlations between pQWL index values and demographic data for mathematics teachers are presented in Table 36. Several of these coefficients indicate a moderate relationship between the selected demographic factors and the major workplace variables. Consistent with the total sample and science teacher pQWL index correlations, the Spearman coefficients were predominantly negative for this subgroup as well.

Table 34. Significant Total Sample Spearman Correlations of Demographic Variables with Workplace Categories Using Index Values.

	Years of Experience	Years in the School	Level of Education	Age	Primary Income Source	Salary
Working Conditions	-.09					.08
Resources	-.19	-.18	-.15	-.10		-.32
Work Load					.11	-.09
Support Systems	-.14		-.14	-.16		-.26
Formal Rewards System			-.12		-.11	-.23
Work Control			-.10			-.09
Inclusion	-.10		-.11	-.14		-.13
Job Enrichment	-.15		-.08	-.13		
Sense of Achievement	-.12		-.14	-.10		-.17
Recognition	-.20	-.11	-.32			-.13
Growth						
Status			-.09			-.12

N = 479; Significant correlations =  $p < .10$ .

Table 35. Significant Science Teacher Spearman Correlations of Demographic Variables with Workplace Categories Using Index Values.

	Years of Experience	Years in the School	Level of Education	Age	Primary Income Source	Salary
Working Conditions			.20	-.04		.42
Resources	-.30		-.25			-.38
Work Load			-.29	-.20		
Support Systems	-.19			-.35		-.22
Formal Rewards System			-.29	-.22		
Work Control			-.22	-.26		
Inclusion			-.23	-.21		
Job Enrichment					-.23	
Sense of Achievement						
Recognition	-.23					
Growth	-.30					-.20
Status				-.19		-.30

N = 78; Significant correlations =  $p < .10$ .

Table 36. Significant Mathematics Teacher Spearman Correlations of Demographic Variables with Workplace Categories Using Index Values.

	Years of Experience	Years in the School	Level of Education	Age	Primary Income Source	Salary
Working Conditions				.27		
Resources						-.31
Work Load						
Support Systems						
Formal Rewards System						-.23
Work Control	.37	.30		.28		
Inclusion		.23		-.22		
Job Enrichment			-.23			
Sense of Achievement		.38				
Recognition	-.24			-.35	.21	-.21
Growth			-.26			-.25
Status		.32		.20		

N = 76; Significant correlations =  $p < .10$ .

## VII. INTERVIEW DATA

A supplementary data source was obtained by conducting a series of on-site interviews within each participating school. Members of the interview sample were selected by means of a design yielding proportionate representation across both grade levels and subject areas. Interview questions (Appendix A) were designed to address areas comparable to the survey instrument.

The interview process, involving respondents, generated 2017 usable comments. These were recorded and classified in relation to the 12 variable categories in the written instrument. The results of this classification are portrayed in Table 37. The total numbers of responses concerning each variable are presented along with frequencies and percentages of comments applicable to specific themes. This analysis provides a more detailed portrayal of the nature of respondents' perceptions regarding their workplace conditions.

Variables receiving the highest percentages of comments were formal rewards system, inclusion, working conditions and work control. Those receiving the lowest percentages of comments were job enrichment, growth, sense of achievement and resources. A substantial number of comments (239, or 12% of total) did not pertain directly to the variables being studied, addressing more general aspects of career satisfaction.

Comparison with the weighted response values from the survey instrument showed a correspondence between the two sets of data.

Table 37. Interview Responses Classified by Variable Categories.

	Number of Responses	Percentage of Total Responses (%)
Formal Rewards System (N = 2017)		
TOTAL NUMBER OF COMMENTS REGARDING FORMAL REWARDS SYSTEM	265	13.3
Satisfaction in General	64	3.2
Dissatisfaction in General	65	3.4
Satisfaction Compared to Others in Teaching	27	1.4
Dissatisfaction Compared to Others in Teaching	22	1.1
Satisfaction Compared to Other Professions	4	0.2
Dissatisfaction Compared to Other Professions	81	4.1
Other	0	0.0
Inclusion (N = 2017)		
TOTAL NUMBER OF COMMENTS REGARDING INCLUSION	228	11.5
Positive Comments Regarding Friendliness of School	77	3.9
Negative Comments Regarding Friendliness of School	8	0.4
Unsure of Friendliness of School	3	0.2
Satisfied with Collegial Relationships	90	4.6
Dissatisfied with Collegial Relationships	6	0.3

Table 37 (continued).

	Number of Responses	Percentage of Total Responses (%)
More Inclusion Favored	18	0.9
Citations of Problem Areas Regarding Inclusion	26	1.4
Working Conditions (N = 2017)		
TOTAL NUMBER OF COMMENTS REGARDING WORKING CONDITIONS	204	10.3
Working Conditions Affect Teaching Performance	76	3.9
Working Conditions Do Not Affect Teaching Performance	10	0.5
Working Conditions at _____ Positively Affect Teaching Performance	30	1.5
Working Conditions at _____ Negatively Affect Teaching Performance	88	4.5
Work Control (N = 2017)		
TOTAL NUMBER OF COMMENTS REGARDING WORK CONTROL	193	9.7
Positive Comments Regarding Opportunity to Make/Influence Decisions Regarding:		
Within classroom matters	107	5.4
Outside the classroom matters	2	0.1
Negative Comments Regarding the Opportunity to Make/Influence Decisions Regarding:		
Within classroom matters	24	1.3
Outside the classroom matters	60	3.0



Table 37 (continued).

	Number of Responses	Percentage of Total Responses (%)
Support Systems (N = 2017)		
TOTAL NUMBER OF COMMENTS REGARDING SUPPORT SYSTEMS	175	8.8
Positive Comments Regarding:		
Administrative support	65	3.2
Parental/community support	8	0.4
Negative Comments Regarding:		
Administrative support	37	1.9
Parental/community support	18	0.9
More Support Needed	39	1.9
Other	8	0.4
Work Load (N = 2017)		
TOTAL NUMBER OF COMMENTS REGARDING WORK LOAD	134	6.8
Positive Comments Regarding Work Load	0	0.0
Negative Comments Regarding Work Load	134	6.7
Inadequate time for planning, grading papers	43	2.2
Overabundance of paperwork	42	2.1
Extra duties	21	1.1
Classload	18	0.9
Other	10	0.5

Table 37 (continued).

	Number of Responses	Percentage of Total Responses (%)
Status (N = 2017)		
TOTAL NUMBER OF COMMENTS REGARDING STATUS OF TEACHING AS A PROFESSION	128	6.4
Personal Perception of Status of Teaching:		
Positive	19	1.0
Negative	60	3.0
Perception of Others Regarding Status of Teaching:		
Positive	9	0.5
Negative	40	2.0
Recognition (N = 2017)		
TOTAL NUMBER OF COMMENTS REGARDING RECOGNITION	112	6.0
Positive Comments Regarding Recognition	8	0.4
Negative Comments Regarding Recognition	45	2.2
More Recognition Needed	67	3.4
Job Enrichment (N = 2017)		
TOTAL NUMBER OF COMMENTS REGARDING JOB ENRICHMENT	111	5.6
Opportunity to Use Own Best Abilities Available	70	3.5
Opportunities to Use Own Best Abilities Not Available	12	0.6

Table 37 (continued).

	Number of Responses	Percentage of Total Responses (%)
Variety of Work Experiences Available	6	0.3
Variety of Work Experiences Not Available	10	0.5
Opportunity to be Creative/Innovative Available	8	0.4
Opportunity to be Creative/Innovative Not Available	0	0.0
Other	5	0.3
Growth (N = 2017)		
TOTAL NUMBER OF COMMENTS REGARDING GROWTH	90	4.5
Comments Regarding Personal Growth Opportunities:		
Positive	3	0.2
Negative	0	0.0
Comments Regarding Professional Growth Opportunities:		
Positive	26	1.3
Negative	20	1.0
Comments Regarding Leadership Opportunities Available:		
Positive	3	0.2
Negative	4	0.2
Comments Regarding Future Plans Other than Classroom Teaching	26	1.3
Comments on the Need for More Growth Opportunities	8	0.4

Table 37 (continued).

	Number of Responses	Percentage of Total Responses (%)
Sense of Achievement (N = 2017)		
TOTAL NUMBER OF COMMENTS REGARDING SENSE OF ACHIEVEMENT	76	3.8
Sense of Achievement Relative to Student Outcomes		
Positive comments	56	2.8
Negative comments	1	0.1
Sense of Achievement Relative to Job Itself		
Positive comments	19	1.0
Negative comments	0	0.0
Resources (N = 2017)		
TOTAL NUMBER OF COMMENTS REGARDING RESOURCES	62	3.1
Positive Comments Regarding Resources	26	1.3
Negative Comments Regarding Resources	36	1.8
General Satisfaction/Dissatisfaction (N = 2017)		
TOTAL NUMBER OF COMMENTS EXPRESSING GENERAL SATISFACTION	129	6.5
TOTAL NUMBER OF COMMENTS EXPRESSING GENERAL DISSATISFACTION	110	5.5
General Satisfaction with:		
Teaching as a career	17	0.9
Students	17	0.9
Subject	20	1.0

Table 37 (continued).

	Number of Responses	Percentage of Total Responses (%)
General Dissatisfaction with:		
Teaching as a career	60	3.0
Students/parents	20	1.0
Discipline	30	1.5
Other	0	0.0

The variable categories with the highest values relative to satisfaction were for the most part those accounting for high percentages of interview comments.

## CHAPTER V

### CONCLUSIONS AND RECOMMENDATIONS

#### I. INTRODUCTION

The purpose of this investigation was to generate information relative to the workplace satisfaction needs of secondary classroom teachers, including the specific subgroups of science and mathematics instructors. The various data sources presented in the previous chapter portray classroom teacher perceptions of the educational workplace. The sample utilized in the study represented individuals functioning under a broad range of workplace conditions and responsibilities.

The investigation was designed as a descriptive study that concentrated on both intrinsic and extrinsic influences on job satisfaction identified through the quality of worklife model. The research objectives formulated through this approach included:

- (1) To determine workplace variables important to job satisfaction within educational organizations.
- (2) To identify the workplace variables that are most important to science and mathematics teachers.
- (3) To determine the level of perceived satisfaction for both the total sample of classroom teachers and the subgroups of science and mathematics instructors relative to the variables of importance.

- (4) To design a QWL model to affect science and mathematics teachers' job satisfaction that would potentially reduce attrition from these fields.

Data to address these objectives were collected through three different methods. These methods included an indepth search of literature related to job satisfaction theory and practice within both educational and noneducational organizations. From this literature base a survey instrument was designed to identify the degree of importance as well as the level of satisfaction relative to specific workplace variables. The third source of information was an on-site interview designed to validate the survey responses. These data were then portrayed and analyzed in terms of variable importance and satisfaction relative to the total sample as well as the major subgroups of interest.

## II. WORKPLACE FACTORS' IMPORTANCE AND SATISFACTION IN EDUCATIONAL ORGANIZATIONS

Most of the variables comprising the survey instrument were rated as important to the quality of working life for classroom teachers. However, three specific variables were consistently identified as being more important in comparison with all other variables. Factors related to the variable categories pertaining to resources, support systems, and work load were perceived as most important by the total sample. The weighted importance value calculated for each of these variables was higher than for any of the nine other major categories.



Items that compose these categories relate to workplace factors that are extrinsic in nature. Availability of needed materials, equipment and program funding, as well as acceptable class size, fair distribution of non-instructional duties, appropriate work assignments, provision for planning time and various forms of administrative and parental support represent these highly important categories.

The variables perceived as least important, as measured by mean weighted importance value, were inclusion, recognition, and growth. These variables are primarily represented by items that can be classified as intrinsically related to workplace satisfaction. Sense of personal involvement in work activities and decision processes as well as a sense of mutual trust were among the items of lowest importance. Aspects related to appreciation expressed by students, attention by administrators for the quality of work and peer or community approval were also perceived as relatively unimportant. In addition, classroom teachers viewed self improvement and opportunities for leadership and advancement lowest in importance of all categories.

These findings are for the most part consistent with other research in the area of teacher job satisfaction. Inability to acquire needed resources to sustain an educational program, lack of a support network and unreasonable work loads have been identified in other studies as being important contributors to teacher attrition (Howe & Gerlovich, 1981; Olstad & Beal, 1981; Guthrie & Zusman, 1982).

Information concerning the perceived level of satisfaction relative to the 12 major workplace variables emphasized different categories from those considered to be important. The means calculated for the weighted satisfaction values indicate that factors of highest satisfaction were resources, sense of achievement and job enrichment. Items that compose these categories are related to both intrinsic and extrinsic aspects of job satisfaction. Those items concerning the availability of materials, equipment and program financial support extrinsically affect satisfaction. Conversely, items dealing with personal reward tied to student achievement, confidence felt in quality of teaching and opportunity to initiate creative ideas and assume leadership roles were among those intrinsic factors viewed as most satisfied.

Variables perceived by the total sample of classroom teachers as being least satisfied were growth, status, and formal rewards system. Items that compose the category related to growth are intrinsic to job satisfaction. Opportunities relative to the use of personal abilities and talent as well as the exercise of leadership roles within the school system intrinsically impact the perception of workplace satisfaction. Aspects concerning formal rewards function extrinsically to affect job satisfaction. These factors include level of salary and benefits, availability of monetary incentives and opportunities for promotion.

### III. WORKPLACE FACTORS' IMPORTANCE AND SATISFACTION

#### AMONG SCIENCE TEACHERS

Science teachers in the sample considered most variable categories as important to the quality of working life within educational organizations. Variables perceived to be most important, as determined by the means of the weighted importance values, were resources, work load, and status. Items within these categories relate primarily to workplace conditions that are considered extrinsic to job satisfaction. Program financial support and availability of needed equipment and materials were among items selected as most important. Aspects related to class size, number of student contacts per day, provision for planning time, non-instructional duties and the assignment of instructional positions based upon expertise were also perceived as important to the quality of worklife. In addition to these factors, the status of teaching as perceived by students, colleagues, and the community was also rated as relatively important.

Variables judged by science teachers as least important to the quality of working life were those related to intrinsic workplace factors. Categories with the lowest mean weighted importance values were inclusion, recognition, and growth. The intrinsic nature of these categories related to the sense of personal involvement in faculty work activities and the decision making process. Interaction with staff members, willingness to include new staff and the sense of mutual trust with colleagues and administrators were also perceived

at a comparatively low level of importance. Other aspects of relatively low importance included appreciation expressed by students, attention by administrators for the quality of work, peer approval and support, as well as commendations from parents and community members. Factors related to personal growth within the workplace were perceived as lowest in importance among the 12 major variables. These factors of least importance included opportunities to develop one's own best abilities, assume leadership roles and gain advancement within the school system.

Variable categories perceived in this subgroup as having the highest levels of satisfaction were sense of achievement, resources, job enrichment, and support systems. These variables represented both extrinsic and intrinsic influences on job satisfaction. Availability of resources to maintain an educational program, as well as the various forms of administrative, parental, and community support impact the perceived level of job satisfaction extrinsically, while the opportunity to initiate creative ideas and encounter a variety of work experiences are among the intrinsic factors affecting workplace perceptions. Sense of achievement in terms of personal reward when students perform well, confidence felt in the quality of teaching and satisfaction derived from professional contributions were also intrinsic items satisfied at a relatively high level.

Mean weighted satisfaction values indicated that the variable categories viewed as least satisfied were growth, status, and formal rewards system. These major variable categories also represent

both intrinsic and extrinsic aspects of job satisfaction. Items related to personal growth within the workplace setting can be classified as intrinsic, while items dealing with status and formal rewards are more extrinsic to job perceptions. Aspects related to these areas include satisfaction with the perceived status of education as a profession as well as the level of salary and benefits associated with teaching.

#### IV. WORKPLACE FACTORS' IMPORTANCE AND SATISFACTION AMONG MATHEMATICS TEACHERS

The mathematics teacher subgroup indicated that the majority of variables comprising the instrument were important to the quality of working life. However, three specific variables were identified as most important in comparison with all other variables. Factors related to status, resources, and work load were perceived as most important by mathematics teachers. The weighted importance value computed for each of these variables was higher than for any of the nine other major categories.

Items that compose these categories relate to workplace factors that are extrinsic in nature. Satisfaction with the status of teaching as a profession and availability of material and equipment, as well as acceptable class size, fair distribution of non-instructional duties and provision for planning time are among these important extrinsic factors.

The least important variables as measured by mean weighted importance values were inclusion, recognition, and growth. These intrinsic elements of job satisfaction relate to the sense of personal involvement in work activities and decision processes and the sense of mutual trust among colleagues and administrators, as well as the various forms of appreciation and support given by students, administrators and community members. Personal growth associated with the workplace had the lowest mean weighted importance value.

Analysis of perceived levels of satisfaction relative to the major variable categories yielded different results than those obtained for importance values. The means computed for the weighted satisfaction values indicated that factors of highest perceived satisfaction were resources, sense of achievement and working conditions. The variable categories of working conditions and resources are characterized by items that are extrinsic to workplace satisfaction. These items include the adequacy of building facilities, the quality of maintenance, and the availability of needed materials, equipment and program financial support. Intrinsic items perceived as highly satisfied were those associated with personal reward derived from student performance, confidence felt in the quality of teaching and satisfaction obtained from professional contributions.

Variables indicating areas of lowest perceived satisfaction included status, growth and formal rewards system. Both status and formal rewards can be classified as extrinsically related to workplace satisfaction, while personal growth is more intrinsic to satisfaction.

## V. IMPORTANCE-SATISFACTION RELATIONSHIPS

The variables perceived as most important by the total sample and the two subgroups of interest were, in most cases, the same. The computed means for the weighted importance values indicated that the science and mathematics teacher subgroups viewed resources, work load and status as the three most important QWL factors. Responses from the total sample of classroom teachers also perceived resources and work load as highly important. In addition, the variable related to support systems was viewed by the total sample as very important to the quality of working life. It is interesting to note that the variables considered important by participating groups were all extrinsically related to worklife quality.

The variable categories perceived by all study participants as least important were identical. Inclusion, recognition, and growth yielded the lowest mean weighted importance values. All of these least important factors can be classified as intrinsically related to QWL perceptions. However, due to the narrow range of importance values generated concerning the QWL variables, it is apparent that most of the 12 major categories held a relatively high degree of importance to the respondents.

Weighted satisfaction values also revealed considerable similarity across all participant groups. Respondents composing the total sample as well as the subgroup of science teachers indicated that the variables representing resources, sense of achievement, job

enrichment and support systems were viewed as having the highest level of satisfaction.

Participating mathematics teachers also viewed resources, sense of achievement and support systems as relatively well satisfied. In addition, this subgroup included working conditions as being a variable of comparatively high satisfaction. The variables that were identified as more highly satisfied than most others represent both intrinsic and extrinsic influences on workplace satisfaction.

The variables perceived as being least satisfied were the same for all groups of respondents. These variables were growth, status and formal rewards system. The variable representing growth is primarily an intrinsic factor, while status and formal rewards represent extrinsic job satisfaction factors.

In general these variables identified as most important were not the variables indicated as being relatively well satisfied. The single exception to this pattern was the extrinsic factor of resources. This anomaly may be attributable in part to the composition of the sample for this investigation. However, a similar equilibrium pattern is also manifested relative to those variables of least importance and lowest satisfaction. Intrinsic variables were identified across all groups as least important, while primarily extrinsic factors were viewed as lowest in satisfaction. The only exception to the pattern was the variable related to the intrinsic



factor of growth. This variable was perceived as poorly satisfied by all groups.

Further insight concerning the relationships between perceived levels of importance and satisfaction was obtained by analyzing mean index values. Representing the perceived influence of a specific variable on the quality of worklife, pQWL:Vi indices were generated for the total sample as well as for science and mathematics teachers (Appendix B). These index values indicate that all groups involved in the study identified the variables of formal rewards system and status as being most discrepant (greatest difference between the degree of importance and the level of satisfaction). Both of these variable categories represent extrinsic influences on workplace satisfaction. Other major variable categories occurring in all groups with somewhat lower mean pQWL:Vi values were recognition and growth. These discrepant areas relate primarily to intrinsic job satisfaction factors. In an exception to the above pattern, the pQWL:Vi index values for science teachers indicated that working conditions were viewed as relatively discrepant. This extrinsic factor may portray the prescribed need of science teachers for adequate laboratory facilities and needed work space.

Data representing the least discrepant variables fell within a very narrow range among all participating groups. Therefore, meaningful patterns related to the least discrepant areas are more difficult to establish. However, pQWL:Vi index values indicate that the variable categories dealing with the intrinsic factors

of job enrichment and sense of achievement were among the least discrepant QWL variables. The extrinsic variable pertaining to support systems also exhibited a comparatively low index value in all groups.

Additional variables reflecting lower discrepancy included extrinsic as well as intrinsic components. Mean pQWL:Vi values indicated that the total sample as well as science teachers viewed work control, an intrinsic variable, as relatively nondiscrepant. Work control did not appear as one of the least discrepant factors for mathematics teachers. However, this subgroup did perceive the extrinsic variable of working conditions as one of the least discrepant workplace factors.

In general, the most discrepant areas correspond to the variables identified as having the lowest levels of satisfaction. Specifically, status, formal rewards system, and growth occur both among the most discrepant and the least satisfied QWL factors for the total sample as well as for science and mathematics teachers. In addition, growth and recognition were areas of low satisfaction that yielded rather high pQWL:Vi discrepancy values. However, both recognition and growth were viewed as the least important to the quality of working life by all groups.

It seems apparent, then, that differences in perceptions regarding the QWL variables involved in this study were minimal among all three groups of participants. Through the treatment and analysis of data from three different perspectives (item response frequencies,

weighted importance and satisfaction values, and pQWL:Vi indices), it is clear that for this sample the two most important workplace dissatisfiers were status and formal rewards, both extrinsic influences on job satisfaction.

The variable identified by all groups involved in the study as yielding the highest level of satisfaction was the intrinsic factor, sense of achievement. Aspects related to job enrichment were also among those intrinsic factors of high satisfaction for all groups. Satisfaction levels concerning the more extrinsic QWL factors exhibited differences among the groups involved in the study. The total sample viewed resources and work control as major areas of satisfaction, while the subgroup of mathematics teachers viewed support system and working conditions as well satisfied. Science teachers perceived work control and support systems as being relatively satisfying. Due to this similarity in results among all participant groups, it seems clear that interventions designed to positively affect the quality of working life can be implemented for all classroom teachers. The sources of satisfaction and dissatisfaction for science and mathematics teachers within this study were essentially the same as for the total sample of classroom teachers regardless of academic responsibility.

These results seem to generally support the job satisfaction research of Herzberg (1966) and others. Herzberg's motivation-hygiene theory indicates that extrinsic (hygiene) workplace factors are major sources of dissatisfaction when they are perceived as inadequate.

He theorizes that even when these factors are supplied at appropriate levels, they do not generally improve satisfaction, but tend to create workplace dissatisfaction. Data indicate that for this sample of classroom teachers the extrinsic factors of status and formal rewards constitute sources of job dissatisfaction, while such intrinsic aspects as sense of achievement and job enrichment may be sources of satisfaction to teachers of science, mathematics, and other secondary school subjects.

Similarities found among the target groups' importance and satisfaction values suggest that the development of a clearer understanding of workplace satisfaction may depend on additional levels of analysis. Correlational analyses of the weighted importance and satisfaction values and the pQWL:Vi indices in relation to key demographic factors were found, for example, to yield a number of interesting results. Demographic factors which appear to exhibit a relationship with several of the major QWL variables include years of experience, number of years in the present school, level of education, age, and salary (Appendix C). Specific QWL variables found to be associated with several demographic factors were resources, status, job enrichment, sense of achievement, work load, working conditions, and growth. Coefficients indicating particularly clear associations were those concerning age, salary, and level of education in relation to those QWL variables judged to have the greatest influence on workplace satisfaction and dissatisfaction. For example, the variables of status and formal rewards, the prime sources of

dissatisfaction for all groups represented in the study frequently produced relatively high correlation coefficients ( $|r_s| \geq .20$ ) with the demographic factors of age, salary, and level of education.

Job enrichment and sense of achievement, perceived at rather high levels of satisfaction for all groups, also produced significant correlations ( $|r_s| \geq .20$ ) with these demographic factors.

Knowledge of these significant correlations may be particularly useful when considering ways to improve workplace satisfaction among specific subgroups of the teaching staff. For instance, several of the demographic factors are associated with the age of individuals participating in the study, such as years of experience, years in the school and the level of education. This consideration gains importance in light of teacher attrition data, which indicate that a high percentage of science and mathematics teachers leave relatively early in their careers (Chapman, 1983; Levin, 1982). The science and mathematics teachers in this sample were among the younger individuals, with fewer years of experience. If this finding is confirmed through subsequent research, interventions to increase the quality of working life for those groups may need to be designed to accommodate age-related perceptions and priorities, or to focus greater attention on the younger segment of the secondary teacher workforce.

## VI. PROPOSED MODEL FOR IMPROVING WORKLIFE QUALITY

In order to effectively utilize information concerning the major QWL variables, an overall model or framework is needed.

The formulation of such a framework depends upon the integration and analysis of several types of data.

The model presented in Figure 4 depicts the data sources and important processes deemed necessary for addressing QWL concerns. These major information sources are viewed as essential based upon the results of the present investigation. The first two are acquired by assessing the present status of teacher worklife to determine both intrinsic and extrinsic factors held to be important, how well they are being satisfied, and the discrepancies existing between importance and satisfaction levels. Knowledge gained from studies of educational and other organizations represents a third major data source that should be consulted to keep abreast of emerging developments.

The three data sources are considered in designing tentative strategies to enhance teacher worklife. These strategies are then to be screened or analyzed in terms of two additional types of information. As discussed earlier in this chapter, demographic factors (e.g., age, educational level) appear to be associated with QWL perceptions, and need to be taken into consideration. Secondly, it is prudent to incorporate specific contextual information that would tend to delimit or shape the types of strategies that can be considered feasible (e.g., state mandates, local financial constraints, changes in leadership).

At each stage of the model, ongoing feedback and evaluation are incorporated. The worklife improvement strategies that result

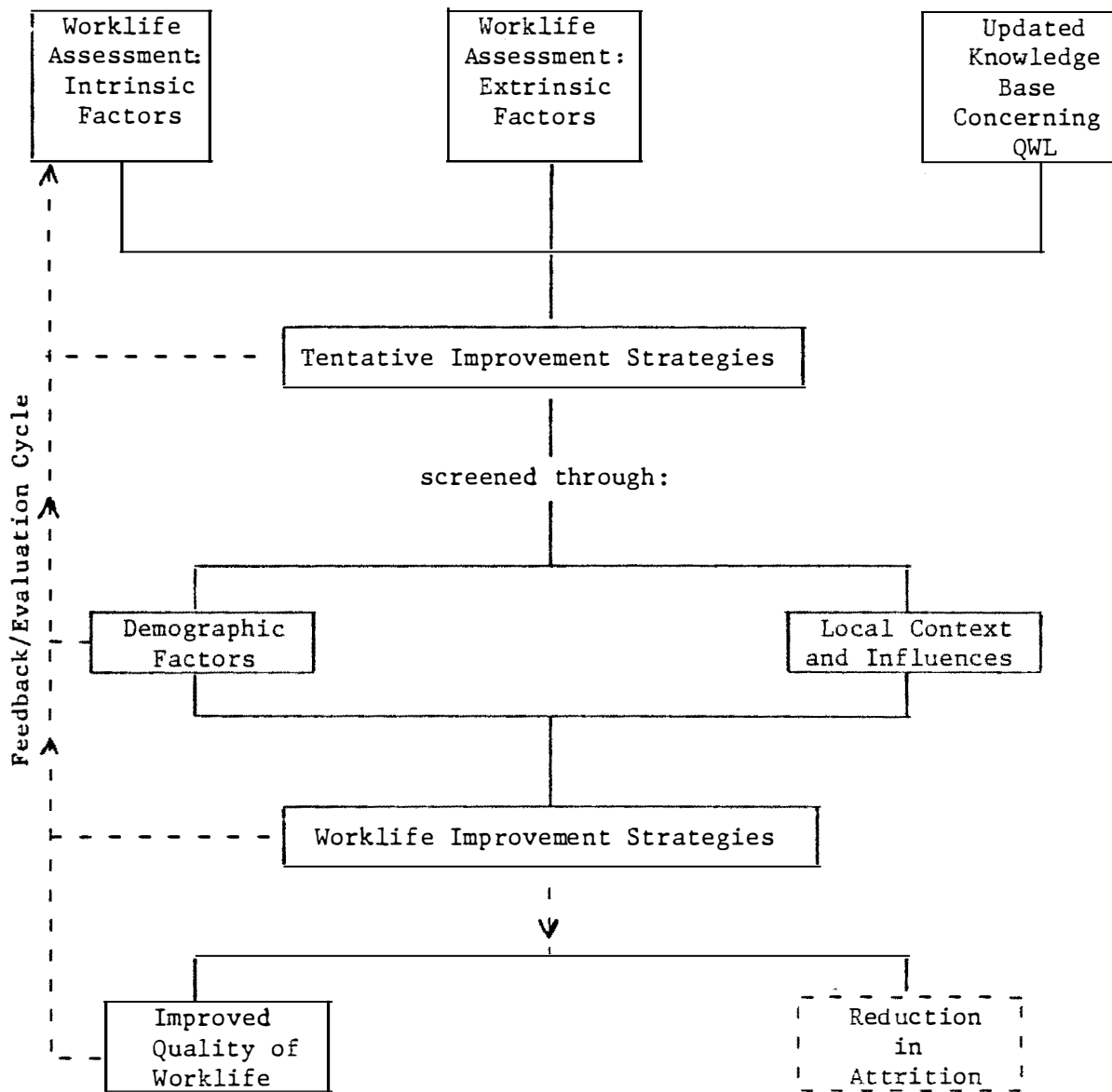


Figure 4. A Model for Improving Worklife Quality.

should lead to two major outcomes: enhanced quality of worklife and reduced teacher attrition. Naturally, these outcomes will be relatively gradual in their emergence, making measurement from several perspectives and across an extended time frame essential features to follow up on the strategies implemented.

## VII. RECOMMENDATIONS FOR FUTURE RESEARCH

In order to expand upon the previous investigation, further research is needed concerning components related to the quality of work life within educational organizations. Potential research activities might center upon the following considerations:

1. The context within which the instrument has been utilized needs to be broadened. This would necessitate the inclusion of more diversified types of school districts in future studies. Districts representing a more complete spectrum of socioeconomic levels, community characteristics, school district sizes, and schools offering alternative educational programs would add valuable information concerning workplace perceptions.
2. An in-depth probe of demographic aspects may contribute to the determination of workplace factors pertinent to major groups within the teaching profession. For example, specific information needs to be collected concerning the relationships of age to status; recognition to level of education; and recognition to age.



3. The QWL model formulated within this investigation needs to be implemented and evaluated. The long-term collection and analysis of data concerning both QWL perceptions and teacher attrition are necessary if an accurate assessment of the model is to be made. In order to increase the model's usefulness, more analytical techniques for data analysis should be applied. Application of appropriate techniques such as factor or discriminant analysis may represent valuable avenues of research concerning the effectiveness of the QWL model.

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## APPENDICES

## APPENDIX A

### SURVEY AND INTERVIEW INSTRUMENTS

## QUALITY OF SCHOOL LIFE INVENTORY

The items below pertain to the factors often associated with the quality of school life for teachers. Please rate each item as to Importance and Satisfaction.

IMPORTANCE - How important is the item to you in judging the quality of your school life as a teacher?  
Rate from Unimportant to Very Important.

SATISFACTION - How well is the item being satisfied by your current work assignment(s)? Rate from very Poor to Very Good.

CATEGORY	SCHOOL LIFE FACTORS	IMPORTANCE					SATISFACTION				
		Unimportant	Little Imp.	Important	Very Imp.	Very Poor	Poor	Good	Very Good		
Working Conditions	1. Adequacy of the building facilities 2. Availability of needed work space 3. Quality of maintenance										
Resources	4. Availability of needed materials 5. Availability of equipment 6. Level of financial support for programs										
Work Load	7. Number of student contacts per day 8. Class size 9. Provision for planning time 10. Distribution of non-instructional duties 11. Instructional work assignments related to expertise										
Support Systems	12. Administrative support for: <u>discipline</u> <u>instructional process</u> <u>and procedures</u> <u>new ideas (e.g. curriculum, teaching strategies)</u> 13. Community organizations support of school programs 14. Parental support of school activities and programs										
Formal Rewards System	15. Level of salary 16. Level of benefits 17. Availability of monetary incentives 18. Opportunities for promotion										
Work Control	19. Opportunity to: <u>participate in school-wide decisions</u> <u>affect departmental decisions</u> <u>make decisions regarding student discipline</u> <u>make decisions regarding instructional methods</u> <u>make decisions regarding course content</u>										
Inclusion	20. Sense of personal involvement in: <u>faculty work activities</u> <u>decision making processes</u> <u>day to day interactions with staff members</u> 21. Willingness of staff to include new staff 22. Sense of mutual trust: <u>with colleagues</u> <u>with administrative staff</u>										
Job Enrichment	23. Opportunity to: <u>use own best abilities</u> <u>initiate new and creative ideas</u> <u>assume leadership roles</u> 24. Opportunity for a variety of work experiences										
Sense of Achievement	25. Personal reward when students perform well 26. Confidence felt in quality of teaching 27. Satisfaction derived from professional contributions (e.g. prof. organ., forums, articles, projects)										
Recognition	28. Appreciation expressed by students 29. Attention by administrators for quality of work 30. Peer approval and support for contributions 31. Commendations from parents/community members										
Growth	32. Opportunity to develop own best skills, abilities, talents 33. Opportunities for: <u>leadership roles within the school system</u> <u>advancement within the school system</u>										
Status	34. Satisfaction with status of teaching as a profession <u>as perceived by students</u> <u>as perceived by colleagues</u> <u>as perceived by parents and community</u> 35. Personal satisfaction with prestige of teaching as a profession										

This project is a means for university faculty and school personnel to combine efforts to improve the educational workplace. When the educational workplace becomes more rewarding for teachers, it is also likely to be more productive for learners. The project is a field based study of the conditions that can make a difference in teachers' well being and attitudes about their work.

The major objectives of the project are to identify the work satisfiers that are important to teachers in selected school units; develop and implement plans that focus on the important work satisfiers; and share the findings from the project schools with others concerned about improving the educational workplace. We will then have a better chance of recruiting and keeping talented teachers.

There are obvious benefits for those involved in the project. The University of Tennessee will benefit by translating the findings from the individual projects into improved undergraduate and graduate programs and experiences. The university team will also be able to add to the body of knowledge about improving the educational workplace. The schools will be able to determine ways to increase teacher satisfaction and keep talented teachers in the profession. By sharing the findings from all of the project schools, all participants should improve their understanding about approaches that can improve school practice. Finally, others interested in this important educational challenge will benefit from the dissemination of the results.

Please provide the following background information:

Position \_\_\_\_\_

Subject area(s)/grade level(s) \_\_\_\_\_

Years of teaching experience: \_\_\_\_\_

Years in this school: \_\_\_\_\_

Education: Bachelor's \_\_\_\_\_ Masters \_\_\_\_\_

Ed. Specialist \_\_\_\_\_ Doctorate \_\_\_\_\_

Age: 20-29 \_\_\_\_\_ 30-39 \_\_\_\_\_ 40-49 \_\_\_\_\_

50-59 \_\_\_\_\_ 60+ \_\_\_\_\_

Tenured: Yes \_\_\_\_\_ No \_\_\_\_\_

Gender: Male \_\_\_\_\_ Female \_\_\_\_\_

Which best typifies students in your current major teaching assignment(s)?

Remedial/low achievers \_\_\_\_\_

Advanced/high ability \_\_\_\_\_

Primary source of the family income?

Yes \_\_\_\_\_ No \_\_\_\_\_

Salary: \_\_\_\_\_

\_\_\_\_\_ under \$15,000

\_\_\_\_\_ \$15,000-\$20,000

\_\_\_\_\_ \$20,000-\$25,000

\_\_\_\_\_ \$25,000-\$30,000

\_\_\_\_\_ \$30,000-\$35,000

\_\_\_\_\_ over \$35,000

Member of local teacher organization?

Yes \_\_\_\_\_ No \_\_\_\_\_

## WORKPLACE STUDY INTERVIEW

1. What is your present teaching assignment in this school? How long have you held this position?
2. Does the physical environment affect your performance as a teacher? In what way?
3. How much freedom do you have in carrying out your responsibilities? Are you satisfied with this amount of freedom?
4. a) What are your best abilities? What are the things you do very well?  
b) Do you have a chance to use these?
5. a) How do you feel about your remuneration?  
b) As compared to others in the teaching profession?  
c) As compared to other professions?
6. What do you like best about your work assignment?
7. What do you like least about your assignment?
8. a) How many people directly supervise your work?  
b) What are their positions?  
c) Describe the things you like most about the person(s) to whom you report.  
d) What do they do best?
9. If you were to make recommendations about improving their performance, what are the most important things you would recommend?
10. If you had the opportunity to change your assignment, what changes would you make?
11. a) Do you see your school as a friendly place to work?  
b) Are you satisfied with the relationship you have with your colleagues?



12. How do you feel about teaching as compared to other professions?  
How much prestige does teaching afford compared to the other professions? How would you rank teaching as compared to other professions?
13. What causes you to feel most satisfied about your work?
14. What causes you the most dissatisfaction?
15. If you were given the opportunity to make any changes necessary in the school to make it a place where talented teachers would prefer to continue teaching here, what would they be?
16. What does the future hold for you in the teaching profession?
17. Is there any comment you would like to make concerning your workplace that has not been addressed by the survey or the interview? Is there anything I've left out? Something you would like to add?

## APPENDIX B

### WEIGHTED IMPORTANCE AND SATISFACTION VALUES

Table 38. Weighted Importance Values (Means) and Weighted Satisfaction Values (Means): Total Sample, Science Teachers, and Mathematics Teachers.

Total Sample		Science Teachers		Mathematics Teachers	
Category	Means	Category	Means	Category	Means
<u>Weighted Importance Values</u>					
Resources	43.62	Resources	44.00	Status	43.74
Support Systems	42.28	Work Load	42.09	Resources	43.16
Work Load	42.08	Status	41.53	Work Load	42.38
Status	41.79	Support Systems	41.42	Work Control	41.62
Job Enrichment	41.61	Working Conditions	41.03	Support Systems	41.18
Working Conditions	41.79	Job Enrichment	41.00	Formal Rewards System	41.13
Work Control	41.13	Sense of Achievement	40.62	Sense of Achievement	40.74
Formal Rewards System	40.69	Work Control	40.31	Job Enrichment	40.58
Sense of Achievement	40.52	Formal Rewards System	39.69	Working Conditions	40.42
Inclusion	40.28	Inclusion	39.13	Inclusion	40.32
Recognition	39.82	Recognition	38.46	Recognition	40.11
Growth	38.49	Growth	38.15	Growth	38.84
<u>Weighted Satisfaction Values</u>					
Resources	37.30	Sense of Achievement	37.85	Resources	36.42
Sense of Achievement	36.30	Resources	37.33	Sense of Achievement	35.80
Job Enrichment	35.30	Job Enrichment	37.00	Working Conditions	35.79
Support System	35.11	Support Systems	36.98	Support Systems	35.05
Work Control	34.43	Work Control	36.18	Work Load	34.55
Working Conditions	33.88	Work Load	34.22	Job Enrichment	34.50
Work Load	33.87	Inclusion	33.95	Work Control	33.99
Inclusion	33.48	Recognition	33.31	Inclusion	33.84
Recognition	31.38	Working Conditions	32.92	Recognition	30.79

Table 38 (continued).

Total Sample		Science Teachers		Mathematics Teachers	
Category	Means	Category	Means	Category	Means
Growth	30.71	Growth	30.67	Status	30.24
Status	30.22	Status	30.00	Growth	30.11
Formal Rewards System	27.84	Formal Rewards System	28.08	Formal Rewards System	27.95

## APPENDIX C

### CORRELATIONS

Table 39. Mean Index Values: Measure of Discrepancy between Degree of Importance and Level of Satisfaction.

Total Sample		Science Teachers		Mathematics Teachers	
Category	Mean Index Value	Category	Mean Index Value	Category	Mean Index Value
Formal Rewards System	1.65	Formal Rewards System	1.59	Formal Rewards System	1.71
Status	1.49	Status	1.50	Status	1.61
Recognition	1.36	Working Conditions	1.37	Recognition	1.41
Growth	1.34	Growth	1.36	Growth	1.40
Working Conditions	1.31	Work Load	1.30	Work Load	1.29
Work Load	1.30	Resources	1.25	Work Control	1.25
Inclusion	1.26	Inclusion	1.22	Resources	1.24
Support Systems	1.25	Recognition	1.21	Inclusion	1.22
Job Enrichment	1.25	Job Enrichment	1.16	Job Enrichment	1.22
Work Control	1.24	Support Systems	1.15	Support Systems	1.21
Resources	1.23	Work Control	1.14	Working Conditions	1.17
Sense of Achievement	1.14	Sense of Achievement	1.10	Sense of Achievement	1.16

Table 40. Relationship between Demographic Factors and Those QWL Variables Perceived Most Important and Most Satisfied.

Variable Category	Demographic Factor Significant $r_s$				Primary Income Source	
	Years of Experience	Years in the School	Level of Education	Age		Salary
<u>Most Important</u>						
Total Sample						
Resources		-.09	-.09			
Support Systems	-.09					
Work Load					.13	
Science Teachers						
Resources				-.46		
Work Load				-.21		.21
Status				-.30		
Mathematics Teacher						
Status		.34				
Resources		-.24				-.24
Work Load		-.20		-.23	.27	-.27

Table 40 (continued).

Variable Category	Demographic Factor Significant $r_s$					
	Years of Experience	Years in the School	Level of Education	Age	Primary Income Source	Salary
<u>Highest Satisfaction</u>						
Total Sample						
Resources	.18	.15	.13	.09		.33
Sense of Achievement	.09	.08		.11		.15
Job Enrichment	.08			.08		.09
Support System	.12			.14		.24
Science Teachers						
Sense of Achievement		.25				.18
Resources	.27		.22			.47
Job Enrichment				-.26		
Support Systems		.26				
Mathematics Teachers						
Resources						.27
Sense of Achievement		-.20				
Working Conditions						
Support Systems						



Table 41. Relationship between Demographic Factors and Those QWL Variables Perceived Least Important and Satisfied.

Variable Category	<u>Demographic Factor</u> Significant $r_s$				Primary Income Source	
	Years of Experience	Years in the School	Level of Education	Age		Salary
<u>Lowest Importance</u>						
Total Sample						
Inclusion			-.10			
Recognition				-.11		
Growth		.08			-.09	.10
Science Teachers						
Inclusion					-.38	
Recognition				-.29	-.18	
Growth		.19		-.18		
Mathematics Teachers						
Inclusion						
Recognition						
Growth	.30	.30				.22

Table 41 (continued).

Variable Category	Demographic Factor					Primary Income Source	Salary
	Years of Experience	Years in the School	Level of Education	Age	Significant $r_s$		
<u>Lowest in Satisfaction</u>							
Total Sample							
Growth	.07			.08			.15
Status							.17
Formal Rewards System			.12				.29
Science Teachers							
Growth		.19		-.18			
Status				-.30			
Formal Rewards System				-.28	-.24		
Mathematics Teachers							
Status		.31					.41
Growth	.30	.30					.22
Formal Rewards System			.29				.26

Table 42. Relationship between Demographic Factors and the pQWL Index.

Variable Category	Demographic Factor Significant $r_s$					
	Years of Experience	Years in the School	Level of Education	Age	Primary Income Source	Salary
<u>Most Discrepant</u>						
Total Sample						
Formal Reward System			-.12		-.11	-.23
Status			-.09			-.12
Recognition	-.20	-.11	-.32			-.13
Growth						
Science Teachers						
Formal Reward System			-.29	-.22		
Status				-.19		-.30
Working Conditions			.20	-.04		.42
Growth						
Mathematics Teachers						
Formal Reward System						-.23
Status		.32		.20		
Recognition	-.24			-.35	.21	-.21
Growth			-.26			-.25

Table 42 (continued).

Variable Category	Demographic Factor Significant $r_s$				Primary Income Source	Salary
	Years of Experience	Years in the School	Level of Education	Age		
<u>Least Discrepant</u>						
Total Sample						
Job Enrichment	-.15		-.08	-.13		
Work Control			-.10			-.09
Resources	-.19	-.18	-.15	-.10		-.32
Sense of Achievement	-.12		-.14	-.10		-.17
Science Teachers						
Job Enrichment					-.23	
Support Systems	-.19			-.35		-.22
Work Control			-.22	-.26		
Sense of Achievement						
Mathematics Teachers						
Job Enrichment			-.23			-.26
Support Systems						
Working Conditions				.27		
Sense of Achievement		.38				

## VITA

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Previous career pursuits have included research in plant breeding, science teaching at the secondary level, and various occupations exposing him to a wide range of unique workplace conditions.