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Title: Factors that Influence Electronics Technicians to Participate in Work-Related Training

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The purpose of this study was to identify the factors that influence electronics technicians to participate in work-related training and to explain the relationships among those factors. Based on Steers and Rhodes' Employees Attendance Process Model, the subjects' willingness to participate in work-related training was regarded as an indicator of actual participation. The factor of willingness to participate was, in turn, predicted by four factors: job satisfaction, values and internal expectations, external expectations, and personal characteristics. To predict subjects' training participation, this model also suggested another path from personal characteristics through attendance ability toward the actual training participation. A causal model was presented to indicate these relationships.

Questionnaires were mailed to 130 randomly selected electronics technicians in the State of Oregon during March 1988.

Forty-seven electronics technicians responded. Multiple regression and partial correlation were employed to verify the proposed causal model. Factor analysis was employed to extricate the possible factors which existed within external expectations and values and internal expectations.

It was concluded that electronics technicians' work-related training participation was influenced by their willingness and ability to participate. Their willingness to participate in work-related training was determined by their job satisfaction and external expectations. Reducing restrictions on participation, providing flexible time to attend, and paying for training costs were effective ways of increasing their ability to attend, and, therefore encouraging them to participate in work-related training.

Factors that Influence Electronics Technicians to Participate in Work-Related Training

by

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I. INTRODUCTION

The purpose of this study was to identify the factors that influence electronics technicians to participate in work-related training and to explain the relationships among those factors.

Education and training are among the most important enterprises in modern society. There is no clear-cut boundary between education and training. According to Hill (1982), "Education deals a great deal with the acquisition of knowledge; training deals with the application of knowledge" (p. 273). Every individual has been exposed to some training situations if one includes the skill development activities of early schooling (Deming, 1982).

Although there are many different definitions of training, the definitions most often used by the public to explain training are similar. Training usually refers to the communication and learning of the manual skills necessary to perform an economic task. It is usually a presentation of controlled information and practice resulting in performance of criterion behavior by the learner in a manner which allows evaluation (Geroy, 1986; Johns-Manville, 1976). Over the years, training has come to include a broader spectrum of activities, ranging from skill training to individual development to organizational change (Otto & Glaser,

1970). More recently, training has become a process of preparing people to perform defined functions in predictable situations. In this way "training" differs from education, which is a process of equipping people to perform undefined functions in unpredictable situations (Hill, 1982).

Today, workers are viewed as assets that enable enterprises to distinguish themselves in performance. Workers are more than mere current resources used in production processes. They have long economic lives which, for the corporations' best interest, deserve the same attention given to other assets (Vetter, 1967).

This recognition that people constitute a company's critical resource is creating a boom in corporate training. It is estimated that corporations annually spend nearly $60 billion on training, about the same amount spent on education in the nation's four-year colleges and universities (Eurich & Boyer, 1985). About eight million people, the same number as are enrolled in institutions of higher education, are involved in training within corporations (Eurich & Boyer, 1985; Naisbitt & Aburdene, 1985). These figures indicate that human resources could be the single most critical resource for public and private enterprises in the 1980s and 1990s. Other factors affecting this present pivotal position of human resources are the slowdown in the growth rate of the labor force and increasing occupational obsolescence in the workplace (Tracy, 1984).

Because the use of technology in the workplace is growing exponentially, training workers to utilize this technology is

ongoing. Twenty years ago, computers were built with thousands of individual transistors, which all had to be connected manually. Today, an entire microprocessor can be put on a tiny silicon chip (Resources in Technology, 1987; Weisbecker, 1979). Predicting the impact of scientific breakthroughs on the future is difficult. As basic research provides greater knowledge, engineers steadily apply it to existing problems. Such applications inevitably have broad implications for the production procedures, methods, and even the products (Bulkeley, 1986). The need for training is greater in organizations whose products and services are based on rapidly changing states of the art or which have to maintain an up-to-date technology (Bracker & Pearson, 1987; Warren, 1969).

With the application of computers, the electronics industry has expanded its service scope to many high-technology fields (Rodenstein, 1983). According to occupational employment projections (U.S. Department of Labor, 1984), the electronics industry will be among the twenty fastest growing areas from 1988 through 1995. The electronics industry is approaching a $400-billion business. Parnell (1986) predicted that within two years 75 percent of all jobs in the electronics industry would involve computers in some capacity. The U.S. Department of Labor (1984) also estimated that 115,000 new electronics technicians, or a 60-percent increase, would be needed between 1986 and 1987 in addition to replacements of older workers.

Due to dramatic technological changes, electronics technicians become outdated in both skills and knowledge after

working for only five to seven years (Hubbard, 1986). It has been estimated that a person's knowledge degenerates by 5 percent each year, and only 50 percent of useful knowledge remains 10 years later if advanced knowledge is not sought after (Chang, 1985). To become successful, electronics technicians must continually broaden their knowledge and sharpen their skills through "work-related training" (Iversen, 1986). As the rate of technological change increases, the importance of work-related training increases.

Work-related training in general refers to those kinds of knowledge and skills that need specialized learning procedures in the workplace. This includes in-plant training, in-house training, in-company training, on-the-job training and inservice training (Hawes & Hawes, 1982; Husen & Postlethwaite, 1985; Page, Thomas & Marshall, 1980; Rowntree, 1982). Work-related training is aimed at making workers more productive in their work and has been considered as a cost-effective approach to upgrading workers' knowledge and skills to match production needs (Barton, 1986; Burns, 1980; Chang, 1985; Hubbard, 1986; Rowntree, 1982). Work-related training has been adopted by most industries, especially by the highly technological corporations.

Some highly technological companies may soon budget 15 to 20 percent of the current cost of personnel towards work-related training (Barton, 1986; Zahniser, Schler & Ashley, 1984). It has been estimated that 73 percent of all U.S. enterprises with 50 or more employees offered some sort of technical training or work-

related training at cost to the companies (Zemke, 1985). Most work-related training has operated under agreements between industries and universities in the form of scholarships or educational support for workers.

In response to rapid technological challenges, electronics companies are investing in new equipment and facilities, and providing work-related training for their employees. Work-related training is believed to raise communication standards among technicians, employers, and customers (Cothran, 1987) and has been considered to be one of the most effective ways of coping with technological changes in the industry.

Statement of The Problem

The electronics industry is one of the most important subsystems of the information society. Parnell (1986) predicted that the electronics industry will be one of the fastest growing industries from 1988 through 1995. Any marked change due to technological innovation creates severe problems of adjustment for electronics technicians (Stern, 1988). Thus, work-related training offered to them has increased dramatically (Zemke, 1986). However, for this training to be effective, it must be appropriate. Electronics technicians must benefit from this training and be able to apply it in the work environment. The effectiveness of such training, however, is also contingent upon their motivation or willingness to participate.

Previous studies attempted to explain and predict workers' motivation to participate in many aspects of further education

(Boshier, 1971; Boshier & Collins, 1985; Burgess, 1971; Dean, 1986; Houle, 1961; Yarger, Brannigan & Mintz, 1980). These were not multivariate studies; they usually considered only a few variables at a time. Furthermore, work-related training of electronics technicians as a group has not been studied. The identity of factors that may influence these particular workers to participate in work-related training, and how significant these factors may be, are still unknown.

Therefore, this study addressed the following questions: What factors will influence electronics technicians to participate in work-related training? Furthermore, what are the relationships among these factors? An understanding of the factors that influence electronics technicians to comprehend and assimilate work-related training will help electronics companies to design and deliver technical training programs more effectively. These training programs will then be more effective in improving productivity and will help electronics technicians pursue individual excellence.

Definition of Terms

Technicians are workers who work in direct support of engineers or scientists, utilizing theoretical knowledge of fundamental scientific, engineering, mathematical, or draft design principles (U.S. Department of Labor, 1977). Their tasks include solving practical problems encountered in fields of specialization, such as those concerned with development of

electrical and electronic circuits, and establishment of testing methods of electronics or electrical devices and mechanisms (U.S. Department of Labor, 1977).

Electronics technicians are those who are employed in the manufacturing of electronics equipment, including those in occupations classified in the Dictionary of Occupational Title as "electronics technicians" (workers applying electronics-related knowledge to lay out, build, test, troubleshoot, repair, and modify developmental and production electronics equipment, such as computers, missile-control instrumentation, and machine tool numerical controls) (Oregon Industrial Outlook, 1986; U.S. Department of Labor, 1977).

Inservice training is special training or instruction for employed persons, including professionals, aimed at increasing workers' competence. It is a training undertaken during a break in professional service or in conjunction with it (Good, 1959; Page, Thomas & Marshall, 1980).

In-plant training is a program of training established, financed, and operated by an industry concerned with training for workers. It is training for the employees of an organization held on the premises (Good, 1959; Page, Thomas & Marshall, 1980).

On-the-job training involves supervision and other supplemental instruction furnished to workers while they are employed as beginners or trainees in the regular duties of positions or jobs for which wages are paid (Good, 1959). It is also training in the skills of an occupation while the individual

is actually carrying out the work of an employed position (Hawes & Hawes, 1982).

Further education refers to part-time and full-time education for people who have left school. It is usually more vocational or recreational and of a lower academic standard than higher education (Page, Thomas & Marshall, 1980). Rowntree (1982) defined further education as that "which includes all post-secondary education other than that provided in a university, i.e. broadly the 'maintained' sector. The courses [range] from lower-level technical work to professional training to degree-level work and even post-graduate studies" (p. 100).

Review of Related Literature

Motivation and Behavior

There are as many definitions of motivation as there are theories of motivation. The definitions of motivation have varied with the development of motivation theories. The term "motivation" was originally derived from the Latin word "movere," which means "to move." In the 1960s and 1970s, motivation was concerned with what energizes human behavior, what directs or channels behavior, and how this behavior is maintained or sustained (Steers & Porter, 1983). Motivation refers to what a person is willing to do (Schaefer, 1977). It consists of the contemporary influences on the direction, vigor, and persistence of action (Atkinson, 1964). Motivation activates and directs behavior toward goals (Berelson & Steiner, 1964). People seem

inclined to do that which they value or view as helping them to achieve what they value (Sredl & Rothwell, 1987).

According to the Expectancy Theory (Vroom, 1964), a person is motivated to obtain a particular outcome, the importance of which varies with the value attributed to these outcomes. Furthermore, the higher a person's expectation of receiving some incentives or rewards, whether a promotion or a good grade, the harder he or she will work for it.

Expectation is the perception of likelihood of success at the task (Biglan & Mitchell, 1971; Nebeker & Mitchell, 1973; Rossett, 1987). If one believes that hard work leads to success, and success leads to recognition, and recognition leads to valued, reward, then he or she must be a motivated worker (Michalak & Yager, 1979). Expectation can influence the way a person actually does perform.

The thesis that expectation influences behavior has substantial research support (Cooper, 1983; Elashoff & Snow, 1971; Martinek, Crowe & Rejeski, 1982; Rosenthal & Jacobson, 1968). Rosenthal and Jacobson (1968) examined 300 studies of the effects of expectations on behavior. Of these, 37 percent of the studies found that expectations seemed to influence behavior. Since expectations are affirmations of the future, it may be possible to meet an expectation if proper action is taken by the worker. Companies can perpetuate workers' actions through creating a perception of the environment which holds possibility for worker success. Management personnel who perceive their workers as

having value and worth, in turn, stimulate self-motivated workers (Baxter & Bowers, 1985).

In addition to expectation, the Vroom's Expectancy Theory identifies "value" as another variable that affects motivation. Psychologists have defined "value" in various ways. Value is what one regards as conducive to one's welfare (Locke, 1976). Value is viewed as the worth individuals attach to things or outcomes (Rogers, Clark & Schuster, 1971; Rossett, 1987). Value is an important element in an individual's frame of reference which guides actions and perceptions (Pennings, 1970). Value is also considered to be part of the normative standards used to judge and to choose among alternative modes of behavior (Becker & McKlintock, 1967; Elizur, 1984; Kluckhohn, 1973). Based upon these definitions, if workers view themselves as having meaningful duties, they are more likely to make a commitment to the company.

As discussed above, both expectation and value appear to influence motivation (Keller, 1983; Nadler & Lawler, 1979). The Expectancy Theory is a concrete representation of this idea. In this theory, human behavior is a function of the interactive processes between the characteristics of an individual and the perceived environment (Steer & Porter, 1983). People have their own needs and mental maps of what the world is like. They use these maps to make decisions about how they will behave (Nadler & Lawler, 1979). In short, motivation is a function of expectation and value. As value and expectation change, so does motivation.

Although expectation and value have been widely used to

explain motivation, Vroom's Expectancy Theory is a simple formulation that encompasses a highly complex and poorly understood set of variables and variable dynamics (Campbell & Pritchard, 1979). Research indicates that the value and expectation factors may not be sufficient to explain motivation (Boshier & Collins, 1985; Keller, 1983). As proposed by Keller (1983) and Boshier and Collins (1985), values and internal expectations and external expectations exist independently. In addition, the Expectancy Theory ignored important factors such as job satisfaction, attendance ability, and personal characteristics.

The Steers and Rhodes Process Model

Steers and Rhodes (1978) proposed a process model that extends Vroom's Expectancy Theory. The process model suggests, as does Vroom, that "motivation" influences an employee's attendance behavior (Figure 1-1). Unlike Vroom (1964), however, an employee's values do not directly influence attendance behavior; they affect the person's motivation indirectly through satisfaction with the job situation. Rather than values, a person's ability to attend training in conjunction with motivation will influence attendance behavior. In this regard, attendance motivation is influenced by both job satisfaction and various internal and external pressures to attend.

Furthermore, Steers and Rhodes (1978) argue that at least three other variables could affect attendance ability. These variables are (a) illness and accidents, (b) family

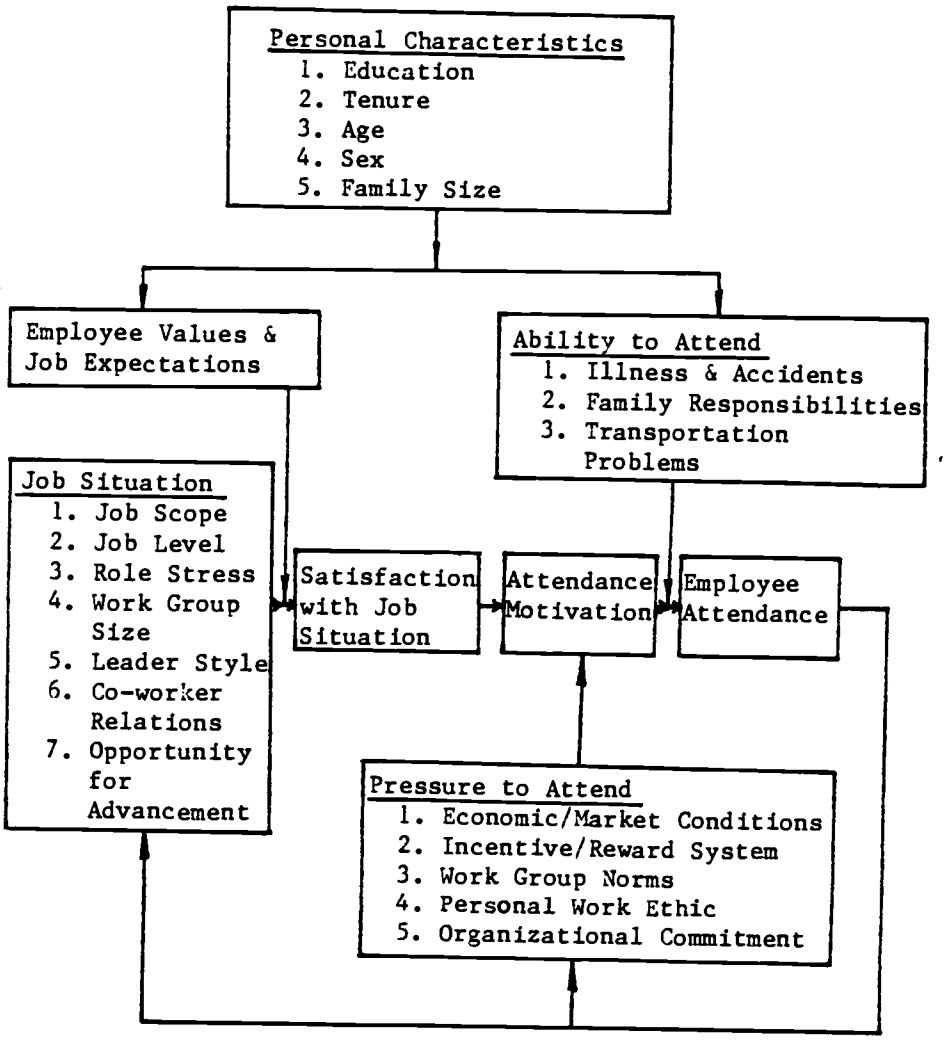


Figure 1-1. The Steers and Rhodes Process Model.

responsibilities, and (c) transportation problems. Regardless of a worker's motivation to go to work, these variables could still prevent a person from attending. Other researchers, however, think that time and cost of training may be the major barriers for workers to participate in work-related training (Hamilton & McElroy, 1983; Henich, 1987; Keyser, 1977; Theis, 1981). In a study titled "What motivates teachers to sign up for in-service courses?" Yarger, Brannigan and Mintz (1980) found that the distance from home to the place of training was very important.

Motivation, in the Steers and Rhodes process model, is the most significant factor that is directly related to training participation. This point is also supported by Dean's (1986) study. In this study, Dean found that willingness or motivation to participate was the major factor that influenced workers to participate in education and training programs (p. 35).

Examining the psychological variables reported in Steers and Rhodes' paper leads to two propositions. First, the Steers and Rhodes process model defines internal expectations as employee values and job expectations. Secondly, this model defines external expectations as pressure to attend an activity. These concepts are consistent with the viewpoints of Boshier and Collins (1985), Dean (1986), and Keller (1983). Expectation is composed of internal and external facets (Boshier & Collins, 1985; Keller, 1983). Internal expectations include cognitive interest, social interest, escape and stimulation, and professional advancement. External expectations include the influence of significant others

and the adoption of new technology in the workplace (Boshier & Collins, 1985; Houle, 1961). In Dean's (1986) study, the general feeling of hope regarding participation may be classified as values and internal expectations; the encouragement of significant others and program benefits may be classified as external expectations (p. 35).

Interaction may exist between values and internal expectations and external expectations. Values and internal expectations influence the demand for and utilization of work-related training opportunities by workers. In addition to supervisors' expectations, providing employees opportunities to participate in work-related training may become a reality. The idea that external expectations influence behavior is argued by Rosenthal and Jacobson (1968). Thus, through the mechanism of the Pygmalion Effect, supervisors' expectations may serve as a powerful influence on the willingness of employees to participate in work-related training (Baxter & Bowers, 1985).

Values and internal expectations, external expectations, and job satisfaction factors all seem to influence the motivation of employees to participate in work-related training. Highly motivated employees seem more likely to have higher training participation than those who are less motivated. Training participation, however, seems not only influenced by the motivation factor, but is also influenced by attendance ability.

The pressure-to-attend variable in the Steers and Rhodes process model, is an important dimension of external expectations.

Employees' values and job expectations are also part of internal expectations. Certain parts of a job situation combine to become both internal and external expectations. For example, the opportunity to advance belongs to internal expectations; co-worker relations belongs to external expectations according to current psychological arguments (Boshier & Collins, 1985; Keller, 1983).

Job satisfaction is a pleasurable or positive emotional state resulting from the appraisal of a workers' job or job experiences (Locke, 1976). Basically, job satisfaction refers to a set of attitudes that employees have about their jobs (Schultz, 1982). It has been linked to motivation, productivity, and even general life satisfaction (Landy, 1978).

Job satisfaction represents a psychophysiological state of pleasure or displeasure (Landy, 1978). This unique state has implications for future choices by individuals. However, the studies show that using job satisfaction as a predictor to explain training attendance motivation and/or behavior is still arguable. Heresz and Orem (1986) found that job satisfaction (work itself, responsibility, personal relations, achievement, advancement) was an important factor in influencing teachers to participate in adult basic education. Nnanna (1983) and Watson (1981) found no correlation between job satisfaction and participation behavior.

Personal characteristics that are important to employees' attendance are education, tenure, age, and sex. Education or formal educational attainment is an important subset of personal

characteristics when considering employees' attendance possibilities (Caras, 1985; Carson, 1985; Hermosa, 1986; Mckenna, 1984; Roldan, 1986). Research indicates that there exists a relationship between formal educational attainment and continuing education participation (Hermosa, 1986; Roldan, 1986). In Dimmock's (1986) study, the explanatory power of education to the adult education participation is between 7 percent and 39 percent (p. 100). In the Steers and Rhodes process model, the influence of formal education attainment to employees' attendance motivation is mediated through values and internal and external expectations.

Tenure or number of years in the profession might be the most significant influence when considering employee's work-related training attendance (Caras, 1985; Carson, 1985; Hermosa, 1986; Roldan, 1986). In Japan, work-related training is one of the most important components of the long-term orientation of Japanese personnel planning (Takezawa, 1983). Japanese companies use such opportunities as rewards and incentives for the promising workers. Major considerations in sending employees for work-related training, especially on sabbatical leave, are influenced by tenure or work experiences (Westney & Sakakibara, 1986). This concept is supported by Keller (1983) and Friedman and Yarbrough (1985). Keller (1983) indicates that personal motivation will tend to strengthen with increases in personal expectancy for success, and personal expectancy for success is influenced by past experience with success at the given task. During the early stages and after seven years of employment, the worker's job

satisfaction is higher than for the period in between. The reason is that new workers are attracted to new jobs. And, after seven years work, the salary and benefits are too good to give up (Schultz, 1982). Within this period, employees who work in the same working environment might feel burned out, on a plateau, or trapped (Kahnweiler, 1985). In this depression period, work-related training may create a bridge from dissatisfaction to satisfaction by providing appropriate learning experiences and opportunities to experience self-fulfillment (Friedman & Yarbrough, 1985).

Age is a significant dimension when considering employees' work-related training attendance (Caras, 1985; Carson, 1985; Mckenna, 1984; Roldan, 1986). Age is a major contributor to job satisfaction. Schultz (1982) found that high job dissatisfaction among young workers has increased in the past decade and apparently reflected the new workers' greater expectations about their jobs as compared to past generations of workers. Furthermore, research indicates that the aggressive and energetic youth with recent technical training can cause the middle-aged to feel threatened or obsolete, and, furthermore, motivates them to seek continuing education or training (Morgan, Patton & Baker, 1985).

Sex has been found to be an important subset of personal characteristics when considering employees' attendance ability (Caras, 1985; Carson, 1985; Mckenna, 1984). Numbers of woman workers have increased significantly in the working force. It may

not be a worker's sex that relates to job satisfaction but rather a group of factors that varies with sex (Schultz, 1982). In the past, discrimination against women employees was widespread in industry, business, and education. The 1964 Civil Rights Act prohibiting sex discrimination should bring about changes in the opportunities and job satisfaction for women.

The Steers and Rhodes process model was applied by Watson (1981). The subjects for Watson's study were 116 production employees of a manufacturing company. Their primary work was metal fabrication. For the purpose of measuring employees' work attendance, Watson (1981) simplified the Steers and Rhodes model by removing some factors such as pressure to attend and attendance motivation. The independent variables were personal characteristics, job situation, and job satisfaction; the dependent variable was employees' attendance. A major finding of Watson's (1981) study was that job satisfaction (shift, supervisor, pay, promotion, co-workers) was not a major influence on attendance. Furthermore, absence from work was significantly related to variables that included personal characteristics (own house, sex, age, marital status, number of children) and job situation (shift, tenure, other employment). The results of Watson's study indicate that the employee's attendance behavior, such as in work-related training, could be investigated by adopting the Steers and Rhodes process model.

A Proposed Causal Model

The concept of motivation seems to interact with situational conditions which are perceived by workers (Kornadt, 1984). Every motive is a subsystem of enduring dispositions which are developed in interaction between person's values, expectations, job satisfaction, needs, and environmental incentives, threats, and rewards (Michalak & Yager, 1979; Ribler, 1983).

Previous sections have examined the relationships among values and expectations, attendance ability, personal characteristics, job satisfaction, and the motivation or willingness of work-related training participation. The review of contemporary motivation theories, related conceptual schemes, and previous research may provide insight into the factors that may influence electronics technicians to participate in work-related training.

Values and internal expectations, external expectations, job satisfaction, and personal characteristics together might explain the willingness of electronics technicians to attend training. Moreover, the attendance ability and the willingness to participate might also explain this behavior.

Job satisfaction is incorporated in this proposed model for further examination, although using job satisfaction to predict willingness to participate in training is still arguable.

Job situation is discarded for two reasons. First, the subjects in this study are a homogeneous group, all electronics technicians in the electronics industry. Therefore, they may be

considered to have the same situations of job scope, job level, and role stress. Secondly, the relationship between co-workers was classified as a subset of the external expectations factor.

In accordance with the Steers and Rhodes process model and the findings of the review of literature, the operational definitions for factors in this proposed model are as follows:

1. Personal characteristics are defined as demographic variables including education (formal educational attainment), tenure, age, and sex.
2. Values and internal expectations are defined as the opportunity for advancement, self-actualization, self-esteem, and incentive/reward system results from participating in work-related training.
3. External expectations are defined as co-worker relationships, organizational commitment, economic/market conditions (new technology innovation) that result from participating in work-related training.
4. Job satisfaction is defined as the total perception of workers toward their work environment.
5. Attendance ability is related to transportation problems, time of day, and cost of training.
6. Willingness to participate is defined as the motivation of electronics technicians to participate in work-related training.
7. Training Participation is defined as the number of days that subjects had participated in previous work-related

training programs.

The proposed causal model of work-related training participation for electronics technicians is shown in Figure 1-2.

The causal relationships (Asher, 1976; Pfaffenberger, 1979; Schumm, Southerly & Figley, 1980; Turner & Stevens, 1959) among these factors are shown by linkages and directions in Figure 1-3.

The model proposes that training participation of electronics technicians is influenced by their willingness and ability to attend. The willingness to participate in training is influenced by job satisfaction and external expectations. Job satisfaction, in turn, is influenced by values and internal expectations. Both values and internal expectations and external expectations are influenced by each other. Values and internal expectations and external expectations, and attendance ability are influenced by personal characteristics (education, tenure, age, sex).

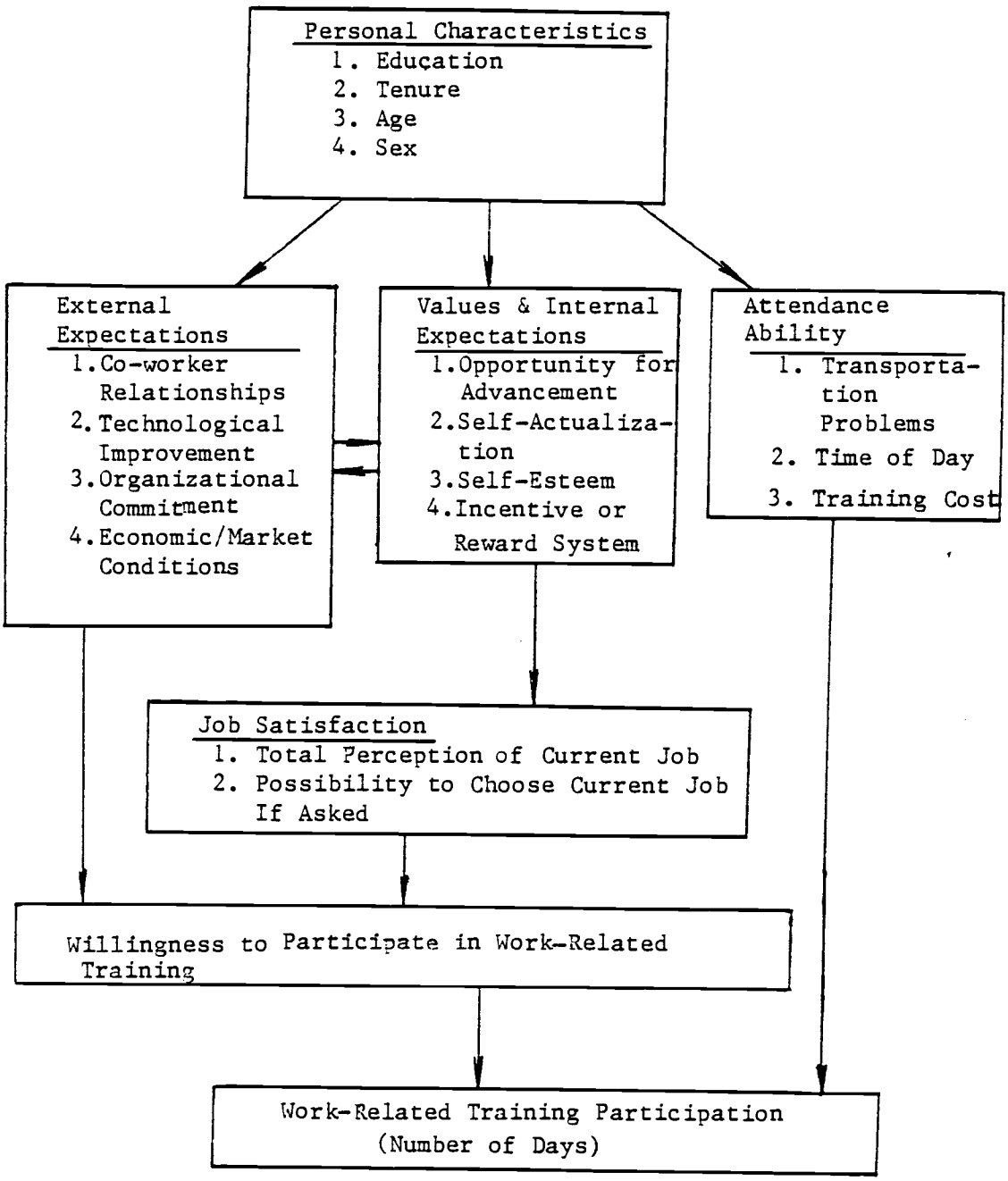
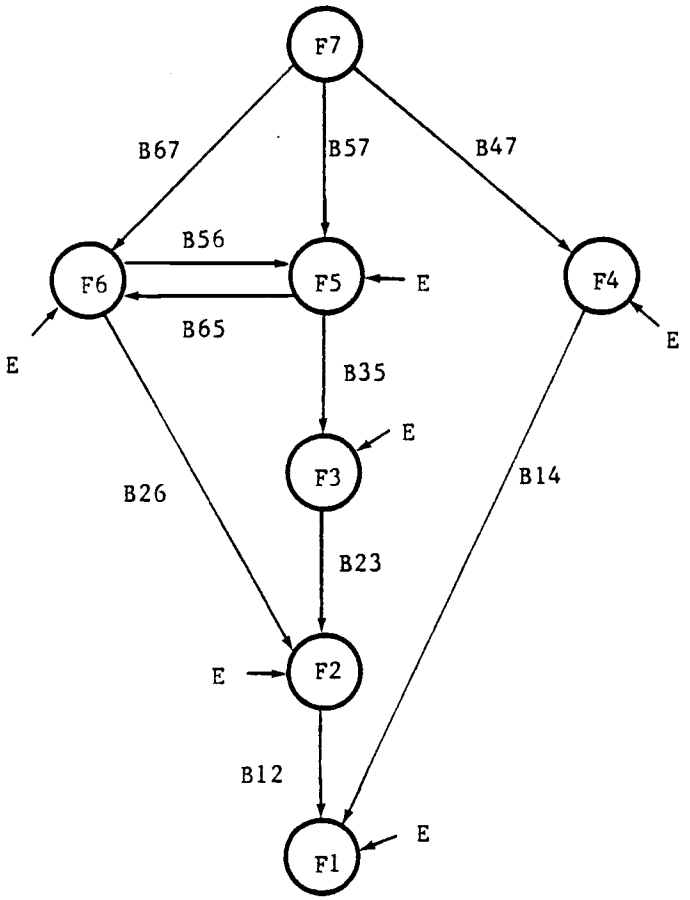


Figure 1-2. A Proposed Conceptual Model of Work-Related Training Participation for Electronics Technicians.



Note: Arrows indicate the direction of influence.

Where: F1 = Work-related training participation;

F2 = Willingness to participate in work-related training;

F3 = Job satisfaction;

F4 = Attendance ability;

F5 = Values and internal expectations;

F6 = External expectations;

F7 = Personal characteristics;

Bxy = Causal correlation coefficients; E = Residuals.

Figure 1-3. The Proposed Path Model of Work-Related Training Participation for Electronics Technicians.

The causal equations that indicate direct relationships among factors are as follows:

$$F1 = B12\ F2 + B14\ F4 + E$$

$$F2 = B23\ F3 + B26\ F6 + E$$

$$F3 = B35\ F5 + E$$

$$F4 = B47\ F7 + E$$

$$F5 = B56\ F6 + B57\ F7 + E$$

$$F6 = B65\ F5 + B67\ F7 + E$$

Where: F1 = Work-related training participation;

F2 = Willingness to participate in work-related training;

F3 = Job satisfaction;

F4 = Attendance ability;

F5 = Values and internal expectations;

F6 = External expectations;

F7 = Personal characteristics;

Bxy = Causal correlation coefficients; E = Residuals.

All other relationships among factors should be indirect. The indirect relationships are as follows:

The relationship should not exist between:	If the effects of these factors are controlled:
F1, F3	F2, F4, F5, F6, F7
F1, F5	F2, F3, F4, F6, F7
F1, F6	F2, F3, F4, F5, F7
F1, F7	F2, F3, F4, F5, F6
F2, F4	F3, F5, F6, F7
F2, F5	F3, F6, F7
F2, F7	F3, F5, F6
F3, F4	F5, F6, F7
F3, F6	F5, F7
F3, F7	F5, F6
F4, F5	F6, F7
F4, F6	F5, F7

II. METHODOLOGY

Population and Sample

Full-time electronics technicians in electronics companies in the State of Oregon formed the population in this study. According to the Oregon Industrial Outlook (Oregon Employment Division, 1986), 4,364 "electrical/electronic technicians" were employed in 1983. To further define the population, only the "electrical/electronics technicians" who were employed by companies classified as manufacturers of radio and television receiving equipment, communication equipment, and electronic components and accessories were considered as members of the population. An estimated 451 "electrical/electronics technicians" were employed in these three classifications in 1983.

The 1987-1988 Directory of Oregon Manufacturers (Oregon Economic Development Department, 1987) was used to identify 145 companies that employed electrical/electronics technicians in the three classifications. Only 28 companies (19.3 percent) that employed 50 or more people were initially included in the study. Zemke (1986) used only companies employing 50 or more people in his study of technical training. He speculated that companies with fewer than 50 employees would have one or only a very few supervisory and managerial personnel. It was then assumed that these small companies would generally not have formal employee training programs. Another assumption was that these small companies would employ few if any electronics technicians. However, selecting companies with 50 or more employees presents a

disadvantage. Electronics technicians who are employed in the very small companies (employing less than 50) would not be represented.

A two-stage survey sampling was used in this study. The first stage of the survey was done by employing a stratified random sampling technique (Scheaffer, Mendenhall & Ott, 1986). In this stage, the survey instruments were sent after the sampled companies had shown commitment and willingness to participate in this study.

Of these 28 (19.3 percent) electronics companies that were identified as target companies for the first sampling, 13 of them were categorized as small companies (employing between 50 and 99 technicians), eight were categorized as medium sized companies (employing between 100 and 149 technicians), and 7 were categorized as large companies (employing more than 150 technicians). One randomly selected large company had initially participated in the pilot study; therefore, a different large company was selected to replace it.

Thirty percent of the companies in each stratum were initially identified to participate in this study. Four small companies, three medium sized companies, and two large companies were randomly selected (Table 2-1). The Oregon Industrial Outlook (Oregon Employment Division, 1986) reported that five percent of the employed workers in this field were electrical/electronic technicians. This proportion was employed to estimate the number

Table 2-1. Electronics Companies (employing 50 or more employees) that were Selected in the First Sample.

Company Size	Number of Companies	Initial Sample of Companies	Estimated (5%) Number of Electronics technicians Employed in Electronics Companies
Small Company (50-99)	13	4	15
Medium Company (100-149)	8	3	19
Large Company (150-801)	7	2	40
Total:	28	9	74

Note: 1. The estimate (5 percent) used for this Table was adopted from the Oregon Industrial Outlook, 1986.
2. Estimated sample size for the small company was obtained from 75 x .05 x 4 = 15.
3. Estimated sample size for the medium sized company was obtained from 125 x .05 x 3 = 19.
4. Estimated sample size for the large company was obtained from 400 x .05 x 2 = 40.

of subjects that may be employed in the sampled companies.

A total of six companies were removed from the sample because they indicated that they did not wish to participate. These included two that replaced the replacements. The reasons for removal were as follows: A small company indicated that it did not have any technicians. Another company was planning to do a similar study and did not want to have their technicians complete two similar questionnaires. Contact could not be made with two companies because one had ceased operations and the other was being reorganized. One company indicated that their technicians were trained in another country and therefore did not wish to participate in the study. Finally, it was decided to stop calling one company after six attempts failed to establish contact with an appropriate person. As an indication of the difficulty with identifying and making contact with the companies, chief executive officers of two companies had been replaced, one up to two years ago. It should be noted that a large company was used to substitute for a medium-sized company during the period in which replacements were being made. The error was not discovered until final editing of this chapter.

Seven out of nine companies agreed to participate in this study. In telephone conversations, representatives of these participating companies supplied the numbers of technicians that they employed. It was found that in the first sample, 4.3 percent of the total employees were electronics technicians. This figure is very close to the estimated five percent reported on the Oregon

Industrial Outlook (Oregon Employment Division, 1986). Sixty-four electronics technicians (all electronics technicians in the sampled companies) were selected. Thirty-nine electronics technicians participated in the first stage of the survey. The response rate for the first sample was 60.9 percent (Table 2-2).

During the period when companies were being replaced in the sample, estimates indicated that the numbers of questionnaires returned by technicians employed by medium and large companies would be substantially lower than expected. It was therefore decided to draw a second sample of companies. Companies employing 20 to 150 people were included in the population. Again using a stratified random sampling procedure, nine (45 percent) very small companies (20 to 49 employees), six (30 percent) small companies (50 to 99 employees), and five (25 percent) medium sized companies were selected. It was estimated that these 20 companies employed at least 66 electronics technicians (Table 2-3). The number of companies in the second sample was considerably larger than the first sample because of the expectation that very small companies would have fewer technicians. Furthermore, it was anticipated that the survey method employed with the second sample would be less efficient than the method used with the first sample. The response rate of the second sample was 12 percent.

In the second sampling, five companies returned 14 questionnaires with memos stating that they did not employ electronics technicians. In addition, one instrument returned by the subject of the first sample was incomplete. Another

Table 2-2. Electronics Companies that Participated in the First Sample.

Company Size	Sampled Companies	Actual Number of Electronics Technicians Employed in Sampled Companies	Returned Questionnaires	
			N	%
Small Company (50-99)	4	10	8	80.0
Medium Company (100-149)	2	9	8	88.9
Large Company (150-801)	3	45	23	51.1
Total:	9	64	39	60.9

Table 2-3. Electronics Companies (employing 20 to 50 employees) that were Selected in the Second Sample.

Company Size	Population	Sampled Companies	Estimated Electronics Technicians	Returned Questionnaires	
				N	%
Very Small Company (20-49)	33	9	18	2	11.1
Small Company (50-99)	13	6	21	6	28.6
Medium Company (100-149)	8	5	27	0	0.0
Total:	54	20	66	8	12.1

Note: The estimate (5 percent) used for this Table was adopted from the Oregon Industrial Outlook, 1986.

instrument returned after the deadline was discarded. Deducting the unusable questionnaires, the exact response rates of the first sample and the second sample were 62 percent and 16 percent, respectively (Table 2-4). Combining the first and the second sample, the overall response rate was 41 percent.

Previous work-related training participation and sex of the subjects are presented in Table 2-5 and Table 2-6, respectively. Sixty-three percent of respondents had participated in work-related training in the past five years. A majority of respondents (80.9 percent) were male.

Age and work experiences and formal education attainment of the subjects are presented in Table 2-7 and Table 2-8, respectively. The average age of respondents was 34 with a standard deviation of 7.9. The minimum age was 21, and the maximum age was 51. The average years of work experience in the current employing company was 3.8 with a standard deviation of 3. The average years of work experience in the prior employing companies was 4.6 with a standard deviation of 6.3.

Instrument Development

Initial Instrument

To address the research questions, a questionnaire (Appendix B) was developed to gather descriptive data for the pilot test. A panel of experts from Oregon State University was chosen on the basis of their professional expertise for establishing content validity. Each panel member was requested to review statements

Table 2-4. Number and Rate of Response.

	Survey Sample		
	I	II	Total
Initial Number of Subjects Total Questionnaires Mailed	64	66 *	130 *
Number of Instruments Returned Unusable or Not Deliverable	1	14	15
Actual Number of Subjects	63	52 *	115 *
Number of Usable Returned Instruments	39	8	47
Response Rate	62%	16% *	41% *

Note: * These numbers are estimated numbers.

Table 2-5. Number and Percentage of Previous Work-Related Training Participation.

Previous Work-Related Training Participation	N	Percentage
Yes	30	63.8
No	17	36.2
Total:	47	100.0

Table 2-6. Number and Percentage by Sex.

Sex	Female		Male		Total	
	N	%	N	%	N	%
	9	19.1	38	80.9	47	100

Table 2-7. Number and Percentage by Age and Work Experience.

Variable	Mean	S.D.	Min.	Max.
Age	34.1	6.9	21	55
Total Years of Work Experience in the Current Employing Company	3.8	3.0	1	12
Total Years of Work Experience in Prior Employing Companies	4.6	6.3	0	25

Note: N = 47

Table 2-8. Number and Percentage of Subjects by Educational Attainment.

Formal Education Attainment	N	Percentage
Some Graduate School Education	3	6.4
Four-year College or University	7	14.9
More Than Community College	11	23.4
Two-year Community College	8	17.0
Some Community College	13	27.7
Senior High School	3	6.4
Others	2	4.3
Total:	47	100.0

Median: Two-year Community College.

and to recommend addition of items, deletion of items, or other changes to clarify the questionnaire statements. As a result of this validation process, a preliminary questionnaire was developed for the pilot test.

The initial version of the instrument (Appendix B) was divided into four major sections. The first section included the willingness to participate in work-related training (Items 4.1, 4.2 in section I), former experiences of work-related training participation (Items 1, 1.1, 1.2, 2 in section I), and job satisfaction (items 5, 6 in section I).

The second section consisted of 16 items related to internal expectations and external expectations and was constructed according to the "Educational Participation Scales" (Boshier & Collins, 1985).

The third section included 18 items related to values and internal expectations and external expectations and was constructed by referring to the "Work Values Inventory" (Maples, 1977; Super, 1968; Super, Crites, Hummel, Moser, Overstreet & Warnath, 1957; Tiedeman, 1973).

The fourth section included items for gathering information on personal characteristics variables. These items were age, sex, education (formal educational attainment), and tenure (work experiences).

Pilot Test and Revised Instrument

The initial instrument (Appendix A) was subjected to a pilot test. A primary purpose of the pilot test was to determine how

the intended population would respond to the questionnaire. The reduction of the number of items and the verification of the internal consistency of the factors were also major goals.

Thirty-four electronics technicians employed by a large company in Oregon participated in the pilot test in August 1987. The pilot-test participants were randomly chosen from the pool of electronics technicians. No follow-up efforts were made during the ten-day data collection period.

Twenty-four (70.6 percent) of the subjects completed and returned their questionnaires. After the primary data were gathered from the pilot test survey, the reliability subprogram of Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner & Bent, 1975) was used to calculate the Cronbach Alpha coefficients of internal consistency for the factors. Items in the motivation to participate factor were 2.1, 5.1, 5.2, and 5.3 in section I. The job satisfaction items were 7 and 8 in section I. Former experiences of work-related training participation factor included items 1, 1.1, and 1.2, in section I. The personal characteristics factor (education, tenure, age, sex) with fewer than two items in the same variable remained unchanged.

For the first set of values and internal expectations and external expectations factors in section II, high correlation coefficients were found between the overall item and the specific items (items 1, 10, 13, and 16 in section II). Therefore, these four items were deleted in the final version of the instrument.

For the second set of values and internal expectations and

external expectations factors in section III, high correlation coefficients were found between the overall item and the specific items (items 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 14, 16, 17, and 18 in section III). Therefore, these 15 items were deleted in the final version of the instrument. Only two sources of significant others' influence were retained (items 3 and 4 in section I) for measuring external expectations. All other sources (relatives, myself, others) were not selected by the subjects, therefore, these items were discarded.

New items were added to the revised instrument for measuring the attendance ability factor. These were training cost (items 5.1 and 5.2 in section I), transportation problems (item 5.3 in section I) and time of day (item 6 in section I). Job title (item 1 in section IV) was added to verify the usability of returned questionnaires. Formal educational attainment (item 4 in section IV) was given two more options to extend its inclusiveness.

Cronbach generalizability theory (Cronbach, Rajaratnam & Gleser, 1963) was used to estimate the internal consistency of factors both in the pilot test and in the field test (Table 2-9). Very high internal consistency coefficients were found in the willingness to participate in training (Alpha = .76), job satisfaction (Alpha = .78), attendance ability (Alpha = .74), values and internal expectations (Alpha = .60), and external expectations (Alpha = .82). The measures on the work-related training participation and personal characteristics (education,

Table 2-9. Reliability Coefficients for the Instruments.

Factor	Cronbach Alpha Coefficient Pilot Test Instrument (N = 24)	Final Instrument (N = 47)
1. Work-Related Training Participation	NA	NA
2. Willingness to Participate in Work-Related Training	.83	.76
3. Job Satisfaction	NA	.78
4. Attendance Ability	NA	.74
5. Values and Internal Expectations	.76	.60
6. External Expectations	.81	.82
7. Personal Characteristics	NA	NA

Note: NA: Not available.
Items used for calculating the factors in this study are presented in Table 2-10.

tenure, age, sex) factors included only one item; therefore, their internal consistencies could not be estimated. Items that were used for the factors are presented in Table 2-10. The revised instrument that was used in data collection for this study is provided in Appendix A.

Survey Procedures

First Survey Sample

After the electronics companies were randomly selected from the 1987-1988 Directory of Oregon Manufacturers (Oregon Department of Economic Development, 1987), a packet consisting of an abstract of this study, a sample instrument and an introductory letter (Appendix F) was mailed to the chief executive officer of eleven companies and to the training and development director of the twelfth company. The identity for the training and development director was obtained from the Oregon Training and Development Association's Portland membership directory. The cover letter stated that they would be contacted within a few weeks of receipt of the packet. Seven of the twelve companies (58 percent) agreed to support this study.

Within the specified (10-day) period, the researcher's major advisor telephoned each company's chief executive officer requesting his/her support and commitment to participate in this study. The exact number of electronics technicians employed by each participating company and the appropriate ways to distribute survey instruments were also discussed in these telephone communications.

Table 2-10. Items Used for Each Factor in the Final Instrument.

Factor	Section	Item Number	Number of Items
1. Work-Related Training Participation	I	1.2	1
2. Motivation to Participate in Work-Related Training	I	2.1	4
	I	5.1	
	I	5.2	
	I	5.3	
3. Job Satisfaction	I	7	2
	I	8	
4. Attendance Ability	I	5.1	3
	I	5.2	
	I	5.3	
5. Values and Internal Expectations	II	8	4
	II	9	
	II	10	
	III	7	
6. External Expectations	I	3, 4	13
	II	1, 2, 3, 4, 5, 6	
	II	7, 11, 12	
	III	5, 6	
7. Personal Characteristics			
Sex	IV	2	1
Age	IV	3	1
Education	IV	4	1
Tenure	IV	5.1	2
	IV	5.2	

Note: Final instrument is provided in Appendix A.
All items contributing to each factor were equally weighted except for the personal characteristics.

The appropriate number of instrument packets were then sent to these companies. Every packet consisted of a copy of the final instrument (Appendix A), a cover letter (Appendix F), and a pre-addressed stamped return envelope. The contact person for these companies then distributed questionnaires to their electronics technicians.

Since a personal contact was made with each target company before sending survey instruments, the commitment and willingness of company directors to help complete this study did ensure that survey instruments reached all technicians. Therefore, no follow-up procedures were necessary in the first stage of the survey.

Second Survey Sample

A packet, which included an abstract of this study, a sample questionnaire, a cover letter (Appendix F), and questionnaires was mailed to the 20 companies selected from the second sample. The number of questionnaires sent to each company was the same as the estimated number of electronics technicians employed in that company. The envelopes were addressed to the "Director of Human Resources or Personnel." The directors of sampled companies were asked to distribute questionnaires to their electronics technicians with their cover memos. Subjects were asked to return the questionnaires to the researcher within a week. Two weeks later, a reminder (Appendix F) was sent to each sampled company.

Statistical Analyses

The levels of significance used in this study were .10 for regression analysis and .05 for the chi-square test and the t test. Path analysis was the major statistical technique for testing the causal model. Standardized regression coefficients were used to depict the influence from one factor to the next factor since different scales and units were used for different factors. According to Asher (1976), these standardized regression coefficients are called causal coefficients. Multiple regression analysis was applied to obtain direct causal effects on given dependent factors. The unpredicted linkages were tested by partial correlations. The controlled variables in the partial correlation were the factors prior to or intervening between the two factors in the equations. Factor analysis was applied to examine further those items that were screened out by the reliability test.

Since this study used a two-stage sampling procedure, there was concern that responses of subjects in the first and second samples might be different. Student t tests were employed to test these hypotheses. The results indicate that the two samples were drawn from the same population for 9 of the 10 variables (Table 2-11). A further analysis of the tenure variable indicated that electronics technicians who were employed in large companies tended to stay longer than those who were employed in small companies ($t = 6.4$, $ndf = 46$, $p = .01$). Since tenure is only one-fourth of the personal characteristics variable, these two groups

Table 2-11. Significance Tests of Variables Between the First Sample and the Second Sample.

Variable	t Tests Value	p
1. Work-Related Training Participation	4.6	.85
2. Willingness to Participate in Work-Related Training	30.9	.71
3. Job Satisfaction	15.9	.09
4. Attendance Ability	26.2	.49
5. Values and Internal Expectations	22.5	.72
6. External Expectations	25.7	.67
7. Personal Characteristics		
Education	11.2	.54
Tenure	6.4	.01 *
Age	14.3	.32
Sex	12.3	.15

Note: Degrees of Freedom = 46 Significance: * $p < .05$

of subjects were merged in the final data analysis.

The above statistical analyses were accomplished by utilizing the Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner & Bent, 1975) available in the Milne Computer Center at Oregon State University.

III. FINDINGS AND DISCUSSION

Based upon the related literature, a causal model was proposed to explain the relationships among factors that may influence the willingness of electronics technicians to participate in work-related training. The purpose of this chapter is to report the test of this causal model and discuss those results.

Findings

The mean and standard deviation of factors investigated by this study are reported in Appendix D. The zero-order correlation coefficients for the factors are presented in Table 3-1.

There were substantial correlations among factors proposed by Steers and Rhodes. The correlation coefficients were .40 for willingness to participate in training and job satisfaction and .34 for willingness to participate and external expectations. As the causal model predicted, values and internal expectations and external expectations were correlated with each other .26 ($p < .10$).

Significant correlations were found between willingness to participate and attendance ability ($r = .98$, $p < .10$), job satisfaction and attendance ability ($r = .41$, $p < .10$), and external expectations and attendance ability ($r = .29$, $p < .10$). These results imply that attendance ability could influence willingness to participate, job satisfaction, and external expectations, although Steers and Rhodes (1978) did not discuss these relationships.

Table 3-1. Intercorrelation (Zero-Order) Coefficients among Factors.

Factor	Factor 1	2	3	4	5	6
1. Work-Related Training Participation						
2. Willingness to Participate in Work-Related Training	.02					
3. Job Satisfaction	.04	.40 *				
4. Attendance Ability	.08	.98 *	.41 *			
5. Values and Internal Expectations	.08	.17	.18	.12		
6. External Expectations	.13	.34 *	.07	.29 *	.26 *	
7. Personal Characteristics						
A. Education	.21	.18	.01	.16	.28 *	.09
B. Tenure	.13	.04	.41 *	.01	.13	.02
C. Age	.28 *	.04	.29 *	.05	.16	.34 *
D. Sex	.16	.13	.25 *	.19	.01	.07

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Table 3-1. (Continued)

Factor	Factor 7a	7b	7c
7. Personal Characteristics			
a. Education			
b. Tenure	.01		
c. Age	.01	.29 *	
d. Sex	.20	.41 *	.39 *

Note: N = 47 * $p < .10$

As proposed by Steers and Rhodes, the relationship between values and internal expectations and personal characteristics was significant for education ($r = .28$, $p < .10$), and age ($r = .34$, $p < .10$). Personal characteristics, such as education ($r = .16$, $p > .10$), tenure ($r = .01$, $p > .10$), age ($r = .05$, $p > .10$), and sex ($r = .19$, $p > .10$) were not related to attendance ability. Among the personal characteristics, tenure and age ($r = .29$, $p < .10$), tenure and sex ($r = .41$, $p < .10$), and age and sex ($r = .39$, $p < .10$) were related to each other significantly.

The proposed model was described by six causal equations. These equations indicated the direct linkages among the factors and the relative importance between causal coefficients. The results of the statistical tests of these path equations are shown in Table 3-2 as well as in Appendix E. Also reported in Table 3-2 are the results of each causal coefficient, the accounted-for variance (R square), error (E square), and residual (E) for each factor as predicted by its causal equation. A schematic representation of these direct linkages and their representative standardized causal coefficients and residuals is shown in Figure 3-1.

The results indicate that attendance ability and willingness to participate may directly influence electronics technicians to participate in work-related training. The causal coefficient between attendance ability and work-related training participation was 1.25 ($t = 1.89$, $ndf = 44$, $p = .08$), and between willingness to

Table 3-2. Statistical Tests of Causal Coefficients and Causal Equations.

(1) F1 = B12 F2 + B14 F4 + E

B12 = 1.20, t = 1.81, p = .07 *

B14 = 1.25, t = 1.89, p = .08 *

R Square = .03, E Square = .97, R = .17, E = .98

F = 1.78, ndf = 2, 44, p = .18

(2) F2 = B23 F3 + B26 F6 + E

B23 = .38, t = 2.91, p = .01 *

B26 = .32, t = 2.42, p = .02 *

R Square = .23, E Square = .77, R = .48, E = .88

F = 7.70, ndf = 2, 44, p = .00 *

(3) F3 = B35 F5 + E

B35 = .18, t = 1.25, p = .22

R Square = .01, E Square = .99, R = .10, E = .99

F = 1.55, ndf = 1, 45, p = .22

(4) F4 = B47a F7a + B47b F7b + B47c F7c + B47d F7d + E

B47a = .12, t = .81, p = .42

B47b = .06, t = .38, p = .71

B47c = .01, t = .08, p = .94

B47d = .20, t = 1.13, p = .26

R Square = .06, E Square = .94, R = .25, E = .97

F = .65, ndf = 4, 42, p = .63

(Continued on next page)

Table 3-2. (Continued)

(5) F5 = B56 F6 + B57a F7a + B57b F7b + B57c F7c + B57d F7d + E

B56 = .21, t = 1.36, p = .18

B57a = .25, t = 1.67, p = .10 *

B57b = .12, t = .73, p = .47

B57c = .07, t = .43, p = .67

B57d = .05, t = .31, p = .76

R Square = .15, E Square = .85, R = .39, E = .92

F = 1.44, ndf = 5, 41, p = .23

(6) F6 = B65 F5 + B67a F7a + B67b F7b + B67c F7c + B67d F7d + E

B65 = .21, t = 1.36, p = .18

B67a = .03, t = .19, p = .85

B67b = .10, t = .64, p = .53

B67c = .34, t = 2.15, p = .04 *

B67d = .02, t = .11, p = .91

R Square = .17, E Square = .83, R = .42, E = .91

F = 1.65, ndf = 5, 41, p = .17

Key: F1 = Work-related training participation;

F2 = Willingness to participate in work-related training;

F3 = Job satisfaction;

F4 = Attendance ability;

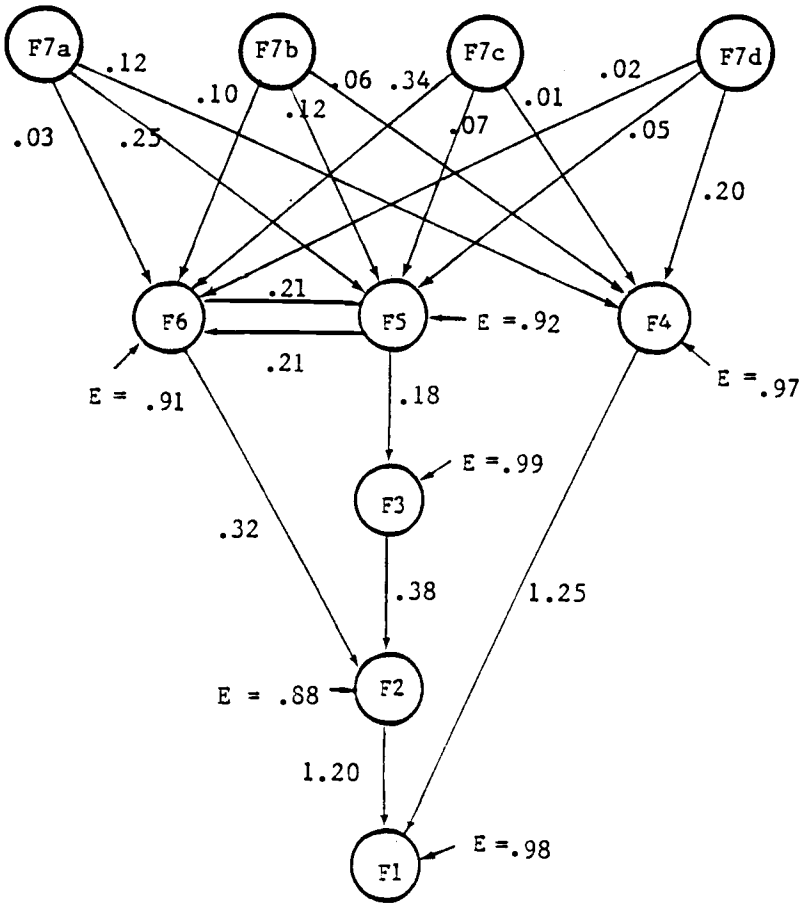
F5 = Values and internal expectations;

F6 = External expectations;

F7 = Personal characteristics;

F7a = Education; F7b = Tenure; F7c = Age; F7d = Sex;

* = Significant at .10 level.



Where: F1 = Work-related training participation;

F2 = Willingness to participate in work-related training;

F3 = Job satisfaction;

F4 = Attendance ability;

F5 = Values and internal expectations;

F6 = External expectations;

F7 = Personal characteristics;

F7a = Education; F7b = Tenure; F7c = Age; F7d = Sex;

Bxy = Causal correlation coefficients; E = Residuals.

Note: The standardized causal coefficients are reported with their respective linkages.

Figure 3-1. Schematic Representation of Factors, Paths and Causal Coefficients of the Proposed Model.

participate and training participation was 1.20 (t = 1.81, ndf = 44, p = .07).

As the model proposed, willingness to participate was significantly influenced by job satisfaction and external expectation. The causal coefficient between willingness to participate and job satisfaction was .38 (t = 2.91, ndf = 44, p = .01), and between willingness to participate and external expectations was .32 (t = 2.42, ndf = 44, p = .02).

Values-and-internal-expectations factor was not a significant contributor to job satisfaction. The causal coefficient between values and internal expectations and job satisfaction was .18 (t = 1.25, ndf = 45, p = .22).

As the model predicted, education was significantly related to values and internal expectations (B = .25, t = 1.67, ndf = 41, p = .10). Age was significantly related to external expectations (B = .34, t = 2.15, ndf = 41, p = .04).

The linkages between values and internal expectations and external expectations were not significant (B = .21, t = 1.36, ndf = 41, p = .18, and B = .21, t = 1.36, ndf = 41, p = .18). These results suggest that values and internal expectations and external expectations are not influenced by each other; they are two independent variables.

Personal characteristics (education, tenure, age, sex) as a whole do not appear to influence attendance ability. The causal coefficients between attendance ability and education (B = .13, t = .81, ndf = 42, p = .42), tenure (B = .06, t = .38, ndf = 42, p =

.71), age (B = .01, t = .08, ndf = 42, p = .94), sex (B = .20, t = 1.13, ndf = 42, p = .26) were not significant.

The proposed causal model held that relationships should not exist between 21 pairs of factors. Partial correlations were used to test whether or not this was true. The results are shown in Table 3-3. As the model proposed, correlation coefficients were hypothetically zero for 15 pairs of factors. These pairs were between the following factors:

a. training participation and job satisfaction (partial r = .05, N = 37, p = .78),
b. training participation and values and internal expectations (partial r = .07, N = 37, p = .67),
c. training participation and external expectations (partial r = .03, N = 37, p = .86),
d. training participation and education (partial r = .22, N = 37, p = .18),
e. training participation and tenure (partial r = .00, N = 37, p = .99),
f. training participation and age (partial r = .26, N = 37, p = .12),
g. training participation and sex (partial r = .00, N = 37, p = .99),
h. willingness to participate and values and internal expectations (partial r = .17, N = 39, p = .29),
i. willingness to participate and education (partial r = .12, N = 39, p = .46),

Table 3-3. Partial Correlation Coefficients between Factors that Should Not Have Direct Linkages in the Proposed Causal Model.

Factors	Controlled Factors	Partial r	N	p
F1 - F3	F2, F4, F5, F6, F7abcd	.05	37	.78
F1 - F5	F2, F3, F4, F6, F7abcd	.07	37	.67
F1 - F6	F2, F3, F4, F5, F7abcd	.03	37	.86
F1 - F7a	F2, F3, F4, F5, F6	.22	37	.18
F1 - F7b	F2, F3, F4, F5, F6	.00	37	.99
F1 - F7c	F2, F3, F4, F5, F6	.26	37	.12
F1 - F7d	F2, F3, F4, F5, F6	.00	37	.99
F2 - F4	F3, F5, F6, F7abcd	.97	38	.00 *
F2 - F5	F3, F6, F7abcd	.17	39	.29
F2 - F7a	F3, F5, F6	.12	39	.46
F2 - F7b	F3, F5, F6	.29	39	.07 *
F2 - F7c	F3, F5, F6	.07	39	.67
F2 - F7d	F3, F5, F6	.07	39	.66
F3 - F4	F5, F6, F7abcd	.46	39	.00 *
F3 - F6	F5, F7abcd	.20	40	.20

(Continued on next page)

Table 3-3. (Continued)

Factors	Controlled Factors	Partial r	N	p
F3 - F7a	F5, F6	.03	40	.82
F3 - F7b	F5, F6	.31	40	.05 *
F3 - F7c	F5, F6	.21	40	.20
F3 - F7d	F5, F6	.05	40	.78
F4 - F5	F6, F7abcd	.02	40	.91
F4 - F6	F5, F7abcd	.32	40	.05 *

Key: F1 = Work-related training participation;

F2 = Willingness to participate in work-related training;

F3 = Job satisfaction;

F4 = Attendance ability;

F5 = Values and internal expectations;

F6 = External expectations;

F7abcd = Personal characteristics (education, tenure, age, sex);

F7a = Education;

F7b = Tenure;

F7c = Age;

F7d = Sex;

* = Significant at .10 level.

j. willingness to participate and age (partial r = .07, N = 39, p = .67),

k. willingness to participate and sex (partial r = .07, N = 39, p = .66),

l. job satisfaction and external expectations (partial r = .20, N = 40, p = .20),

m. job satisfaction and education (partial r = .03, N = 40, p = .82),

n. job satisfaction and age (partial r = .21, N = 40, p = .20),

o. job satisfaction and sex (partial r = .05, N = 40, p = .78),

p. attendance ability and values and internal expectations (partial r = .02, N = 40, p = .91).

Five unpredicted relationships existed statistically. The highest partial correlations were found between willingness to participate and attendance ability (partial r = .97, N = 38, p = .00), and between job satisfaction and attendance ability (partial r = .46, N = 39, p = .00). Partial correlation coefficients also suggested direct linkages between attendance ability and external expectations (partial r = .32, N = 40, p = .05), job satisfaction and personal characteristics (tenure) (partial r = .31, N = 40, p = .05), and willingness to participate and personal characteristics (tenure) (partial r = .29, N = 39, p = .07).

In summary, the analyses of causal coefficients and partial correlations indicate that 22 of the 31 possible relationships

among the seven factors were verified as predicted by the causal model. Deviations from the proposed model are presented as follows:

a. An unpredicted correlation was found between willingness to participate and attendance ability.

b. An unpredicted correlation was found between willingness to participate and tenure.

c. An unpredicted correlation was found between job satisfaction and attendance ability.

d. An unpredicted correlation was found between job satisfaction and tenure.

e. An unpredicted correlation was found between attendance ability and external expectations.

f. The predicted correlation between job satisfaction and values and internal expectations did not exist statistically.

g. The predicted correlation between attendance ability and personal characteristics (education, tenure, age, sex) did not exist statistically.

h. The predicted correlation between values and internal expectations and personal characteristics (tenure, age, sex) did not exist statistically.

i. The predicted correlation between external expectations and personal characteristics (education, tenure, sex) did not exist statistically.

j. The predicted correlation between external expectations

and values and internal expectations did not exist statistically.

Discussion

The results indicate that both job satisfaction and external expectations significantly influenced electronics technicians' willingness to participate in work-related training. Job satisfaction and external expectations were relatively good predictors of their willingness to participate in training (23 percent of the total variance). This finding supported the assertion by Steers and Rhodes (1978) that job satisfaction and external expectations can be used to predict electronics technicians' willingness to participate in work-related training when appropriately measured.

The ability to attend and willingness to participate were good predictors of training attendance. This finding supported the assertion by Steers and Rhodes that willingness to participate and attendance ability can be used to predict electronics technicians' training participation when appropriately measured. The predicting power was four percent of the total variance.

Values and internal expectations did not relate to external expectations. This finding supported the viewpoints of Keller (1983) and Boshier and Collins (1985) that expectations could be divided into two factors: a values-and-internal-expectations factor and an external-expectations factor. This finding suggests that external expectations, such as co-worker relationships, technological development, organizational commitment, and

economic/market conditions are significant in predicting willingness to participate in work-related training. However, values and internal expectations, including opportunity for advancement, self-actualization, self-esteem, and an incentive/reward system may not be good predictors of willingness to participate in work-related training. This finding supported the Pygmalion Effect (Rosenthal & Jacobson, 1968) that external expectations may serve as a powerful influence on people's behaviors (Baxter & Bowers, 1985).

As the model proposed, personal characteristics (education, tenure, age, sex) seemed to influence values and internal expectations and external expectations. However, personal characteristics (education, tenure, age, sex) did not seem to influence attendance ability although Steers and Rhodes (1978) believed it should.

The linkages proposed in the Steers and Rhodes model that in this study did not exist statistically were between job satisfaction and values and internal expectations, between attendance ability and personal characteristics, and between values and internal expectations and external expectations. Weak causal coefficients in these linkages raise two questions. First, do these linkages actually exist? If they do, then possible deficiencies in the wording of items in these factors may have existed. Since the factors seemed reliable, the second question raises a major concern with the Steers and Rhodes model. It asks whether or not these linkages should exist. It was speculated

that the items used for measuring the values and internal expectations factor, with a Cronbach Alpha coefficient of .60, might belong to different factors. To clarify this speculation, factor analysis was employed on the items that were used for measuring values and internal expectations (Table 3-4).

Examining the factor loadings, four items (16, 17, 18, 27) were extricated as factor 1, and two items (23, 24) were extricated as factor 2. The first factor may be characterized as a "promotion-and-pay-oriented" variable; the second factor may be characterized as a "self-centered" variable.

Items 21 and 22 did not belong to either factor 1 or factor 2. They seemed to belong to the fifth level (self-actualization) of Maslow's Theory of Need Hierarchy. Factor analysis results support the speculation that items used for the values-and-internal-expectations factor did not belong to a single factor, but seemed to belong to two or more independent factors. This may have resulted in weakening the statistical linkage between values and internal expectations and job satisfaction.

Drawing the pilot test sample from a single large company may have caused a measurement problem. Including the items that were removed to improve internal consistency did not improve the causal coefficient between the job-satisfaction factor and the values-and-internal-expectations factor ($B = .13$, $ndf = 45$, $t = .9$, $p = .37$). Hence, it is reasonable to assume that the items used to describe values and internal expectations need improvement. Considering the strong support in contemporary

Table 3-4. Factor Analysis Results of Values and Internal Expectations (Factor Matrix).

Variable (Item)	Factor 1	Factor 2	Communality
16. Make More Money	.66	-.26	.73
17. Change the Emphasis of Present Responsibilities	.60	.14	.68
18. Increase the Likelihood of Advancement	.70	.17	.73
21. Have Authority Over Others	-.36	.08	.22
22. Add Beauty to the World	.13	-.40	.27
23. Make My Own Decisions	-.04	.81	.74
24. Lead the Kind of Life I Enjoy	.40	.58	.75
27. Receive Pay Increase	.59	-.39	.64

Note: Principal component analysis with Varimax rotation.

scholarly literature, the linkage between values and internal expectations and job satisfaction should be regarded as extant.

In addition, five relationships that were not proposed in the Steers and Rhodes model existed statistically. These relationships were willingness to participate and attendance ability, willingness to participate and tenure, job satisfaction and attendance ability, job satisfaction and tenure, attendance ability and external expectations. High partial correlation coefficients found between these variables raise two questions. First, do these linkages actually exist? Second, if these linkages exist, what is the direction of their influence? These unpredicted linkages were examined further by including them in the path equations. This led to the following results (Table 3-5):

a. The linkage from attendance ability to willingness to participate was significant (partial r = .97, N = 43, t = 26.3, p = .00). It may account for five percent of the total variance for willingness to participate in work-related training.

b. The linkage from willingness to participate to attendance ability was significant (partial r = .97, N = 43, t = 29.8, p = .00). It may also account for five percent of the total variance for attendance ability.

c. The linkage from personal characteristics (tenure) to willingness to participate was not significant (partial r = .29, N = 43, t = 1.6, p = .12).

Table 3-5. The Influence of the Unpredicted Linkages.

Direction of Influence From - To	Partial r (1)	Adjusted R Square if This Path Included (2)	Error = 1 - (2) (3)	Part Correlation Square = (1)x(1)x(3) (4)
F4 --> F2	.97	.95	.05	.05 *
F2 --> F4	.97	.95	.05	.05 *
F7b --> F2	.29	.25	.75	.06
F2 --> F7b	.29	.02	.98	.08
F3 --> F4	.46	.15	.85	.02 *
F4 --> F3	.46	.19	.81	.17 *
F7b --> F3	.31	.15	.85	.08 *
F3 --> F7b	.31	.15	.85	.08 *
F4 --> F6	.32	.13	.87	.09
F6 --> F4	.32	.04	.96	.10 *

Note: F1 = Work-related training participation;
F2 = Willingness to participate in work-related training;
F3 = Job satisfaction;
F4 = Attendance ability;
F5 = Values and internal expectations;
F6 = External expectations;
F7abcd = Personal characteristics;
F7a = Education;
F7b = Tenure;
F7c = Age;
F7d = Sex;
(1) : Partial correlation coefficients.
(2) : Accounted-for variance when this path is included in the model.
(3) : Error when this path is included in the model.
(4) : Part correlation square or the influence for the linkage.
* : Significant at .05 level.

d. The linkage from willingness to participate to personal characteristics (tenure) was not significant (partial r = .29, N = 43, t = .3, p = .80).

e. The linkage from job satisfaction to attendance ability was significant (partial r = .46, N = 41, t = 3.2, p = .00). It may account for two percent of the total variance for attendance ability.

f. The linkage from attendance ability to job satisfaction was significant (partial r = .46, N = 41, t = 3.3, p = .00). It may account for 17 percent of the total variance for job satisfaction.

g. The linkage from personal characteristics (tenure) to job satisfaction was significant (partial r = .31, N = 44, t = 2.9, p = .01). It may account for eight percent of the total variance for job satisfaction.

h. The linkage from job satisfaction to personal characteristics (tenure) was significant (partial r = .31, N = 44, t = 3.0, p = .00). It may account for eight percent of the total variance for personal characteristics.

i. The linkage from attendance ability to external expectations was not significant (partial r = .32, N = 41, t = 2.0, p = .05).

j. The linkage from external expectations to attendance ability was significant (partial r = .32, N = 41, t = 2.1, p = .04). It may account for 10 percent of the total

variance for attendance ability.

These results suggest that seven linkages may be important to the Steers and Rhodes process model. These linkages are from (a) attendance ability to willingness to participate, (b) willingness to participate to attendance ability, (c) job satisfaction to attendance ability, (d) attendance ability to job satisfaction, (e) personal characteristics (tenure) to job satisfaction, (f) job satisfaction to personal characteristics (tenure), and (g) external expectations to attendance ability. Although these linkages existed statistically [except the linkage between personal characteristics (tenure) and job satisfaction], they lack theoretical bases. Therefore, these relationships may be due to measurement errors.

The literature review in Chapter I indicated that a personal characteristics (tenure) was related to job satisfaction curvilinearly (Schultz, 1982; Kahnweiler, 1985). The results of this study indicate that electronics technicians experience fluctuating job satisfaction before the fourth year of their employment (Figure 3-2). In the first year and after the fourth year, electronics technicians' job satisfaction was significantly ($t = 9.9$, $ndf = 46$, $p = .02$) higher than during the period in between, which was called the "depression period" (Table 3-6). Unlike Schultz (1982) and Kahnweiler's (1985) research, however, the depressed period started during the second year and ended during the fourth year. Schultz (1982) and Kahnweiler (1985) indicated that workers' job satisfaction began to increase after

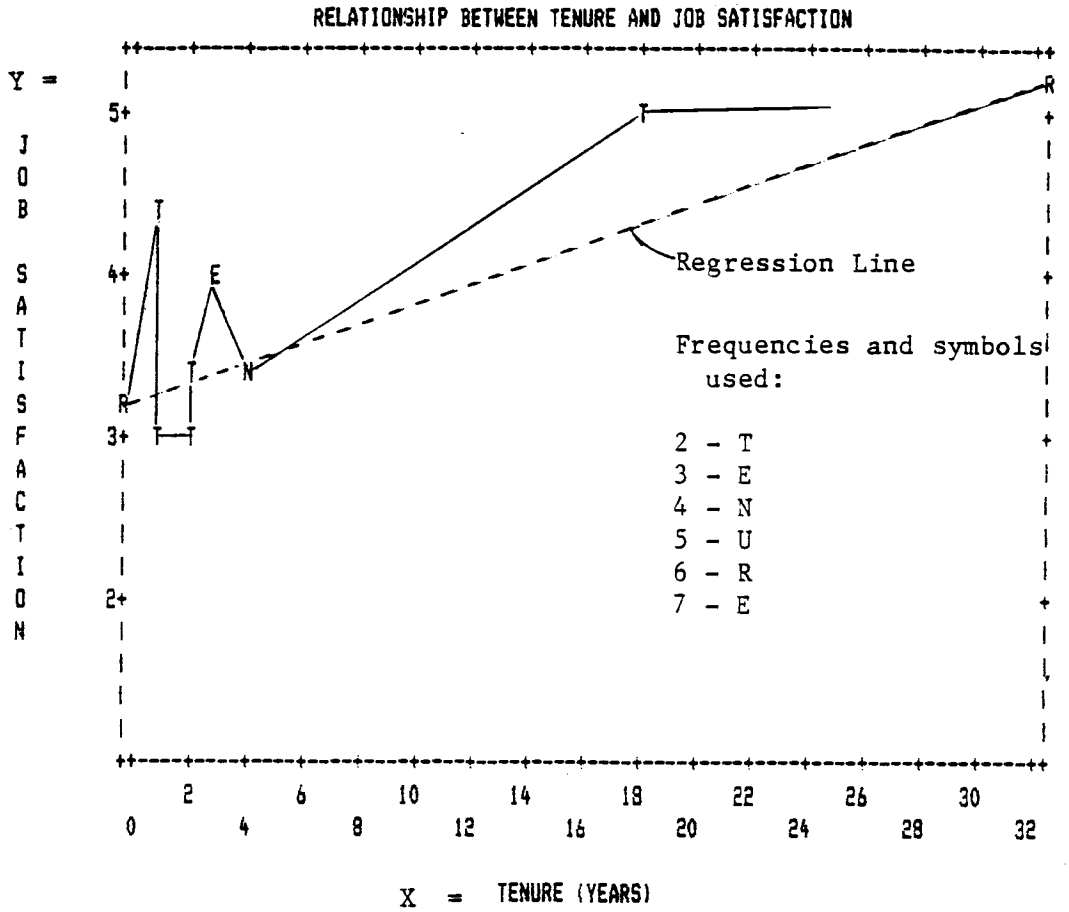


Figure 3-2. The Relationship between Personal Characteristics (tenure) and Job Satisfaction.

Table 3-6. Significance Test between Job Satisfaction and Personal Characteristics (tenure).

t-Test Value	ndf	p
9.9	46	.02 *

Note: Significance: * $p < .05$

the seventh year of employment. They did not state when job satisfaction began to drop.

The deletion of items from the values-and-internal-expectations factor and the external-expectations factor to increase their reliability raised two questions. Were these items redundant for the intended factors or do some other dimensions beyond values and internal expectations and external expectations exist? Factor analysis was conducted to answer these questions. Examining the factor loadings (Table 3-7), it was found that almost all items regarding external expectations (Items 9, 10, 11, 12, 13, 14, 15, 19, 20) were extricated as factor 1, and items relating to values and internal expectations (Items 16, 17, 18, 27) were extricated as factor 2. Items 23 and 24 seemed not to belong to either values and internal expectations or external expectations. Based upon the apparent meaning of items 23 and 24, factor 3 may be characterized as "ego/individualism." A further examination of factor 4 indicated that items 3 and 4 were the major contributors. Although these two items may be categorized as subsets of factor 1 (external expectations), the factor analysis results suggested that factor 4 was an independent factor and may be characterized as "significant others' influence" (Woelfel & Haller, 1971).

Factor analysis also suggests that two factors (factors 3 and 4) may be added to the causal model of this study. The accounted-for variances for factors 3 and 4 were 9.0 and 8.6

Table 3-7. Factor Analysis Results of Values and Internal Expectations and External Expectations (Factor Matrix).

Variable (Item)	Factor 1	2	3	4	h^2
3. Supervisor's Expectations	.26	-.33	.00	.49	.41
4. Colleagues' Influence	.30	-.08	.25	.51	.42
9. Keep Up with Technological Development	.52	.19	-.58	.12	.66
10. Develop New Professional Knowledge and Skills	.51	-.02	.03	.43	.45
11. Develop Proficiency to Maintain Performance	.54	-.14	-.47	.14	.56
12. Exchange Ideas with Professional Colleagues	.66	-.19	.22	-.54	.81
13. Relate Ideas to Professional Peers	.76	-.20	.16	-.16	.66
14. Interact with Other Professionals	.71	-.34	.23	-.27	.75
15. Challenged by the Thinking of Professional Colleagues	.63	.00	.16	-.41	.60
16. Make More Money	-.07	.69	.24	.16	.57
17. Change the Emphasis of Present Responsibilities	.31	.52	-.07	.00	.38
18. Increase the Likelihood of Advancement	.54	.50	.12	-.16	.59
19. Keep Abreast of New Development	.74	-.07	-.23	.23	.66
20. Learn More About the Direction in My Field	.54	.27	.28	-.04	.45
21. Have Authority Over Others	.20	-.22	-.16	.20	.16
22. Add Beauty to the World	-.27	.31	-.05	.11	.19
23. Make My Own Decisions	.24	-.33	.51	.41	.60
24. Lead the Kind of Life I Enjoy	.09	.14	.67	.24	.56
25. Gain Prestige in My Field	.47	.30	-.26	-.16	.41
26. Know Others Consider that My Work is Important	.54	.30	-.21	.33	.55
27. Receive Pay Increase	.02	.64	.18	.07	.45

Note: Principal component analysis with Varimax rotation.
h^2 Square: Communality.

percent, respectively (Table 3-8). Taking these two factors into consideration simultaneously accounted for 52 percent of the variance.

In summary, this study supports the thesis that the six linkages proposed by the research model existed. These linkages were from (a) attendance ability to training participation, (b) willingness to participate to training participation, (c) job satisfaction to willingness to participate, (d) external expectations to willingness to participate, (e) personal characteristics (education) to values and internal expectations, and (f) personal characteristics (age) to external expectations. The argument that external expectations and values and internal expectations are two independent factors (Keller, 1983; Boshier & Collins, 1985) was supported. Unlike studies by Watson (1981) and Nnanna (1983), this study supported the Steers and Rhodes' model as well as Heresz and Orem's (1986) study regarding the linkages between job satisfaction and willingness to participate. Job satisfaction is a contributor to electronics technicians' willingness to participate in work-related training. Rosenthal and Jacobson's (1968) argument that expectations may serve as a powerful influence on behavior was also supported.

Two additional linkages may be added to the Steers and Rhodes process model. These linkages are from (a) personal characteristics (tenure) to job satisfaction and (b) job satisfaction to personal characteristics (tenure). These support the viewpoints that tenure is a key factor in influencing job

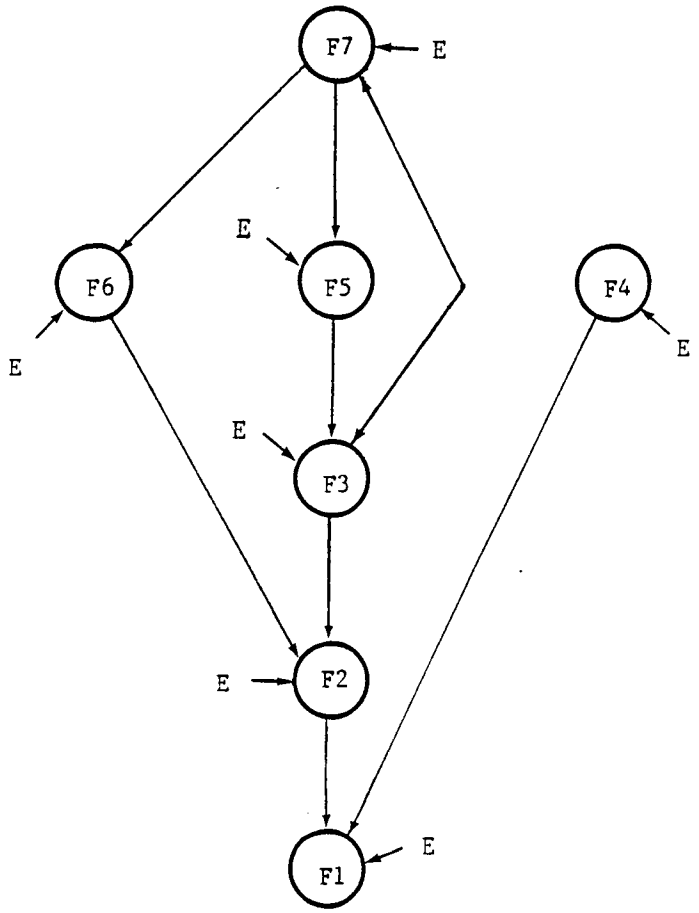
Table 3-8. The Accounted-for Variance for Each Factor Extracted from Values and Internal Expectations and External Expectations.

Factor	Eingenvalue	Percentage of Variance	Cumulative Percentage
1	4.8	23.0	23.0
2	2.3	11.0	34.0
3	1.9	9.0	43.0
4	1.8	8.6	51.6

Note: Factor 1 : External expectations.
Factor 2 : Values and internal expectations.
Factor 3 : Ego/Individualism.
Factor 4 : Significant others' influence.

satisfaction (Schultz, 1982; Kahnweiler, 1985) and vise versa. Electronics technicians' job satisfaction was highly related to their tenure. The longer they stayed in this occupation, however, the higher the job satisfaction they were likely to have. However, there was one exception. Schultz (1982) and Kahnweiler (1985) proposed that electronics technicians will experience a depression period in job satisfaction. In addition to factors of values and internal expectations and external expectations in the Steers and Rhodes (1978) process model, there may exist two new factors of "ego/individualism" and "significant others' influence."

A revised model is presented in Figure 3-3. This revised model proposes that workers' training attendance is influenced by their willingness and ability to attend. The willingness to attend, in turn, is influenced by job satisfaction and external expectations. Job satisfaction is influenced by personal characteristics and values and internal expectations. Values and internal expectations is influenced by personal characteristics. External expectations is influenced by personal characteristics.



Note: Arrows indicate the direction of influence.

Where: F1 = Training attendance;

F2 = Willingness to participate;

F3 = Job satisfaction;

F4 = Attendance ability;

F5 = Values and internal expectations;

F6 = External expectations;

F7 = Personal characteristics;

E = Residuals.

Figure 3-3. A Revised Conceptual Model of Training Attendance for Workers.

IV. SUMMARY AND IMPLICATIONS

Summary

The purpose of this study was to identify the factors that influence electronics technicians to participate in work-related training and to explain the relationships among those factors. Two questions were addressed. What factors will influence electronics technicians to participate in work-related training? What are the relationships among these factors?

Based on Steers and Rhodes' (1978) Employees Attendance Process Model, it was proposed that the extent to which electronics technicians actually attend work-related training can be predicted by their willingness and ability to participate. It was then proposed that electronics technicians' willingness to participate can be directly influenced by job satisfaction and external expectations regarding participation in work-related training. Electronics technicians' values and internal expectations can then directly influence their job satisfaction and external expectations. In addition, it was suggested that personal characteristics, such as education, tenure, age and sex, as a whole, can influence attendance ability, external expectations, and values and internal expectations.

An instrument was developed to answer the research questions. Questionnaires were mailed to 130 Oregon electronics technicians who were randomly selected from the 1987-1988 Directory of Oregon Manufacturers.

A two-stage sampling technique was used in this study. The first-stage survey was done by employing a stratified random sampling technique. Zemke's (1986) company selection criterion (companies employing 50 or more employees) was applied. Questionnaires were sent after the sampled companies had shown commitment and willingness to participate this study. Four (4.3) percent of the electronics employees in the state of Oregon were identified as electronics technicians. The second sample was selected by using stratified random sampling survey procedures. Questionnaires were sent to the sampled companies. Electronics companies employing 20 to 150 workers were included in this sample.

The response rate for the first sample was 62 percent. The estimated response rate for the second sample was 16 percent. Combining the first sample and the second sample, the overall estimated response rate was 41 percent. There were no significant differences in responses to the research variables between the two survey samples. Thus, these two samples were merged in the final data analyses. The coefficients of internal consistency (Cronbach Alpha) ranged from .60 to .82 for the factors that consisted of more than one item.

The direct relationships among the seven factors proposed by this study were expressed by six causal equations. These causal equations were used to test the predicted direct relationships among factors in the proposed model. Six verified linkages among factors were from (a) attendance ability to training

participation, (b) willingness to participate to training participation, (c) job satisfaction to willingness to participate, (d) external expectations to willingness to participate, (e) personal characteristics (education) to values and internal expectations, and (f) personal characteristics (age) to external expectations. Weak causal coefficients in four linkages raise a question: Do these linkages actually not exist? A further examination of the items used for measuring the factor for values and internal expectations indicated that two independent variables existed, which may be characterized as "promotion-and-pay-oriented" and "self-centered."

Partial correlations were used to determine whether or not relationships existed among the factors where they should not have. Seven of the twenty-one unpredicted relationships were statistically sound. These linkages are from (a) attendance ability to willingness to participate, (b) willingness to participate to attendance ability, (c) job satisfaction to attendance ability, (d) attendance ability to job satisfaction, (e) personal characteristics (tenure) to job satisfaction, (f) job satisfaction to personal characteristics (tenure), and (g) external expectations to attendance ability. It is possible that these linkages should be added to the Steers and Rhodes (1978) model.

Items that were deleted from values-and-internal-expectations and external-expectations factors in the reliability test were reexamined by factor analysis. The factor analysis

results suggested that two additional factors, "ego/individualism" and "significant others' influence," may be presented. The accounted-for variance of these two new factors were nine percent for "ego/individualism" and four percent for "significant others' influence." About one half (51.6 percent) of the accounted-for variance can be expected if these two new factors are included simultaneously.

In summary, the findings of this study suggest that job satisfaction and external expectations are significant factors that may be changed to influence electronics technicians' willingness to participate in work-related training. Ability to attend is a basic factor that may be changed to influence training participation.

Implications

The willingness of electronics technicians to participate in work-related training is influenced by three factors. These factors are external expectations, values and internal expectations, and ability to attend. Providing technicians with actual and perceived ability to participate in work-related training is most influential. Job satisfaction and external expectations directly influence verbalized willingness to participate in work-related training. Values and internal expectations influence job satisfaction.

The linkage between values-and-internal-expectations factor and job-satisfaction factor could not be verified statistically.

It is believed that items used for measuring values and internal expectations may need improvement in their wording. To clarify this point, further research is needed that might focus on the structure and content of values and internal expectations. Introducing new factors, such as "promotion-and-pay-oriented" and "self-centered" may be another way to determine the factors that influence workers' values and internal expectations. The role of significant others may also be influential and should be studied further. The relationship of company size to these factors should be examined.

Procedures that could be taken by companies for enhancing external expectations range from encouraging the significant others (colleagues and supervisors) to influence technicians to attend work-related training to actively providing in-plant work-related training. On the values and internal expectations dimension, procedures would include providing opportunities for advancement and better incentive systems. Reducing restrictions on participation, providing flexible time to attend, and paying for training costs may be effective ways of increasing electronics technicians' ability to attend, and, therefore encouraging them to participate in work-related training. Eventually, work-related training could help electronics technicians pursue individual excellence and improve their productivity. However, the opportunities used as items in this study were only a sample of actions that could be taken by companies. Therefore, a comprehensive inquiry should be conducted into the types of

opportunities that would enable technicians to attend work-related training. Identification of these incentives could enhance the success of any company's work-related training program.

It should be noted, as indicated in the previous chapter, that electronics technicians' job satisfaction is related to their tenure. The longer they stay in this occupation, the higher the degree of job satisfaction they have. However, between the first and the fourth years of their employment they often experience a "depression" period. The existence of this phenomenon needs additional study with larger samples. This study also examined the relationship between these factors by using cross-sectional data; longitudinal data may provide more definitive insight into this phenomenon.

The five possible linkages that were verified statistically but without literature support need further examination. These linkages are from (a) attendance ability to willingness to participate, (b) willingness to participate to attendance ability, (c) job satisfaction to attendance ability, (d) attendance ability to job satisfaction, and (f) external expectations to attendance ability. Because the electronics industry is highly dynamic, the applicableness of the model to other industries also deserves further study.

Finally, the subjects' participation in work-related training was based upon their actual experience during the past five years. Yet, items on ability to attend work-related training were oriented toward future participation. It is therefore

recommended that the linkages be reexamined by using longitudinal data on participation in work-related training. Furthermore, the quality of participation in work-related training was not assessed; research on the productivity of work-related training is needed.

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APPENDICES

APPENDIX A: THE FINAL INSTRUMENT

Factors that Influence Electronics Technicians
to Participate in Work-Related Training

SECTION I. General Perception about Work-Related Training

1. Have you participated in any training related to your current work within the past five years?

___ NO (if no, please answer Question 2.)
___ YES (if yes, please answer the following questions.)

1.1 Where did this training take place?

___ AT YOUR PLACE OF WORK
___ COLLEGE OR UNIVERSITY NEARBY
___ OTHERS (Please specify)_____

1.2 What kind of training did you receive? How long was it?

	TYPE OF TRAINING	TIME (DAYS)
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

2. In the space provided below, please list up to FIVE topics in which you would like to participate. List them in order of preference, starting with number 1.

1._____
2._____
3._____
4._____
5._____

2.1 How willing are you to participate in training related to your work in the topics you identified above?

___ DEFINITELY YES
___ PROBABLY YES
___ NOT SURE
___ PROBABLY NO

(Continue on other side)

2.2 How willing are you to participate in training related to your work topics NOT identified above?

___ DEFINITELY NO
___ PROBABLY NO
___ NOT SURE
___ PROBABLY YES

3. How much influence has your supervisor had in getting you to participate in training related to your work?

___ VERY INFLUENTIAL
___ INFLUENTIAL
___ MODERATE INFLUENCE
___ OF LITTLE INFLUENCE
___ NOT INFLUENTIAL

4. How much influence have your colleagues had in getting you to participate in training related to your work?

___ VERY INFLUENTIAL
___ INFLUENTIAL
___ MODERATE INFLUENCE
___ OF LITTLE INFLUENCE
___ NOT INFLUENTIAL

5. If your company should offer you an opportunity to participate in training related to your work, how willing would you be to participate in this activity?

5.1 If the training were provided in your workplace at company's cost?

___ DEFINITELY YES
___ PROBABLY YES
___ NOT SURE
___ PROBABLY NO
___ DEFINITELY NO

5.2 If the training were provided in the nearest college or university at company's cost?

___ DEFINITELY YES
___ PROBABLY YES
___ NOT SURE
___ PROBABLY NO
___ DEFINITELY NO

(Continue on next page)

5.3 If the training were provided in the nearest college or university but at your own cost?

___ DEFINITELY YES
___ PROBABLY YES
___ NOT SURE
___ PROBABLY NO
___ DEFINITELY NO

6. The best time for you to participate in training related to your work would be:

___ DURING OFFICE HOURS
___ NIGHTS
___ WEEKENDS
___ I DON'T CARE
___ OTHERS (Please specify)_____

7. Would you enter the same job as a technician if you had the opportunity to choose again?

___ DEFINITELY YES
___ PROBABLY YES
___ NOT SURE
___ PROBABLY NO
___ DEFINITELY NO

8. Please check the statement that best describes your present attitude toward your current job.

___ VERY SATISFIED
___ SATISFIED
___ NEITHER SATISFIED NOR DISSATISFIED
___ DISSATISFIED
___ VERY DISSATISFIED

(Continue on other side)

SECTION II.

There are many reasons for participating in training related to your work. The following items indicate the relative importance of the reasons you might have for participating in training related to your work. For each item CIRCLE the number which best represents the degree of importance you attach to each reason.

```
|--------- 5 means "VERY IMPORTANT"
| |------- 4 means "IMPORTANT"
| | |----- 3 means "MODERATELY IMPORTANT"
| | | |--- 2 means "OF LITTLE IMPORTANCE"
| | | | |- 1 means "NOT IMPORTANT"
| | | | |
| | | | |  My reasons for participating in training . . . .
```

5 4 3 2 1 To keep up with technological development for job security.

5 4 3 2 1 To develop new professional knowledge and skills.

5 4 3 2 1 To develop the proficiency necessary to maintain quality performance.

5 4 3 2 1 To exchange ideas with professional colleagues.

5 4 3 2 1 To relate my ideas to those of my professional peers.

5 4 3 2 1 To learn from the interaction with other professionals.

5 4 3 2 1 To be challenged by the thinking of my professional colleagues.

5 4 3 2 1 To make more money.

5 4 3 2 1 To consider changing the emphasis of present professional responsibilities.

5 4 3 2 1 To increase the likelihood of advancement in my present work position.

5 4 3 2 1 To keep abreast of new developments in my field.

5 4 3 2 1 To learn more about the direction in which my profession is going.

(Continue on next page)

SECTION III.

The statements below represent values which people consider important in their work. Some of these statements may be very important to you but of little importance to others. Read each statement carefully and indicate how important it is to you. For each statement CIRCLE the number which best represents the degree of importance you attach to each reason.

```
|-------- 5 means "VERY IMPORTANT"
| |------ 4 means "IMPORTANT"
| | |---- 3 means "MODERATELY IMPORTANT"
| | | |-- 2 means "OF LITTLE IMPORTANCE"
| | | | - 1 means "NOT IMPORTANT"
| | | | | _____________________________________________
| | | | |
| | | | |  WORK in which I . . .

5 4 3 2 1  have authority over others.

5 4 3 2 1  add beauty to the world.

5 4 3 2 1  make my own decisions.

5 4 3 2 1  lead the kind of life I enjoy.

5 4 3 2 1  gain prestige in my field.

5 4 3 2 1  know that others consider that my work is important.

5 4 3 2 1  receive pay increases that keep up with the cost of
           living.
```

(Continue on other side)

SECTION IV.

1. What is your job title? _____

2. What is your sex?

___ MALE
___ FEMALE

3. What is your age? _____ years.

4. Highest level of formal education you have completed

___ SOME GRADUATE SCHOOL MAJOR:_____
___ 4 YEARS COLLEGE OR UNIVERSITY MAJOR:_____
___ MORE THAN 2 YEARS BUT LESS THAN BACHELOR'S DEGREE MAJOR:_____
___ COMMUNITY COLLEGE ASSOCIATE DEGREE OR CERTIFICATE MAJOR:_____
___ SOME COMMUNITY COLLEGE MAJOR:_____
___ SENIOR HIGH SCHOOL
___ OTHER (Please specify) _____

5. How many years have you been employed in this technical position?

IN THE CURRENT EMPLOYING COMPANY: _____ YEAR(S)
IN FORMER EMPLOYING COMPANIES: _____ YEAR(S)

If there is something else on your mind related to technical training but not covered by this questionnaire, please let us know by writing in the space below.

_____

_____

_____

_____

Thank you for your cooperation.

APPENDIX B: THE INITIAL INSTRUMENT

A Study of Factors that Influence Electronics Employees to Participate in Work-Related Training

SECTION I. General Perception about Work-Related Training

1. Have you participated in any work-related training in your current company within the past 5 years?

___ NO (if no, please answer Question 2.)
___ YES (if yes, please answer the following questions.)

1.1 Where did this training take place?

___ AT YOUR PLACE OF WORK
___ COMMUNITY COLLEGE NEARBY
___ OTHERS (Please specify)_____

1.2 What kind of training did you received? How long was it?

	TYPE OF TRAINING	TIME (DAYS)
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

2. In the space provided below, please list up to five educational or training courses you would like to participate in. List them in order of preference, starting with number 1.

1._____
2._____
3._____
4._____
5._____

3. Who do you think influenced (or will influence) your willingness to participate in work-related training activities. Please check " X " the person that influenced (or will influence) your decision.

___ MY SUPERVISOR
___ MY COLLEAGUES
___ MY RELATIVES
___ MYSELF
___ OTHERS (Please specify)_____

Please place a double " XX " check next to the person you feel had (or will have) the greatest influence on your willingness to participate in work-related training.

4. If your company should offer you an opportunity to participate in work-related training, what is your willingness to participate in this training activity. Assume that your participation is optional and there is no relationship between the training and your salary.

4.1 If the training is provided in your workplace:

___ YES I WILL DEFINITELY PARTICIPATE
___ YES I WILL PROBABLY PARTICIPATE
___ NOT SURE
___ NO I WILL PROBABLY NOT PARTICIPATE
___ NO I WILL DEFINITELY NOT PARTICIPATE

4.2 If the training is provided in a nearby college or university.

___ YES I WILL DEFINITELY PARTICIPATE
___ YES I WILL PROBABLY PARTICIPATE
___ NOT SURE
___ NO I WILL PROBABLY NOT PARTICIPATE
___ NO I WILL DEFINITELY NOT PARTICIPATE

5. Please check the statement that best describes your present attitude toward your current job.

___ VERY SATISFIED
___ SATISFIED
___ NEITHER SATISFIED NOR DISSATISFIED
___ DISSATISFIED
___ VERY DISSATISFIED

6. Would you enter the same job as a technician if you had the opportunity to choose again?

___ DEFINITELY YES
___ PROBABLY YES
___ NOT SURE
___ PROBABLY NO
___ DEFINITELY NO

7. Your future career plans may not be definite at this point, but please indicate your present expectations. Please remember that all comments will remain confidential.

___ I EXPECT TO WORK AT THIS COMPANY UNTIL RETIREMENT
___ I EXPECT TO CHANGE MY JOB WITHIN THIS COMPANY
___ I EXPECT TO LEAVE THIS JOB IF I FIND A NEW ONE
___ OTHERS (Please specify)_____

SECTION II.

There are many reasons for participating in training related to your work. The following items indicate the relative importance of the reasons you might have for participating in training related to your work. For each item CIRCLE the number which best represents the degree of importance you attach to each reason.

```
|--------- 5 means "VERY IMPORTANT"
| |------- 4 means "IMPORTANT"
| | |----- 3 means "MODERATELY IMPORTANT"
| | | |--- 2 means "OF LITTLE IMPORTANCE"
| | | | |- 1 means "NOT IMPORTANT"
| | | | |
| | | | |  My reasons for participating in training . . . .
```

5 4 3 2 1 To further enhance my knowledge or skills to meet the demands of my work situation.

5 4 3 2 1 To keep up with technological development for job security.

5 4 3 2 1 To develop new professional knowledge and skills.

5 4 3 2 1 To develop the proficiency necessary to maintain quality performance.

5 4 3 2 1 To exchange ideas with professional colleagues.

5 4 3 2 1 To relate my ideas to those of my professional peers.

5 4 3 2 1 To learn from the interaction with other professionals.

5 4 3 2 1 To be challenged by the thinking of my professional colleagues.

5 4 3 2 1 To make more money (salary or wage).

5 4 3 2 1 To maintain my identity with my profession.

5 4 3 2 1 To consider changing the emphasis of present professional responsibilities.

5 4 3 2 1 To increase the likelihood of advancement in my present work position.

5 4 3 2 1 To help increase my productivity.

5 4 3 2 1 To keep abreast of new developments in my field.

5 4 3 2 1 To learn more about the direction in which my profession is going.

5 4 3 2 1 To help me be more competent in my current work.

SECTION III.

The statements below represent values which people consider important in their work. Some of these statements may be very important to you but of little importance to others. Read each statement carefully and indicate how important it is to you. For each statement CIRCLE the number which best represents the degree of importance you attach to each reason.

```
|-------- 5 means "VERY IMPORTANT"
| |------ 4 means "IMPORTANT"
| | |---- 3 means "MODERATELY IMPORTANT"
| | | |-- 2 means "OF LITTLE IMPORTANCE"
| | | | - 1 means "NOT IMPORTANT"
| | | | | ____________________________________________________
| | | | |
| | | | |  WORK in which I . . .
```

5 4 3 2 1 have authority over others.

5 4 3 2 1 add beauty to the world.

5 4 3 2 1 make my own decisions.

5 4 3 2 1 lead the kind of life I enjoy.

5 4 3 2 1 have to keep solving new problems.

5 4 3 2 1 gain prestige in my field.

5 4 3 2 1 know that others consider that my work is important.

5 4 3 2 1 add to the well-being of other people.

5 4 3 2 1 are looked up to by others.

5 4 3 2 1 see the result of my efforts.

5 4 3 2 1 look forward to changes in my job.

5 4 3 2 1 can be the kind of person I would like to be.

5 4 3 2 1 form friendships with my fellow employees.

5 4 3 2 1 have a supervisor who is considerate.

5 4 3 2 1 receive pay increases that keep up with the cost of living.

5 4 3 2 1 am sure of always having a job.

5 4 3 2 1 am able to enjoy my lifestyle apart from the job.

5 4 3 2 1 am paid enough to live comfortably.

SECTION IV. Demographic Variables

1. What is your sex?

___ MALE
___ FEMALE

2. What is your age: _____

3. Highest level of formal education you have completed?

___ 4 YEARS COLLEGE OR UNIVERSITY MAJOR:_____
___ COMMUNITY COLLEGE MAJOR:_____
___ SENIOR HIGH SCHOOL MAJOR:_____
___ JUNIOR HIGH SCHOOL
___ OTHER (Please specify) _____

4. How many years have you been employed in this technical position?

In the current employing company: _____ year(s)
In the former employing companies: _____ year(s)

If there is something else on your mind related to technical training but not covered by this questionnaire, please let us know by writing in the space below.

_____

_____

_____

_____

Thank you for your cooperation.

APPENDIX C: LIST OF ELECTRONICS COMPANIES

First Sample

1. Arnav Systems Inc.
2. Aeroscientific Co.
3. Signal Control Co.
4. Metheus Co.
5. Sideral Corporation
6. Litton Systems Inc.
7. Wacker Siltronic Co.

Second Sample

1. Kamerman Labs, Inc.
2. A T & E Systems Inc.
3. Current Electronics Inc.
4. Microcosms Inc.
5. UET
6. Beaver Lec-Tronix Inc.
7. Showtime Video Ventures
8. National Electronic Cable
9. Simco/Ramic Co.
10. Open Door Inc.
11. Biamp Systems Inc.
12. Electronic Cont. Design

(Continued on next page)

13. Northwest PCB Inc.
14. Lattice Semiconductor
15. Westak of Oregon
16. Nu-Decor Inc.
17. Cablesus Systems Inc.
18. PSI Manufacturing Co.
19. Emerald Cable Assemblies
20. Microflect Co, Inc.

APPENDIX D: DESCRIPTIVE STATISTICS FOR FINAL INSTRUMENT

Table 1. Summary of Factor Scores in the Proposed Model.

Factor	Range of Scale	Mean	S.D.
1. Work-Related Training Participation	—	2.34	1.74
2. Motivation to Participate in Work-Related Training	1 to 5 (1 to 4)	4.26	.55
3. Job Satisfaction	1 to 5	3.70	.94
4. Attendance Ability	1 to 5	4.10	.63
5. Values and Internal Expectations	1 to 5	3.82	.74
6. External Expectations	1 to 5	3.62	.56
7. Personal Characteristics			
A. Education	1 to 7	3.81	1.53
B. Tenure	1 to 25	4.20	6.70
C. Age	21 to 55	34.10	6.90
D. Sex	M F	—	—

Note: N = 47

APPENDIX E. ANOVA SUMMARIES FOR CAUSAL EQUATIONS

Table 1. Analysis of Variance of the Training Participation (F1) Factor Predicted by Attendance Ability (F4) and Willingness to Participate (F2) Factors.

Source of Variance	Sum of Square	df	Mean Square	F	p
Regression	10.38	2	5.19	1.78	.180
Residual	128.18	44	2.91		
Total	138.56	46			

---------- Variables in Equation Number (1) ----------

Variable	B	SE B	Beta	t	Sig t
F4	3.45776	1.83659	1.25332	1.883	.0664
F2	3.81389	2.10849	1.20414	1.809	.0773
(Constant)	.28545	2.32158		.123	.9027

Table 2. Analysis of Variance of the Willingness to Participate Factor (F2) Predicted by Job Satisfaction (F3) and External Expectations (F6) Factors.

Source of Variance	Sum of Square	df	Mean Square	F	p
Regression	3.58	2	1.79	7.70	.001
Residual	10.23	44	.23		
Total	13.81	46			

---------- Variables in Equation Number (2) ----------

Variable	B	SE B	Beta	t	Sig t
F6	.31108	.12833	.31531	2.424	.0195
F3	.22125	.07612	.37808	2.907	.0057
(Constant)	2.31154	.53022		4.360	.0001

Table 3. Analysis of Variance of Job Satisfaction (F3) Factor Predicted by Values and Internal Expectations (F5) Factor.

Source of Variance	Sum of Square	df	Mean Square	F	p
Regression	1.35	1	1.35	1.55	.219
Residual	38.98	45	.87		
Total	40.33	46			

---------- Variables in Equation Number (3) ----------

Variable	B	SE B	Beta	t	Sig t
F5	.23279	.18676	.18268	1.246	.2190
(Constant)	4.59118	.72606		6.323	.0000

Table 4. Analysis of Variance of Attendance Ability (F4) Factor Predicted by Personal Characteristics [Education (F7a), Tenure (F7b), Age (F7c), Sex(F7d)] Factor.

Source of Variance	Sum of Square	df	Mean Square	F	p
Regression	1.05	4	.26	.65	.634
Residual	17.15	42	.41		
Total	18.20	46			

---------- Variables in Equation Number (4) ----------

Variable	B	SE B	Beta	t	Sig t
F7d	.07926	.06990	.20044	1.134	.2633
F7a	.05147	.06333	.12496	.813	.4209
F7c	.00586	.07767	.01253	.075	.9403
F7b	.01330	.03491	.06352	.381	.7051
(Constant)	3.64712	.40217		9.069	.0000

Table 5. Analysis of Variance of Values and Internal Expectations (F5) Factor Predicted by Personal Characteristics [Education (F7a), Tenure (F7b), Age (F7c), Sex(F7d)] and External Expectations (F6) Factors.

Source of Variance	Sum of Square	df	Mean Square	F	p
Regression	3.71	5	.74	1.44	.231
Residual	21.13	41	.52		
Total	24.84	46			

---------- Variables in Equation Number (5) ----------

Variable	B	SE B	Beta	t	Sig t
F7d	.02435	.07855	.05272	.310	.7581
F6	.27742	.20433	.20968	1.358	.1820
F7a	.11887	.07140	.24703	1.665	.1000
F7b	.02863	.03933	.11707	.728	.4708
F7c	.03984	.09278	.07294	.429	.6699
(Constant)	2.54554	.94105		2.705	.0099

Table 6. Analysis of Variance of External Expectations (F6) Factor Predicted by Personal Characteristics [Education (F7a), Tenure (F7b), Age (F7c), Sex(F7d)] and Values and Internal Expectations (F5) Factors.

Source of Variance	Sum of Square	df	Mean Square	F	p
Regression	2.38	5	.48	1.65	.168
Residual	11.81	41	.29		
Total	14.19	46			

---------- Variables in Equation Number (6) ----------

Variable	B	SE B	Beta	t	Sig t
F7d	.00665	.05879	.01906	.113	.9105
F5	.15509	.11423	.20519	1.358	.1820
F7a	.01026	.05514	.02820	.186	.8534
F7b	.01885	.02945	.10196	.640	.5257
F7c	.14157	.06592	.34296	2.148	.0377
(Constant)	3.47143	.53806		6.452	.0000

Key: F1 = Training participation

F2 = Willingness to participate

F3 = Job satisfaction

F4 = Attendance ability

F5 = Values and internal expectations

F6 = External expectations

F7 = Personal characteristics

F7a = Education

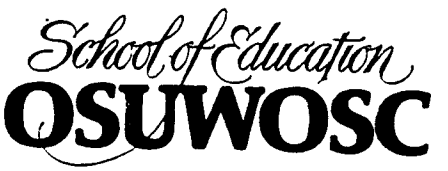
F7b = Tenure

F7c = Age

F7d = Sex

APPENDIX F. TRANSMITTAL LETTERS

LETTER 1. PILOT TEST - 1



A merged School serving Oregon State University and Western Oregon State College with graduate and undergraduate programs in Education

August 20, 1987

Dear Hewlett-Packard Electronics Technician:

Thank you for participating in a study of technical training conducted by the Vocational and Technical Education Department of Oregon State University. Your participation will help identify factors that influence electronics technicians to participate in work related training.

It will take about twenty minutes for you to complete the enclosed survey. Your responses will be kept confidential. After you complete the survey, please use the enclosed envelope to return it to Steve Yarrow, Hewlett-Packard.

Thank you again for your cooperation.

Sincerely yours,

Dr. Sam Stern
Associate Professor
Industrial Education

Mr. Chu-Hsun Kuo
Research Assistant
Vocational Education

Enclosures

LETTER 2. PILOT TEST - 2

HEWLETT PACKARD

NORTHWEST INTEGRATED CIRCUITS DIVISION
1020 N.E. Circle Boulevard. Corvallis, Oregon 97330. Telephone 503 757-2000 TWX# 510-596-0683

September 1, 1987

Mr. Chu-Hsun Kuo
Dept. of Vocational Education
Oregon State University
Corvallis, OR 97331

Dear Mr. Kuo:

Enclosed you will find the survey results Dr. Stern requested. Of the 34 surveyed processing technician program participants 24 returned the survey. The sampled population consisted of 13 processing technicians, 13 candidates currently in the program, and 8 candidates new to the program.

If there is any way we can be of further assistance with this research, please feel free to contact me.

Sincerely,

Steve Yarrow
TQC Trainer/Consultant
Processing Tech Coordinator
Hewlett-Packard Company

LETTER 3. FIRST SAMPLING - 1

School of Education
OSU/WOSC

A merged School serving Oregon State University and Western Oregon State College with graduate and undergraduate programs in Education.

February 15, 1988

Dear Sir:

We are conducting a study entitled "Factors that Influence Electronics Technicians to Participate in Work Related Training." An abstract of the study and a copy of the survey instrument that we will be using are enclosed for your information. We are attempting to determine how electronics technicians can be encouraged to keep their skills and knowledge up to date.

The principal investigator for this study is Mr. Chu-Hsun Kuo, a doctoral candidate from Taiwan, Republic of China. He now needs to acquire information on the potential factors from approximate 200 electronics technicians. Your organization was randomly selected as a representative of those who employ electronics technicians.

May we administer the survey instrument to all of your electronics technicians? We will call you within the next few weeks to arrange for a meeting with you or your representative who may be able to help us.

If you have any questions, please feel free to call us at 754-2961.

Sincerely yours,

Warren Suzuki
Head Graduate Advisor

Enclosures

Department of Vocational and Technical Education
OSU Campus: Snell Hall, Room 301 · Corvallis, Oregon 97331 · (503) 754-2961

LETTER 4. FIRST SAMPLING - 2

School of Education
OSU/WOSC

A merged School serving Oregon State University and Western Oregon State College with graduate and undergraduate programs in Education.

March 3, 1988

Dear Ms. Warburton:

We appreciate your willingness to help us with our study on work related training for electronics technicians. As we discussed, enclosed are 5 packets. Each packet consists of a questionnaire, a cover letter and a pre-addressed, pre-stamped return envelope. Please distribute these packets to your electronics technicians.

Thank you again for your help. When this study is completed, you will receive a summary of the overall report as well as a summary of the information provided by your technicians. If you have any questions, please feel free to call me at 754-2961.

Sincerely yours,

Warren Suzuki
Head Graduate Advisor

Enclosures

Department of Vocational and Technical Education
OSU Campus, Shell Hall, Room 301 · Corvallis, Oregon 97331 · (503) 754-2961

LETTER 5. FIRST SAMPLING - 3

School of Education
OSU/WOSC

A merged School serving Oregon State University and Western Oregon State College with graduate and undergraduate programs in Education.

March 3, 1988

Dear Electronics Technician:

Rapid technological change and increasing international competition have significantly impacted and will continue to impact on the electronics industry. Technicians play a key role in the productivity of the electronics industry. We are therefore conducting a study to determine how electronics technicians can remain on the cutting edge of technology by benefiting from job related training.

You are one of a small group of electronics technicians who are being asked to give their opinions on this issue. In order that the results truly represent the thinking of all electronics technicians, it is important that you complete and return the attached questionnaire. Although you need not answer any or all of the questions, every bit of information that you provide will contribute to the certainty of the answers to the question.

You may be assured of complete confidentiality. After answering the questions, please use the enclosed envelope to return your questionnaire to us.

Thank you for participating in this study. Please feel free to contact us should you have any questions. We would appreciate your returning of the questionnaire within a week.

Sincerely yours,

Warren N. Suzuki
Head Graduate Advisor

Chu-Hsun Kuo
Research Assistant and
a former Electronics
Technician

Enclosure

Department of Vocational and Technical Education
OSU Campus: Snell Hall, Room 301 · Corvallis, Oregon 97331 · (503) 754-2961

LETTER 6. SECOND SAMPLING - 1

School of Education
OSU/WOSC

A merged School serving Oregon State University and Western Oregon State College with graduate and undergraduate programs in Education.

March 16, 1988

Dear Sir:

We would like to get information from your electronics technicians. The information will be used in a study titled, "Factors that Influence Electronics Technicians to Participate in Work Related Training." Your organization was selected as representative of those who employ electronics technicians in the State of Oregon. We have enclosed a brief description of the study and a copy of the survey questionnaire for your information.

Enclosed are TWO packets. Each packet consists of a questionnaire, a cover letter and a pre-addressed, pre-stamped return envelope. Please distribute these packets to two RANDOMLY selected electronics technicians in your company.

Thank you for your help. If you have any questions, please feel free to call me at 754-2961.

Faithfully yours,

Larry Kenneke
Chairperson, Department of
Vocational and Technical Education

Enclosures

Department of Vocational and Technical Education
OSU Campus: Snell Hall, Room 301 · Corvallis, Oregon 97331 · (503) 754-2961

LETTER 7. SECOND SAMPLING - 2

School of Education
OSU/WOSC

A merged School serving Oregon State University and Western Oregon State College with graduate and undergraduate programs in Education.

March 28, 1988

Dear Sir:

About two weeks ago, we sent a packet of survey materials to acquire your electronics technicians' opinions on job related training. WE NEED YOUR HELP! We have not yet received any questionnaires from your technicians.

Please encourage your electronics technicians to return their questionnaires. Thank you again for your help. Your assistance is greatly appreciated.

Faithfully yours,

Larry Kenneke
Head, Department of
Vocational and Technical Education

Department of Vocational and Technical Education
OSU Campus: Snell Hall, Room 301 · Corvallis, Oregon 97331 · (503) 754-2961