DOCUMENT RESUME

ED 097 446 CE 002 208

AUTHOR Salvatore, Joseph
TITLE Occupational Stability in Technical Occupations.
PUB DATE 28 Apr 72
NOTE 14p.; Paper presented at the Joint Spring Conference of the American Technical Education Association, and the American Society for Engineering Education, Technical Institute Unit (Springfield, Massachusetts, April 28, 1972)

EDRS PRICE MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS *Engineers; *Job Layoff; *Job Tenure; Occupational Mobility; Relocation; *Technical Occupations; Unemployment; Vocational Counseling; Wages
IDENTIFIERS *Occupational Stability

ABSTRACT

Since occupational stability factors are integral to career decision-making processes for students, a study was made to seek information pertaining to occupational stability factors for technicians. Two assumptions made in the study were that inadequate counseling, due to insufficient knowledge about technical education, and an unrealistic emphasis on four years of college and too little prestige attached to technical programs were deterrents to the technical education program. A major hypothesis of the study was that technicians have greater occupational stability than engineers--no salary loss for new jobs; fewer days of unemployment, and lesser distance for job relocation. In reports reviewed for the study, salary change, length of unemployment, and relocation were given as primary concerns of technical personnel seeking new jobs. Conclusions indicated no significant salary difference for technical personnel or engineers in new jobs after lay-off. Technicians experience a longer period of unemployment than engineers after lay-off, while engineers are more likely to relocate than technicians in accepting new positions after lay-off. (EA)

OCCUPATIONAL STABILITY IN TECHNICAL OCCUPATIONS

Joseph Salvatore, Ph.D.

Chairman, Engineering Technology Program

Division of Vocational-Technical Education

Rhode Island Junior College

Voc - Tech Publication

73-001

Presented At
The Joint Spring Conference of the American
Technical Education Association, and the American
Society for Engineering Education, Technical Institute Unit

Springfield Technical Community College
Springfield, Massachusetts
April 28, 1972

This report is based on the author's dissertation, "A Comparative Analysis of Occupational Stability Factors for Electronic Technicians and Engineers", submitted to Laurence University, Sarasota, Florida in partial fulfillment of the requirements for the degree of Doctor of Philosophy. Submitted in 1971.

Student enrollment into technical programs in two-year colleges has been far short of anticipated figures. Occupational training programs in two-year colleges have not been promoted with the same vigor as transfer programs and general education programs with the result that recruitment of students into programs which prepare semi-professionals for technical occupations has been difficult.

The response of high school students for entering post-secondary technical programs has, in fact, been low to the extent that some programs have been eliminated. As an example, Chemical Technology, has been discontinued in many two-year colleges because of insufficient enrollment. The American Chemical Society reacted by setting up a special project to develop a curriculum which might attract students into chemical technology.

A study of several reports concerned with the ACS project revealed that the problem of recruiting has four distinct components:

1. A low level of student awareness of the demand for technicians.
2. A low level of student awareness of characteristics of technician occupations.
3. A low level of counsellor awareness of needs and of the characteristics of technician occupations.
4. Emphasis on traditional high school programs.

Let us look into Component 2, Low Level of Student Awareness of the Characteristics of Technical Occupations. There is general knowledge as to salary, required education, security, and status in occupations above or below the technician. The engineer is respected and receives a relatively high salary. The skilled craftsman is still

paid and has public recognition in our economy even though he does not enjoy the prestige of the engineer. The status of the technician and the earnings of employees in technical occupations are not clear; the relation of the technician to the engineer and the craftsman is not distinct. The situation is further confused by a statement of the Department of Labor[1] that indicates no general recognition of the "technician" category. It is apparent, then, that a part of the low level of awareness of the characteristics of technician occupations is due to the poor delineation of these occupations.

Another reason for the low level of awareness is the lack of information in the literature concerning the relative stability of technician occupations. Occupational stability factors are integral to career decision-making processes for students. Since knowledge about these factors is important, a study was made to seek information descriptive of occupational stability factors for technicians. The term "occupational stability" is used rather than "job security". Job security implies that a person's condition of employment on a given job centers on feelings of permanency in that job. In these times of dynamic change, however, particularly in technical occupations, no specific job can be considered permanent. We must, therefore, emphasize a broader aspect, that of occupational stability. Occupational stability is defined as the extent to which salary, employment status, and residence remain constant during changing employment conditions.

The purpose of the study was to ascertain information about selected occupational stability factors of technician occupations as compared to the same factors for engineering occupations.

A number of assumptions were made in the study, two of which are:

a. Inadequate counselling in high school due to lack of information, is a major factor which impedes efforts to increase the supply of technicians.

Torpey[2] has stated that counsellors as a group are not sufficiently knowledgeable about technician education, including information on the nature of technical education, academic requirements, the kind of work graduates actually perform, and range of earnings.

In too many instances, according to Knoebel,[3] counselling services are provided in a narrow fashion designed "primarily for baccalaureate degree candidates" or at a "too late" date. He points out that many potential enrollees are deficient in specific requirements to enter technician training programs in two-year colleges. The deficiencies are discovered when they are ready to graduate from high school.

b. There is an unrealistic emphasis on four years of college for everyone and too little prestige attached to technical programs and the associate degree.

Businessmen, labor leaders, administrators, teachers, parents and students have been indifferent to vocational education. They have promoted the idea that the only good education is one which culminates in four years of college. The bachelor's degree is held out as the educational goal to almost all students from the day they enter school. The undue regard for four years of college and the bachelor's degree has originated from a desire for prestige, a sense of tradition, and the belief that the degree can assure high income and job advancement. By contrast, not much prestige has been attached

to the two-year college or to the Associate Degree.

The major hypothesis of the study was that technicians have greater occupational stability than engineers. Subhypotheses were that, under changing conditions of employment:

1. The technician is likely to be placed on a new job with no less in salary. The engineer is likely to be placed on a new job with a loss in salary.
2. The technician will experience fewer days of unemployment than the engineer.
3. Should residence relocation be necessary for technical personnel accepting new jobs, the technician will move a lesser distance than the engineer.

It was apparent in the preliminary field survey, that when a critical unemployment situation develops in technically based industries, the plight of the engineer is given more attention than that of the technician. The dramatic emphasis on the post lay-off problems of engineers on television, radio, and in the newspapers overshadows the problems of technicians who are seeking reemployment. Very little was found in the literature concerning the post lay-off problems of technicians. Perhaps technicians do not experience the problems that face engineers when technical personnel are laid off as a result of cut-backs in defense spending. It seems also, that there are features in employment as a technician which have advantages over employment as an engineer. Some of the features concern salary, effects of specialization and obsolesence, proper utilization of technical personnel, and placement of graduates from technical programs.

Slurzberg[4] has pointed out that a great many technical positions

do not require four years of college, but pay high salaries with excellent fringe benefits. These benefits often include extra pay for overtime, insurance coverages, early retirement at substantial pay, liberal vacation, sick leave provisions, and excellent working conditions. In contrast, many college graduates work on jobs that do not provide all these benefits. High starting salary, then should not be a prime determinant in the choice of engineering as a professional career. The National Industrial Conference Board[5] reported a study of five groups of professionals in which salaries were compared at graduation and at five year intervals. It was found that engineers, one of the five groups, were offered the highest salaries upon graduation but that the percent of rise in salary was the smallest of the five groups.

Rice of the Boston Globe interviewed Harold Goldberg of the Institute for Electrical and Electronic Engineers, concerning employment conditions along Route 128.[6] Goldberg commented that, "People talk about the wonderful starting salaries for engineers but nobody hears about what happens to these salaries over the years." Engineers salaries do not increase as much as they increase in other professional fields. Goldberg also pointed out that there seems to be a "ceiling" on these salaries.

In a questionnaire given by Rollins to employees terminated during 1970 from the NASA Center in Cambridge,[7] only five percent of the respondents reported reductions in salary on new jobs, while seventy percent reported high salaries. However, the validity of these responses is questioned by Rollins. He indicated that most employees signed questionnaires and may not have desired that the

real new salary be known by their peers and he doubts that engineers can find new jobs without a loss in salary.

Cut-backs in defense spending have affected placement of graduates of the engineering schools which provided much of the manpower for the electronics industries. Graduates have had considerable difficulty in their placement effort. According to the placement office of one large university in Boston,[8] twice as many engineering graduates had not been placed in 1970 in comparison to figures at an equivalent date in 1969. In contrast to this, the placement record of 1970 graduates from one of the nation's most respected technical institutes in Boston[9] showed that all graduates were placed, and that many had a variety of job options. The placement officer of this institute also commented that while the need for technicians to do semi-professional work is still a serious problem, there are indications that employers are willing to use competent technicians for much of the work previously done by engineers.

Throughout the literature, reports, surveys, and TV presentations relative to the Boston situation which were reviewed for the study, there was very little reference to technicians. One conjecture is that the employment situation for semi professional workers was not critical. This was affirmed by all personnel managers interviewed in a preliminary survey for the study. Without exception, they stated that technicians released by their firms obtained new jobs with little difficulty and at equitable salaries. This reflects experiences of engineers and technicians laid off in 1965 by Republic Aircraft. Of the high level technical personnel released by Republic at that time ninety-two percent of the semi professionals accepted semi-professional

jobs while only seventy-two percent of the professionals accepted professional jobs.[10]

There actually may be an increase in the employment of technicians when engineers are laid off. For example, the Boeing Company, in response to a questionnaire concerning layoffs at one division, reported a technical staff of 276 professionals constituting seventy-two percent of the labor force before lay-off, and fifty-four semi-professionals constituting fourteen percent of the labor force before lay-off.[11] Six months later the technical labor force was found to be comprised of 227 professionals who constituted sixty-eight percent of the labor force, and sixty-six semi-professionals who constituted twenty percent. Thus, while the number of professionals decreased, the number and proportion of semi-professionals increased. A prime example is the take-over of the NASA Cambridge Research Center by the Department of Transportation in 1970. Practically all the technicians were retained by D.O.T. for their research. Engineers, because of their specialized background in Aerospace Engineering, could not be retained by D.O.T. and most found themselves unemployed. The background of a technician, such as an electronic technician, is broad enough to be usefully applied in research in aerospace travel.

The Little Study of the Massachusetts unemployment situation reported that cut-backs of highly skilled employees were greater than cut-backs of low skilled employees.[12] This study anticipates a change in occupational structure in technical industries and predicts a decrease in the percent of professional workers compared to technicians, skilled workers and unskilled workers. Workers in high

levels of employment rather than those at the bottom of the occupational ladder were affected most by the recent lay-offs and the trend is expected to continue. In some industries the need for professionals will disappear entirely, while automation will supplant low level workers. Hence, only technicians and skilled workers will be required.

In the reports reviewed for the study, salary change, length of unemployment, and relocation were given as primary concerns of technical personnel seeking new jobs. The study that is the basis for this presentation was concerned with the same three factors. Personal factors such as age, sex and physical capability were found to be of little importance in the selection or acceptance of employment. The general feeling in seeking employment after lay-off from defense based jobs was a desire for stability. Rollins, in the NASA study, reported that sixty-five percent of the employees laid off desired to leave the field of aerospace for reasons of instability.[13]

The three factors in occupational stability, 1) change in salary, 2) duration of unemployment, and 3) change in residence, were examined to ascertain the extent to which they were affected by the change in employment conditions from 1969 to 1970. Data relative to change in employment conditions were necessary in order to evaluate occupational stability as it has been defined in this paper. These factors were examined under conditions of previous employment and conditions of present employment for two groups of technical personnel, technicians and engineers. A comparison of the factors was made to ascertain the relative occupational stability of technicians -- the semi-professionals, and engineers -- the professionals.

Approximately one-half of the information forms for the study were sent to electronic technicians and the remaining forms were sent to electronic engineers. Information forms were sent to persons who had been released in the months of July and August, 1970 by electronics firms located on Route 128.

The respondents are representative of:

1. The largest group of high level technical personnel in industry; electronic engineers and electronic technicians.
2. Employees in the largest goods producing industry, the electrical electronics industry.
3. Employees who had been released from jobs as a result of defense cut-backs.

Summary of Findings

1. Salaries for engineers who accepted new jobs after lay-off averaged 1.1 percent lower than previous salaries. Salaries for technicians who accepted new jobs after lay-off averaged 0.6 percent lower than that of previous salaries.
2. The average length of time for engineers to find new jobs after lay-off was 27 days while the average length of time for technicians to find new jobs after lay-off was 42.5 days.
3. Of the engineers who accepted new jobs after lay-off, 28 percent relocated but of the technicians who accepted new jobs after lay-off only 5 percent relocated.

4. The engineers who relocated to accept new positions moved an average distance of 1,170 miles but technicians who relocated to accept new positions moved an average distance of 203 miles. Actually one technician moved 475 miles and if this is not considered in the calculation, the average distance moved by technicians would be a maximum of 95 miles.

Conclusions

Salary Change

When technical personnel are reemployed after lay-off, there is no significant difference in the salary received in the new job as compared to the salary received on the previous job.

Engineers do not experience any significantly greater change in salary than technicians when accepting new jobs after lay-off. The response of engineers, however, is somewhat questionable.

Length of Unemployment

Technicians experience a longer period of unemployment than engineers as they seek new jobs after lay-off. Here again, however, the responses of engineers are questionable. It is possible that the engineers who did not respond were still unemployed at the time they received the questionnaire. The employment situation in the greater Boston area, as reported throughout the first part of 1972, still indicates a substantial number of engineers unable to find employment.

Residence Relocation

Engineers are more likely to relocate in order to accept new positions after lay-off than technicians. Conversely, technicians are likely to remain in their communities when accepting new positions after lay-off.

Engineers must move relatively long distances in relocating to accept new positions of comparable responsibility.

Occupational Stability

Factors such as salary change and length of unemployment are not among the considerations for comparing occupational stability of technicians with engineers.

However, in terms of the necessity for residence relocation after lay-off, technicians do have greater occupational stability than engineers.

REFERENCES

[1]U. S. Department of Labor, Bureau of Labor Statistics, Employment Outlook for Technicians, Bulletin 1550-88 (Washington, D.C.: Government Printing Office, 1968), p. 1.

[2]William C. Torpey, "The National Shortage of Engineering Technicians," Junior College Journal, Vol. 39, No. 2 (October, 1968), p. 25.

[3]U. S. Office of Education, Bureau of Research, Occupations and Education--Leaders in the Field Speak Out, Proceedings of the Occupational Education Programs Development Institute held at San Francisco, California, July 7-10, 1969, p. 17.

[4]Morris Slurzberg, "Where Are the Jobs for Everyone?" Technical Education News, Vol. 29, No. 2 (April, May, 1970), p. 1.

[5]Shirley H. Rhine and Daniel Creamer, The Technical Manpower Shortage: How Acute (New York: National Industrial Conference Board, 1970), p. 50.

[6]Berkeley Rice, "Down and Out Along Route 128," New York Times, November 1, 1970, Section 8, p. 103.

[7]Robert Harvey Rollins, II, "Closing of the NASA Electronics Research Center" (unpublished M.Sc. Thesis, Massachusetts Institute of Technology, Sloan School of Management, Cambridge, Massachusetts, 1970), p. 48.

[8]Alvah Bohrman (private interview held at Northeastern University, Placement Office, Boston, Massachusetts, September 10, 1970).

[9]Carl W. Nickerson (private interview held at Wentworth Institute, Placement Office, Boston, Massachusetts, November 9, 1970).

[10]U. S. Arms Control and Disarmament Agency, Post Lay-Off Experiences of Republic Aviation Workers (Washington, D.C.: Government Printing Office, 1966), Table F-2, p. 131.

[11]R. P. Loomba, Stabilization of Engineering and Scientific Employment in Industry (San Jose, California: Center for Interdisciplinary Studies, San Jose State College, 1966), p. 57.

[12]Fostering Industrial Growth in Massachusetts, Vol. 1, Cutbacks in Defense Spanding and the Economy of Massachusetts, 1968-1972 (Cambridge, Massachusetts: Arthur D. Little, Inc., 1970), Table 16, p. 41.

[13]Robert Harvey Rollins, II, "Closing of the NASA Electronics Research Center" (unpublished M.Sc. Thesis, Massachusetts Institute of Technology, Sloan School of Management, Cambridge, Massachusetts, 1970), p. 48.