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Industrial Practices and Perceptions of Management Toward Training/Education with Implications for a Regional University

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INDUSTRIAL PRACTICES AND PERCEPTIONS OF MANAGEMENT TOWARD TRAINING/EDUCATION WITH IMPLICATIONS FOR A REGIONAL UNIVERSITY

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by

Shirley Lewis Morgan

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APPROVAL

This is to certify that the Advanced Graduate Committee of

SHIRLEY LEWIS MORGAN

met on the

eighth day of April, 1982.

The committee read and examined her dissertation, supervised her defense of it in an oral examination, and decided to recommend that her study be submitted to the Graduate Council and the Dean of the School of Graduate Studies in partial fulfillment of the requirements for the degree Doctor of Education.

Chairman, Dissertation

Signed on behalf of
the Graduate Council

Dean, School of Graduate Studies

Abstract

INDUSTRIAL PRACTICES AND PERCEPTIONS OF MANAGEMENT TOWARD TRAINING/EDUCATION WITH IMPLICATIONS FOR A REGIONAL UNIVERSITY

by

Shirley Lewis Morgan

The problem of this study was to determine the difference between industrial practices and perceptions of management toward training and education programs in selected manufacturing industries. The survey was conducted within a 50-mile radius of a regional university to determine how academic institutions could better assist industries with training and education programs.

Data were collected through the use of a two-part instrument sent to 426 industries in North Carolina, Virginia, and Tennessee. Part I collected data on the perceptions of industrial management. The perceptions were grouped into five categories: (1) employee assistance, (2) employee participation, (3) responsibility assignment, (4) employee benefits, and (5) program planning. Five null hypotheses for these categories were formulated to be tested at .05 level of significance. Part II identified the practices of industrial management toward training and education. Ten research questions were formulated to report the practices. The analysis of variance was used to determine significant differences between manufacturing industries by SIC classification and size in each perception. If a significant difference was revealed, the Newman-Keuls Multiple Range Test was conducted to determine which industry groups were significantly different.

The testing of the null hypotheses revealed that no significant differences existed in the perceptions under employee participation; eight significant differences existed in the perceptions under the other four categories. Thus, null hypotheses 2, 3, 4, and 5 were rejected and the research hypotheses were accepted for employee assistance, responsibility assignment, employee benefits, and program planning.

Major conclusions from the study revealed that manufacturing industries were strongly involved in training and education in 1980. The most utilized methods were in-house activities and outside conferences. The principal needs indicated by manufacturing industries were supervisory, management, technical, and skills training. There was little or no agreement between the perceptions of management

toward training and education and the actual practices in the firms. Recommendations included suggestions for university and industry collaboration and future research in training and education.

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Dissertation prepared under the guidance of Dr. William A. Pafford, Dr. Floyd H. Edwards, Dr. Gem Kate Greninger, Dr. Sue B. Mays, and Dr. Robert G. Shepard.

DEDICATION

to

My Three M. T.'s

Monroe Talton, Sr.

Monroe Talton, Jr.

Marcus Thomas

for their

love and understanding

ACKNOWLEDGEMENTS

The writer is deeply grateful to many people for their contribution to this research study. It would be impossible to acknowledge all of them. Special thanks and appreciation are extended to the following persons:

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Chapter 1

INTRODUCTION

The role of the regional university is clearly one of being responsive to the region it serves. Effective execution of this role requires resourcefulness on the part of educators to keep informed about corporate training and educational needs. In a series of articles in Fortune magazine, beginning in October, 1975, Walter Guzzardi, Jr., wrote in the first article of the series that many communities' businessmen were collaborating with education to bring the two worlds closer together, although such collaboration would not be easy. He stated that educational institutions tended to be heavily bureaucratized and bound to the tradition of the past, and slow to adjust to emerging needs. Yet he claimed that the business institution had not yet fully recognized its stake in educational processes, nor the ways in which it could strengthen them. He further stated that education and business were suspicious of each other.[1]

In the third of the series of articles on "Education for the World of Work" in Fortune magazine, Guzzardi stated that educators were regarding the business community with new interest and respect.[2]

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[1]Walter Guzzardi, Jr., "Education for the World of Work," Fortune, XCII (October, 1975), 124-129, 184, 188.

[2]Walter Guzzardi, Jr., "The Uncertain Passage from College to Job," Fortune, XCIII (January, 1976), 127.

Guzzardi further stated:

> Gone are the days when all they /educators_/ wanted from businessmen or corporations was money, and no advice, please. Like the new student, today's educator is seeking from business knowledge and direction about a world he never made. Educators are asking businessmen what jobs in business are really like, . . . what kinds of people they look for, what methods of training and selection and promotion they use -- all with a view of putting this information to practical use with job-hungry students. To their gratification, surprised educators are finding that business has a lot to contribute, and that help is readily extended once they ask for it.[3]

Business and industry have long been associated with educational institutions. This association is in evidence with respect to regional universities where leaders from the business community serve on governing boards and councils for college programs. Business and industry also provide assistance in some university-related activities such as cooperative work programs where students work and receive college credit. This collaborative effort is helpful in assisting universities in developing and maintaining various programs; however, these coordinated efforts represent relatively few companies. Because of the limited interaction between a large segment of industry and educational institutions, the status of training and education should be examined in order to assist continuing education in regional universities in providing programs for industrial employees.

The Problem

Statement of the Problem

The problem of this study was to determine the difference

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[3]Ibid., p. 127.

between industrial practices and perceptions of management toward training and education programs for on-the-job improvement in selected manufacturing industries with recommendations for continuing education in a selected regional university.

Sub-Problems of the Study

The following sub-problems were developed in order to examine the practices of those responsible for employee training/education in the industries:

Sub-problem 1. To identify and report the practices of selected manufacturing industries toward training and education programs within a fifty mile radius of a selected regional university.

Sub-problem 2. To analyze and determine any significant difference in the perceptions of management toward training and any significant difference in educational practices between selected manufacturing industries within a fifty mile radius of a selected regional university.

Limitations

The study was subject to the following limitations:

1. The selected population included the manufacturing industries within a 50-mile radius of East Tennessee State University in Johnson City, Tennessee.

2. Only the manufacturing industries having at least 10 firms represented in the 20 groups of the Standard Industrial Classification (SIC) Manual were included in the study.

3. Responses were limited to the information obtained from the returned questionnaires.

4. The study was limited to a computerized mailing list of the population of manufacturing industries from Hugo Dunhill, Inc. in

New York.

5. Due to the dynamic nature of the subject, the study was limited to a review of literature for the past five year period.

Assumptions

The following assumptions were considered essential in this study:

1. A survey instrument was developed which would provide quantitative measurement of the perceptions of management as well as identify the actual practices of training and education in manufacturing industries.

2. The selected population of industries was sufficiently representative of the standard industrial classification (SIC) groups included in this study.

3. The survey instrument accurately reflected the philosophy of the respondents.

Research Questions

In meeting the objectives of this study, the following questions were answered from Part II of the survey instrument:

Question 1. What was the practice of manufacturing industries toward the number of employees participating in training and education programs?

Question 2. What was the practice of manufacturing industries toward the number of training hours provided for each employee?

Question 3. What was the practice of manufacturing industries toward maintaining an annual formal budget for

training and education?

Question 4. What was the practice of manufacturing industries toward providing assistance to the employees for training and education?

Question 5. What was the practice of manufacturing industries toward assigning the responsibility for training and education?

Question 6. What was the practice of manufacturing industries toward maintaining employee records for training and education activities?

Question 7. What was the practice of manufacturing industries toward utilizing different methods of training and education?

Question 8. What was the practice of manufacturing industries toward utilizing different types of training and education?

Question 9. What was the practice of manufacturing industries toward completing a needs analysis of training and education?

Question 10. What was the practice of manufacturing industries toward identifying educational services that could be provided by a college or university?

Hypotheses

The following hypotheses, stated in the null format, were tested at the .05 level of significance from Part I of the survey instrument:

Hypothesis 1. There will be no significant difference in the

means between manufacturing industries in the perceptions of management toward employee participation in training and education.

Hypothesis 2. There will be no significant difference in the means between manufacturing industries in the perceptions of management toward providing assistance for the employee in training and education.

Hypothesis 3. There will be no significant difference in the means between manufacturing industries in the perceptions of management toward assigning the responsibility for training and education.

Hypothesis 4. There will be no significant difference in the means between manufacturing industries in the perceptions of management toward maintaining benefits for employees in training and education.

Hypothesis 5. There will be no significant difference in the means between manufacturing industries in the perceptions of management toward program planning for training and education.

Significance of the Study

The study was significant for the following reasons:

1. The results of this study may encourage cooperative ventures between continuing education programs of industry and regional universities.

2. Industrial educators and training specialists may find the results important in determining the needs and interests of the

employees.

3. Educational institutions may use the findings in preparing programs and courses for students in order to maintain a viable curriculum.

4. The results of this study may reinforce the idea that education and training is a lifelong learning experience.

Definition of Terms

For the purposes of this study, the following operational definitions of terms were utilized:

Company

A company is a firm, industrial in nature, which is engaged in manufacturing processes.

Continuing Education

Continuing education is the courses or programs of study offered by a regional university for the training and education of industrial employees.

Education

Education is instruction, broad in scope, that increases the individual's overall ability.

Formal Course

A formal course is any structured plan of study taken for credit from a high school, college, or university.

Industrial Procedures

Industrial procedures are the actual practices employed by

manufacturing industries for the training and education of its employees.

Industry-Education Cooperation

Industry-education cooperation is any collaborative involvement between industry and education to better utilize the resources which are vital to both.

In-House Training

In-house training is any educational activity offered within an industry to improve the technical skills and competence of the employee.

Management

Management is the employees of manufacturing industries who are designated to formulate and implement the policies and procedures necessary for the successful operation of the company.

Management Perceptions

Management perceptions are the opinions of management concerning the desired role of training and educational activities in manufacturing industries.

Manufacturing Industries

Manufacturing industries include the "establishments engaged in the mechanical or chemical transformation of materials or substances into new products. These establishments are usually described as plants, factories, or mills and characteristically use power driven

machines and materials handling equipment."[4]

Program

A program is planned activity offered by college, university, or manufacturers for on-the-job improvement of industrial employees.

Regional University

A regional university is an institution of higher education serving a limited geographical area offering comprehensive programs oriented toward undergraduate and limited graduate instruction for the continued education of industrial employees.

Training

Training is instruction, narrow in scope, that develops employee skills and improves job performance.

Training/Education

Training/education is any learning activity which improves the employee's knowledge and skills for constructive on-the-job performance. It includes such common terms as professional development, staff development, continuing education, training, retraining, etc. Activities may include seminars, conferences, short courses, formal courses for college credit, etc.

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[4]U.S., Executive Office of the President, Office of Management and Budget, The Standard Industrial Classification Manual (/Washington: Government Printing Office, 1972_/), 57.

Organization of Study

The study is organized into five chapters:

Chapter I includes the introduction, the statement of the problem, the sub-problems of the study, the limitations, the assumptions, the research questions, the hypotheses, the significance of the study, the definition of terms, and the organization of the study.

Chapter II presents the review of the literature and research related to the problem statement.

Chapter III contains the methodology and procedures of the study. Included are the description of the study, the description of the population, the instrument construction, the field study, and the treatment of the data.

Chapter IV contains the presentation and discussion of the data collected in the study. Analyses are presented in regard to the industrial practices and perceptions of management concerning the training and education of employees.

Chapter V is the concluding chapter of the study. A summary of the findings, conclusions, and recommendations is included.

CHAPTER 2

REVIEW OF RELEVANT LITERATURE

Introduction

To serve as a basis for this study, the review of relevant literature covered the period of five years from 1975 through 1980. The review of relevant literature was concentrated within four sections: (1) background information of geographical area, (2) need for education and training programs in industry, (3) industrial training and education programs, and (4) cooperation between industry and colleges and universities.

Background Information of Geographical Area

The geographical area of this study was situated in the South East Central region of the United States. The 50-mile radius area included eleven counties (seven complete, four partial) in the northeastern part of Tennessee, five (four partial, one complete) counties in the southwestern part of Virginia, and nine (four complete, five partial) in the western part of North Carolina (location map in Appendix A).

At the center of the 50-mile geographical area is East Tennessee State University (ETSU) which is located in Washington County, Tennessee. The University is a growing institution of approximately 10,000 students located within an area of towering peaks and rolling valleys

of the Southern Appalachian Mountains.[5]

East Tennessee State University is a member of the State University and Community College System of Tennessee. The University is organized into four colleges, four schools, and one division: the Colleges of Arts and Sciences, Business, Education, and Medicine; the Schools of Nursing, Public and Allied Health, Applied Science and Technology, and Graduate Studies; and the Division of Extended Services.[6]

The Continuing Education program at the University has been in existence for more than thirty years. Since 1950, the program has been expanded to include undergraduate and/or graduate credit programs in many disciplines at six centers in upper East Tennessee. Non-credit continuing education programs have been offered in the tri-cities area of East Tennessee since 1967. It is the non-credit programs which have been most unique in their approach to the development of training programs for business and industry.[7]

Although East Tennessee State University has a history of fast growth, it has not kept pace with business and industry in the area of training, as training needs have been changing faster than academic programming and administration could change. However, continuing education is attempting to keep pace with changes in business and

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[5]Introduction, East Tennessee State University Bulletin, II, No. 6 (1979-80), 5.

[6]East Tennessee State University Bulletin, p. 5.

[7]Howard Ledbetter, "ETSU Continuing Education - A Training Partner with Business and Industry" (Johnson City, Tennessee: East Tennessee State University, 1981), p. 1. (Mimeographed.)

and industry by developing in-house courses for training programs, by developing training/education curriculums, and by coordinating meetings between the company training officers and a department of the University.[8]

Need for Education and Training Programs

Technological changes in our society have brought about an increased need for continued education and training programs for industrial employees. Stan Luxenberg pointed out that in a changing economy where technological innovations alter entire businesses in a short time, companies have to keep employees up-to-date, competitive, and productive. Thus, from management's point of view, continuing education is a question of survival.[9]

A Western Electrical executive suggested that

> No longer can we merely hire skilled help or depend upon people to develop themselves. Rather, people must be trained by experts on the job, so that they develop new skills, upgrade existing skills, and keep ahead of the numerous changes that are part of our advancing scientific knowledge.[10]

Seymour Lusterman suggested that since futurists estimate that the volume of technological and scientific information doubles every eight years, education and training programs are needed to standardize

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[8]Ledbetter, p. 2.

[9]Stan Luxenberg, "Education at AT and T," Change, IX (December-January, 1978-1979), 27.

[10]Rosemary Springborn, "Technical and Skill Training: We Need to Do More," Training, October, 1977, p. 20.

present manufacturing practices or to introduce new ones.[11] Anthony E. Schwaller added that industrial education and training programs are incorporated to achieve, maintain, and improve quality standards while improving speed of production.[12]

The need for industrial education and training was summarized by Rosemary Springborn when she suggested that the organization that trains its workers now is safeguarding its position today. But the organization that also educates its workers is preparing for its place in the future.[13]

Industrial Training and Education Programs

There were many broad terms used interchangeably in literature for training and education programs in industry. Norman Cecil Whitehorn viewed continuing education as inclusive of such terms as training, re-training, professional development, staff development, executive development, manpower development, and human resource development.[14] Norman R. Smith used corporate training, corporate education, and training and development as applying to training and education

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[11]Seymour Lusterman, Education in Industry (New York: The Conference Board, 1977), p. 49.

[12]Anthony E. Schwaller, "The Need for Education/Training Programs in Industry," Phi Delta Kappan, LXI (January, 1980), 322-323.

[13]Springborn, p. 22.

[14]Norman Cecil Whitehorn, "Attitudes and Practices of Larger Firms in Manufacturing Industries Toward Continuing Education: (PhD dissertation, Texas A & M University, 1978), p. 6.

programs.[15] Lin Bothwell noted that corporate education takes many different forms and has many different delivery systems.[16]

Although many educational programs in industry were called training programs, it depended upon the content of the program as to whether both education and training were accomplished. Schwaller referred to education as applying to the development of concepts, whereas training suggested skills acquisitions through repetition in performance.[17] Smith also differentiated corporate training and education. He gave the following simplified version of corporate training:

> . . . it is really what Newman meant by mechanical and useful studies. Its purpose is simply to elicit in the trainee constructive on-the-job behavior and to increase productivity. Its goal is most emphatically not the pursuit of general knowledge; . . . .[18]

In the past five years, corporate training and education has received considerable attention. More people are involved in continuing education today than ever before. Lusterman's research, published in 1977, embraced an employee population of 32 million in 7500 firms ranging in size from 500 to more than 5000. This study revealed that at least one out of eight of the employees took part in some formal education or training under company sponsorship. He also found that

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[15]Norman R. Smith, "Corporate Training and the Liberal Arts," Phi Delta Kappan, LXI (January, 1980), 312.

[16]Lin Bothwell, "Assessing Recurrent Education and Management Development Programs in a Corporate Setting," Dissertation Abstracts International, XXXVIII (June, 1977), 7079A.

[17]Schwaller, p. 322.

[18]Smith, pp. 312-313.

during the single recessive year of 1975, the 7500 employers spent over $2 billion on employee education.[19]

In 1977, Whitehorn reported there were approximately 3.5 million employees in the nation's large manufacturing industries who participated in at least one continuing education activity. This amounted to 16.4 percent of the total employees in firms in the United States having assets of 1 million dollars and over.[20]

Literature revealed that large technological corporations have established sophisticated professional training programs.[21] However, there were basic prevailing features that could be incorporated into the training and educational programs of any industry. Probably the ideal place to observe the industrial practices in continuing education was at the American Telephone and Telegraph Company (AT and T). To maintain its skilled work force, AT and T performed more education and training than any university in the world.[22] To accomplish the goals of this extensive educational network, Luxenberg reported the following training features: (1) corporate learning centers, (2) standardized training programs, (3) tuition reimbursement programs, (4) assessment techniques for review of training programs, and (5)

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[19]Seymour Lusterman, "Education in Industry," Relating Work and Education, ed., Dychman W. Vermilye (San Francisco: Jossey-Bass, Inc., 1977), pp. 79-86.

[20]Whitehorn, p. 94.

[21]Peter M. Dean, "Education and Training at IBM," Phi Delta Kappan, LXI (January, 1980), 317-319; Luxenberg, pp. 26-35.

[22]Luxenberg, p. 27.

training technologists to coordinate programs.[23]

Whitehorn directed research relating to management's attitudes toward continuing education in the larger manufacturers in the United States. His research revealed the following: (1) the firms should encourage their employees in educational pursuits; (2) most firms were reluctant for employees to participate in planning educational programs; (3) larger firms segregated the functions of the continuing education programs, whereas smaller firms did not; (4) firms were willing to let the employee use company time for some but not all educational activities; and (5) continuing education should be provided by academic institutions, professional associations, private firms, and the employer.[24]

Relatively little research was available regarding the continuing education practices of smaller firms. This paucity of information would seem to bear out Whitehorn's conclusion that smaller companies were not as heavily involved in continuing education as the larger ones.[25] However, a study made in 1978 revealed that smaller regional firms were involved to some extent in continuing education activities.

In 1978, the University of Wisconsin-Oshkosh assessed continuing education of technically-trained employees in smaller geographically dispersed industries. W. Sam Adams reported the following results: (1) most small companies recorded employee participation in continuing

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[23]Luxenberg, pp. 25-35.

[24]Whitehorn, pp. 88-101.

[25]Whitehorn, p. 97.

education but few give formal rewards for participation; (2) companies were most likely to finance workshops, seminars, and conferences, while college credit and non-credit courses were primarily partially funded; (3) companies were reluctant to give released time to employees for continuing education; (4) workshops, seminars, and conferences were the most effective types of continuing education; and (5) management and employees indicated that continuing education was very important in improving one's performance on the job.[26]

Among manufacturing industrial firms of comparable size, the prevalence and scope of education and training activities vary widely from industry to industry. Lusterman pointed out that this variance was due to the following: (1) differences in the ability of companies to absorb training and education costs, (2) differences in management judgements concerning the benefits of educational programs, (3) differences in the availability and quality of outside educational resources, (4) differences in the availability of qualified people in the labor market, (5) differences in the degree to which employee populations are clustered or dispersed, and (6) differences in the specific skills and knowledge requirements of firms.[27]

Cooperation Between Industry and Colleges and Universities

During the 1950's and 1960's, the American higher education

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[26]W. Sam Adams, Assessing Continuing Education Needs in Small Geographically Dispersed Industries, U.S., Educational Resources Information Center, ERIC Document 171 364, 1979.

[27]Lusterman, Relating Work and Education, p. 82.

system provided students with both training and education that promised high earning and occupational status. Richard Freeman and J. Herbert Hollomon reported that this golden age of higher education came to an abrupt end in the 1970's when the college job market withered. The collapse of the college job market was due to a change in the supply and demand balance.[28]

Dennis J. Prager and Gilbert S. Omenn reported that the links between the university and industry weakened during the decade following World War II and approached their lowest points in the 1970's. These links were weakened because of the following barriers: (1) academicians often rejected the profit orientation and distrusted the motives of industry; (2) the management philosophies differed greatly with industry being responsible to its stockholders while universities presented themselves to the public; and (3) universities were reluctant to enter into detailed agreement with industry for fear of compromising academic freedom.[29] B.L.R. Smith and J.J. Karlesky attributed the linkage decline to industry's diminishing role in basic research. Since the key to active interaction between universities and industry was scientist to scientist contact on research matters of common interest, the decline in industrial basic research decreased such contacts and impeded university-industry relations.[30]

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[28]Richard Freeman and J. Herbert Hollomon, "The Declining of College Going," Change, VII (September, 1975), 24-31.

[29]Denis J. Prager and Gilbert S. Omenn, "Research, Innovation, and University-Industry Linkages," Science, CCVII (January, 1980), 397-384.

[30]B.L.R. Smith and J.J. Karlesky, "The State of Academic Science: The Universities in the Nation's Research Effort," Change, V (1977), 62.

Bettie Burres Young and Richard D. Brooks suggested that further linkages were prevented due to the inability of student transfer of learning from the classroom to the work scene. They also indicated there was a lack of communication of expected competencies between educational institutions and management.[31]

Collaboration between the university and industry will not be easy.

> As in the past, our society remains dominated by two major idealistic goals - to become, on the one hand, a nation of learners, constantly advancing literacy and knowledge; and, on the other hand, to remain economically, technologically, and commercially strong. These twin ideological threads are deeply woven into the fabric of schooling and work in this country.[32]

Only through the cooperative venture of schooling and work will these two idealistic goals become complementary; both university and industry will then derive benefit.

Cooperation between colleges and universities and industry is more apparent in today's climate than ever before.[33] John T. Yantis suggested that industry, the employee, and the university were best served if degree programs could be offered in conjunction with industry. Central Michigan University's commitment to corporate input, individualized curricula and advising, and flexible program location

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[31]Bettie Burres Young and Richard D. Brooks, "Education and Business: Developing New Initiatives in Education-Work Relations," College Student Journal, XIII (Summer, 1979), 206-208.

[32]Frederic Jacobs and Donald Phillips, "Beyond the Little Red Schoolhouse," Change, VII (July-August, 1979), 10.

[33]Whitehorn, p. 16.

and course scheduling resulted in educational programs that were beneficial to all parties. These cooperative programs culminated in either a certificate, a bachelor's degree, or a master's degree.[34]

Prager and Omenn reported that the California Institute of Technology has developed several industrial associates programs. Top university scientists regularly visit industries to lay the groundwork for potential cooperative arrangements.[35]

Strengthening the linkage between the university and industry could be an approach to stimulating industrial innovation. To successfully initiate this linkage, new knowledge would have to be translated into commercial services and products. Such linkage depends upon close interaction between those who do the research (university) and those who use it for product development to commercialization.[36]

> Given the history of corporate instructional efforts and the economic climate of the 1970's, it seems unlikely that the corporate giants will invest heavily in broad educational efforts. On the contrary, for the forseeable future this will remain the province of the colleges and universities. How well they do their job may depend, in part at least, on whether they can successfully adapt corporate methodologies to their own purposes.[37]

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[34]John T. Yantis, "The University and Industry as Partners in Education," Phi Delta Kappan, LX (April, 1979), 608.

[35]Prager and Omenn, p. 381.

[36]Prager, p. 379.

[37]Luxenberg, p. 35.

Chapter 3

METHODOLOGY AND PROCEDURES

Description of Study

This study was descriptive in nature, utilizing the questionnaire method of collecting data. The study determined if differences existed between the practices and perceptions of management toward training and education programs for on-the-job improvement in selected manufacturing industries and provided recommendations for a regional university. Data collected represented the perceptions of management in selected manufacturing industries within a 50-mile radius of East Tennessee State University in Johnson City, Tennessee (Location Map in Appendix A).

The manufacturing industries within a 50-mile radius of East Tennessee State University were selected as the population. The population included the North Carolina manufacturers as listed in the Directory of North Carolina Manufacturing Firms[38], the Virginia manufacturers as listed in the Virginia Industrial Directory[39], and the Tennessee manufacturers as listed in the Tennessee Directory of Manufacturers[40] as compiled through the computer services of Hugo Dunhill,

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[38]North Carolina Department of Commerce, Raleigh, 1981-1982 Directory of North Carolina Manufacturing Firms.

[39]Virginia State Chamber of Commerce, Richmond, 1981-1982 Virginia Industrial Directory.

[40]Tennessee Department of Economic and Community Development, Nashville, 1980 Tennessee Directory of Manufacturers.

Inc., in New York.[41]

Manufacturing industries were classified by The Standard Industrial Classification Manual (SIC). The SIC "defines industries in accordance with the composition and structure of the economy and covers the entire field of economic activities."[42] Table 1 lists the manufacturing industries considered in this study, giving both the SIC number and a description of the product manufactured.

The population of manufacturing industries was stratified into the SIC classifications for the following reasons:

1. The companies included in the population could be arranged into groups, each of which had homogeneous characteristics.

2. Using the entire population of each industry group, broader representation was assured which was a desirable feature for the outcome of the study.

The geographical area of this study included 12 complete counties and 13 partial counties within a 50-mile radius of East Tennessee State University in Johnson City, Tennessee. The 25 counties were contained within the states of Tennessee, Virginia, and North Carolina. Table 2 lists the complete and partial counties included in the study.

In the 50-mile radius area, there were 243 manufacturing industries in Tennessee, 138 industries in North Carolina, and 45 industries in Virginia for a total of 426 manufacturing industries. For

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[41]Bruce Gauche, Hugo Dunhill Computer Mailing List (New York: Hugo Dunhill, Inc., 1981).

[42]The Standard Industrial Classification Manual, p. 3.

TABLE 1

MANUFACTURING INDUSTRIES INCLUDED IN STUDY

SIC NUMBER	INDUSTRY DESCRIPTION
20	Food and Kindred Products
22	Textile Mill Products
23	Apparel and Other Finished Products From Fabrics, Etc.
24	Lumber and Wood Products, Except Furniture
25	Furniture and Fixtures
27	Printing and Allied Industries
28	Chemicals and Allied Products
30	Rubber and Miscellaneous Plastics Products
32	Stone, Shell, Clay, Glass, and Concrete Products
34	Fabricated Metal Products, Except Machinery and Transportation Equipment
35	Machinery, Including Selected Electrical and Electronic Machinery
36	Electrical and Electronic Equipment
39	Miscellaneous Manufacturing Industries

Source: The Standard Industrial Classification Manual, Executive Office of the President, Office of Management and Budget, Washington, D. C.: U.S. Government Printing Office, 1972.

TABLE 2

COUNTIES INCLUDED IN STUDY

STATE	COUNTIES	
	COMPLETE	PARTIAL
VIRGINIA	Scott	Lee Russell Washington Wise
TENNESSEE	Carter Greene Hawkins Johnson Sullivan Unicoi Washington	Cocke Grainger Hamblen Hancock
NORTH CAROLINA	Avery Madison Mitchell Yancey	Ashe Buncombe Caldwell McDowell Watauga

this study, the population was limited to the manufacturing industries having at least 10 firms represented in the 20 groups of the Standard Industrial Classification (SIC) Manual. Table 3 displays the population of the manufacturing industries within the geographical area of the study.

Instrument Construction

In order to accomplish the objectives of this study, it was necessary to develop a survey instrument which would provide quantitative measurement of the perceptions of management toward training/education as well as to determine the practices used in industrial training/education. The survey instrument was reviewed for clarity and conciseness by a panel of judges composed of the investigator's doctoral committee, the Director of Training at Tennessee Eastman Corporation, the Director of Training at Texas Instruments, the Director of Training at Burlington Industries, the Director of Extended Services at East Tennessee State University, and the Director of Continuing Education at East Tennessee State University. After discussion with each reviewer, modifications and changes were made in areas where the instrument required clarification.

The instrument utilized for the study was a two-part questionnaire/opinionnaire developed around the main features of a training/education program. Based on the review of the literature, the perceptions and practices of industrial management toward the training/education of employees identified in this study were grouped into five categories: (1) employee assistance, (2) employee participation, (3) responsibility assignment, (4) employee benefits, and (5) program

TABLE 3

POPULATION OF GEOGRAPHICAL AREA

INDUSTRY SIC GROUP	NUMBER OF MANUFACTURING INDUSTRIES			
	NC	TN	VA	TOTAL
20	10	18	8	36
22	22	6	3	31
23	7	10	5	22
24	15	38	9	62
25	7	26	2	35
27	18	43	2	63
28	4	7	1	12
30	2	7	1	10
32	17	18	3	38
34	16	31	3	50
35	10	17	1	28
36	3	12	0	15
39	7	10	7	24
Total	138	243	45	426

planning. Section I of the survey instrument was composed of a total of 14 training/education perceptions within the above categories. The respondents indicated if they "strongly disagreed," "disagreed," were "undecided," "agreed," or "strongly agreed" to each practice statement. Section II of the survey instrument consisted of 13 questions regarding the training/education practices of the manufacturing industries. The respondents indicated the different practices employed by their company.

Field Study

Names and addresses of the 426 manufacturing industries in the study population, as well as the top executive of each company, were obtained from the computer services of Hugo Dunhill Company. The top executive, in most instances, was the president of the company. It was felt that he/she could direct the survey instrument to the appropriate person in his company for a response. It was believed also that he/she might have some influence in prompting a reply. On November 7, 1981, a survey instrument accompanied by a cover letter was mailed to the 426 manufacturing industries included in the study population (Appendix C).

A follow-up letter with a duplicate survey instrument was mailed on December 8, 1981, to those firms which did not respond to the first letter. Additional responses were received from the follow-up letters. A copy of the follow-up letter can be found in Appendix D. By January 11, 1982, a total of 145 instruments had been returned. This represented a total return of 34.0 percent. Table 4 presents a distribution by industry of all responses. The percent of returns

TABLE 4

SAMPLE RETURNS BY INDUSTRY CLASSIFICATION

SIC	POPULATION	RETURNS							
		USABLE		NOT-USABLE		OUT-OF-BUSINESS		TOTAL	
		NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
20	36	7	19.4	1	2.8	2	5.6	10	27.8
22	31	9	29.0	2	6.5	4	12.9	15	48.4
23	22	3	13.6	2	9.1	3	13.6	8	36.4
24	62	12	19.4	1	1.6	7	11.3	20	32.3
25	32	8	25.0	0	0.0	2	6.3	10	31.2
27	63	15	23.8	0	0.0	3	4.8	18	28.6
28	12	6	50.0	0	0.0	1	8.3	7	58.3
30	10	2	20.0	0	0.0	0	0.0	2	20.0
32	38	9	23.7	1	2.6	0	0.0	10	26.3
34	50	17	34.0	0	0.0	2	4.0	19	38.0
35	28	7	25.0	0	0.0	2	7.1	9	32.1
36	15	6	40.0	0	0.0	0	0.0	6	40.0
39	24	6	25.0	4	16.7	1	4.2	11	45.8
TOTAL	426	107	25.1	11	2.6	27	6.3	145	34.0

ranged from 20.0 in the rubber industry (SIC 30) to 58.3 in the chemical industry (SIC 28). Of the total population, 107 responses (25.1 percent) were usable. Table 5 shows the sample returns when separated by states. The percent of returns ranged from 28.3 from North Carolina to 40.0 from Tennessee. Of the 145 responses, 18.6 percent indicated they were out of business.

Treatment of Data

A two-part instrument was used for collecting data for the study. Section I was composed of 14 perceptions regarding the training/education program of manufacturing industries. Respondents were asked to indicate their level of agreement with each perception concerning training and educational practices in their company. Means of responses were identified by industry classification and size in the fourteen perceptions of management. Sub-problem 2 of the study was determined from Section I of the instrument by conducting an analysis of variance (ANOVA) to determine significant differences between manufacturing industries in the perceptions of management toward training and education practices. Each of the practices was tested statistically by ANOVA at the .05 level of significance to see if there was a difference in the means between industry SIC groups and between firms by employee size. After all F values were completed, the Newman-Keuls was used on those F values which were significant. This multiple comparison procedure determined which industry classification (SIC) differed significantly or which industry size differed significantly.

Section II of the instrument included 13 questions asking for

TABLE 5

SAMPLE RETURNS BY STATES

STATE	POPULATION	USABLE		NOT-USABLE		OUT-OF-BUSINESS		TOTAL	
		NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Tennessee	243	69	28.4	5	2.1	14	5.8	88	36.2
North Carolina	138	27	19.6	3	2.2	9	6.5	39	28.3
Virginia	45	11	24.4	3	6.7	4	8.9	18	40.0
TOTAL	426	107	25.1	11	2.6	27	6.3	145	34.0

information on training/education practices used by the industry. Sub-problem 1 of the study was determined from this section by simple mathematical calculation of the percent of firms, according to industry size and classification, that utilized certain training/education practices. After the collection of data from the returned instruments, responses were coded, key punched, and computed at the East Tennessee State University Data Processing Center.

CHAPTER 4

PRESENTATION AND ANALYSIS OF DATA

The primary purpose of this study was to determine the differences between the practices and perceptions of management toward training and education programs for on-the-job improvement in selected manufacturing industries. To achieve this purpose the following sub-problems were developed:

Sup-problem 1. To identify and report the practices of selected manufacturing industries toward training and education programs within a 50-mile radius of a selected regional university.

Sub-problem 2. To analyze and determine any significant difference in the perceptions of management toward training and any significant difference in education practice between selected manufacturing industries within a 50-mile radius of a selected regional university.

The results of the analysis of the data collected on the 107 usable responses to the survey instrument are presented in this chapter. This chapter is divided into three main sections. The first section presents the practices identified by management regarding training/education and the company. The practices reported provide information relating to the 10 questions listed in Chapter 1 (pp. 4-5). The second section presents an analysis of the perceptions of management toward training/education in manufacturing industries. For the purposes of presenting the data, the perceptions are grouped into five categories which are used throughout the second section. The third

section presents the results of the analysis of variance and Newman-Keuls Multiple Comparison Test. The results are displayed under the five hypotheses as detailed in Chapter 1 (pp. 5-6).

Training/Education Practices

This section presents the responses of industrial management regarding training/education and the company. The data were analyzed to enable the researcher to react to the 10 questions listed in Chapter 1 (pp. 4-5) of this study.

Question 1. What was the practice of manufacturing industries toward the number of employees participating in training and education programs?

The 107 firms responding to the survey had a total of 33,373 employees in 1980. Table 6 indicates that 11,059 (33.14 percent) of these employees participated in at least one training/education activity in 1980. This table shows also the percent of employees engaged in training/education activities by SIC industry groups. The percent ranged from 2.1 percent in the rubber industry (SIC 30) to 63.5 percent in the apparel industry (SIC 23). It is difficult to explain why there was such a wide variation in the percent by SIC groups. Not all the variations can be explained by differences in the technological requirements of the firms. The apparel industry which is generally not considered highly technical had 63.5 percent of the employees engaged in training/education. This might be related to the main training/education needs expressed by the apparel firms for machine operators, employee motivation, and quota awareness. The data indicated that the rubber and plastic industry which is considered highly

TABLE 6

EMPLOYEE PARTICIPATION BY INDUSTRY CLASSIFICATION
IN TRAINING/EDUCATION ACTIVITIES

1980

SIC INDUSTRY GROUP	NUMBER IN SAMPLE	NUMBER OF EMPLOYEES	EMPLOYEES IN TRAINING/EDUCATION	
			NUMBER	PERCENT
20	7	417	92	22.1
22	9	1180	181	15.3
23	3	580	368	63.5
24	12	1117	81	7.3
25	8	3335	518	15.5
27	15	1223	251	20.5
28	6	16399	7075	43.1
30	2	194	4	2.1
32	9	1858	414	22.3
34	17	1628	242	14.9
35	7	190	27	14.2
36	6	4840	1752	36.2
39	6	412	54	13.1
TOTAL	107	33,373	11,059	33.1

technical had the lowest percent (2.1) of the employees engaged in training/education activities. However, this could be attributed to the small number of responses received from this industry group and the fact that the industries responding had less than 175 employees.

Table 7 presents employee participation by industry size in the different types of training/education activities for 1980. This table indicates that the industries surveyed engaged in more in-house training activities than any other kind. Those firms with more than 1000 employees had a 75.2 percent participation in in-house training while those with less than 100 employees had 64.8 percent participation. The percent of employees engaged in conferences and seminars ranged from 11.1 percent in the largest group to 28.9 percent in the smallest group. The percent participating in formal courses for credit ranged from 3.6 percent in the 100-299 group to 13.7 percent in the more than 1000 employee size group.

Question 2. What was the practice of manufacturing industries toward the number of training hours provided for each employee?

Only 62 of the 107 firms responded to this question. Table 8 reveals that each company provided an average of 73.5 training hours for each employee. This data from this table indicate that the electrical (SIC 36), apparel (SIC 23), and textile (SIC 22) industries provided more training hours for the employees than any other SIC group. The training hours per employee ranged from 10 in the rubber industry (SIC 30) to 276 in the electrical industry (SIC 36).

Question 3. What was the practice of manufacturing industries

TABLE 7

EMPLOYEE PARTICIPATION BY INDUSTRY SIZE IN TYPES OF TRAINING/EDUCATION ACTIVITIES

1980

INDUSTRY SIZE	NUMBER IN SAMPLE	PERCENT EMPLOYEES IN TRAINING/EDUCATION		
		IN-HOUSE	CONFERENCES SEMINARS	FORMAL COURSES CREDIT
(1) Less than 100	51	64.8	28.9	6.3
(2) 100-299	26	75.7	20.8	3.6
(3) 300-999	11	74.7	14.7	10.6
(4) More than 1000	3	75.2	11.1	13.7
TOTAL	91	72.5	18.9	8.6

TABLE 8

EMPLOYEE TRAINING HOURS BY INDUSTRY CLASSIFICATION
IN TRAINING/EDUCATION ACTIVITIES

SIC INDUSTRY GROUP	NUMBER IN SAMPLE	TRAINING HOURS	
		COMPANY TOTAL	PER EMPLOYEE
20	5	165.3	33.1
22	8	968.0	121.0
23	2	520.0	260.0
24	7	283.0	40.4
25	4	263.0	65.8
27	7	213.0	30.4
28	4	69.0	17.3
30	1	10.0	10.0
32	4	174.0	43.5
34	8	93.0	11.6
35	2	36.0	18.0
36	6	1656.0	276.0
39	4	109.0	27.3
TOTAL	62	4559.3	75.5

toward maintaining an annual formal budget for training and education?

Table 9 shows that 30.2 percent of the 106 industries responding to this question had a formal budgeted program for training/education. This table also reveals that the food (SIC 20), apparel (SIC 23), rubber (SIC 30), and machinery (SIC 35) industries had no budgeted program, while all firms within SIC Group 28 (chemical and allied products) maintained a formal training/education budget.

When the industries were grouped according to size in Table 10, 83.6 percent of the group with less than 100 employees did not present a formal budget for training/education. This can probably be linked to the informality in training/education programs of smaller manufacturing industries. All industries with more than 1000 employees maintained a formal budget for training/education. From Table 10, it can be seen also that approximately two-thirds of the companies with 300-999 employees had a training/education budget while only one-third of the companies with 100-299 employees maintained such a budget.

Question 4. What was the practice of manufacturing industries toward providing assistance to the employees for training and education?

Over one-half of the manufacturing industries, according to SIC classification, provided training/education assistance through tuition fees to employees for courses. One hundred percent of the industries in SIC Group 28 (chemical and allied products) provided tuition fees for employees. These tabulations of the responses are revealed in Table 11. More than three-fourths (83.3 percent) of the electrical and electronic industry (SIC 36) provided tuition fees while two-thirds

TABLE 9

FIRMS ACCORDING TO INDUSTRY CLASSIFICATION THAT HAD A FORMAL BUDGETED TRAINING/EDUCATION PROGRAM

SIC INDUSTRY GROUP	NUMBER IN SAMPLE	BUDGET		NO BUDGET	
		NUMBER	PERCENT	NUMBER	PERCENT
20	7	0	0.0	7	100.0
22	9	2	22.0	7	77.8
23	3	0	0.0	3	100.0
24	12	3	25.0	9	75.0
25	8	3	37.5	5	62.5
27	15	6	40.0	9	60.0
28	5	5	100.0	0	0.0
30	2	0	0.0	2	100.0
32	9	1	11.1	8	88.9
34	17	4	23.5	13	16.5
35	7	0	0.0	7	100.0
36	6	5	83.3	1	16.7
39	6	3	50.0	3	50.0
TOTAL	106	32	30.2	74	69.8

TABLE 10

FIRMS ACCORDING TO INDUSTRY SIZE THAT HAD A FORMAL BUDGETED TRAINING/EDUCATION PROGRAM

EMPLOYEE SIZE	NUMBER IN SAMPLE	BUDGET		NO BUDGET	
		NUMBER	PERCENT	NUMBER	PERCENT
(1) Less than 100	61	10	16.4	51	83.6
(2) 100-299	29	10	34.5	19	65.5
(3) 300-999	11	7	63.6	4	36.4
(4) More than 1000	5	5	100.0	0	0.0
TOTAL	106	32	30.2	74	69.8

TABLE 11

FIRMS ACCORDING TO INDUSTRY CLASSIFICATION THAT PROVIDED TRAINING/EDUCATION ASSISTANCE THROUGH TUITION FEES FOR EMPLOYEES

SIC INDUSTRY GROUP	NUMBER IN SAMPLE	TUITION FEES		NO TUITION FEES	
		NUMBER	PERCENT	NUMBER	PERCENT
20	7	3	42.9	4	57.1
22	9	7	77.8	2	22.2
23	3	2	66.7	1	33.3
24	12	8	66.7	4	33.3
25	8	5	62.5	3	37.5
27	15	7	46.7	8	53.3
28	5	5	100.0	0	0.0
30	2	1	50.0	1	50.0
32	9	6	66.7	3	33.3
34	17	7	41.2	10	58.8
35	7	2	28.6	5	71.4
36	6	5	83.3	1	16.7
39	6	4	66.7	2	33.3
TOTAL	106	62	58.5	44	41.5

of the apparel (SIC 23), lumber (SIC 24), stone (SIC 32), and miscellaneous (SIC 39) companies provided assistance.

When the manufacturing industries were grouped according to size in Table 12, the firms with more than 300 employees provided 100 percent of the tuition fees. The firms with 100-299 employees provided three-fourths (75.9) percent) of the fees while the firms with less than 100 employees only provided slightly over one-third (39.3 percent) of the fees.

Question 5. What was the practice of manufacturing industries toward assigning the responsibility for training and education?

In determining the official responsible for the training/education program, the 101 responses were grouped into 10 different categories as revealed in Table 13. The tabulations from this table showed that approximately one-fourth (25.7 percent) of the industries did not have an official assigned this responsibility while one-fifth (20.8 percent) used the personnel or business manager in this capacity. The table reveals also that one-third of the firms with less than 100 employees had no specific official assigned this responsibility. The industries with more than 1000 employees used only three officials: the training director, a combination of officials, and the industrial relations controller for the responsibility. The firms with 100-999 employees assigned the responsibility of training/education primarily to the personnel manager.

Question 6. What was the practice of manufacturing industries toward maintaining employee records for training and education activities?

TABLE 12

FIRMS ACCORDING TO INDUSTRY SIZE THAT PROVIDED TRAINING/EDUCATION ASSISTANCE THROUGH TUITION FEES FOR EMPLOYEES

EMPLOYEE SIZE	NUMBER IN SAMPLE	TUITION FEES		NO TUITION FEES	
		NUMBER	PERCENT	NUMBER	PERCENT
(1) Less than 100	61	24	39.3	37	60.7
(2) 100-299	29	22	75.9	7	24.1
(3) 300-999	11	11	100.0	0	0.0
(4) More than 1000	5	5	100.0	0	0.0
TOTAL	106	62	58.5	44	41.5

TABLE 13

FIRMS ACCORDING TO INDUSTRY SIZE THAT ASSIGNED AN OFFICIAL THE RESPONSIBILITY FOR THE TRAINING/EDUCATION PROGRAM

OFFICIAL	EMPLOYEE SIZE (1) LESS THAN 100		(2) 100-299		(3) 300-999		(4) MORE THAN 1000		TOTAL	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
None	20	19.8	5	5.0	1	1.0	0	0.0	26	25.7
Industrial Relations Controller	0	0.0	1	1.0	1	1.0	1	1.0	3	3.0
Training Director	0	0.0	2	2.0	0	0.0	2	2.0	4	4.0
Personnel Business Manager	9	8.9	7	6.9	5	5.0	0	0.0	21	20.8
Owner-Manager	11	10.9	0	0.0	0	0.0	0	0.0	11	10.9
Department Head	3	3.0	3	3.0	1	1.0	0	0.0	7	6.9
Plant Superintendent	3	3.0	1	1.0	0	0.0	0	0.0	4	4.0
President	2	2.0	1	1.0	0	0.0	0	0.0	3	3.0
Vice President	2	2.0	2	2.0	1	1.0	0	0.0	5	5.0
Combination*	9	8.9	4	4.0	2	2.0	2	2.0	17	16.8

*Combination is any two of the above listed officials.

Table 14 shows that two-thirds (66.7 percent) of the manufacturing firms according to SIC group maintained employee records for training/education activities. The rubber (SIC 20), machinery (SIC 35), and electrical and electronic (SIC 36) industries had the highest percent of firms which maintained employee records. The food industry (SIC 20) had the lowest percent of firms which maintained employee records.

When the firms were grouped according to employee size in Table 15, the percentage of companies maintaining records ranged from 59 percent in the less than 100 employee group to 100 percent in the more than 1000 employee group.

Question 7. What was the practice of manufacturing industries towards utilizing different methods of training/education?

Table 16 presents the industrial training/education methods by manufacturing industries in five categories: commercially-produced, in-house developed, educational institutions, educational consultants, and outside conferences. About three-fourths of all the manufacturing firms responding used in-house developed programs; two-thirds used outside conferences; about one-half used educational institutions and commercially-produced programs; and one-fourth used educational consultants.

The tabulation of responses from Table 16 indicates that the percentage of chemical (SIC 28) and apparel (SIC 23) firms which used commercially-produced programs was higher than the percentage for any other SIC groups. Additionally, Table 17 reveals that firms with more than 1000 employees had the highest utilization of commercially-

TABLE 14

FIRMS ACCORDING TO INDUSTRY CLASSIFICATION THAT MAINTAINED RECORDS OF EMPLOYEE TRAINING/EDUCATION ACTIVITIES

SIC INDUSTRY GROUP	NUMBER IN SAMPLE	RECORDS		NO RECORDS	
		NUMBER	PERCENT	NUMBER	PERCENT
20	7	2	28.6	5	71.4
22	9	7	77.8	2	22.2
23	3	1	33.3	2	66.7
24	11	4	36.4	7	63.6
25	8	7	87.5	1	12.5
27	15	9	60.0	6	40.0
28	5	4	80.0	1	20.0
30	2	2	100.0	0	0.0
32	9	5	55.6	4	44.4
34	17	12	70.6	5	29.4
35	7	7	100.0	0	0.0
36	6	6	100.0	0	0.0
39	6	4	66.7	2	33.3
TOTAL	105	70	66.7	35	33.3

TABLE 15

FIRMS ACCORDING TO INDUSTRY SIZE THAT MAINTAINED EMPLOYEE RECORDS OF TRAINING/EDUCATION ACTIVITIES

EMPLOYEE SIZE	NUMBER IN SAMPLE	RECORDS		NO RECORDS	
		NUMBER	PERCENT	NUMBER	PERCENT
(1) Less than 100	61	36	59.0	25	41.0
(2) 100-299	28	19	67.9	9	32.1
(3) 300-999	11	10	90.9	1	9.1
(4) More than 1000	5	5	100.0	0	0.0
TOTAL	105	70	66.7	35	33.3

TABLE 16

FIRMS ACCORDING TO INDUSTRY CLASSIFICATION THAT UTILIZED DIFFERENT TRAINING/EDUCATION METHODS

SIC INDUSTRY GROUP	NO. IN SAMPLE (N)	COMMERCIALLY PRODUCED		N	IN-HOUSE DEVELOPED		N	EDUCATIONAL INSTITUTIONS		N	EDUCATIONAL CONSULTANTS		N	OUTSIDE CONFERENCES	
		NO.	PERCENT		NO.	PERCENT		NO.	PERCENT		NO.	PERCENT		NO.	PERCENT
20	7	2	28.6	7	6	85.7	7	1	14.3	7	1	14.3	7	3	42.9
22	8	3	37.5	8	8	100.0	8	6	75.0	8	1	12.5	7	6	85.7
23	2	2	100.0	3	2	66.7	3	3	100.0	3	2	66.7	3	3	100.0
24	9	5	55.6	9	4	44.4	10	6	60.0	10	2	20.0	9	8	88.9
25	7	2	28.6	8	6	75.0	8	4	50.0	7	3	42.9	7	4	57.1
27	11	7	63.6	13	11	84.6	12	6	50.0	11	5	45.5	7	6	85.7
28	4	4	100.0	4	4	100.0	5	3	60.0	4	4	100.0	4	4	100.0
30	2	0	0.0	2	1	50.0	2	0	0.0	2	0	0.0	2	1	50.0
32	8	3	37.5	8	6	75.0	9	5	55.6	8	2	25.0	8	5	62.5
34	14	3	21.4	15	11	73.3	16	8	50.0	13	1	7.7	14	7	50.0
35	6	3	50.0	7	6	85.7	7	2	28.6	6	0	0.0	5	1	20.0
36	5	4	80.0	5	4	80.0	5	5	100.0	5	2	40.0	6	6	100.0
39	4	2	50.0	5	2	40.0	4	4	100.0	4	0	0.0	4	3	75.0
TOTAL	87	40	46.0	94	71	75.5	96	33	55.2	88	23	26.1	83	57	68.7

produced training/education programs.

In-house developed programs were used extensively by the majority of firms as shown in Table 16. The textile (SIC 22) and the chemical (SIC 28) industries utilized more in-house programs than the other SIC groups. Table 17 indicates that the companies with more than 1000 employees used more in-house developed programs than any other group.

More than one-half of the respondents made use of educational institutions as a method of training/education. The percentage of the apparel (SIC 23), electrical (SIC 36) and the miscellaneous (SIC 39) industries which utilized educational institutions was higher than the percentage for any other SIC groups. The firms with 300-999 employees had the highest utilization of educational institutions with the lowest utilization in firms with less than 100 employees.

Table 16 reveals that few companies utilized educational consultants as a method of training/education. The chemical industry (SIC 28) made the most use of this method. Table 17 reveals that firms with more than 1000 employees used more educational consultants in training/education.

Table 16 indicates also that outside conferences were used more by the apparel (SIC 23), chemical (SIC 28), and electrical (SIC 36) industries. When grouped according to size in Table 17, the firms with 300 or more employees had high utilization of outside conferences as a method of training/education.

A trend was apparent in the tabulation of responses in Table 17. In general, as the employee size decreased, the percentage of usage of all training/education methods also decreased.

Question 8. What was the practice of manufacturing industries

TABLE 17

FIRMS ACCORDING TO INDUSTRY SIZE THAT UTILIZED DIFFERENT TRAINING/EDUCATION METHODS

SIC INDUSTRY GROUP	NO. IN SAMPLE (N)	COMMERCIALLY PRODUCED		N	IN-HOUSE DEVELOPED		N	EDUCATIONAL INSTITUTIONS		N	EDUCATIONAL CONSULTANTS		N	OUTSIDE CONFERENCES	
		NO.	PERCENT		NO.	PERCENT		NO.	PERCENT		NO.	PERCENT		NO.	PERCENT
(1) Less than 100	47	18	38.3	52	38	73.1	52	22	42.3	47	7	14.9	44	23	52.3
(2) 100-299	25	12	48.0	26	19	73.1	28	17	60.7	26	7	26.9	24	20	83.3
(3) 300-999	11	6	54.5	11	9	81.8	11	10	90.9	11	6	54.5	11	10	90.9
(4) More than 1000	4	4	100.0	5	5	100.0	5	4	80.0	4	3	75.0	4	4	100.0
TOTAL	87	40	46.0	94	71	75.5	96	53	55.2	88	23	26.1	83	57	68.7

toward utilizing different types of training and education?

The industrial training/education types were presented in four categories: operator-skills, supervisory management, professional training and technical training. Table 18 shows that all manufacturing firms incorporated more operator-skills than the other types in their training/education programs. The food industry (SIC 20) had the lowest usage of operator-skills training. When the firms were grouped according to size in Table 19, the percents ranged from 80.0 in the smallest group to 100.0 in the largest group. This range indicated that as the employee size increased, the usage of operator-skills training also increased. However, the firms with less than 100 employees had more operator-skills training than any other type of training/education.

Table 18 shows that supervisory management was incorporated in the training/education programs of approximately two-thirds of the manufacturing industries responding to this question. It also shows that the apparel (SIC 23) and chemical (SIC 28) firms had the highest usage of supervisory management training while the rubber industry (SIC 30) had the lowest utilization of this method. Table 19 reveals that as the employee size of the industry increased, the usage of supervisory training also increased.

Less than one-half of the manufacturing firms employed professional training in the training/education program with the highest usage in the chemical industry (SIC 28). When the firms were grouped according to size, the percent of professional training ranged from 26.8 in the smallest group to 100.0 percent in the largest group.

TABLE 18

FIRMS ACCORDING TO INDUSTRY CLASSIFICATION THAT INCORPORPORATED DIFFERENT TYPES OF TRAINING/EDUCATION

SIC INDUSTRY GROUP	NO. IN SAMPLE (N)	OPERATOR-SKILLS		N	SUPERVISORY		N	PROFESSIONAL		N	TECHNICAL	
		NUMBER	PERCENT		NUMBER	PERCENT		NUMBER	PERCENT		NUMBER	PERCENT
20	6	3	50.0	6	3	50.0	6	1	16.7	7	5	71.4
22	8	7	87.5	8	7	87.5	7	2	28.6	8	6	75.0
23	3	3	100.0	3	3	100.0	3	2	66.7	3	2	66.7
24	9	7	77.8	11	5	45.5	9	9	33.3	9	4	44.4
25	7	4	57.1	8	5	62.5	8	3	37.5	8	5	62.5
27	10	7	70.0	13	10	76.9	10	6	60.0	11	8	72.7
28	4	4	100.0	4	4	100.0	5	4	80.0	4	3	75.0
30	2	2	100.0	2	0	0.0	2	0	0.0	2	1	50.0
32	7	6	85.7	9	5	55.6	8	3	37.5	8	5	62.5
34	13	12	92.3	17	13	76.5	11	4	36.4	14	9	64.3
35	6	6	100.0	6	4	66.7	5	2	40.0	6	5	83.3
36	5	5	100.0	5	3	60.0	5	3	60.0	6	5	83.3
39	5	4	80.0	4	3	75.0	4	2	50.0	4	3	75.0
TOTAL	85	70	82.4	96	65	67.7	83	35	42.2	90	61	67.8

TABLE 19

FIRMS ACCORDING TO INDUSTRY SIZE THAT INCORPORATED DIFFERENT TYPES OF TRAINING/EDUCATION

EMPLOYEE SIZE	NO. IN SAMPLE (N)	OPERATOR-SKILLS			SUPERVISORY			PROFESSIONAL			TECHNICAL	
		NUMBER	PERCENT	N	NUMBER	PERCENT	N	NUMBER	PERCENT	N	NUMBER	PERCENT
(1) Less than 100	45	36	80.0	52	30	57.7	41	11	26.8	49	34	69.4
(2) 100-299	25	21	80.0	28	21	75.0	26	13	50.0	25	15	60.0
(3) 300-999	11	9	81.8	11	9	81.8	11	6	54.5	11	7	63.6
(4) More than 1000	4	4	100.0	5	5	100.0	5	5	100.0	5	5	100.0
TOTAL	85	70	82.4	96	65	67.7	83	35	42.2	90	61	67.8

Technical training was incorporated in the training/education program of two-thirds of the industries. The percent of firms that used this method ranged from 44.4 to 83.3 with the highest percent in the machinery (SIC 35) and electrical (SIC 36) industries.

Question 9. What was the practice of manufacturing industries toward completing a needs analysis of training and education?

In Table 20 it can be seen that only 14.3 percent of the manufacturing industries conducted a formal needs analysis of employee training/education. This table displays the percent of responses as ranging from 0.0 percent to 40.0 percent. Of the 105 firms responding to this question, 40 percent of the chemical (SIC 28) and electrical (SIC 36) industries carried out a formal needs analysis of training/education. On the other hand, none of the food (SIC 20), rubber (SIC 30), stone (SIC 32), and miscellaneous (SIC 39) firms carried out a formal needs analysis.

Table 21 indicates that of the industries surveyed, the firms with more than 1000 employees conducted a needs analysis of training/education. The smaller companies generally did not carry out a needs analysis of employee training/education.

Question 10. What was the practice of manufacturing industries toward identifying educational services that could be provided by a college or university?

It was determined from the 106 responses to this question in Table 22 that approximately one-half of the manufacturing industries identified services that could be provided by a college or university. The percentage of chemical (SIC 28) and machinery (SIC 35) industries

TABLE 20

FIRMS ACCORDING TO INDUSTRY CLASSIFICATION THAT CONDUCTED A FORMAL NEEDS ANALYSIS OF EMPLOYEE TRAINING/EDUCATION

SIC INDUSTRY GROUP	NUMBER IN SAMPLE	ANALYSIS		NO ANALYSIS	
		NUMBER	PERCENT	NUMBER	PERCENT
20	7	0	0.0	7	100.0
22	9	1	11.1	8	88.9
23	3	1	33.3	2	66.7
24	12	1	8.3	11	91.7
25	8	1	12.5	7	87.5
27	15	5	33.3	10	66.7
28	5	2	40.0	3	60.0
30	2	0	0.0	2	100.0
32	9	0	0.0	9	100.0
34	17	1	5.9	16	94.1
35	7	1	14.3	6	85.7
36	5	2	40.0	3	60.0
39	6	0	0.0	6	100.0
TOTAL	105	15	14.3	90	85.7

TABLE 21

FIRMS ACCORDING TO INDUSTRY SIZE THAT CONDUCTED A FORMAL NEEDS ANALYSIS OF EMPLOYEE TRAINING/EDUCATION

EMPLOYEE SIZE	NUMBER IN SAMPLE	NEEDS ANALYSIS		NO NEEDS ANALYSIS	
		NUMBER	PERCENT	NUMBER	PERCENT
(1) Less than 100	61	5	8.2	56	91.8
(2) 100-299	29	5	17.2	24	82.8
(3) 300-999	10	2	20.0	8	80.0
(4) More than 1000	5	3	60.0	2	40.0
TOTAL	105	15	14.3	90	85.7

TABLE 22

FIRMS ACCORDING TO INDUSTRY CLASSIFICATION THAT IDENTIFIED EDUCATIONAL SERVICES THAT COULD BE PROVIDED BY COLLEGE OR UNIVERSITY

SIC INDUSTRY GROUP	NUMBER IN SAMPLE	SERVICES		NO SERVICES	
		NUMBER	PERCENT	NUMBER	PERCENT
20	7	2	28.6	5	71.4
22	9	5	55.6	4	44.4
23	3	1	33.3	2	66.7
24	12	4	33.3	8	66.7
25	8	3	37.5	5	62.5
27	15	8	53.3	7	46.7
28	5	4	80.0	1	20.0
30	2	1	50.0	1	50.0
32	9	3	33.3	6	66.7
34	17	8	47.1	9	52.9
35	7	5	71.4	2	28.6
36	6	4	66.7	2	33.3
39	6	3	50.0	3	50.0
TOTAL	106	51	48.1	55	51.9

which identified educational services was higher than any other SIC groups. Table 23 presents the responses to the question by employee size. All of the firms with 1000 or more employees identified educational services that could be provided by a college or university.

In order to better provide educational services to manufacturing industries, it is necessary for the college or university to identify the existing needs of the companies. Industrial management was asked to respond to an open-ended question concerning the main training/education needs of their company. Table 24 presents the principal needs in five categories: management, supervisory, technical, skills, and professional. When the firms were grouped according to size, responses indicated that generally the two main needs were in supervisory and technical training/education. Industries with less than 100 employees indicated that technical and skills training were the main needs; industries with 100-999 employees stated that supervisory training was the principal need; and firms with more than 1000 employees stated that management training was the predominant training/education need.

Training/Education Perceptions

This section includes an analysis of industrial management's perceptions regarding training/education and the company. The perceptions of industrial management toward training/education of employees identified in this study were grouped into five categories: (1) employee participation, (2) employee assistance, (3) responsibility assignment, (4) employee benefits, and (5) program planning. The categories were composed of 14 practices which are included in the survey instrument (Appendix B). The respondents indicated if they "strongly

TABLE 23

FIRMS ACCORDING TO INDUSTRY SIZE THAT IDENTIFIED EDUCATIONAL SERVICES THAT COULD BE PROVIDED BY COLLEGE OR UNIVERSITY

EMPLOYEE SIZE	NUMBER IN SAMPLE	SERVICES		NO SERVICES	
		NUMBER	PERCENT	NUMBER	PERCENT
(1) Less than 100	61	25	41.0	36	59.0
(2) 100-299	29	14	48.3	15	51.7
(3) 300-999	11	7	63.6	4	36.4
(4) More than 1000	5	5	100.0	0	0.0
TOTAL	106	51	48.1	55	51.9

TABLE 24

FIRMS ACCORDING TO INDUSTRY SIZE THAT INDICATED
MAIN TRAINING/EDUCATION NEEDS

TRAINING	INDUSTRY SIZE								TOTALS	
	LESS THAN 100		100-299		300-999		MORE THAN 1000			
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Management	6	7.7	4	5.1	3	3.9	2	2.6	15	19.2
Supervisory	5	6.4	9	11.5	4	5.1	0	0.0	18	23.3
Technical	11	14.1	6	7.7	0	0.0	1	1.3	18	23.1
Skills	11	14.1	0	0.0	0	0.0	0	0.0	11	14.1
Professional	8	10.3	6	7.7	1	1.3	1	1.3	16	20.5
TOTAL	41	52.6	25	32.1	8	10.3	4	5.1	78	100.0

disagreed," "disagreed," were "undecided," "agreed," or "strongly agreed" to each statement. A mean was obtained for each industry for each perception by assigning numerical values to the level of agreement (strongly disagree - 1, disagree - 2, undecided - 3, agree - 4, and strongly agree - 5). Means of responses were identified by industry classification and size in the perceptions of management toward training/education. The manufacturing industries were divided into four groups by employee size: (1) less than 100 employees, (2) 100-299 employees, (3) 300-999 employees, and (4) more than 1000 employees. After talking with representatives in industry, the employee size groups were arbitrarily chosen to insure adequate representation in each group. The classification of these industries was based on the SIC (Standard Industrial Classification) industries which were prevalent in the geographical area of the study.

The 14 perceptions identified in this study were grouped under the following categories:

1. Employee Participation

    a. The company should allow its employees to participate in required training/education on company time.

    b. The company should allow employees time-off to work toward a degree for professional development.

2. Employee Assistance

    a. The company should inform the employees of training/education activities available to them.

    b. The company should provide planning assistance to the employees interested in training/education.

c. The company should sustain all the expenses of its employees in training/education activities required by the company.

d. The company should sustain at least a portion of the expenses of its employees in training/education which is not required by the company.

3. Responsibility Assignment

a. The company should provide training/education for its employees through educational institutions, private consulting firms, professional associations, and the company.

b. Training/education should be conducted by the line supervisor, the training director, the personnel manager, a curriculum specialist, or the owner-manager.

4. Employee Benefits

a. The company should maintain training/education records in employee's files.

b. The company should consider participation in training/education as criteria for employee salary increases.

5. Program Planning

a. The company should maintain a formal budget program of training/education for its employees.

b. The company would be interested in forming a cooperative planning council with regional educational institutions.

c. The company would be interested in educational services from a regional university.

d. The company should formulate training/education requirements on the basis of employee-initiated requests, supervisor-initiated requests, formal professional needs assessment, or company prescribed-basic programs.

For the purposes of this study, if a mean was 3.5 or above on a five-point scale, the respondents were classified as agreeing; a mean below 2.5 was classified as disagreeing; and a mean from 2.6 through

3.4 was classified as undecided.

Employee Participation

Results of the responses of management to the two perceptions grouped under the employee participation category are presented in Tables 25 and 26.

Generally, the manufacturing industries were undecided ($\bar{x}$ = 3.26) on the perception that the employee should be allowed to participate in training/education on company time. Only the apparel (SIC 23), rubber (SIC 30), stone and concrete (SIC 32), electrical (SIC 36), and miscellaneous (SIC 39) industries agreed that the employee should participate in training/eduation on company time. The rest were undecided. The data indicated that firms with 1000 or more employees agreed with this perception while those firms with less than 1000 employees were undecided.

Industrial management was undecided ($\bar{x}$ = 2.68) regarding the employees being allowed time-off to work toward a degree. Only the rubber industry (SIC 30) agreed while the food (SIC 20), lumber (SIC 24), and machinery (SIC 35) industries disagreed with this perception. The means of the responses ranged from 2.25 to 4.00. It can be seen also that only the largest group agreed that employees should be allowed time-off to work toward a degree.

Employee Assistance

Reference should be made to Table 27 and 28 for data relating to the four perceptions under employee assistance.

All manufacturing industries according to size and SIC classification agreed that the employees should be informed regarding training/

TABLE 25

MEANS OF RESPONSES BY INDUSTRY TOWARD TRAINING/EDUCATION
IN PERCEPTIONS OF MANAGEMENT TOWARD EMPLOYEE PARTICIPATION

SIC INDUSTRY GROUP	EMPLOYEES SHOULD BE ALLOWED TO PARTICIPATE ON COMPANY TIME	EMPLOYEE SHOULD BE ALLOWED TIME-OFF TO WORK TOWARD A DEGREE
20	2.71	2.29
22	1.11	3.00
23	4.00	3.00
24	3.33	2.25
25	3.00	2.75
27	2.93	2.53
28	3.20	2.67
30	3.50	4.00
32	3.67	2.89
34	3.00	2.59
35	3.29	2.43
36	3.83	3.40
39	3.83	3.00
TOTAL	3.26	2.68

TABLE 26

MEANS OF RESPONSES BY INDUSTRY SIZE TOWARD TRAINING/EDUCATION IN PERCEPTIONS OF MANAGEMENT TOWARD EMPLOYEE PARTICIPATION

PERCEPTIONS	NUMBER OF EMPLOYEES				TOTAL
	LESS THAN 100	100-299	300-999	MORE THAN 1000	
Employees should be allowed to participate on company time	3.19	3.25	3.30	4.00	3.66
Employees should be allowed time-off to work toward a degree	2.66	2.71	2.45	3.20	2.68

TABLE 27

MEANS OF RESPONSES BY INDUSTRY TOWARD TRAINING/EDUCATION IN PERCEPTIONS OF MANAGEMENT TOWARD PROVIDING EMPLOYEE ASSISTANCE

SIC INDUSTRY GROUP	EMPLOYEES SHOULD BE INFORMED ABOUT ACTIVITIES	EMPLOYEES SHOULD BE PROVIDED PLANNING ASSISTANCE	COMPANY SHOULD SUSTAIN ALL EXPENSES OF REQUIRED ACTIVITIES	COMPANY SHOULD SUSTAIN A PORTION OF EXPENSES OF NON-REQUIRED ACTIVITIES
20	4.29	3.43	2.86	2.57
22	4.11	3.56	2.89	3.44
23	4.33	5.00	4.00	3.67
24	3.83	4.08	3,42	2.88
25	4.25	4.00	3.38	3.13
27	3.93	3.73	3.20	3.23
28	4.50	4.00	4.00	3.80
30	4.00	3.00	3.00	2.00
32	4.22	3.89	3.33	3.44
34	4.24	3.88	3.53	3.29
35	4.00	3.57	2.57	2.43
36	4,33	4.17	3.33	4.00
39	4.50	4.17	4.00	3.67
TOTAL	4.16	3.87	3.33	3.21

TABLE 28

MEANS OF RESPONSES BY INDUSTRY SIZE TOWARD TRAINING/EDUCATION IN PERCEPTIONS OF MANAGEMENT TOWARD PROVIDING EMPLOYEE ASSISTANCE

PERCEPTIONS	NUMBER OF EMPLOYEES				TOTAL
	LESS THAN 100	100-299	300-999	MORE THAN 1000	
Employees should be informed about activities	4.09	4.17	4.36	4.60	4.16
Employees should be provided planning assistance	3.81	3.79	4.27	4.20	3.87
Company should sustain all expenses of required activities	3.15	3.52	3.82	3.40	3.33
Company should sustain a portion of expenses of non-required activities	3.02	3.19	4.00	4.00	3.21

education activities.

A large majority of the industries had a favorable attitude toward providing employees with planning assistance for training/education. Only the food (SIC 20) and rubber (SIC 30) industries were undecided while the rest agreed with this perception. Both large and small firms agreed that the employees should be provided planning assistance.

Approximately two-thirds of the industries were undecided as to whether or not the company should sustain all expenses for required training/education activities. The data revealed that only one-third of the SIC groups agreed with this perception. The firms with less than 100 and more than 1000 employees were undecided while those firms employing 100-999 agreed that the company should sustain all expenses.

Most of the industries were undecided ($\bar{x}$ = 3.21) regarding the company sustaining a portion of the non-required training/education activities. The apparel (SIC 23), chemical (SIC 28), electrical (SIC 36), and miscellaneous (SIC 39) firms agreed while the rubber industry (SIC 30) disagreed. When the responses were separated according to company size, the data indicated that those firms with more than 300 employees were in agreement with the perception; the firms with less than 300 employees were undecided.

Responsibility Assignment

Table 29 and 30 show the results obtained from the responses concerning the two perceptions under responsibility assignment.

The manufacturing industries were in agreement that educational institutions and the company should provide employee training/education. The firms were undecided ($\bar{x}$ = 3.06) as to whether private firms

TABLE 29

MEANS OF RESPONSES BY INDUSTRY TOWARD TRAINING/EDUCATION IN PERCEPTIONS OF MANAGEMENT TOWARD RESPONSIBILITY ASSIGNMENT

SIC INDUSTRY GROUP	EMPLOYEE TRAINING/EDUCATION SHOULD BE PROVIDED THROUGH:					EMPLOYEE TRAINING/EDUCATION SHOULD BE CONDUCTED BY:				
	EDUCATIONAL INSTITUTIONS	PRIVATE FIRMS	PROFESSIONAL ASSOCIATIONS	THE COMPANY		LINE SUPERVISOR	TRAINING DIRECTOR	PERSONNEL MANAGER	CURRICULUM SPECIALIST	OWNER-MANAGER
20	3.57	3.00	3.14	4.29		3.43	3.57	2.86	3.00	3.29
22	3.88	2.83	3.33	4.14		3.75	3.86	3.13	3.43	2.71
23	4.33	3.00	3.67	5.00		4.33	4.00	3.33	3.33	4.00
24	3.33	3.00	3.10	3.88		3.80	4.00	3.00	2.86	3.43
25	3.75	2.71	3.00	3.86		3.29	3.50	3.14	3.00	2.86
27	3.75	3.67	3.70	4.00		3.71	3.88	3.43	3.64	3.56
28	4.17	3.83	3.83	4.60		3.80	3.80	2.80	3.33	3.20
30	4.00	3.00	3.50	3.00		4.00	4.00	2.00	4.00	2.00
32	3.63	2.57	3.43	4.13		3.29	3.75	3.29	3.14	3.43
34	3.47	2.87	3.14	3.71		3.15	3.27	3.09	3.31	2.85
35	3.60	3.00	3.33	4.00		3.60	3.00	1.67	3.00	3.00
36	4.00	3.00	3.83	4.50		4.17	4.50	3.60	4.00	3.00
39	4.67	3.67	4.00	3.60		2.60	4.00	3.00	4.00	3.67
TOTAL	3.72	3.06	3.40	4.01		3.54	3.71	3.07	3.33	3.15

TABLE 30

MEANS OF RESPONSES BY INDUSTRY SIZE TOWARD TRAINING/EDUCATION IN PERCEPTION OF MANAGEMENT TOWARD RESPONSIBILITY ASSIGNMENT

PERCEPTIONS	NUMBER OF EMPLOYEES				TOTAL
	LESS THAN 100	100-299	300-999	MORE THAN 1000	
Employee training/ education should be provided through:					
Educational institutions	3.58	3.71	4.27	4.00	3.72
Private firms	2.88	3.08	3.45	3.75	3.06
Professional associations	3.20	3.42	3.73	4.20	3.40
The company	3.91	4.04	4.20	4.60	4.01
Employee training/ education should be conducted by:					
Line supervisor	3.51	3.54	3.55	3.75	3.54
Training director	3.62	3.68	4.00	4.00	3.71
Personnel manager	2.76	3.00	4.09	3.50	3.07
Curriculum specialist	3.12	3.44	3.60	4.00	3.33
Owner-manager	3.23	2.90	3.40	3.00	3.15

should provide the training/education. About one-half of the firms responding reported that professional associations should provide the training/education. Both large and small industries agreed that educational institutions should provide employee training. Only the companies with more than 1000 employees agreed that the company should provide the training/education. When comparisons were made according to company size, the data revealed that the industries with more than 300 employees were in agreement that both professional associations and the company should provide the training.

The majority of the firms agreed that employee training/education should be conducted by the line supervisor and the training director. Almost all the SIC industries were in agreement that the training director should conduct the training education, and about two-thirds of the firms felt the line supervisor should be responsible. When the respondents were separated by company size, all firms agreed that both the line supervisor and the training director should conduct the training/education. The industries were undecided as to whether or not the personnel manager ($\bar{x}$ = 3.07), curriculum specialist ($\bar{x}$ = 3.33), and owner-manager ($\bar{x}$ = 3.15) should conduct the training/education. Only the rubber (SIC 30), printing (SIC 27), electrical (SIC 36), and miscellaneous (SIC 39) industries indicated that the curriculum specialist should conduct the training/education. Companies with 300 or more employees agreed that the curriculum specialist should conduct the training/education. Both large and small firms were undecided as to whether or not the owner-manager should conduct the training/education.

Employee Benefits

Data showing the responses of management to the two perceptions toward employee benefits are found in Tables 31 and 32.

There was strong agreement that manufacturing industries should maintain employee training/education records in company files. The mean of the responses ranged from 3.33 to 4.50. When separated by size, a large majority of firms agreed that the company should maintain training/education records for the employees.

About one-half of the manufacturing industries agreed the company should consider participation in training/education as criteria for salary increases. The other industries were undecided. The firms with more than 1000 employees disagreed with this perception while the firms with 100-299 employees agreed.

Program Planning

The survey results of the responses to the four perceptions toward program planning are revealed in Tables 33 and 34.

There was general agreement that the manufacturing industries should maintain a formal budgeted program for training/education. The rubber industry (SIC 30) disagreed with this perception; the food (SIC 20), machinery (SIC 35), textile (SIC 32), and lumber (SIC 24) industries were undecided. The data also revealed that the firms with less than 100 employees were undecided; all firms with more than 100 employees agreed that the company should maintain a formal budgeted program.

The industries were generally undecided ($\bar{x} = 3.10$) about forming a cooperative planning council with regional educational institutions,

TABLE 31

MEANS OF RESPONSES BY INDUSTRY TOWARD TRAINING/EDUCATION IN PERCEPTIONS OF MANAGEMENT TOWARD EMPLOYEE BENEFITS

SIC INDUSTRY GROUP	EMPLOYEE PARTICIPATION SHOULD BE MAINTAINED IN FILES	EMPLOYEE PARTICIPATION SHOULD BE CONSIDERED FOR SALARY INCREASES
20	3.57	3.14
22	4.33	3.67
23	3.33	4.00
24	3.55	2.50
25	4.00	3.38
27	3.87	3.56
28	4.50	2.67
30	3.50	4.00
32	3.89	2.89
34	4.06	3.13
35	4.14	3.00
36	4.17	3.50
39	4.33	3.50
TOTAL	3.97	3.18

TABLE 32

MEANS OF RESPONSES BY INDUSTRY SIZE TOWARD TRAINING/EDUCATION IN PERCEPTIONS OF MANAGEMENT TOWARD EMPLOYEE BENEFITS

PERCEPTIONS	NUMBER OF EMPLOYEES				TOTAL
	LESS THAN 100	100-299	300-999	MORE THAN 1000	
Employee participation should be maintained in files	3.90	4.00	4.09	4.44	3.97
Employee participation should be considered for salary increases	3.05	3.64	3.09	2.40	3.18

TABLE 33

MEANS OF RESPONSES BY INDUSTRY TOWARD TRAINING/EDUCATION IN PERCEPTIONS OF MANAGEMENT TOWARD PROGRAM PLANNING

SIC INDUSTRY GROUP	SHOULD MAINTAIN A FORMAL BUDGET	SHOULD FORM A PLANNING COUNCIL	WOULD LIKE UNIVERSITY SERVICES	SHOULD FORMULATE A PROGRAM ON THE BASIS OF: EMPLOYEE-INITIATED REQUESTS	SUPERVISOR-INITIATED REQUESTS	FORMAL NEEDS ASSESSMENT	COMPANY PRESCRIBED PROGRAMS
20	2.71	2.43	2.86	3.67	3.67	2.71	3.50
22	3.44	3.67	3.67	3.63	3.43	3.57	4.00
23	4.00	3.33	4.00	4.00	4.00	3.67	4.00
24	3.42	2.73	3.27	3.50	3.63	3.14	3.82
25	3.50	3.25	3.63	3.14	3.71	3.00	3.57
27	3.64	2.93	3.64	3.89	4.00	3.67	3.92
28	4.33	3.33	4.00	4.20	4.00	3.83	4.17
30	2.00	3.50	4.00	4.00	4.00	4.00	4.00
32	3.56	3.00	3.38	3.86	4.00	3.17	3.75
34	3.59	3.06	3.41	3.80	3.93	3.30	4.00
35	3.00	3.43	3.83	4.00	3.80	3.33	3.86
36	4.17	3.67	4.17	4.00	4.20	3.67	4.20
39	4.00	2.83	3.67	3.60	3.50	4.00	4.17
TOTAL	3.54	3.10	3.57	3.76	3.83	3.43	3.91

TABLE 34

MEANS OF RESPONSES BY INDUSTRY SIZE TOWARD TRAINING/EDUCATION IN PERCEPTIONS OF MANAGEMENT TOWARD PROGRAM PLANNING

PERCEPTIONS	NUMBER OF EMPLOYEES				TOTAL
	LESS THAN 100	100-299	300-999	MORE THAN 1000	
Should maintain a formal budget	3.31	3.57	4.27	4.60	3.54
Should form a planning council	3.15	2.83	3.45	3.40	3.10
Would like university services	3.43	3.62	4.00	4.00	3.57
Should formulate a program on the basis of:					
Employee-initiated requests	3.84	3.60	3.70	4.00	3.76
Supervisor-initiated requests	3.77	3.84	4.00	4.00	3.83
Formal needs assessment	3.29	3.54	3.30	4.20	3.43
Company prescribed programs	3.89	3.81	4.18	4.00	3.91

yet the rubber (SIC 30) and electrical (SIC 36) firms agreed with this perception. When the responses were separated according to company size, all industries were undecided ($\bar{x}$ = 3.10).

Approximately two-thirds of the manufacturing industries indicated they would be interested in educational services from a regional university. However, the food (SIC 20), lumber (SIC 24), stone and glass (SIC 32), and metal (SIC 34) industries were undecided. Those firms with less than 100 employees were undecided ($\bar{x}$ = 3.43) while all firms with more than 100 employees agreed they would be interested in educational services from a regional university.

All manufacturing industries agreed that the company should formulate the training/education program on the basis of supervisor-initiated requests and company-prescribed basic programs. Most industries were in agreement that the training/education program should be based on employee-initiated requests. When the firms were separated according to size, all industry groups agreed with this perception. The data indicated that half of the firms were undecided concerning the use of a professional needs assessment as a source for formulating the training/education program. The firms with 100-299 and more than 1000 employees agreed that a formal needs assessment should be a basis for formulating training/education programs.

Analysis of Variance and Multiple Range Test

This section includes an analysis of the responses of industrial management regarding training/education perceptions and the company. The data were analyzed to enable the researcher to respond to the five hypotheses in Chapter 1 (pp. 5-6) of this study.

The perceptions from Section I of the Survey Instrument (Appendix A) were tested statistically by the analysis of variance at the .05 level of significance. The purpose of the test was to determine if there was a significant difference in the means between SIC industry groups and between firms by employee size. A Statistical Package for Social Sciences (SPSS) was used for the analysis of data with calculations computed at the East Tennessee State University Data Processing Center.

After all F tests were computed, the Newman-Keuls Multiple Range Test was used on those F values which were significant. The Newman-Keuls determined which SIC industry differed significantly or which industry size differed significantly.

Hypothesis 1. There will be no significant difference in the means between industry in the perceptions of management toward employee participation in training/education.

Table 35 presents a summary of the analysis of variance in the perceptions of employee participation as shown by 107 respondents. There was no significant difference between SIC industry groups or between company sizes in the perception that employees should be allowed to participate in training/education on company time. Thus, the investigator failed to reject the null hypothesis for employee participation.

Hypothesis 2. There will be no significant difference in the means between manufacturing industries in the perceptions of management toward providing assistance for the employee in training/education.

TABLE 35

SUMMARY OF ANALYSIS OF VARIANCE BY INDUSTRY AND BY EMPLOYEE SIZE FOR EMPLOYEE PARTICIPATION

PERCEPTIONS	F VALUE	
	BY INDUSTRY	BY SIZE
Employees should be allowed to participate on company time	1.19	1.12
Employee should be allowed time-off to work toward a degree	0.96	0.70

$p > .05$

A summary of the analysis of variance in the perceptions of employee assistance is presented in Table 36. The F value was significant for two perceptions of employee assistance. There was one significant difference between SIC industry groups in regard to the perception that employees should be provided training/education assistance. The other significant difference was between company sizes in the perception that the company should sustain a portion of the expenses of non-required training/education activities.

In looking more closely at the perception that employees should be provided planning assistance, the F value indicated there was a significant difference in the means between SIC industries. The results of the Newman-Keuls Test between industries in this perception are shown in Table 37. The significant difference is shown in the table by parallel lines to the left of the means. Any industries not covered by the same line are significantly different from each other. Thus, the apparel industry was significantly different from the machinery, textile, food, and rubber firms. Only the apparel industry strongly agreed that the company should provide planning assistance for employees.

In looking more closely at the perception that the company should sustain a portion of the expenses of non-required training/education activities, the F value indicated there was a significant difference in the means according to company size. Table 38 presents the results of the Newman-Keuls Multiple Range Test between company sizes for this perception. This test did not reveal which SIC Groups differed significantly. However, as reported in Table 28, the firms with more than 300 employees were in agreement with the perception while the firms

TABLE 36

SUMMARY OF ANALYSIS OF VARIANCE BY INDUSTRY AND BY EMPLOYEE SIZE FOR EMPLOYEE ASSISTANCE

PERCEPTIONS	F VALUE	
	BY INDUSTRY	BY SIZE
Employees should be informed about activities	0.98	1.71
Employees should be provided planning assistance	2.14*	2.08
Company should sustain all expenses of required activities	1.03	1.58
Company should sustain a portion of expenses of non-required activities	1.62	3.98*

*$p < .05$

TABLE 37

RESULTS OF NEWMAN-KEULS MULTIPLE RANGE TEST BETWEEN INDUSTRIES IN THE PERCEPTION THAT THE COMPANY SHOULD PROVIDE PLANNING ASSISTANCE FOR EMPLOYEES

GROUPING		MEAN*	N	INDUSTRY
I	*	5.00	3	Apparel and Other Finished Products
I	I	4.17	6	Electrical and Electronic Equipment
I	I	4.17	6	Miscellaneous Industries
I	I	4.08	12	Lumber and Wood Products
I	I	4.00	8	Furniture and Fixtures
I	I	4.00	6	Chemicals and Allied Products
I	I	3.89	9	Stone and Concrete Products
I	I	3.88	17	Fabricated Metal Products
I	I	3.73	15	Printing and Allied Industries
*	I	3.57	7	Machinery
*	I	3.56	9	Textile Mill Products
*	I	3.43	7	Food and Kindred Products
*	I	3.00	2	Rubber and Plastic Products

*Any industries not covered by the same line are significantly different from each other.

TABLE 38

RESULTS OF NEWMAN-KEULS MULTIPLE RANGE TEST BETWEEN INDUSTRY SIZES IN THE PERCEPTION THAT THE COMPANY SHOULD SUSTAIN A PORTION OF EMPLOYEE EXPENSES OF NON-REQUIRED ACTIVITIES

	SIZE			
	(4) Over 1000	(3) 300-999	(2) 100-299	(1) Less than 100
N	5	11	27	61
MEAN*	4.00	4.00	3.19	3.02

*Any groups not underlined by the same line are significantly different from each other.

with less than 300 employees were undecided.

There were two significant differences in the means of manufacturing industries toward providing planning assistance for the employees in training/education. Thus null hypothesis 2 was rejected and the research hypothesis was accepted for employee assistance.

Hypothesis 3. There will be no significant difference in the means between manufacturing industries in the perception of management toward assigning the responsibility for training and education.

A summary of the analysis of variance in Table 39 indicated that there were two significant differences between SIC industries in the perceptions of responsibility assignment. There was only one significant difference between groups when ranked according to size of employment.

The first significant difference between industries was in the perception that the company should provide the employee training/education. Table 40 presents the results of the Newman-Keuls Multiple Range Test between industries in this perception. This Multiple Range Test did not indicate which SIC groups differed significantly. However, examination of the means revealed that twelve of the thirteen groups were in agreement that the company should provide the training/education. The means ranged from 3.00 to 5.00 with the rubber industry undecided about this perception.

The other significant difference between industries was in the perception that the training director should administer the employee training/education. Table 41 shows only one significant difference in the industry means. Again, this is revealed by the parallel lines on

TABLE 39

SUMMARY OF ANALYSIS OF VARIANCE BY INDUSTRY AND BY EMPLOYEE SIZE FOR RESPONSIBILITY ASSIGNMENT

PERCEPTIONS	F VALUE	
	BY INDUSTRY	BY SIZE
Employee training/education should be provided through:		
Educational institutions	1.10	2.45
Private firms	1.06	1.89
Professional associations	0.83	2.57
The company	1.99*	1.62
Employee training/education should be administered by:		
Line supervisor	1.29	0.08
Training director	1.92*	1.17
Personnel manager	1.02	7.75*
Curriculum specialist	0.93	2.05
Owner-manager	1.22	0.90

*$p < .05$

TABLE 40

RESULTS OF NEWMAN-KEULS MULTIPLE RANGE TEST BETWEEN INDUSTRIES IN THE PERCEPTION THAT EMPLOYEE TRAINING/EDUCATION SHOULD BE PROVIDED THROUGH THE COMPANY

GROUPING	MEAN*	N	INDUSTRY
|	5.00	3	Apparel and Other Finished Products
|	4.60	5	Chemicals and Allied Products
|	4.50	6	Electrical and Electronic Equipment
|	4.29	7	Food and Kindred Products
|	4.14	7	Textile Mill Products
|	4.13	8	Stone and Concrete Products
|	4.00	12	Printing and Allied Industries
|	4.00	6	Machinery
|	3.86	7	Furniture and Fixtures
|	3.80	10	Lumber and Wood Products
|	3.71	17	Fabricated Metal Products
|	3.60	5	Miscellaneous Industries
|	3.00	2	Rubber and Plastic Products

*Any industries not covered by the same line are significantly different from each other.

TABLE 41

RESULTS OF NEWMAN-KEULS MULTIPLE RANGE TEST BETWEEN INDUSTRIES IN THE PERCEPTION THAT EMPLOYEE TRAINING/EDUCATION SHOULD BE ADMINISTERED BY TRAINING DIRECTOR

GROUPING		MEAN*	N	INDUSTRY
|	*	4.50	4	Electrical and Electronic Equipment
|	|	4.00	4	Miscellaneous Industries
|	|	4.00	1	Rubber and Plastic Products
|	|	4.00	8	Lumber and Wood Products
|	|	4.00	3	Apparel and Finished Products
|	|	3.88	8	Printing and Allied Industries
|	|	3.86	7	Textile Mill Products
|	|	3.80	5	Chemicals and Allied Products
|	|	3.75	8	Stone and Concrete Products
|	|	3.57	7	Food and Kindred Products
|	|	3.50	8	Furniture and Fixtures
|	|	3.27	11	Fabricated Metal Products
*	|	3.00	5	Machinery

*Any industries not covered by the same line are significantly different from each other.

the left side of the table. The electrical industry differed significantly from the machinery industry in the perception that the training director should administer the training/education.

In the perception of the personnel manager administering the employee training/education, there was a significant difference in the means of groups according to company size but not between industries. The means presented in Table 42 show that there was one significant difference in the four groups in regard to this perception. Group 3 (300-999 employees) differed significantly from Group 2 (100-299 employees) and Group 1 (less than 100 employees). There were no other significant differences. In examining the mean responses in Table 32, it is evident that industries with 300 or more employees were in agreement that the personnel manager should administer employee training/education while those with less than 300 employees were undecided.

There were three significant differences in the means of manufacturing industries toward assigning the responsibility for training/education. Therefore, null hypothesis 3 was rejected and the research hypothesis was accepted for responsibility assignment.

Hypothesis 4. There will be no significant difference in the means between manufacturing industries in the perceptions of management toward benefits for employees in training and education.

The summary of the analysis of variance as shown in Table 43 indicated that there were two significant differences in the perceptions of employee benefits. There was a significant difference between industries in the perception that the company should maintain training/education records in employee files. Table 44 presents the results of

TABLE 42

RESULTS OF NEWMAN-KEULS MULTIPLE RANGE TEST BETWEEN INDUSTRY SIZES IN THE PERCEPTION THAT EMPLOYEE TRAINING/EDUCATION SHOULD BE ADMINISTERED BY PERSONNEL MANAGER

	SIZE			
	(3) 300-999	(4) Over 1000	(2) 100-299	(1) Less than 100
N	11	4	23	37
MEAN*	4.09	3.50	3.00	2.76
	*			
			*	*

*Any groups not underlined by the same line are significantly different from each other.

TABLE 43

SUMMARY OF ANALYSIS OF VARIANCE BY INDUSTRY AND BY EMPLOYEE SIZE FOR EMPLOYEE BENEFITS

PERCEPTIONS	F VALUE	
	BY INDUSTRY	BY SIZE
Employee participation should be maintained in files	2.00*	1.09
Employee participation should be considered for salary increases	1.54	4.11*

$p < .05$

TABLE 44

RESULTS OF NEWMAN-KEULS MULTIPLE RANGE TEST BETWEEN INDUSTRIES IN THE PERCEPTION THAT EMPLOYEE PARTICIPATION SHOULD BE MAINTAINED IN FILES

GROUPING	MEAN*	N	INDUSTRY
	4.50	6	Chemicals and Allied Products
	4.33	6	Miscellaneous Industries
	4.33	9	Textile Mill Products
	4.17	6	Electrical and Electronic Equipment
	4.14	7	Machinery
	4.06	17	Fabricated Metal Products
	4.00	8	Furniture and Fixtures
	3.89	9	Stone and Concrete Products
	3.87	15	Printing and Allied Products
	3.57	7	Food and Kindred Products
	3.55	11	Lumber and Wood Products
	3.50	2	Rubber and Plastic Products
	3.33	3	Apparel and Finished Products

*Any industries not covered by the same line are significantly different from each other.

the Newman-Keuls Multiple Range Test for this perception. The test did not reveal any significant differences. In observing the means in Table 31, there were 12 industries which agreed that employee participation should be maintained in files.

There was a significant difference in the means of the respondents when firms were divided according to company size in the perception that the company should consider participation in training/education as criteria for salary increases. From Table 45 it can be seen that there was one significant difference in the means of respondents regarding this perception. Group 2 (100-299 employees) differed significantly from Group 1 (less than 100 employees) and Group 4 (more than 1000 employees). The industries with 100-299 employees agreed with this perception; industries with more than 1000 employees disagreed; the other groups were undecided.

There were two significant differences in the means of industries toward benefits for employees in training and education. Null hypothesis 4 was therefore rejected and the research hypothesis was accepted for employee benefits.

Hypothesis 5. There will be no significant difference in the means between manufacturing industries in the perceptions of management toward program planning for training/education.

Table 46 provides a summary of the analysis of variance in the perceptions relating to program planning in training/education. The F values indicated that there was only one area of significant difference. The significant difference appeared when industries were divided according to company size regarding the company maintaining a formal

TABLE 45

RESULTS OF NEWMAN-KEULS MULTIPLE RANGE TEST BETWEEN INDUSTRY SIZES IN THE PERCEPTION THAT EMPLOYEE PARTICIPATION SHOULD BE CONSIDERED FOR SALARY INCREASES

	SIZE			
	(2) 100-299	(3) 300-999	(1) Less than 100	(4) Over 1000
N	28	11	61	5
MEAN*	3.64	3.09	3.05	2.40
			*	*
	*			

*Any groups not underlined by the same line are significantly different from each other.

TABLE 46

SUMMARY OF ANALYSIS OF VARIANCE BY INDUSTRY AND BY EMPLOYEE SIZE FOR PROGRAM PLANNING

PERCEPTIONS	F VALUE	
	BY INDUSTRY	BY SIZE
Should maintain a formal budget	1.72	5.32*
Should form a planning council	1.68	2.18
Would like university services	1.28	2.11
Should formulate a program on the basis of:		
Employee-initiated requests	0.95	0.83
Supervisor-initiated requests	1.22	0.76
Formal needs assessment	1.32	2.16
Company prescribed programs	1.08	1.38

*$p < .05$

budget program for training/education. Table 47 presents the results of the Newman-Keuls Test in this perception. This multiple range test shows that Groups 3 and 4 differed significantly from Group 1. In looking closely at the means in Table 34, the industries with over 100 employees agreed that the company should maintain a formal budget. Industries with less than 100 employees were undecided. There was one significant difference in the means of industries toward program planning for training/education. Thus, null hypothesis 5 was rejected and the research hypothesis was accepted for program planning.

TABLE 47

RESULTS OF NEWMAN-KEULS MULTIPLE RANGE TEST BETWEEN INDUSTRY SIZES IN THE PERCEPTION THAT THE COMPANY SHOULD MAINTAIN A FORMAL BUDGET

	SIZE			
	(4) OVER 1000	(3) 300-999	(2) 100-299	(1) LESS THAN 100
N	5	11	28	62
MEAN*	4.60	4.27	3.57	3.31
	*	*		*

*Any groups not underlined by the same line are significantly different from each other.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purposes of this chapter were to summarize the findings of the study, draw conclusions, and make recommendations based on the conclusions.

Summary

Purpose of Study

The primary purpose of this study was to determine the difference between the practices and perceptions of management regarding the training/education programs in selected manufacturing industries. To achieve this goal, two sub-problems were developed:

1. To identify the practices of industries toward training/education within a 50-mile radius of a regional university.

2. To analyze any significant differences in the perceptions of management toward training and education practices within a 50-mile radius of a regional university.

This survey was conducted within a geographical area of a regional university to determine how academic institutions could better assist manufacturing industries with training/education programs.

Methods and Procedures

A two-part survey instrument was developed which provided quantitative measurement of the perceptions of management as well as the

identification of actual practices of training/education in manufacturing industries in 1980. Based on a review of the literature, the practices and perceptions of industrial management toward the training/education of employees were grouped into five categories: (1) employee assistance, (2) employee participation, (3) responsibility assignment, (4) employee benefits, and (5) program planning. A computerized mailing list of the total population was obtained from Hugo Dunhill, Inc., in New York. The study population of manufacturing industries included 138 firms in North Carolina, 243 in Tennessee, and 45 in Virginia for a total of 426 industries. On November 7, 1981, a survey instrument was mailed to 426 firms in 13 groups according to Standard Industrial Classification (SIC). By January 11, 1982, a total of 145 instruments had been received, of which 107 were usable. The total percent of responses ranged from 20.0 percent in the rubber and plastic industries to 58.3 percent in the chemical industries.

Sub-problem 1 of this study was determined from the responses to the 13 questions in Section II of the survey instrument. The data were analyzed by simple mathematical calculation of the percent of firms by industry size and industry classification that utilized certain training/education practices.

Sub-problem 2 of this study was determined from the 14 questions in Section I of the survey instrument. An analysis of variance was conducted to determine significant differences between manufacturing industries in perceptions of management toward training/education practices. The Newman-Keuls Multiple Range Test was used to determine which industry SIC groups differed significantly or which size

of industry differed significantly.

Findings

The major findings from the data analysis were summarized in three sections: (1) findings concerning training/education practices, (2) findings concerning training/education perceptions, and (3) findings resulting from analysis of Variance and Multiple Range Test.

Findings concerning training/education practices. The practices of industrial management toward training/education are summarized as follows:

1. The 107 firms responding to the survey had a total of 33,373 employees with 11,059 (33.14 percent) of them participating in at least one training/education activities in 1980.

2. Approximately three-fourths of the employees in manufacturing industries attended in-house training/education activities in 1980. Nineteen percent participated in conferences and seminars while nine percent attended formal courses for credit.

3. Seventy percent of the manufacturing firms did not maintain a formal budgeted training/education program in 1980. All industries with more than 1000 employees presented a formal budget for training/education.

4. Over one-half of the manufacturing industries provided training/education assistance through payment of tuition fees to employees for courses. The firms with more than 300 employees contributed 100 percent of the tuition fees.

5. Approximately one-fourth (25.7 percent) of the industries did not have an official assigned the responsibility for training/education

while one-fifth (20.8 percent) used the personnel or business manager in this capacity.

6. Of the 105 industries responding, 67 percent maintained employee records for training/education. All companies with more than 1000 employees kept records of employee training/education activities.

7. More than one-half of the manufacturing industries utilized educational institutions as a method of training/education. The firms with 300-999 employees had the highest utilization while the firms with less than 100 employees had the lowest.

8. All manufacturing firms incorporated more operator-skills training/education than any other type. About two-thirds incorporated supervisory management and technical training; less than one-half of the companies used professional training in the training/education program.

9. Only 14.3 percent of the manufacturing industries conducted a formal needs analysis of employee training/education. Generally, firms with less than 100 employees did not conduct a needs analysis.

10. From the 106 responses, approximately one-half identified services that could be provided by a college or university. The chemical and machinery firms identified the greatest number of services while the food industry identified the least number.

11. Generally, the two main training/education needs of the firms were supervisory and technical training. Industries with more than 1000 employees revealed that management training was the predominant need.

Findings concerning training/education perceptions. The

perceptions of industrial management toward training/education are summarized as follows:

1. Generally, the manufacturing industries were undecided as to whether or not employees should be allowed to participate in training/education on company time. Firms with 1000 or more employees agreed with this perception.

2. Only the largest industry group agreed that the employee should have time-off to work toward a degree for professional development; other groups were undecided.

3. All manufacturing industries according to size and SIC classification agreed that the employees should be informed regarding training/education activities.

4. All groups according to industry size agreed that the employees should be provided planning assistance for training/education.

5. Only one-third of the SIC industries stated that the company should sustain all expenses for required training/education activities; the others were undecided. Those firms with 100-999 employees agreed that the company should sustain all the expenses.

6. Manufacturing firms with more than 300 employees agreed that the company should sustain a portion of the non-required training/education activities; the firms with less than 300 employees were undecided.

7. Manufacturing industries were in agreement that educational institutions and the company should provide employee training/education. The firms were undecided as to whether or not private firms and professional associations should provide training/education.

8. All firms in each size category agreed that both the line

supervisor and the training director should conduct the training/education. The industries were undecided as to whether or not the personnel manager, curriculum specialist, and owner-manager should conduct the training/education.

9. There was strong agreement that manufacturing industries should maintain employee training/education records in company files.

10. About one-half of the firms agreed that the company should consider participation in training/education as criteria for salary increases. The firms with more than 1000 employees disagreed with this perception.

11. There was general agreement that the manufacturing industries should maintain a formal budgeted program for training/education. The smallest firms were undecided while all firms with more than 100 employees agreed with this perception.

12. All industry groups by size category were undecided as to whether or not a cooperative planning council should be formed with regional educational institutions.

13. Approximately two-thirds of the industries indicated they would be interested in educational services from a regional university. There was stronger agreement among firms with 100 or more employees.

14. All manufacturing industries agreed that the company should formulate the training/education program on the basis of supervisor-initiated requests, company-prescribed basic programs, and employee-initiated requests. The firms were undecided concerning the use of a professional needs assessment.

Findings concerning analysis of variance and multiple range test. Eight statistically significant perceptions concerning training/education and the company were found to exist. The perceptions were significant at the .05 level of confidence in the following:

1. A significant difference existed between industries in the perception that the company should provide their employees with planning assistance. The apparel industry was significantly different from the machinery, textile, food, and lumber firms. Only the apparel industry agreed with this perception.

2. A significant difference existed between industries by size in the perception that the company should sustain a portion of the expenses of non-required training/education activities. Yet, the Newman-Keuls Test did not reveal which industry groups differed significantly.

3. A significant difference existed between industries in the perception that the company should provide the employee training/education. The Newman-Keuls Range Test did not indicate which SIC groups differed significantly.

4. A significant difference existed between industries in the perception that the training director should administer the training/education. The electrical industry differed significantly from the machinery industry. There was strong agreement in the electrical firms; the machinery firms were undecided.

5. A significant difference existed between industries by size in the perception that the personnel manager should administer the employee training/education. The Newman-Keuls Test indicated that Group 3 differed significantly from Group 2 and Group 1.

6. A significant difference existed between industries in the perception that the company should maintain training/education records in employee's files. Again, the Newman-Keuls Test did not reveal which SIC groups differed significantly.

7. A significant difference existed between industries by size in the perception that the company should consider participation in training/education as criteria for salary increases. Group 2 differed significantly from Group 1 and Group 4 as revealed by the Newman-Keuls Test.

8. A significant difference was found to exist between industries by size in the perception that the company should maintain a formal budget. The Newman-Keuls Test indicated that Group 1 differed significantly from Group 3 and Group 4.

Conclusions

Based on the analysis of the data collected in this study, the following conclusions were made:

1. The manufacturing industries were strongly involved in training/education activities with approximately one-third of all employees having participated in at least one training/education activity in 1980.

2. Among the manufacturing industries surveyed, the most utilized methods of training/education were in-house activities and outside conferences. The larger firms were more heavily involved in these activities in 1980.

3. Although manufacturing industries generally agreed they should maintain a formal budgeted program for training/education, a

majority of the industries did not actually maintain a program.

4. Among the manufacturing industries surveyed, there was little or no agreement that the company should sustain all or a portion of the expenses of the training/education activities. In actual practice approximately half of the firms provided expenses through tuition fees to the employees for courses with the larger firms sustaining all of the expenses.

5. Most manufacturing firms either did not have an official assigned the responsibility for the training/education program or used the personnel-business manager in this capacity. However, the firms agreed that the training director, personnel manager, and the line supervisor should conduct this program.

6. Manufacturing industries strongly agreed that employee records should be maintained in company files. As the employee size increased, the percentage of firms maintaining records also increased.

7. Among the manufacturing firms surveyed, most agreed that educational institutions and the company should provide employee training/education. Generally, the larger the employee size of the industry, the higher the utilization of educational institutions.

8. Among the manufacturing industries surveyed, more than half of the firms incorporated four main types of training/education: operator-skills, supervisory management, professional training, and technical training. The larger firms made the most utilization of all types of training/education.

9. All manufacturing industries made extensive use of operator-skills training/education. As the employee size increased, the usage of operator-skills training also increased.

10. Among manufacturing industries surveyed, there was little agreement on allowing the employee time-off to work toward a degree or company time to participate in training/education activities.

11. Most manufacturing industries agreed that the company should consider any participation in training/education activities as criteria for employee salary increases.

12. Manufacturing industries agreed the company should inform the employees of available training/education activities and provide planning assistance for interested employees.

13. Among manufacturing firms surveyed, formal needs analyses were evident in the larger industries and the highly technical chemical and electrical industries.

14. Among manufacturing industries surveyed, the larger industries and high technology firms identified more educational services which could be provided by a college or university.

15. Among manufacturing industries surveyed, the larger firms saw their greatest need as supervisory and management training while the smaller firms indicated the need for technical and skills training.

Recommendations

After examining the results of this study, the following recommendations were made:

1. The favorable perceptions of industrial management toward training/education in this study confirm the possibility of greater cooperative opportunities between industry and educational institutions.

2. Continuing education should be more actively involved in

building a stronger linkage between industry and educational institutions. Thus, colleges and universities should spend substantially more time and funds on continuing education in order to develop new and diversified programs that better serve industrial needs.

3. Colleges and universities should not be reluctant to adopt methods that are working elsewhere and use them to further their own goals. There is a need to give careful consideration to non-traditional methods of learning such as external degrees in conjunction with industry.

4. Industrial employees should seek out educational opportunities and communicate these to the employer. They should also take advantage of any planning assistance, financial rewards, or on-the-job training coordinated by the company.

5. Regional universities should consider using a coordinator in each school or college to better promote, develop, and coordinate continuing education programs with industry.

6. Colleges and universities should consider establishing a top level advisory committee of plant managers to lay the groundwork for potential cooperative arrangements between industry and higher education.

7. Educational institutions should make an effort to assist management regarding the up-dating of skills of in-house instructors or coordinators, particularly in the larger companies where a need was indicated.

8. Further research should be made to determine the perceptions and practices of non-manufacturing industries such as real estate, insurance, public services, etc. so that universities could better

serve this clientele.

9. Similar research should be conducted to determine if geographical locales around similar regional colleges or universities make a difference in the industrial perceptions and practices toward training and education.

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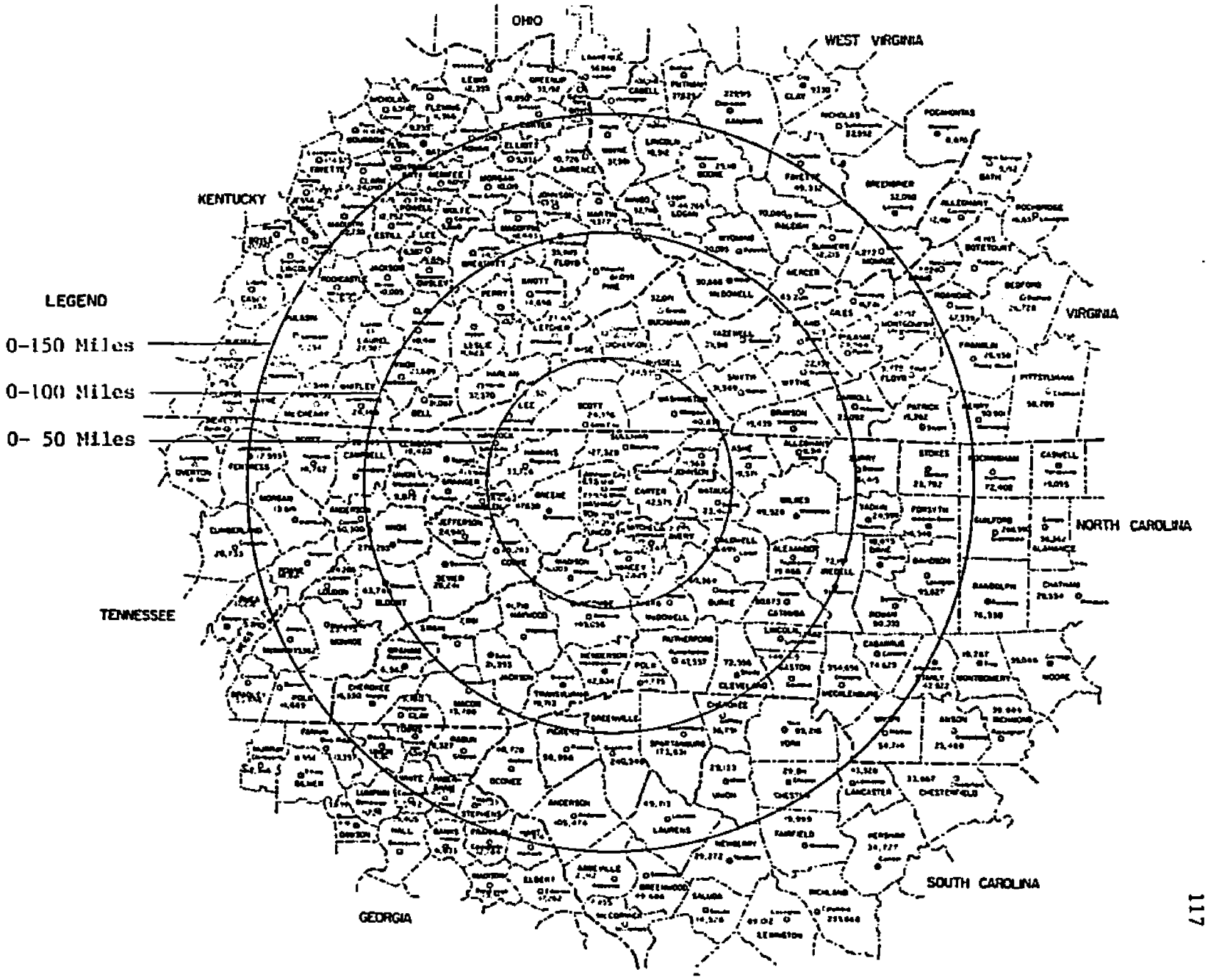
APPENDICES

APPENDIX A

LOCATION MAP

EAST TENNESSEE STATE UNIVERSITY AREA LOCATION MAP



APPENDIX B

SURVEY INSTRUMENT

DEFINITION OF TRAINING/EDUCATION

Training/education is defined in this study as any learning activity which improves the employee's knowledge and skills for constructive on-the-job performance. It includes such common terms as professional development, staff development, continuing education, training, retraining, etc. Activities may include seminars, conferences, short courses, formal courses for college credit, etc.

SECTION I - TRAINING/EDUCATION PERCEPTIONS

Please check (✔) the block to the right of each statement that represents your level of agreement regarding training/education and your Company.	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. The company should maintain a formal budget program of training/education for its employees.					
2. The company should inform the employees of training/education activities available to them.					
3. The company should provide planning assistance to the employees interested in training/education.					
4. The company should sustain all the expenses of its employees in training/education activities required by the company.					
5. The company should sustain at least a portion of the expenses of its employees in training/education which is not required by the company.					
6. The company should allow its employees to participate in required training/education on company time.					
7. The company should provide training/education for its employees through:					
Educational institutions					
Private consulting firms					
Professional associations					
The company					
8. The company should allow employees time-off to work toward a degree for professional development.					
9. The company should maintain training/education records in employee's files.					
10. The company should consider participation in training/education as criteria for employee salary increases.					

SECTION I - TRAINING/EDUCATION PERCEPTIONS (CONTINUED)

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
11. Training/education should be conducted by:					
Line supervisor					
Training director					
Personnel manager					
Curriculum specialist					
Owner-manager					
12. The company would be interested in forming a cooperative planning council with regional educational institutions.					
13. The company would be interested in educational services from a regional university.					
14. The company should formulate training/education requirements on the basis of the following sources:					
Employee-initiated requests					
Supervisor-initiated requests					
Formal professional needs assessment					
Company prescribed-basic programs					

SECTION II - TRAINING/EDUCATION PRACTICES

Please check (✔) the block to the right of each question regarding training/education practices in your Company.	YES	NO
1. Does the company have an annual formal budgeted training/education program?		
2. Does the company provide assistance to the employee for training/education through tuition fees for courses?		
3. Does the company currently maintain records of employee training/education activities?		
4. Has the company made a formal needs analysis of the training/education needs of the employees?		
5. Has the company identified educational services which could be provided by a college or university?		

SECTION II - TRAINING/EDUCATION PRACTICES (CONTINUED)			
		YES	NO
6.	Which of the following methods are utilized in the education program of the company?		
	Commercially-produced training programs		
	Programs developed by in-house personnel		
	Programs developed by local educational institutions		
	Programs provided by educational consultants		
	Outside programs/conferences selected by the company		
7.	Which of the following types of training are incorporated in the training/education program at the company?		
	Operator-Skills training/education		
	Supervisory Management training		
	Professional training		
	Technical training		
	Please complete each of the following items by supplying the appropriate responses in the space provided.	NUMBER	
8.	Approximate number of employees in the company.		
9.	Approximate number of employees who participated in at least one training/education activity during 1980.		
10.	Approximate number of training hours per employee during 1980.		
11.	Approximate number of employees attending training-education activities the company offered and/or coordinated for the employee during 1980:		
	In-house training		
	Outside conferences, short courses, seminars		
	Formal courses for credit, (high school or college)		
12.	What official position in the company is assigned the responsibility for the training/education program?		
	_____		
13.	What is the company's main training/education need?		
	_____		

APPENDIX C

COVER LETTER

November 7, 1981

Dear Sir:

A research study is being conducted to determine the perceptions of management toward training/education in manufacturing industries. The geographical area of this study includes selected industries in northeastern Tennessee, southwestern Virginia, and western North Carolina. It is important to establish a data base so that colleges or universities may be better prepared to cooperate and assist in continuing education programs.

Your response to this study is vitally important. Would you please direct this letter and the Questionnaire to the person in your firm most qualified to respond, and return the completed form to me at your earliest convenience. The data from all firms responding will be assembled in one report. Responses from individual companies will not be identified in any way in this study.

Even though your company may not have been involved in any training or education programs, please return the Questionnaire. If you would like to receive a summary of the findings of this research, please advise me.

Thank you for your help.

Sincerely yours,

Shirley L. Morgan

Shirley L. Morgan
Doctoral Student
ETSU Department of Supervision and Administration

APPENDIX D

FOLLOW-UP LETTER

December 8, 1981

Dear Sir:

On November 7, 1981, we mailed you a Questionnaire concerning the perceptions of management toward training/education of employees in your company. We have had good responses from many companies; however, thus far we have not received your completed Questionnaire. It is very important that you be included in the research study so that an accurate description of the perceptions of management regarding training and education might be obtained.

If you have not returned your completed Questionnaire, would you please have the appropriate person in your company forward it to us at your earliest convenience. Please disregard this request if you have already responded to the Questionnaire.

We are grateful for the time and cooperation you have given us in this valuable research study. May I reassure you that the data from all firms responding will be assembled in one report and that responses from individual companies will be kept in the utmost confidence.

Please let us know if you would like to receive a summary of the findings of this research.

Sincerely yours,

Shirley L. Morgan

Shirley L. Morgan
Doctoral Student
ETSU Department of Supervision and
Administration

VITA

SHIRLEY LEWIS MORGAN

Personal Data:
Date of Birth: February 1, 1940
Place of Birth: Elizabethton, Tennessee
Marital Status: Married

Education:
Public Schools, Carter County, Tennessee.
East Tennessee State University, Johnson City, Tennessee; chemistry, B.S., 1960.
East Tennessee State University, Johnson City, Tennessee; environmental health, health education, M.S.E.H., 1976.
East Tennessee State University, Johnson City, Tennessee; educational supervision, Ed. D., 1982.

Professional Experience:
Cancer Chemotherapy Research, Hazelton Laboratories, Falls Church, Virginia, 1960-1961.
Teacher, Chapel Hill Junior High School, Chapel Hill, North Carolina, 1962.
Teacher, Orange County School System, Orange, Virginia, 1962-1963.
Teacher, Happy Valley High School, Elizabethton, Tennessee, 1963-1968.
Teacher, Fairmont Elementary, Johnson City, Tennessee, 1974-1979.
Internship, Tennessee State Department of Education, Johnson City, Tennessee, 1980.
Doctoral Fellow, East Tennessee State University, Johnson City, Tennessee, 1980-1981.
Science Education Instructor, Department of Curriculum and Instruction, East Tennessee State University, Johnson City, Tennessee, 1980-1981.
Health Instructor, Department of Health Education, East Tennessee State University, Johnson City, Tennessee, 1981-Present.

Professional Membership:
Delta Kappa Gamma
Gamma Chapter, XI State
Phi Delta Kappa
Phi Kappa Phi
Beta Club Sponsor
National Honor Club
Tennessee Education Association
National Education Association
Southern Health Association