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Vocational Administrators' and Business Leaders' Perceptions of Vocational Education in Tennessee

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VOCATIONAL ADMINISTRATORS' AND BUSINESS LEADERS' PERCEPTIONS OF VOCATIONAL EDUCATION IN TENNESSEE

East Tennessee State University Ed.D. 1986

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VOCATIONAL ADMINISTRATORS' AND BUSINESS LEADERS' PERCEPTIONS OF VOCATIONAL EDUCATION IN TENNESSEE

A Dissertation

Presented to

the Faculty of the Department of Supervision and Administration

East Tennessee State University

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

---

by

George Edward Bell

May, 1986

APPROVAL

This is to certify that the Graduate Committee of

GEORGE EDWARD BELL

met on the

4th day of April, 1986.

The committee read and examined his dissertation, supervised his defense of it in an oral examination, and decided to recommend that his study be submitted to the Graduate Council and Associate Vice-President for Research and Graduate Studies in partial fulfillment of the requirements for the degree Doctor of Education.

Chairman, Graduate Committee

Signed on behalf of the Graduate Council

Associate Vice-President for Research and Graduate Studies

ABSTRACT

VOCATIONAL ADMINISTRATORS' AND BUSINESS LEADERS' PERCEPTIONS OF VOCATIONAL EDUCATION IN TENNESSEE

by

George Edward Bell

The purpose of this study was to determine if differences existed between vocational administrators' perceptions of vocational education with business and industry leaders' perceptions in Tennessee. The investigator's concern in this study was to determine the extent of differences between vocational administrators' perceptions of vocational education and perceptions of business and industry leaders in Tennessee.

Forty-nine hypotheses were formulated to be tested at the .05 level of significance. The Business Industry Survey used was developed and validated by Walter H. Timm. The survey format was designed to allow responses to the importance and level of knowledge for certain identified Industrial Skill topics needed by entry level employees.

The topics were: Math, Measuring, Blueprint Reading, Hand Tools, Power Tools, Stationary Equipment, Materials, Electricity, Hydraulics and Pneumatics, Finishes, Fasteners, Bonding, Communication, Free Enterprise System, and Safety.

From the results of the data analysis and interpretation, significant differences were revealed in 36 of the 49 hypotheses tested. Findings are reported as they pertain to each of the hypotheses originally formulated.

A summary of Survey Section I, General Questions, showed that administrators and business leaders demonstrated agreement that entry level employees would need either introductory or intermediate/proficient level skills.

The summary of Survey Section II, Importance Rating, showed that administrators rated the importance significantly higher for 13 of the 15 topics (Math, Measuring, Blueprint Reading, Stationary Equipment, Materials, Electricity, Hydraulics and Pneumatics, Finishes, Fasteners, Bonding, Communications, Free Enterprise System, and Safety). For the remaining two topics (Hand Tools and Power Tools), the vocational administrators and Business/Industry leaders agreed on their importance.

The summary of Section III, Levels of Knowledge desired, showed that administrators rated the level of knowledge desired significantly

higher for 9 of the 15 topics (Math, Blueprint Reading, Stationary Equipment, Electricity, Finishes, Fasteners, Bonding, Communications and Safety). For the remaining six topics (Measuring, Hand Tools, Materials, Hydraulics and Pneumatics, and Free Enterprise System), the vocational administrators and business leaders were in agreement as to the level of knowledge desired.

A summary of Section IV, Special Questions, showed that the use of computer controlled (CNF or NC) or computer assisted devices was rated significantly higher by the vocational administrators in 11 of the 15 topics (Math, Measuring, Blueprint Reading, Power Tools, Stationary Equipment, Materials, Electricity, Hydraulics and Pneumatics, Bonding, Communications, and Safety). For the remaining four topics (Hand Tools, Finishes, Fasteners, Free Enterprise System), the vocational administrators and Business/Industry leaders were in agreement.

In relationship to the uses of Section IV, industrial robotics, computers, and work habits, the vocational administrators rated the importance significantly higher.

INSTITUTIONAL REVIEW BOARD APPROVAL

This is to certify that the following study has been filed and approved by the Institutional Review Board of East Tennessee State University.

Title of Grant of Project VOCATIONAL ADMINISTRATORS' AND BUSINESS LEADERS' PERCEPTIONS OF VOCATIONAL EDUCATION IN TENNESSEE

Principal Investigator George Edward Bell

Department Supervision and Administration

Date Submitted March 24, 1986

Institutional Review Board, Chairman Armand A. Lefemine, M.D.

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Thanks are extended to Dr. Susan Twaddle at the Computer Services Center, East Tennessee State University. Without her assistance my study would have been much more difficult.

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CHAPTER 1

Introduction

The basic purpose of Vocational Education is to provide education and training for both entrance into and progress in an occupational field (Evans & Herr, 1978). The American Vocational Association in its 1969 Report on Advisory Committee noted

> Representatives of the fields for which instruction is to be provided must be consulted regarding the skills, instructional materials, equipment, standards for production work or service provided, and instructions content. All phases of training should be reviewed periodically in order to keep them up-to-date (American Vocational Association, 1969, p. 19).

How the Vocational Administrator communicates and interacts with employers to get necessary information to revise existing curricula or to develop new curricula determines relevancy (Administrative Guide for Vocational Technical Education, 1974). This study will correlate Vocational Administrators' perceptions of vocational education with those in business and industry leaders.

The Problem

The problem of this study was to determine if differences existed between vocational administrators' perceptions of vocational education with business and industry leaders' perceptions in Tennessee.

Significance of the Study

The mission of vocational education is to furnish Business/ Industry leaders with skilled employees to enter the labor force and supplies the means for upgrading their skills. Therefore, it must be

evaluated and re-evaluated by leaders, engaged in the various occupational fields in order to be certain that its instructions are relevant. Walter Timm, in his 1983 Business/Industry Linkage Report stated:

> Business/Industry input is vital to vocational-technical education at the secondary and post-secondary level. Without this input, vocational-technical would quickly produce a product (student-learner) which would not be appropriately prepared for the jobs available. (Timm, 1983, p. 1)

Knezevich (1975) stated that:

> . . . a traditional and honored role for the school administrator is that of instructional leader. To fulfill this role, the administrator must become acquainted with curriculum needs and provide leadership to meet them. (p. 497)

This study was designed to obtain vocational administrators' realignment of topic emphasis within the trade and industrial curriculum.

Limitations

1. Resources used for this study were limited to those available through the Sherrod Library at East Tennessee State University and State of Tennessee Department of Education Division of Vocational-Technical Education.

2. Responses were limited to a list of fifteen industrial skill topics adopted for the study from the State of Tennessee Business/ Industry Linkage Study (1983).

3. Responses were limited to those from Vocational Administrators of secondary programs in Tennessee.

4. The study was limited to spring, summer, and fall of 1985.

5. The study was limited to a comparison with the 1983 Business/ Industry Linkage Project for Tennessee by Walter Timm.

Assumptions

1. The participants in the study would respond to the survey honestly and seriously.

2. The results of the study can be utilized to prepare emphasis on improving Vocational Technical Education curriculum.

Definitions of Terms

The following definitions were taken from Walter H. Timm, Jr., "Business/Industry Linkage Project" to the State of Tennessee Department of Education, Division of Vocational-Technical Education, in July 1983.

Blueprint Reading Competencies: Blueprint reading competencies include: understanding the alphabet of lines (object lines, section lines, hidden lines, etc.,); reading dimensions using the English and Metric system of measurement; reading actual-size drawings and scale drawings; reading various views in drawings such as orthographic projections, sectional views, and framing plans; understanding common symbols and abbreviations (Timm, 1983).

Bonding Competencies: Bonding competencies are such as: perform soldering, brazing, welding; propose use of adhesive bonding agents such as thermoplastic material, thermosetting materials or a

combination of both; proper use of adhesives such as white liquid glue, plastic resin glue, resorcinol resin glue, animal glue, etc., (Timm, 1983).

Communication Competencies: Communication competencies are the abilities to: write using complete sentences; fill out job applications; communicate verbally using proper English; read and comprehend assignments; read and understand parts and service manuals (Timm, 1983).

Electricity Competencies; Examples of electricity competencies are: proper use of basic electrical test instruments; identify basic electrical components such as resistors, capacitors, inductors, and transistors; read simple electrical and electronic schematics; check for open circuit, shorted circuit and grounded circuit multimeter or continunity tester (Timm, 1983).

Fasteners Competentencies: Examples of fasteners competencies include: identify fastener head types and their uses (flat, oval, pan, etc.); identify and use fastener thread types (external, internal, right-hand, left-hand); identify forms and their uses (American National Coarse, American National Fine, etc.); identify and properly use the family of bolts, nuts, washers, screws, nails, rivets, keys, keyseats, pins, and staples (Timm, 1983).

Finishes Competencies: Finishes competencies consist of the abilities to: apply finishes with a suction feed gun brush, roller, pad, etc.; apply protective coatings such as lacquer, varnish, synthetics, paints

(oil and water base, etc.; prepare wood and metal surfaces for finishes; understand the electroplating process; perform mechanical treatments such as polishing and burnishing; understand the use of finishes on paper, wood, metal, etc., (Timm, 1983).

Free Enterprise System Competencies: Skills under the free enterprise system competencies include: understanding how the individual fits into the free enterprise system and the proper handling of personal finances; taking pride in workmanship; motivating employees to work cooperatively with management; and understanding and appreciating the profit-loss needs of business/industry (Timm, 1983).

Hand Tools Competencies: Hand tools competencies are those that identify and properly use hand saws, wrenches, various screwdrivers, chisels, drilling and boring tools, various pliers, vise grips, files, etc., (Timm, 1983).

Hydraulics and Pneumatics Competencies: Included in the hydraulics and pneumatics competencies are: operation of pneumatic power tools and operation of hydraulic equipment (Timm, 1983).

Intermediate Skills: Intermediate skills include the ability in the introductory skill level plus demonstration of moderate hands-on skills, and understanding (Timm, 1983).

Introductory Skills: Introductory skills are considered as the ability to identify and understand items such as hand tools, limited hands-on capability, but orientation to the skills needed (Timm, 1983).

Materials Competencies: Materials competencies include such competencies as: identifying sheetmetal guage (thickness): identifying and properly using hot-rolled steel, alloy steel, and nonferrous metals; identifying and properly using plywood, building board, wood plastic, fiberglass, and various kinds of paper, etc., (Timm, 1983).

Math Competencies: Math competencies include: to be able to add, subtract, multiply, divide, calculate with whole numbers, fractions, decimals to be able to calculate using the English and Metric system; to be able to compute algebraic equations, to be able to solve geometric formulas; to be able to apply mathematical knowledge to practical job related uses (Timm, 1983).

Measuring Competencies: Measuring competencies include measure within a 32nd of an inch using standard rule or scale; measure within 1 mm using a metric rule or scale; measure with a micrometer; measure with inside and outside calipers (Timm, 1983).

Power Tool Competencies: Power tool competencies include: proper use of a portable electric drill, saber saw, portable sander, and circular saw (Timm, 1983).

Proficient Skills: Proficient skills consist of the ability to work with minimum supervision for a good portion of the time; take directions and then accomplish the task (Timm, 1983).

Safety Competencies: Safety competencies include: proper use of all types of fire extinguishers; know and practice safety in two

categories: a) general shop safety and b) personal safety rules; know basic first aid procedures; demonstrate good housekeeping and cleanup; demonstrate courtesy to other workers (Timm, 1983).

Stationary Equipment Competencies: Stationary equipment competencies are: proper use of a radial arm saw, jointer, table saw, drill press, band saw, lathe, shaper, planer, milling machine, grinder, and printing equipment (Timm, 1983).

Hypotheses

The following hypotheses are stated in the research format. The acceptable level of significance will be at the .05 level.

1. There will be a significant difference in perceptions toward the various trade, industrial, maintenance skills for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

2. There will be a significant difference in perceptions toward importance rating of the industrial skill topic math for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

3. There will be a significant difference in perceptions toward importance rating of the industrial skill topic measuring for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

4. There will be a significant difference in perceptions toward importance rating of the industrial Skill topic blueprint reading for

entry-level employees between vocational administrators and business/ industry leaders in Tennessee.

5. There will be a significant difference in perceptions toward importance rating of the industrial skill topic hand tools for entry-level employees between vocational administrators and business/ industry leaders in Tennessee.

6. There will be a significant difference in perceptions toward importance rating of the industrial skill topic power tools for entry-level employees between vocational administrators and business/ industry leaders in Tennessee.

7. There will be a significant difference in perceptions toward importance rating of the industrial skill topic stationary equipment for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

8. There will be a significant difference in perceptions toward importance rating of the industrial skill topic materials for entry-level employees between vocational administrators and business/ industry leaders in Tennessee.

9. There will be a significant difference in perceptions toward importance rating of the industrial skill topic electricity for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

10. There will be a significant difference in perceptions toward importance rating of the industrial skill topic hydraulics and pneumatics for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

11. There will be a significant difference in perceptions toward importance rating of the industrial skill topic finishes for entry-level employees between vocational administrators and business/ industry leaders in Tennessee.

12, There will be a significant difference in perceptions toward importance rating of the industrial skill topic fasteners for entry-level employees between vocational administrators and business/ industry leaders in Tennessee.

13. There will be a significant difference in perceptions toward importance rating of the industrial skill topic bonding for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

14. There will be a significant difference in perceptions toward importance rating of the industrial skill topic communications for entry-level employees between vocational administrators and business/ industry leaders in Tennessee.

15. There will be a significant difference in perceptions toward importance rating of the industrial skill topic free enterprise system for enty-level employees between vocational administrators and business/ industry leaders in Tennessee.

16. There will be a significant difference in perceptions toward importance rating of the industrial skill topic safety for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

17. There will be a significant difference in perceptions toward levels of knowledge desired of the industrial skill topic math for

entry-level employees between vocational administrators and business/ industry leaders in Tennessee.

18. There will be a significant difference in perceptions toward levels of knowledge desired of the industrial skill topic measuring for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

19. There will be a significant difference in perceptions toward levels of knowledge desired of the industrial skill topic blueprint reading for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

20. There will be a significant difference in perceptions toward levels of knowledge desired of the industrial skill topic hand tools for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

21. There will be a significant difference in perceptions toward levels of knowledge desired of the industrial skill topic power tools for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

22. There will be a significant difference in perceptions toward levels of knowledge desired of the industrial skill topic stationary equipment for entry-level employees between vocational administrators and business/industry leaders in Tennessee,

23. There will be a significant difference in perceptions toward levels of knowledge desired of the industrial skill topic materials for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

24. There will be a significant difference in perceptions toward levels of knowledge desired of the industrial skill topic electricity for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

25. There will be a significant difference in perceptions toward levels of knowledge desired of the industrial skill topic hydraulics and pneumatics for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

26. There will be a significant difference in perceptions toward levels of knowledge desired of the industrial skill topic finishes for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

27. There will be a significant difference in perceptions toward levels of knowledge desired for the industrial skill topic fasteners for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

28. There will be a significant difference in perceptions toward levels of knowledge desired to the industrial skill topic bonding for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

29. There will be a significant difference in perceptions toward levels of knowledge desired of the industrial skill topic communication for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

30. There will be a significant difference in perceptions toward levels of knowledge desired of the industrial skill topic free

enterprise system for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

31. There will be a significant difference in perceptions toward levels of knowledge desired of the individual skill topic safety for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

32. There will be a significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic math between vocational administrators and business/industry leaders in Tennessee.

33. There will be a significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic measuring between vocational administrators and business/industry leaders in Tennessee.

34. There will be a significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic blueprint reading between vocational administrators and business/industry leaders in Tennessee.

35. There will be a significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic hand tools between vocational administrators and business/industry leaders in Tennessee.

36. There will be a significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic power tools between vocational administrators and business/industry leaders in Tennessee.

37. There will be a significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill stationery equipment between vocational administrators and business/industry leaders in Tennessee.

38. There will be a significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill materials between vocational administrators and business/industry leaders in Tennessee.

39. There will be a significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill electricity between vocational administrators and business/industry leaders in Tennessee.

40. There will be a significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic hydraulics and pneumatics between vocational administrators and business/industry leaders in Tennessee.

41. There will be a significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic finishes between vocational administrators and business/industry leaders in Tennessee.

42. There will be a significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic fasteners between vocational administrators and business/industry leaders in Tennessee.

43. There will be a significant difference in perceptions toward uses or future uses of computer control or computer assisted devices

with the industrial skill topic bonding between vocational administrators and business/industry leaders in Tennessee.

44. There will be a significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic communications between vocational administrators and business/industry leaders in Tennessee.

45. There will be a significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic free enterprise systems between vocational administrators and business/industry leaders in Tennessee.

46. There will be a significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic safety between vocational administrators and business/industry leaders in Tennessee.

47. There will be a significant difference in perceptions toward training future employees in principles of industrial robotics between vocational administrators and business/industry leaders in Tennessee.

48. There will be a significant difference in perceptions toward training future employees in principles, operation, application, understanding, etc., of computers between vocational administrators and business/industry leaders in Tennessee.

49. There will be a significant difference in perceptions toward levels of importance desired of the industrial topic work habits between vocational administrators and business/industry leaders in Tennessee.

Procedures

The following procedures were used in this study:

1. A review of related literature was conducted.

2. A letter was written to Walter Timm, Vice-President, Faculty and Programs, Isothermal Community College, Spindale, North Carolina, requesting his permission to use his fifteen industrial skill topics and survey (See Appendix A).

3. A cover letter and instrument survey were mailed to each secondary vocational administrator in Tennessee (See Appendix B).

4. Thirty days later a follow-up letter and another survey were mailed to those administrators who had not responded (See Appendix B).

5. When at least 50% of the responses were collected, the data were analyzed and recorded.

Organization of the Study

The study was organized into five chapters. Chapter 1 contains the introduction, the statement of the problem, the significance of the study, the limitations, the assumptions, the definitions of terms, the hypotheses, the procedures, and the organization of the study.

A review of related literature was provided in Chapter 2.

Chapter 3 contains the study design and methodology.

Chapter 4 provides the data analyses.

The summary, findings, conclusions and implications are in Chapter 5.

CHAPTER 2

Review of Related Literature

Introduction

The need for change in vocational education is challenged by projections into the future and perceptions of presently recognized needs.

> There is little question that the remaining years of the twentieth century will be a time of rapid change . . . in a period of transition like the present, it is difficult to know how to best prepare young people . . . for rewarding employment, for the future can only be dimly perceived. Yet as difficult as the task is, those responsible for vocational education programs must make decisions, basing them on the best available information (Lewis, May 1984, p. 26).

Kitchell Collins (1978) suggested that when industry and education ignore each other, possible results include schools turning out unqualified workers and industry suffering manpower shortages.

The Task Force for Economic Growth recommended that vocational administrators provide quality assurances in education. Therefore administrators of vocational education "should identify clearly the skills they expect schools to impart" (Education Commission of the States, Task Force on Education for Economic Growth, Action for Excellence, 1983, p. 11).

A very large part of the success of vocational education has been due to the efforts of business, industry, and labor. Vocational education has tended to have the student learn all about an occupation without relating these to industry. (Education Commission of the States, 1983).

According to Sam King (1961), to be most effective, teachers and industrial educators need the support of community industries and the "assistance and criticism of the real workaday world to insure that the educational programs are up to date and the occupational preparation useful" (pp. 2-3).

According to the American Vocational Association President, Rosemary F. Kolde (1985).

> The role of vocational education in preparing the nation's work force is becoming more and more crucial as we move close to the year 2000 . . . . A career will consist of a minimum of 10 jobs, each involving new knowledge, new skills and responsibilities. The ability of learning, and life-long learning will be vital to both the employer and the employee. (p. 102)

Background and Description of the Survey

A study was conducted to identify and verify the competencies that are considered necessary for beginning vocational administrators in Florida. The respondents rated as essential vocational curriculum evaluation and improvement (Mohammed, 1983).

The patterns of Linkage Project investigated the assumption that linkages between training institutions and employers can reduce discrepancies between training programs and employer demands, and hence increase the employability of youth. Training programs at institutions with strong linkages, and that institutional-level linkages were associated with a greater tendency to please local employers in creating or deleting training programs (patterns of linkage between training institutions and private sector employers, 1982, 1982) (Timm, 1983).

To accommodate the technological advances that are rapidly changing the nature and mix of occupations and the skills they require, administrators in vocational/technical education must broaden the scope of training to keep the profession current. It is necessary to identify and understand the needs of business and industry in order to be capable of training technicians and skilled workers to implement the new technologies. As the structure of society itself changes, it is necessary to continue to question one's purpose and mission. Many changes can be expected in educational institutions as society itself becomes more complex (Bice, 1983).

Recommendations to Improve Vocational Education

Should vocational education be planned, operated, and evaluated jointly by education and the business-industry-labor community, or should it be primarily the responsibility of the schools? Should vocational education be subject-matter based, or should it be based on industry standards and job requirements?

The Carl Perkins Vocational Education Act of 1984 spoke to this issue from many angles, placing more emphasis than earlier legislation on access, program improvement, cooperation between public and private sectors (Cross, 1985). John Dewey stated that only new aims can inspire educational effort for clarity and unity. They alone can reduce confusion; if they do not terminate conflict, they will at least render it intelligent and profitable (Archambault, ed., 1964).

Efforts to close the gap between vocational determinators and business and industry leaders were still lacking in 1965 according to Giddings (1965). Education and industry are mutually interdependent to a very high degree, and yet there has been a surprising lack of understanding on both sides, arising, perhaps, simply because neither group has taken the trouble to understand how the other half wins. Principals must provide for curriculum coordination across all academic and vocational education subject areas and throughout all educational levels. Each secondary school should formulate or contribute to a meaningful and cost-efficient regional plan, within state policy guidelines, for providing employment-related education (Giddings, 1965).

Roy W. Roberts (1971) stated that specific needs for vocational education vary among different communities, and therefore it is necessary to determine the specific needs of each community. While no one procedure may be used in all situations, it is possible to outline some general procedures for making the survey.

The challenge for vocational education is enormous. According to Norm Schneider (1984), "business and industry have a voracious and growing appetite for newly trained employees and for maintaining and updating skills for their existing work forces" (p. 34).

Darrell Parks' (1983) implication for vocational education states that "the vocational leaders of tomorrow must demonstrate the ability to bring together diverse viewpoints, attitudes, and expectations regarding education into a viable, productive entity" (pp. 9-10).

Statements like this are heard at virtually every conference held to improve vocational education. Bill Plute (1983) stated that "often, however, educators seem to be giving lip-service to the idea, or passing over it with an air of hopelessness" (p. 11).

A clear statement on a statewide evaluation process is stated by the Committee on Policy Assessment of the National Association of State Councils on Vocational Education (1985).

> The evaluation of vocational educator programs should include, but not be limited to cost-effectiveness, studies placement and follow-up, and other measures designed to determine the degree to which vocational programs are meeting state and local needs include the needs of student, business, industry, and labor. (p. 7)

The participants of a public hearing addressed the need to create partnerships between vocational education, business and industry. The Council members gained added insight into the important part business and industry plays in helping the vocational programs stay up to date and relevant to the local employment needs. They felt that a close link between schools and employers can help ensure that vocational education programs are teaching students the skills that employers will need. Well designed work experience programs help to improve occupational skills and to open employment opportunities for vocational education students. Close ties with business and labor seem to be typical of high quality programs. These links, programs, and ties form the bases of partnerships (Committee on Policy Assessment of the National Association, 1985).

Partnerships and interaction between business and educators in our community have not reached the level that is necessary to design

and deliver vocational education programs that are relevant to industry trends and skills requirements. In order to have better schools and to fulfill the promise of quality education and better jobs for everyone, the schools must be accessible (Committee on Policy Assessment, 1985).

Recommendations for improving existing vocational programs called for "increased communication with employers and better in-house coordination of cluster curriculum activities, improved counseling and job placement activities" (Owens, 1982, p. 79).

Secondary administrators of vocational education according to Grennan (1983) should "begin to continue to deal with the problem of providing students with the necessary instruction and support service to successfully complete vocational programs and enter occupations" (p. 8).

The mission of vocational educators' programs to furnish skilled workers can scarcely be overestimated;

> While all agree that the nature of jobs changes as a result of technological innovation, there seeme to be little agreement among experts regarding the likely nature of those changes over the next 20 years or so and these effects on the education and training required for the new or altered jobs. (Sherman, 1983, p. 9)

The study pointed out that (1) principals should complete one vocational education course and/or internship program with industry; and (2) principals must provide for curriculum coordination across all academic and vocational education subject areas and throughout all educational levels. Within state policy guidelines, each secondary

school should formulate or contribute to a meaningful and cost-efficient regional plan for providing employment-related education (Sherman, 1983).

Summary

The literature and research point out that vocational education is constantly challenged to meet the training needs of business and industry. If vocational administrators are not aware of the training priorotfes of industry leaders, the vocational graduates will not be prepared for successful employment. There must be continuous communication between vocational administrators and industry leaders so that future employees can be trained with the skills required.

Chapter 3

Study Design and Methodology

The purpose of this chapter was to describe the survey design and methodology used to conduct this study. The chapter was divided into three sections. Section one contains a background and description of the survey design. Section two contains the methodology. Section three contains a description of the procedures for data analysis.

Background and Description of the Survey

The Business/Industry Linkage Project Survey (hereafter referred to as BILPS) was the instrument used to collect the data to correlate vocational administrators' perceptions of vocational education with those of business/industry leaders' perceptions in Tennessee. The BILPS was specifically designed to obtain business/industry input on the skills needed by employees and to obtain it in such a way that the data could be analyzed by computer. The analyzed data were to provide direction within each vocational-technical curriculum. The direction defined what importance and to what level of knowledge employers wanted new trade and industrial employees to have in 15 industrial skill categories. The 15 skill topics are: Math, Measuring, Blueprint Reading, Hand Tools, Power Tools, Stationary Equipment, Materials, Electricity, Hydraulics and Pneumatics, Finishes, Fasteners, Bonding, Communications, Free Enterprise System, and Safety.

The BILPS was reviewed by statistical specialists at East Tennessee State University in order to provide for multiple methods of computer analysis on the data and to ensure reliability and validity. The survey format was designed to allow business/industry to respond to the importance and level of knowledge designed for certain identified industrial skill topics. The industrial skill topics were developed through a task force of business/industry people and the Division of Vocational Educational personnel. The task force identified 15 industrial skill topics to be included in the survey. The survey format was also reviewed by Thomas Woolley, Assistant Professor, Medical Education Statistics, Quillen-Dishner College of Medicine, and Susan Twaddle, Consultant, Computer Services, East Tennessee State University.

The survey form was pilot tested on a group of Tennessee employers in two parts of the state. After minor modifications, the survey was validated and printed for use in the Business/Industry Linkage Project.

The Tennessee State Department of Employment Security obtained a valid stratified random sample of Tennessee employers. Employers selected were those in which the majority of their work force was trade and industrial employees.

The Department of Employment Security and the Division of Vocational Education designated four regions of the state to be sampled. The business/industry mix of these four regions was determined to be a composite of the business/industry mix of the entire state. Each region had an equal portion of the sample.

The total survey population was 935 employers. The total survey return was 506 surveys (or 54% return). The survey form selected was brief, concise and easily coded for computer analysis.

Methodology

Permission to use the business/industry linkage survey was obtained from Walter Timm. Surveys were mailed along with a cover letter to all (193) vocational administrators of secondary programs in Tennessee. The letter explained the purpose of the study and assurance that all information was confidential. The doctoral committee members had previously agreed that a 50% (97) return of all secondary vocational administrators in Tennessee would be sufficient for the study. When the predetermined percentage of return was obtained and sufficient time passed (three weeks), the data were compiled. The data were submitted to the East Tennessee State University Computer Center for statistical analysis.

Data Analyses

The purpose of this study was to determine if differences existed between vocational administrators' perceptions of vocational education with business and industry leaders' perceptions in Tennessee. The investigator's concern in this study was to determine the extent of differences between vocational administrators' perceptions of vocational education and perceptions of business and industry leaders in Tennessee. Kolmogorow-Smirnov (K-S) two-sample test was selected to test for significance of differences between business/industry and

vocational administrators. The primary assumptions of the K-S Two-Sample Test are (1) randomness, (2) two independent samples, and (3) the ordinal level of measurement.

The K-S test is easy to compute and is subject to no sample-size restrictions. It has no restrictive distribution assumptions such as normality, and it is properly regarded as one of the better non-parametric two-sample test at the ordinal level of measurement (Champion, 1970).

Chi square was selected to analyze hypotheses 32-46. These hypotheses were tested to determine differences between administrators' perceptions of vocational education with business and industry leaders' perceptions in Tennessee.

Chi square was selected to test for difference between vocational administrators and business/industry leaders in Tennessee. A 2x2 table was constructed in a chi-square test of independence for hypotheses 32-46.

Summary

The methods and procedures utilized for the study were presented in this chapter. The questionnaire used in this study was the same as the questionnaire used in the Business/Industry Linkage Project.

All (193) secondary vocational administrators in the state of Tennessee were mailed the questionnaire. When a return of over 50% (50.2%) was received, the data were processed using the Kolmogorow-Smirnov (K-S Two-sample Test) and Chi-Square procedure.

These procedures were used to determine where significant differences existed between administrators' perceptions of vocational education and business/industry leaders' perceptions.

CHAPTER 4

Presentation and Analyses of Data

Introduction

The purpose of this study was to determine the extent of differences between vocational administrators' perceptions of vocational education and perceptions of business and industry leaders in Tennessee. To facilitate statistical analysis each hypothesis was stated in the null form at .05 level. The chapter has three purposes: to present data, to discuss each hypothesis, and to provide analysis and information when significant differences were noted.

Presentation of Data

The study indicated significant differences in 36 of the 49 statements listed in the survey instrument that was used to determine the extent of differences between vocational administrators' perceptions of vocational education and perceptions of business and industry leaders in Tennessee. No statistically significant differences were revealed in 13 of the 49 hypotheses tested.

Analyses of Data

The data collected were computer analyzed using the non-parametric statistic Kolomogorow-Smirnov Two-sample Test procedure for hypotheses 1 through 31 and 47 through 49.

The Kolmogorow-Smirnov (K-S) Two-Sample Test evaluates the significant differences between two independent samples. The greatest

proportionate difference between the two samples in any given category is used for hypotheses test purposes (Champion, 1970).

The hypothesis test was made at the .05 level of significance using the following formula to obtain the critical value or absolute d:

$$1.36 \sqrt{N_1 + N_2/N_1 N_2}$$

Chi square was used to analyze hypotheses 32 through 45. These hypotheses were tested to determine differences between vocational administrators' perceptions of vocational education with business and industry leaders' perceptions in Tennessee. The .05 level of significance was established for accepting or rejecting the hypotheses of this study.

Chi square (X^2) is a non-parametric test that is used when research data are in the form of frequency counts.

Hypotheses

$H_0$1. There will be no significant difference in perceptions toward various trade, industrial, and maintenance skills for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The business/industry sample consisted of 504 leaders. The vocational administrator sample was 97. A total of 601 responses was analyzed for this competency. The results of the analysis are listed in Table 1. The P value of .308 was greater than the .05 level of significance used to test the hypothesis. No significant difference was found; therefore, the investigator failed to reject the null hypothesis.

Table 1

Comparison Between Perceptions Toward the Various Trade, Industrial, and Maintenance Skills For Entry-Level Employees

Skill Level Needed	Responses of Business Leaders	Responses of Vocational Administrators	Total
Introductory	102 (20.2%)	15 (15.5%)	117 (19.5%
Intermediate Proficiency	165 (32.6%)	26 (26.8%)	191 (31.8%)
Both 1 & 2	237 (47%)	56 (57.7%)	293 (48.8%)
Column Total	504 (83.9%)	97 (16.1%)	601 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.107	.150	*.308

*Not significant at .05 level

$H_0$2. There will be no significant difference in perceptions toward importance rating of the industrial skill topic math for entry-level employees between vocational administrators and business/ industry leaders in Tennessee.

The results of the analysis are listed in Table 2.

The P value of .0005 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis. The importance of math was significantly higher to the vocational administrators than to the business/industry leaders.

$H_0$3. There will be no significant difference in perceptions toward importance rating of the industrial skill topic measuring for entry-level employees between vocational administrators adn business/ industry leaders in Tennessee.

The results of the analysis are listed in Table 3.

The P value of .001 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis. The importance of measuring was significantly higher to the vocational administrators than to the business/industry leaders.

$H_0$4. There will be no significant difference in perceptions toward importance rating of the industrial skill topic blueprint reading for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 4.

Table 2

Comparison Between Perceptions Toward Importance Rating of the Industrial Skill Topic Math for Entry-Level Employees

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	7 (1.4%)	0 (0.0%)	7 (1.2%)
No Importance	7 (1.4%)	0 (0.0%)	7 (1.2%)
Little Importance	22 (4.3%)	0 (0.0%)	22 (3.6%)
Some Importance	160 (31.6%)	12 (12.4%)	172 (28.5%)
Much Importance	171 (33.8%)	57 (58.8%)	228 (27.7%)
Very Much Importance	139 (27.5%)	28 (28.9%)	167 (27.7%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.264	.151	*.0005

*Significant at < .05 level

Table 3

Comparison Between Perceptions Toward Importance Rating of the Industrial Skill Topic Measuring for Entry-Level Employees

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	26 (5.1%)	1 (1.0%)	27 (4.5%)
No Importance	17 (3.4%)		17 (2.8%)
Little Importance	28 (5.5%)		28 (4.6%)
Some Importance	88 (17.4%)	8 (8.2%)	96 (15.9%)
Much Importance	124 (24.5%)	52 (53.6%)	176 (29.2%)
Very Much Importance	223 (44.1%)	36 (37.1%)	259 (43.0%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.221	.151	*.001

*Significant at < .05 level

Table 4

Comparison Between Perceptions Toward Importance Rating of the Industrial Skill Topic Blueprint Reading for Entry-Level Employees

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	101 (20.0%)	3 (3.1%)	104 (17.2%)
No Importance	51 (10.1%)	1 (1.0%)	52 (8.6%)
Little Importance	46 (9.1%)	8 (8.2%)	54 (9.0%)
Some Importance	82 (16.2%)	32 (33.0%)	114 (18.9%)
Much Importance	98 (19.4%)	29 (29.9%)	127 (21.1%)
Very Much Importance	128 (25.3%)	24 (24.7%)	152 (25.2%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.268	.151	*.0005

*Significant at < .05 level

The P value of .0005 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The importance of Blueprint Reading was significantly higher to the vocational administrators than to the business/industry leaders.

$H_0$5. There will be no significant difference in perceptions toward importance rating of the industrial skill topic hand tools for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 5.

The P value of .54 was greater than the .05 level of significance used to test the hypothesis. No significant difference was found; therefore, the investigator failed to reject the null hypothesis.

$H_0$6. There will be no significant difference in perceptions toward importance rating of the industrial skill topic power tools for entry level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 6.

The P value of .257 was greater than the .05 level of significance used to test the hypothesis. No significant difference was found; therefore, the investigator failed to reject the null hypothesis.

$H_0$7. There will be no significant difference in perceptions toward importance rating of the industrial skill topic stationary equipment for entry level employees between vocational administrators and business/industry leaders in Tennessee.

Table 5

Comparison Between Perceptions Toward Importance Rating of the Industrial Skill Topic Hand Tools for Entry-Level Employees

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	22 (4.3%)	3 (3.1%)	25 (4.1%)
No Importance	10 (2.0%)		10 (1.7%)
Little Importance	23 (4.5%)	1 (1.0%)	24 (4.0%)
Some Importance	110 (21.7%)	19 (19.6%)	129 (21.4%)
Much Importance	136 (26.9%)	37 (38.1%)	173 (28.7%)
Very Much Importance	205 (40.5%)	37 (38.1%)	242 (40.1%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.089	.151	*.54

* Not significant at .05 level

Table 6

Comparison Between Perceptions Toward Importance Rating of the Industrial Skill Topic Power Tools for Entry-Level Employees

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	29 (5.7%)	3 (3.1%)	32 (5.3%)
No Importance	15 (3.0%)		15 (2.5%)
Little Importance	28 (5.5%)	2 (2.1%)	30 (5.0%)
Some Importance	110 (21.7%)	19 (19.6%)	129 (21.4%)
Much Importance	143 (28.3%)	36 (37.1%)	179 (29.7%)
Very Much Importance	181 (35.8%)	37 (38.1%)	218 (36.2%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.112	.151	*.257

*Not significant at .05 level

The results of the analysis are listed in Table 7.

The P value of 0.11 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore the investigator rejected the null hypothesis.

The importance of stationary equipment was significantly higher to the vocational administrators than to the business/industry leaders.

$H_0$8. There will be no significant difference in perceptions toward importance rating of the industrial skill topic materials for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 8.

The P value of .009 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore the investigator rejected the null hypothesis.

The importance of materials was significantly higher to the vocational administrators than to the business/industry leaders.

$H_0$9. There will be no significant difference in perceptions toward importance rating of the industrial skill topic electricity for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 9.

The P value of .005 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The importance of electricity was significantly higher to the vocational administrators than to the business/industry leaders.

Table 7

Comparison Between Perceptions Toward Importance Rating of the Industrial Skill Topic Stationary Equipment for Entry-Level Employees

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	58 (11.5%)	5 (5.2%)	63 (10.4%)
No Importance	24 (4.7%)	1 (1.0%)	25 (4.1%)
Little Importance	61 (12.1%)	4 (4.1%)	65 (10.8%)
Some Importance	158 (31.2%)	32 (33.0%)	190 (31.5%)
Much Importance	104 (20.6%)	36 (37.1%)	140 (23.2%)
Very Much Importance	101 (20.0%)	19 (19.6%)	120 (19.9%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.180	.151	*.011

* Significant at < .05 Level

Table 8

Comparison Between Perceptions Toward Importance Rating of the Industrial Skill Topic Materials for Entry-Level Employees

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	48 (9.5%)	3 (3.1%)	51 (8.5%)
No Importance	34 (6.7%)	1 (1.0%)	35 (5.8%)
Little Importance	57 (11.3%)	5 (5.2%)	62 (10.3%)
Some Importance	128 (25.3%)	29 (29.9%)	157 (26.0%)
Much Importance	138 (27.3%)	45 (46.4%)	183 (30.3%)
Very Much Importance	101 (20.0%)	14 (14.4%)	115 (19.1%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.182	.151	* .009

*Significant at < .05 level

Table 9

Comparison Between Perceptions Toward the Importance Rating of the Industrial Skill Topic Electricity for Entry-level Employees

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	66 (13.0%)	3 (3.1%)	69 (11.4%)
No Importance	46 (9.1%)	1 (1.0%)	47 (7.8%)
Little Importance	88 (17.4%)	5 (5.2%)	93 (15.4%)
Some Importance	122 (24.1%)	45 (46.4%)	167 (27.7%)
Much Importance	79 (15.6%)	32 (33.0%)	111 (18.4%)
Very Much Importance	105 (20.8%)	11 (11.3%)	116 (19.2%)
Column Total	507 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.302	.151	* .005

*Significant at < .05 level

$H_0$10. There will be no significant difference in perceptions toward importance rating of the industrial skill topic hydraulics and pneumatics for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 10.

The P value of .026 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The importance of hydraulics and pneumatics was significantly higher to the vocational administrators than to the business/industry leaders.

$H_0$11. There will be no significant difference in perceptions toward importance rating of the industrial skill top finishes for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 11.

The P value of < .05 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis

The importance of finishes was significantly higher to the vocational administrators than to the business/industry leaders.

$H_0$12, There will be no significant difference in perceptions toward importance rating of the industrial skill topic fasteners for entry-level emplyees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis was listed in Table 12.

Table 10

Comparison Between Perceptions Toward Importance Rating of the Industrial Skill Topic Hydraulics and Pneumatics for Entry-Level Employees

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	95 (18.8%)	12 (12.4%)	107 (17.7%)
No Importance	71 (14.0%)	4 (4.1%)	75 (12.4%)
Little Importance	85 (16.8%)	17 (17.5%)	102 (16.9%)
Some Importance	105 (20.8%)	43 (44.3%)	148 (24.5%)
Much Importance	83 (16.4%)	17 (17.5%)	100 (16.6%)
Very Much Importance	67 (13.2%)	4 (4.1%)	71 (11.8%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.163	.151	*.026

* Significant at < .05 level

Table 11

Comparison Between Perceptions Toward Importance Rating of Industrial Skill Topic Finishes for Entry-Level Employees

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	137 (27.1%)	8 (8.2%)	145 (24.0%)
No Importsnce	80 (15.8%)	3 (3.1%)	83 (13.8%)
Little Importance	81 (16.0%)	13 (13.4%)	94 (15.6%)
Some Importance	91 (18.0%)	43 (44.3%)	134 (22.2%)
Much Importance	52 (10.3%)	27 (27.8%)	79 (13.1%)
Very Much Importance	65 (12,8%)	3 (3.1%)	68 (11.3%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.342	.151	* < .05

* Significant at < .05

Table 12

Comparison Between Perceptions Toward Importance Rating of the Industrial Skill Topic Fasteners for Entry-Level Employees

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	107 (21.1%)	6 (6.2%)	113 (18.7%)
No Importance	67 (13.2%)	2 (2.1%)	69 (11.4%)
Little Importance	67 (13.2%)	10 (10.3%)	77 (12.8%)
Some Importance	109 (21.5%)	45 (46.4%)	154 (25.5%)
Much Importance	79 (15.6%)	27 (27.8%)	106 (17.6%)
Very Much Importance	77 (15.2%)	7 (7.2%)	84 (13.9%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.291	.151	* .0005

*Significant at < .05 level

The P value of .0005 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The importance of fasteners was significantly higher to the vocational administrators than to the business/industry leaders.

$H_0$13. There will be no significant difference in perceptions toward importance rating of the industrial skill topic bonding for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 13.

The P value of < .05 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The importance of bonding was significantly higher to the vocational administrators than to the business/industry leaders.

$H_0$14. There will be no significant difference in perceptions toward importance rating of the industrial skill topic communications for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 14.

The P value of .0005 was less than the ,05 level of significance used to test the hypothesis. Significant difference was found; therefore the investigator rejected the null hypothesis.

The importance of communications was significantly higher to the vocational administrators than to the business/industry leaders.

Table 13

Comparison Between Perceptions Toward Importance Rating of the Industrial Skill Topic Bonding for Entry-Level Employees

Importance	Responses of Business Leaders	Reponses of Vocational Administrators	Total
Not Applicable	130 (25.7%)	8 (8.2%)	138 (22.9%)
No Importance	61 (12.1%)	1 (1.0%)	62 (10.3%)
Little Importance	89 (17.6%)	13 (13.4%)	102 (16.9%)
Some Importance	105 (20.8%)	42 (43.3%)	147 (24.4%)
Much Importance	65 (12.8%)	28 (28.9%)	93 (15.4%)
Very Much Importance	56 (11.1%)	5 (5.2%)	61 (10.1%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.327	.151	* < .05

Significant at < .05 level

Table 14

Comparison Between Perceptions Toward Importance Rating of the Industrial Skill Topic Communications for Entry-Level Employees

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	42 (8.3%)	1 (1.0%)	43 (7.1%)
No Importance	30 (5.9%)	2 (2.1%)	32 (5.3%)
Little Importance	47 (9.3%)	3 (3.1%)	50 (8.3%)
Some Importance	122 (24.1%)	9 (9.3%)	131 (21.7%)
Much Importance	123 (24.3%)	46 (47.4%)	169 (28.0%)
Very Much Importance	142 (28.1%)	36 (37.1%)	178 (29.5%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.322	.151	* .0005

* Significant at < .05 level

$H_0$15. There will be no significant difference in perceptions toward importance rating of the industrial skill topic free enterprise system for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 15.

The P value of .022 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The importance of free enterprise system was significantly higher to the vocational administrators than to the business industry leaders.

$H_0$16. There will be no significant difference in perceptions toward importance rating of the industrial skill topic safety for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 16.

The P value of .0005 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The importance of safety was significantly higher to the vocational administrators than to the business/industry leaders.

$H_0$17. There will be no significant difference in perceptions toward levels of knowledge desired of the industrial skill topic math for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 17.

Table 15

Comparison Between the Perceptions Toward Importance Rating of the Industrial Skill Topic Free Enterprise System for Entry-Level Employees

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	50 (9.9%)	2 (2.1%)	52 (8.6%)
No Importance	40 (7.9%)	1 (1.0%)	41 (6.8%)
Little Importance	41 (8.1%)	6 (6.2%)	47 (7.8%)
Some Importance	111 (21.9%)	29 (29.9%)	140 (23.2%)
Much Importance	111 (21.9%)	43 (44.3%)	154 (25.5%)
Very Much Importance	153 (30.2%)	16 (16.5%)	169 (28.0%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.166	.151	* .022

* Significant at < .05 level

Table 16

Comparison Between Perceptions Toward Importance Rating of the Industrial Skill Topic Safety for Entry-Level Employees

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	3 (0.6%)		3 (0.5%)
No Importance	2 (0.4%)	1 (1.0%)	3 (0.5%)
Little Importance	5 (1.0%)		5 (0.8%)
Some Importance	56 (11.1%)	3 (3.1%)	59 (9.8%)
Much Importance	91 (18.0%)	3 (3.1%)	94 (15.6%)
Very Much Importance	349 (69.0%)	90 (92.8%)	439 (72.8%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.238	.151	* .0005

*Significant at < .05 level

Table 17

Comparison Between Perceptions Toward Levels of Knowledge Desired of the Industrial Skill Topic Math for Entry-Level Employees

Levels of Knowledge	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	8 (1.6%)	2 (2.1%)	10 (1.7%)
Introductory	96 (19.0%)	4 (4.1%)	100 (16.6%)
Intermediate	208 (41.1%)	28 (28.9%)	236 (39/1%)
Proficient	88 (17.4%)	33 (34.0%)	121 (20.1%)
Introductory/Intermediate	35 (6.9%)	10 (10.3%)	45 (7.5%)
Introductory/Proficient	15 (3.0%)	5 (5.2%)	20 (3.3%)
Intermediate Proficient	56 (11.1%)	15 (15.5%)	71 (11.8%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.266	.151	* .0005

* Significant at < .05 level

The level of math knowledge desired by vocational administrators was significantly higher than business/industry leaders. Business/industry leaders desired intermediate level math knowledge.

$H_0$18. There will be no significant difference in perceptions toward levels of knowledge desired of the industrial skill topic measuring for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results are listed in Table 18.

The P value of .205 was greater than the .05 level of significance used to test the hypothesis. No significant difference was found; therefore, the investigator failed to reject the null hypothesis.

$H_0$19. There will be no significant difference in perceptions toward levels of knowledge desired of the industrial skill topic blueprint reading for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 19.

The P value of .001 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The level of blueprint reading knowledge desired by vocational administrators was significantly higher than business/industry leaders. Business leaders equally rated these levels of knowledge--introductory, intermediate, and proficiency.

$H_0$20. There will be no significant difference in perceptions toward levels of knowledge desired of the industrial skill topic hand

Table 18

Comparison Between Perceptions Toward Levels of Knowledge Desired of the Industrial Skill Topic Measuring for Entry-Level Employees

Levels of Knowledge	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	29 (5.7%)	2 (2.1%)	31 (5.1%)
Introductory	83 (16.4%)	8 (8.3%)	91 (15.1%)
Intermediate	133 (26.3%)	28 (28.9%)	161 (26.7%)
Proficient	154 (30.4%)	31 32.0%)	185 (30.7%)
Introductory-Intermediate	29 (5.7%)	11 (11.3%)	40 (6.6%)
Introductory/Proficient	28 (5.5%)	3 (3.1%)	31 (5.5%)
Intermediate/Proficient	50 (9.9%)	14 (14.4%)	64 (10.6%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.118	.151	* .205

* Not significant at .05 level

Table 19

Comparison Between Perceptions Toward Levels of Knowledge Desired of the Industrial Skill Topic Blueprint Reading for Entry-level Employees

Levels of Knowledge	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	156 (30.8%)	9 (9.3%)	165 (27.4%)
Introductory	90 (17.8%)	32 (33.0%)	122 (20.2%)
Intermediate	89 (17.6%)	23 (23.7%)	112 (18.6%)
Proficient	88 (17.4%)	10 (10.3%)	98 (16.3%)
Introductory/Intermediate	27 (5.3%)	5 (5.2%)	32 (5.3%)
Introductory/Proficient	23 (4.5%)	8 (8.2%)	31 (5.1%)
Intermediate/Proficient	33 (6.5%)	10 (10.3%)	43 (7.1%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.216	.151	* .001

* Significance at < .05 level

tools for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 20.

The P value of .289 was greater than the .05 level of significance used to test the hypothesis. No significant difference was found; therefore, the investigator failed to reject the null hypothesis.

$H_0$21. There will be no significant difference in perceptions toward levels of knowledge desired of the industrial skill topic power tools for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 21.

The P value of .404 was greater than the .05 level of significance used to test the hypothesis. No significant difference was found; therefore, the investigator failed to reject the hypothesis.

$H_0$22. There will be no significant difference in perceptions toward levels of knowledge desired of the industrial skill topic stationary equipment for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 22.

The P value of .024 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The level of stationary equipment knowledge desired by vocational administrators was significantly higher than business/industry leaders. Business/industry leaders desired introductory level stationary equipment knowledge.

Table 20

Comparison Between Perceptions Toward Levels of Knowledge Desired of the Industrial Skill Topic Hand Tools for Entry-Level Employees

Levels of Knowledge	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	26 (5.1%)	4 (4.1%)	30 (5.0%)
Introductory	82 (16.2%)	8 (8.2%)	90 (14.9%)
Intermediate	161 (31.8%)	29 (29.9%)	190 (31.5%)
Proficient	143 (28.3%)	29 (29.9%)	172 (28.5%)
Introductory/Intermediate	28 (5.5%)	8 (8.2%)	36 (6.0%)
Introductory/Proficient	30 (5.9%)	4 (4.1%)	34 (5.6%)
Intermediate/Proficient	36 (7.1%)	15 (15.5%)	51 (8.5%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.109	.151	* .289

*Not significant at .05 level

Table 21

Comparison Between Perceptions Toward Levels of Knowledge Desired of the Industrial Skill Topic Power Tools for Entry-Level Employees

Levels of Knowledge	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	44 (8.7%)	4 (4.1%)	48 (8.0%)
Introductory	93 (18.4%)	13 (13.4%)	106 (17.6%)
Intermediate	153 (30.2%)	29 (29.9%)	182 (30.2%)
Proficient	121 (23.9%)	25 (25.8%)	146 (24.2%)
Introductory/Intermediate	30 (5.9%)	8 (8.2%)	38 (6.3%)
Introductory/Proficient	26 (5.1%)	7 (7.2%)	33 (5.5%)
Intermediate/Proficient	39 (7.7%)	11 (11.3%)	50 (8.4%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.099	.151	* .404

*Not Significant at .05 level

Table 22

Comparison Between Perceptions Toward Levels of Knowledge Desired of the Industrial Skill Topic Stationary Equipment for Entry-Level Employees

Levels of Knowledge	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applidable	92 (18.2%)	9 (9.3%)	101 (16.7%)
Introductory	153 (30.2%)	22 (22.7%)	175 (29.0%)
Intermediate	111 (21.9%)	30 (30.9%)	141 (23.4%)
Proficient	66 (13.0%)	10 (10.3%)	76 (12.6%)
Introductory/Intermediate	25 (4.9%)	10 (10.3%)	35 (5.8%)
Introductory/Proficient	24 (4.7%)	7 (7.2%)	31 (5.1%)
Intermediate/Proficient	35 (6.9%)	9 (9.3%)	44 (7.3%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.165	.151	* .024

* Significant at < .05 level

$H_0$23. There will be no significant difference in perceptions toward levels of knowledge desired of the industrial skill topic materials for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 23.

The P value of .314 was greater than the .05 level of significance used to test the hypothesis. No significant difference was found; therefore the investigator failed to reject the null hypothesis.

$H_0$24. There will be no significant difference in perceptions toward levels of knowledge desired of the industrial skill topic electricity for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 24.

The P value of .013 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The level of electricity knowledge desired by vocational administrators was significantly higher than business/industry leaders. Business/industry leaders desired an introductory level of electricity equipment knowledge.

$H_0$25. There will be no significant differences in perceptions toward levels of knowledge desired of the industrial skill topic hydraulics and pneumatics for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 25.

Table 23

Comparison Between Perceptions Toward Levels of Knowledge Desired of the Industrial Skill Topic Materials for Entry-Level Employees

Levels of Knowledge	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	80 (15.8%)	5 (5.2%)	85 (14.1%)
Introductory	158 (31.2%)	31 (32.0%)	189 (31.3%)
Intermediate	139 (27.5%)	31 (32.0%)	170 (28.2%)
Proficient	53 (10.5%)	7 (7.2%)	60 (10.0%)
Introductory/Intermediate	30 (5.9%)	8 (8.2%)	38 (6.3%)
Introductory/Proficient	21 (4.2%)	7 (7.2%)	28 (4.6%)
Intermediate/Proficient	25 (4.9%)	8 (8.2%)	33 (5.5%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.107	.151	* .314

*Not significant at < .05 level

Table 24

Comparison Between Perceptions Toward Levels of Knowledge Desired of the Industrial Skill Topic Electricity for Entry-Level Employees

Levels of Knowledge	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	115 (22.7%)	5 (5.2%)	110 (19.9%)
Introductory	153 (30.2%)	32 (33.0%)	185 (30.7%)
Intermediate	94 (18.6%)	24 (24.7%)	118 (19.6%)
Proficient	63 (12.5%)	9 (9.3%)	72 (11.9%)
Introductory/Intermediate	30 (5.9%)	16 (16.5%)	46 (7.6%)
Introductory/Proficient	26 (5.1%)	8 (8.2%)	34 (5.6%)
Intermediate/Proficient	25 (4.9%)	3 (3.1%)	28 (4.6%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.176	.151	* .013

* Significant at < .05 level.

Table 25

Comparison Between Perceptions Toward Levels of Knowledge Desired of the Industrial Skill Topic Hydraulics and Pneumatics for Entry-Level Employees

Levels of Knowledge	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	161 (31.8%)	5 (19.6%)	180 (29.9%)
Introductory	147 (29.1%)	43 (44.3%)	190 (31.5%)
Intermediate	98 (19.4%)	15 (15.5%)	113 (18.7%)
Proficient	35 (6.9%)	5 (5.2%)	40 (6.6%)
Introductory/Intermediate	27 (5.3%)	7 (7.2%)	34 (5.6%)
Introductory/Proficient	21 (4.2%)	7 (7.2%)	28 (4.6%)
Intermediate/Proficient	17 (3.4%)	1 (1.0%)	18 (3.0%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.122	.151	* .175

* Not significant at .05 level

The P value of .175 was greater than the .05 level of significance used to test the hypothesis. No significant difference was found; therefore, the investigator failed to reject the null hypothesis.

$H_0$26. There will be no significant difference in perceptions toward levels of knowledge desired of the industrial skill topic finishes for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 26.

The P value of .0005 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The level of finishes knowledge desired by vocational administrators was significantly higher than business/industry leaders. Business/industry leaders desired an introductory level of finishes knowledge.

$H_0$27. There will be no significant difference in perceptions toward levels of knowledge desired of the industrial skill topic fasteners for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 27.

The P value of .002 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The level of fasteners knowledge desired by vocational administrators was significantly higher than business/industry leaders. Business/industry leaders desired introductory level fasteners.

Table 26

Comparison Between Perceptions Toward Levels of Knowledge Desired of the Industrial Skill Topic Finishes for Entry-Level Employees

Levels of Knowledge	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	205 (40.5%)	14 (14.4%)	219 (36.3%)
Introductory	142 (28.1%)	38 (39.2%)	180 (20.0%)
Intermediate	77 (15.2%)	16 (16.5%)	93 (15.4%)
Proficient	35 (6.9%)	7 (7.2%)	42 (7.0%)
Introductory/Intermediate	20 (4.0%)	12 (12.4%)	32 (5.3%)
Introductory/Proficient	19 (3.8%)	7 (7.2%)	26 (4.3%)
Intermediate/Proficient	8 (1.6%)	3 (3.1%)	11 (1.8%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.261	.151	* .0005

*Significant at < .05 level

Table 27

Comparison Between Perceptions Toward Levels of Knowledge Desired For the Industrial Skill Topic Fasteners for Entry-Level Employees

Levels of Knowledge	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	155 (30.6%)	10 (10.3%)	165 (27.4%)
Introductory	161 (31.8%)	40 (41.2%)	201 (33.3%)
Intermediate	84 (16.6%)	21 (21.6%)	105 (17.4%)
Proficient	41 (8.1%)	4 (4.1%)	45 (7.5%)
Introductory/Intermediate	28 (5.5%)	15 (15.5%)	43 (7.1%)
Introductory/Proficient	18 (3.6%)	4 (4.1%)	22 (3.6%)
Intermediate/Proficient	19 (3.8%)	3 (3.1%)	22 (3.6%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.203	.151	* .002

*Significant at < .05 level

$H_0$28. There will be no significant difference in perceptions toward levels of knowledge desired of the industrial skill topic bonding for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 28.

The P value of .0005 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The level of bonding knowledge desired by vocational administrators was significantly higher than business/industry leaders. Business/Industry leaders desired introductory level bonding equipment knowledge.

$H_0$29. There will be no significant difference in perceptions toward levels of knowledge of the industrial skill topic communication for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 29.

The P value of .001 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The level of communication knowledge desired by vocational administrators was significantly higher than business/industry leaders. Business/industry leaders desired intermediate level communication knowledge.

Table 28

Comparison Between Perceptions Toward Levels of Knowledge Desired of the Industrial Skill Topic Bonding for Entry-Level Employees

Levels of Knowledge	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	199 (39.3%)	13 (13.4%)	212 (35.2%)
Introductory	138 (27.3%)	43 (44.3%)	181 (30.0%)
Intermediate	75 (14.8%)	18 (18.6%)	93 (15.4%)
Proficient	38 (7.5%)	4 (4.1%)	42 (7.0%)
Introductory/Intermediate	24 (4.7%)	10 (10.3%)	34 (5.6%)
Introductory/Proficient	16 (3.2%)	7 (7.2%)	23 (3.8%)
Intermediate/Proficient	16 (3.2%)	2 (2.1%)	18 (3.0%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.259	.151	* .0005

* Significant at < .05 level

Table 29

Comparison Between Perceptions Toward Levels of Knowledge Desired of the Industrial Skill Topic Communication for Entry-Level Employees

Levels of Knowledge	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	67 (13.2%)	4 (5.2%)	72 (11.9%)
Introductory	120 (23.7%)	10 (10.3%)	130 (21.6%)
Intermediate	134 (26.5%)	30 (30.9%)	164 (27.2%)
Proficient	99 (19.6%)	25 (25.8%)	124 (20.6%)
Introductory/Intermediate	34 (6.7%)	6 (6.2%)	40 (6.6%)
Introductory/Proficient	24 (4.7%)	7 (7.2%)	31 (5.1%)
Intermediate/Proficient	28 (5.5%)	14 (14.4%)	42 (7.0%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critica; Value	Actual P
.215	.151	* .001

*Significant at < .05 level

$H_0$30. There will be no significant difference in perceptions toward levels of knowledge desired of the industrial skill topic free enterprise system for entry-level employees between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 30.

The P value of .775 was greater than the .05 level of significance used to test the hypothesis. No significant difference was found; therefore, the investigator failed to reject the null hypothesis.

$H_0$31. There will be no significant difference in perceptions toward levels of knowledge desired of the individual skill topic safety for entry-level employees between vocational administration and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 31.

The P value of .0005 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The level of safety knowledge desired by vocational administrators was significantly higher than business/industry leaders. Business/industry leaders desired proficient level safety (48.8%) knowledge while 75.3% administrators selected the proficient level.

$H_0$32. There will be no significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic math between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 32.

Table 30

Comparison Between Perceptions Toward Levels of Knowledge Desired of the Industrial Skill Topic Free Enterprise System for Entry-Level Employees

Levels of Knowledge	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	84 (16.6%)	9 (0.3%)	93 (15.4%)
Introductory	126 (23.9%)	26 (26.9%)	152 (25.2%)
Intermediate	115 (22.7%)	32 (33.0%)	147 (24.4%)
Proficient	108 (21.3%)	14 (14.4%)	122 (20.2%)
Introductory/Intermediate	32 (6.3%)	7 (7.2%)	39 (6.5%)
Introductory/Proficient	22 (4.3%)	2 (2.1%)	24 (4.0%)
Intermediate/Proficient	19 (3.8%)	7 (7.2%)	26 (4,3%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.073	.151	* .775

*Not significant at .05 level

Table 31

Comparison Between Perceptions Toward Levels of Knowledge Desired of the Individual Skill Topic Safety for Entry-Level Employees

Levels of Knowledge	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	2 (.4%)	3 (3.1%)	5 (.8%)
Introductory	47 (9.3%)	2 (2.1%)	49 (8.1%)
Intermediate	124 (24.5%)	5 (5.2%)	129 (21.4%)
Proficient	247 (48.8%)	73 (75.3%)	320 (53.1%)
Introductory/Intermediate	17 (3.4%)		17 (2.8%)
Introductory/Proficient	23 (4.5%)	3 (3.1%)	26 (4.3%)
Intermediate/Proficient	46 (9.1%)	11 (11.3%)	57 (9.5%)
Column Total	507 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.239	.151	* .0005

*Significant at < .05 level

Table 32

Comparison Between Perceptions Toward Uses or Future Uses of Computer Control of Computer Assisted Devices With the Industrial Skill Topic Math

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Important	221 (43.6%)	68 (70.1%)	289 (47.9%)
Not Important	285 (56.3%)	29 (29.9%)	314 (52.1%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

$X^2 = 21,73734$ $df = 1$ $p < .0005$

It was hypothesized that there would be no significant difference in perceptions toward uses or future uses of computer or computer control in math. With a chi-square analysis of 21.73734 and a level of significance less than .05 it was concluded that a significant difference existed; therefore, the investigator rejected the null hypothesis that there would be no significant difference.

$H_0$33. There will be no significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic measuring betweeen vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 33.

Table 33

Comparison Between Perceptions Toward Uses or Future Uses of Computer Control or Computer Assisted Devices With the Industrial Skill Topic Measuring

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Important	162 (32.0%)	49 (50.5%)	211 (35.0%)
Not Important	344 (68.0%)	48 (49.5%)	392 (65.0%)
Column Total	506 (83.9%)	95 (16.1%)	603 (100.0%)

X^2 = 11.44635 df = 1 P = .0007

It was hypothesized that there would be no significant difference in perceptions toward uses or future uses of computer or computer control in measuring. With a chi-square analysis of 11.44635 and a level of significance less than .05 it was concluded that a significant difference existed; therefore, the investigator rejected the null hypothesis that there would be no significant difference.

$H_0$34. There will be no significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic blueprint reading between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 34.

Table 34

Comparison Between Perceptions Toward Uses or Future Uses of Computer Control or Computer Assisted Devices With the Industrial Skill Topic Blueprint Reading

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Important	109 (21.5%)	43 (44.3%)	153 (25.2%)
Not Important	397 (78.5%)	54 (55.7%)	451 (74.8%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

$X^2 = 21.22815$ df = 1 P < .00005

It was hypothesized that there would be no significant difference in perceptions toward uses or future uses of computer or computer control in blueprint reading. With a chi-square analysis of 21.22815 and a level of significance less than .05, it was included that a significant difference existed; threfore, the investigator rejected the null hypothesis that there would be no significant difference.

$H_0$35. There will be no significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic hand tools between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 35.

Table 35

Comparison Between Perceptions Toward Uses or Future Uses of Computer Control or Computer Assisted Devices With the Industrial Skill Topic Hand Tools

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Important	44 (8.7%)	13 (13.4%)	57 (9.5%)
Not Important	462 (91.3%)	84 (86.6%)	546 (90.5%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

$X^2 = 1.59247$ df = 1 P = .207

It was hypothesized that there would be no significant difference in perceptions toward uses or future uses of computer or computer control in hand tools. With a chi-square of 1.59247 and a level of significance greater than .05 it was concluded that no significant difference existed; therefore, the investigator failed to reject the null hypothesis that there would be no significant difference.

$H_0$36. There will be no significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic power tools1 between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 36.

Table 36

Comparison Between Perceptions Toward Uses or Future Uses of Computer Control or Computer Assisted Devices With the Industrial Skill Topic Power Tools

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Important	68 (13.4%)	26 (26.8%)	94 (15.6%)
Not Important	438 (86.6%)	71 (73.2%)	509 (84.4%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

$X^2 = 10.05750$ df = 1 O = .0015

It was hypothesized that there would be no significant difference in perceptions toward uses or future uses of computer or computer control in power tools. With a chi-square of 10.05750 and a level of significance less than .05 it was concluded that a significant difference existed; therefore, the investigator rejected the null hypothesis that there would be no significant difference.

$H_0$37. There will be no significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic stationary equipment between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 37.

Table 37

Comparison Between Perceptions Toward Uses or Future Uses of Computer Control or Computer Assisted Devices With the Industrial Skill Topic Stationary Equipment

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Important	110 (21.7%)	35 (36.1%)	145 (24.0%)
Not Important	396 (78.3%)	62 (63.9%)	458 (76.0%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

$X^2 = 8.40017$ df = 1 P = .0038

It was hypothesized that there would be no significant difference in perceptions toward uses or future uses of computer or computer control in stationary equipment. With a chi-square of 8.40017 and a level of significance less than .05 it was concluded that a significant difference existed; therefore, the investigator rejected the null hypothesis that there would be no significant difference.

$H_0$38. There will be no significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic materials between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 38.

Table 38

Comparison Between Perceptions Toward Uses or Future Uses of Computer Control or Computer Assisted Devices with the Industrial Skill Topic Materials

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Important	107 (21.1%)	35 (36.1%)	143 (23.5%)
Not Important	399 (78.9%)	62 (63.9%)	461 (76.5%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

X^2 - 9.27373 df=1 P = .0023

It was hypothesized that there would be no significant difference in perceptions toward uses or future uses of computer or computer control in materials. With a chi-square of 9.27373 and a level of significance less than .05 it was concluded that a significant difference existed; therefore, the investigator rejected the null hypothesis that there would be no significant difference.

$H_0$39. There will be no significant difference in perceptions toward uses of future uses of computer control or computer assisted devices with the industrial skill topic electricity between vocational administrators and business/industry leaders in Tennessee

The results of the analysis are listed in Table 39.

Table 39

Comparison Between Perceptions Toward Uses or Future Uses of Computer Control or Computer Assisted Devices With the Industrial Skill Topic Electricity

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Important	105 (20.8%)	45 (46.4%)	150 (24.9%)
Not Important	401 (79.2%)	52 (53.5%)	453 (76.1%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

$X^2 = 27.28035$ df = 1 P < .00005

It was hypothesized that there would be no significant difference in perceptions toward uses or future uses of computer or computer control in electricity. With a chi-square of 27.28035 and a level of significance less than .05 it was concluded that a significant difference existed; therefore, the investigator rejected the null hypothesis that there would be no significant difference.

$H_0$40. There will be no significant differences in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic hydraulics and pneumatics between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 40.

Table 40

Comparison Between Perceptions Toward Uses or Future Uses of Computer Control or Computer Assisted Devices With the Industrial Skill Topic Hydraulics and Pneumatics

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Important	75 (14.8%)	30 (30.9%)	105 (17.4%)
Not Important	431 (85.2%)	67 (69.1%)	498 (82.6%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

$X^2 = 13.58324$ df = 1 0 = .0002

It was hypothesized that there would be no significant difference in perceptions toward uses or future uses of computer or computer control in hydraulics and pneumatics. With a chi-square of 13.58324 and a level of significance less than .05 it was concluded that a significant difference existed; therefore, the investigator rejected the null hypothesis that there would be no significant differences.

$H_0$41. There will be no significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic finishes between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 41.

Table 41

Comparison Between Perceptions Toward Uses or Future Uses of Computer Control or Computer Assisted Devices With the Industrial Skill Topic Finishes

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Important	32 (6.3%)	10 (10.3%)	42 (7.0%)
Not Important	474 (93.7%)	87 (89.7%)	561 (93.0%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

X^2 = 1.42730 df = 1 P = .2322

It was hypothesized that there would be no significant difference in perceptions toward uses or future uses of computer or computer control in finishes. With a chi-square of 1.42730 and a level of significance greater than .05 it was concluded that no significant difference existed; therefore, the investigator failed to reject the null hypothesis that there would be no significant difference.

$H_0$42. There will be no significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic fasteners between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 42.

Table 42

Comparison Between Perceptions Toward Uses or Future Uses of Computer Control or Computer Assisted Devices With the Industrial Skill Topic Fasneners

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Important	29 (5.7%)	9 (9.3%)	38 (6.3%)
Not Important	477 (94.3%)	88 (90.7%)	565 (93.7%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

X^2 = 1.8573 df = 1 P = .2762

It was hypothesized that there would be no significant difference in perceptions toward uses or future uses of computer or computer control in fasteners. With a chi square of 1.8573 and a level of significance greater than .05 it was concluded that no significant difference existed; therefore, the investigator failed to reject the null hypothesis that there would be no significant difference.

$H_0$43. There will be no significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic bonding between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 43.

Table 43

Comparison Between Perceptions Toward Uses or Future Uses of Computer Control or Computer Assisted Devices With the Industrial Skill Topic Bonding

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Important	17 (3.4%)	14 (14.4%)	31 (5.1%)
Not Important	489 (96.6%)	83 (85.6%)	572 (94.9%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

X^2 = 18.35847 df = 1 P < .00005

It was hypothesized that there would be no significant difference in perceptions toward uses or future uses of computer or computer control in bonding. With a chi-square of 18.35847 and a level of significance less than .05 it was concluded that a significant difference existed; therefore, the investigator rejected the null hypothesis that there would be no significant difference.

$H_0$44. There will be no significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic communications between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 44.

Table 44

Comparison Between Perceptions Toward Uses or Future Uses of Computer Control or Computer Assisted Devices With the Industrial Skill Topic Communications

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Important	140 (27.7%)	57 (58.8%)	197 (32.7%)
Not Important	366 (72.3%)	40 (41.2%)	406 (67.3%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

$X^2 = 34.37914$ df = 1 P < .00005

It was hypothesized that there would be no significant difference in perceptions toward uses or future uses of computer or computer control in communications. With a chi-square of 34.37914 and a level of significance less than .05 it was concluded that a significant differences existed; therefore, the investigator rejected the null hypothesis that there would be no significant difference.

$H_0$45. There will be no significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic free enterprise system between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 45.

Table 45

Comparison Between Perceptions Toward Uses or Future Uses of Computer Control or Computer Assisted Devices With the Industrial Skill Topic Free Enterprise System

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Important	50 (9.9%)	16 (16.5%)	66 (10.9%)
Not Important	456 (90.1%)	81 (83.5%)	537 (89.1%)
Column Total	507 (83.9%)	97 (16.1%)	603 (100.0%)

X^2 = 3.00538 df=1 P = .083

It was hypothesized that there would be no significant difference in perceptions toward uses or future uses of computer or computer control in free enterprise system. With a chi-square of 3.00538 and a level of significance greater than .05 it was concluded that no significant difference existed; therefore, the investigator failed to reject the null hypothesis that there would be no significant difference.

$H_0$46. There will be no significant difference in perceptions toward uses or future uses of computer control or computer assisted devices with the industrial skill topic safety between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 46.

Table 46

Comparison Between Perceptions Toward Uses or Future Uses of Computer Control or Conputer Assisted Devices With the Industrial Skill Topic Safety

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Important	70 (13.8%)	35 (36.1%)	105 (17.4%)
Not Important	436 (86.2%)	62 (63.9%)	498 (82.6%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

$X^2 = 26.49127$ $df = 1$ $P < .00005$

It was hypothesized that there would be no significant difference in perceptions toward uses or future uses of computer or computer control in safety. With a chi-square of 26.49127 and a level of significance less than .05 it was concluded that a significant difference existed; therefore, the investigator rejected the null hypothesis that there would be no significant difference.

$H_0 47$. There will be no significant difference in perceptions toward training future employees in principles of industrial robotics between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 47.

The P value of .0005 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

Table 47

Comparison Between Perceptions Toward Training Future Employees in Principles of Industrial Robotics

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	172 (34.0%)	13 (13.4%)	185 (30.7%)
No Importance	78 (15.4%)	4 (4.1%)	82 (13.6%)
Little Importance	69 (13.6%)	13 (13.4%)	82 (13.6%)
Some Importance	103 (20.4%)	38 (39.2%)	141 (23.4%)
Much Importance	53 (10.5%)	25 (25.8%)	78 (12.9%)
Very Much Importance	31 (6.1%)	4 (4.1%)	35 (5.8%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.321	.151	* .005

*Significant at < .05 level

The importance of robotics was rated significantly higher by the vocational administrators.

$H_0$48. There will be no significant difference in perceptions toward training future employees in principles, operation, application, understanding, etc., of computers between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 48.

The P value of .0005 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore, the investigator rejected the null hypothesis.

The importance of computers was rated significantly higher by the vocational administrators.

$H_0$49. There will be no significant difference in perceptions toward levels of importance desired or the industrial topic work habits between vocational administrators and business/industry leaders in Tennessee.

The results of the analysis are listed in Table 49.

The P value of .041 was less than the .05 level of significance used to test the hypothesis. Significant difference was found; therefore the investigator rejected the null hypothesis. The importance of Work Habits was rated significantly higher by the vocational administration.

Table 48

Comparison Between Perceptions Toward Training Future Employees in Principles, Operation, Application, Understanding, Etc., of Computers

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	67 (13.2%)	6 (6.2%)	73 (12.1%)
No Importance	59 (11.7%)		59 (9.8%)
Little Importance	52 (10.3%)	3 (3.1%)	55 (9.1%)
Some Importance	144 (28.5%)	34 (35.1%)	178 (29.5%)
Much Importance	126 (24.9%)	42 (43.3%)	168 (27.9%)
Very Much Importance	58 (11.5%)	12 (12.4%)	70 (11.6%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.259	.151	* .0005

* Significant at < .05 level

Table 49

Comparison Between Perceptions Toward Levels of Importance Desired of the Industrial Topic Work Habits

Importance	Responses of Business Leaders	Responses of Vocational Administrators	Total
Not Applicable	4 (.8%)	3 (3.1%)	7 (1.2%)
No Importance	7 (1.4%)		7 (1.2%)
Little Importance	3 (.6%)		3 (.5%)
Some Importance	20 (4.0%)	1 (1.0%)	21 (3.5%)
Much Importance	86 (17.0%)	4 (4.1%)	90 (14.9%)
Very Much Importance	386 (76.3%)	89 (91.8%)	475 (78.8%)
Column Total	506 (83.9%)	97 (16.1%)	603 (100.0%)

K-S Two-Sample Test

Absolute d	Critical Value	Actual P
.155	.151	* .041

* Significant at < .05 level

Summary

The purpose of this study was to determine the extent of differences between vocational administrators' perceptions of vocational education and perceptions of business and industry leaders in Tennessee. All secondary vocational administrators from Tennessee were involved in the study. They were asked to provide imput on the skills needed by entry-level employees.

In addition, they were asked to what importance and to what level of knowledge vocational administrators want a new trade and industrial vocational student to have in 15 industrial skill categories. The 15 industrial skill topics were: Math, Measuring, Blueprint Reading, Hand Tools, Power Tools, Stationary Equipment, Materials, Electricity, Hydraulics and Pneumatics, Finishes, Fasteners, Bonding, Communication, Free Enterprise System, and Safety,

The study indicated significant differences in 36 of the 49 hypotheses tested. In all instances which rejected the null hypotheses, the vocational administrators rated the survey item significantly higher.

CHAPTER 5

Summary, Findings, Conclusions, and Implications

This chapter contains a summary of the study, findings based on analyses of the data, conclusions, and implications based on the findings of the study.

Summary

The problem of this study was to determine if differences existed between vocational administrators' perceptions of vocational education with business and industry leaders' perceptions in Tennessee. The investigator's concern in this study was to determine the extent of differences between vocational administrators' perceptions of vocational education and perceptions of business and industry leaders in Tennessee.

The Business/Industry Linkage Project Survey developed by Walter H. Timm, was selected as the instrument for use in this study. The BILPS was specifically designed to obtain business/industry input on the skills needed by entry level employees and to obtain it in such a way that the data could be analyzed by computer.

The business/industry sample consisted of 506 leaders. The vocational administrators sample was 97. This research analyzed a total of 603 responses to determine the extent of difference between vocational administrators' perception of vocational education and perception of business and industry leaders in Tennessee.

The non-parametric statistic Kolomogorow-Smirnov two-sample test procedure was used to determine if significant differences existed

for hypotheses 1-31 and 47-39. Chi square was used to determine if significant differences existed for hypotheses 32-46. The .05 level of significance was established for accepting or rejecting the hypotheses of this study. In all instances where the null hypothesis was rejected, the vocational administrators rated the survey item significantly higher.

Findings

From the results of the data analysis and interpretation, significant differences were revealed in 36 of the 49 hypotheses tested. Findings are reported as they pertain to each of the hypotheses originally formulated.

A summary of Survey Section I (see Appendix C), General Questions, showed that administrators and business leaders demonstrated agreement that entry level employees would need either introductory or intermediate/proficient level skills.

The summary of Survey Section II (see Appendix C), Importance Rating, showed that administrators rated the importance significantly higher for 13 of the 15 topics (Math, Measuring, Blueprint Reading, Stationary Equipment, Materials, Electricity, Hydraulics and Pneumatics, Finishes, Fasteners, Bonding, Communications, Free Enterprise System, and Safety). For the remaining two topics (Hand Tools and Power Tools, the vocational administrators and Business/Industry leaders agreed on their importance.

The summary of Section III (See Appendix C), Levels of Knowledge desired, showed that administrators rated the level of knowledge desired significantly higher for 9 of the 15 topics (Math, Blueprint

Reading, Stationary Equipment, Electricity, Finishes, Fasteners, Bonding, Communications, and Safety). For the remaining six topics (Measuring, Hand Tools, Materials, Hydraulics and Pneumatics, and Free Enterprise System), the vocational administrators and business leaders were in agreement as to the level of knowledge desired.

A summary of Section IV (see Appendix C), special questions, showed that the use of computer controlled (CNC or NC) or computer assisted devices was rated significantly higher by the vocational administrators in 11 of the 15 topics (Math, Measuring, Blueprint Reading, Power Tools, Stationary Equipment, Materials, Electricity, Hydraulics and Pneumatics, Bonding, Communications, and Safety). For the remaining four topics, (Hand Tools, Finishes, Fasteners, Free Enterprise System), the vocational administrators and Business/ Industry leaders were in agreement.

In relationship to the uses of Section IV, industrial robotics, computers, and work habits, the vocational administrators rated the importance significantly higher.

Conclusions

The following conclusions were determined from the study:

1. Vocational administrators maintained a more positive attitude toward importance rating and level of knowledge for entry-level employees on all 15 topics (Math, Measuring, Blueprint Reading, Hand Tools, Power Tools, Stationary Equipment, Materials, Electricity, Hydraulics and Pneumatics, Finishes, Fasteners, Bonding, Communication,

Free Enterprise System, and Safety) than did the Business/Industry Leaders.

2. Vocational administrators' responsiveness to the uses or future uses of computer controlled or computer assisted devices were demonstrated by administrators scoring higher on all skill categories than did the Business/Industry Leaders.

3, Vocational administrators' aspirations and expectations of future employees in related work habits such as: punctuality, initiative and dependability were more positive than the Business/ Industry Leaders.

Implications

As a result of the findings of the study, the researcher recommended the following:

1. Business/Industry leaders and vocational administrators should share in the decision making, planning and implementation process of vocational education.

2. Local vocational administrators should develop better and appropriate mechanisms to involve business and industry in vocational program development and evaluation.

3. Another study should be conducted to determine the working relationship of business and industry with local vocational administrators.

4. Perhaps other states could replicate this study, possibly even a national study, to determine the differences that exist between business and industry leaders' perceptions of vocational education and perceptions by vocational administrators on the same topic.

5. The Tennessee State Board of Education should take additional steps to insure greater involvement of business and industry leaders in all levels of vocational education.

6. Increased efforts at the state level to improve the flexibility and responsiveness of vocational educators could provide the impetus for vocational education to meet the needs that are demanded by the work of work and the demands of those who seek a place in the world.

7. Finally, a study should be conducted to determine the working relationships of vocational administrators with vocational teachers.

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APPENDICES

APPENDIX A

PERMISSION TO USE BUSINESS/INDUSTRY LINKAGE STUDY

East Tennessee State University
Department of Supervision and Administration • Box 19000A • Johnson City, Tennessee 37614-0002 • (615) 929-4415, 4430

February 25, 1985

Dr. Walter H. Tims, Jr.
Vice-President, Faculty and Programs
Isothermal Community College
P. O. Box 804
Spindale, NC 28160-0804

Dear Dr. Tims:

I am a doctoral student at East Tennessee State University, Johnson City, Tennessee. I am interested in using your Business/Industry Linkage Study to correlate with my dissertation.

If you have a copy of the study available, I would like a copy of it and permission to use the study. Permission to use and reproduce the survey included would also be appreciated.

If you would like to receive a summary of the findings of my research, please advise me.

Sincerely,

George E Bell

George E. Bell
Doctoral Fellow
501 West Main St.
Jonesborough, TN 37659

William T. Acuff

William T. Acuff
Chairman, Doctoral Program

CEB:mj

Isothermal Community College
P. O. Box 804
Spindale, N. C.
28160-0804

Dr. Walter H. Timm, Jr.
Vice-President, Faculty and Programs

Telephone No.
704-286-3636

March 1, 1985

Mr. George E. Bell
Doctoral Fellow
501 W. Main Street
Jonesborough, TN 37659

Dear Mr. Bell:

I would be pleased to have you use my Business/Industry Linkage Study for correlation with your dissertation. You also have my permission to copy and use the study and also the survey included in the study.

I would like to receive a summary of the findings in your research when completed.

Sincerely,

Walter H. Timm, Jr., Ed.D.
Vice President, Faculty and Programs

hd

cc: Mr. William T. Acuff

APPENDIX B

CORRESPONDENCE TO VOCATIONAL DIRECTORS

East Tennessee State University
Department of Supervision and Administration • Box 19000A • Johnson City, Tennessee 37614-0002 • (615) 929-4415, 4430

March 7, 1985

Dear Principal/Vocational Director:

I am currently involved in research for my dissertation leading to a doctorate in educational administration from East Tennessee State University. The study is correlating secondary vocational administrators' perceptions of vocational trade and industrial curriculum content and emphasis on education in Tennessee with the perceptions of business and industry leaders on the same topics.

This survey should be completed by the administrator responsible for the trade and industry program in your school. Please answer the questions as you perceive the desires of business and industry leaders' emphasis in your area. The actual answering of questions on the survey should take just a few minutes of your time. Comments concerning any part of the survey are appreciated.

All information is strictly confidential. Neither your name nor your school's name will be associated with the information you provide. The survey is coded only to assist in the data collection process.

Your contribution is appreciated. Please return the completed survey as promptly as possible in the enclosed stamped self-addressed envelope. If you would like to receive a summary of the findings of this research, please advise me.

Thank you very much.

Sincerely,

George Edward Bell

George Edward Bell
Doctoral Fellow
501 West Main Street
Jonesborough, TN 37659

William T. Acuff

William T. Acuff
Chairman, Doctoral Program

Enclosure

East Tennessee State University
Department of Supervision and Administration • Box 19000A • Johnson City, Tennessee 37614-0002 • (615) 929-4415, 4430

April 10, 1985

Dear Principal/Vocational Director:

Several weeks ago I mailed you a letter asking you or the administrator responsible for the trade and industry program in your school to complete a survey of perceptions of vocational trade and industrial curriculum content and emphasis on education in Tennessee. I have had good response from many schools; however, thus far I have not received your completed survey. It is important that your perception be included in this study so that an accurate correlation with the perceptions of business and industry leaders might be obtained.

If you have not returned the completed survey, would you please have the appropriate administrator forward it to me at the earliest convenience. Please disregard this request if you have already responded to the survey.

I am grateful for the time and cooperation you have given me in this important research study.

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

Sincerely,

George E. Ball
Doctoral Fellow
501 West Main Street
Jonesborough, TN 37659

GEB:nj

APPENDIX C

BUSINESS/INDUSTRY LINKAGE STUDY

BUSINESS/INDUSTRY LINKAGE PROJECT

SURVEY DIRECTIONS AND ASSUMPTIONS

Please mark the entire survey taking into consideration the following assumptions:

1. Assume that the economy is in a recovery mode and will continue to improve.
2. Take into consideration the most typical levels of training and related education needed for the various entry-level job openings in your firm.
3. Keep in mind the broad spectrum of trade, industrial, maintenance, and related entry-level positions instead of only one particular entry-level job area.
4. Keep in mind that we are interested in your estimate of what kinds and levels of training and education a possible new employee should have.

Section I
GENERAL QUESTIONS

1. Among the various entry-level trade, industrial, maintenance and related positions in your firm, from which category below would you want to hire? (Circle one depending on your job needs.) Brief Definitional Terms are provided for your convenience on the information sheet.

   a) Someone who has introductory skills gained in several vocational areas instead of in-depth skills in one vocational area.

   b) Someone who has intermediate or proficient skills gained at the secondary or post-secondary level in one vocational area.

   c) Certain entry-level positions would need someone with the requirements of (a), and other entry-level positions would need someone with the requirements of (b).

2. Does your firm have an in-house training program (such as informal or formal apprenticeship training) for new entry-level trade, industrial, maintenance and related employees?

   Mark (x) on one answer: Yes _____, No _____

Section II
IMPORTANCE RATING

Before rating the importance, see the information sheet for a brief explanation of the topics.

Instructions:

Rate each topic as to how important it is to you when you consider hiring a new person for any trade, industrial, maintenance or related entry-level position.

Rating Code:

Na — Not applicable to your company needs; 1 — No importance; 2 — Little importance; 3 — Some importance; 4 — Much importance; 5 — Very much importance

Circle only one response for each topic

Na 1 2 3 4 5 Math
Na 1 2 3 4 5 Measuring
Na 1 2 3 4 5 Blue Print Reading
Na 1 2 3 4 5 Hand Tools
Na 1 2 3 4 5 Power Tools
Na 1 2 3 4 5 Stationary Equipment
Na 1 2 3 4 5 Materials
Na 1 2 3 4 5 Electricity
Na 1 2 3 4 5 Hydraulics and Pneumatics
Na 1 2 3 4 5 Finishes
Na 1 2 3 4 5 Fasteners
Na 1 2 3 4 5 Bonding
Na 1 2 3 4 5 Communications
Na 1 2 3 4 5 Free Enterprise System
Na 1 2 3 4 5 Safety

Section III
LEVELS OF KNOWLEDGE DESIRED

In the various trade, industrial, maintenance and related entry-level positions in business/industry, employers seek to hire individuals who best meet their job requirements. These requirements vary with the different entry-level jobs within the firm itself.

Please mark this section taking into consideration all the different levels of training and related education needed for the various entry-level job openings in your firm now and in the future.

For a brief explanation of the topics, please see the information sheet.

Instructions

Mark the highest level of knowledge that you would desire in a new employee for entry-level trade, industrial, maintenance, or related positions. Also mark the lowest level of knowledge that you would accept in a new employee. In some instances, both levels of knowledge may be the same so one (x) would be appropriate.

Rating Code:

Not Applicable to your company, Introductory Knowledge — lowest level, Intermediate Knowledge — moderate level; Proficient Knowledge — highest level

Example answers:

Topics	Levels of Knowledge Desired			
Hand Tools	Not Applicable	Introductory Knowledge	Intermediate Knowledge	~~Proficient Knowledge~~
Math	Not Applicable	Introductory Knowledge	~~Intermediate Knowledge~~	~~Proficient Knowledge~~
Finishes	~~Not Applicable~~	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge
Electricity	Not Applicable	~~Introductory Knowledge~~	Intermediate Knowledge	~~Proficient Knowledge~~

All the above examples have valid answers based on the various job requirements for the different entry-level jobs in a firm.

Using the above instructions and the example answers now mark the section below.

Topics	Levels of Knowledge Desired			
Math	Not Applicable	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge
Measuring	Not Applicable	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge
Blue Print Reading	Not Applicable	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge
Hand Tools	Not Applicable	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge
Power Tools	Not Applicable	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge
Stationary Equipment	Not Applicable	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge
Materials	Not Applicable	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge
Electricity	Not Applicable	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge
Hydraulics & Pneumatics	Not Applicable	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge
Finishes	Not Applicable	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge
Fasteners	Not Applicable	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge
Bonding	Not Applicable	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge
Communications	Not Applicable	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge
Free Enterprise System	Not Applicable	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge
Safety	Not Applicable	Introductory Knowledge	Intermediate Knowledge	Proficient Knowledge

Section IV
SPECIAL QUESTIONS

1. Below are 15 industrial skill categories. Please circle any of these in which your company uses or foresees the use of computer control (CNC or NC) or computer assisted devices.

Math	Electricity
Measuring	Hydraulics and Pneumatics
Blue Print Reading	Finishes
Hand Tools	Fasteners
Power Tools	Bonding
Stationary Equipment	Communications
Materials	Free Enterprise System
	Safety

2. How important do you regard the training of your future employees in the principles of industrial robotics?:

   Rating Code:

   Na — not applicable to your company needs; 1 — No importance; 2 — Little importance; 3 — Some importance; 4 — Much importance; 5 — Very much importance

   Circle one Na 1 2 3 4 5

3. How important do you regard the training of your future employees in the principles, operation, application, understanding, etc. of computers?

   Rating Code:

   Na — not applicable to your company needs; 1 — No importance; 2 — Little importance; 3 — Some importance; 4 — Much importance; 5 — Very much importance

   Circle one Na 1 2 3 4 5

4. How important do you regard the training of your future employees in related work habits such as: punctuality, initiative, dependability, etc.?

   Rating Code:

   Na — not applicable to your company needs; 1 — No importance; 2 — Little importance; 3 — Some importance; 4 — Much importance; 5 — Very much importance

   Circle one Na 1 2 3 4 5

COMMENTS

Comments concerning any part of the survey or any part of vocational-technical education are appreciated. _____

INFORMATION SHEET

DEFINITION OF TERMS

Introductory Skills — The ability to identify and understand items such as hand tools. Limited hands-on capability, but orientation to the skills needed.

Intermediate Skills — The ability in the introductory skill level plus demonstrate moderate hands-on skills and understanding.

Proficient Skills — The ability to work with minimum supervision for a good portion of the time. Take directions and then accomplish the task.

BRIEF TOPIC EXPLANATION

MATH — Example competencies: Be able to add, subtract, multiply, divide, calculate with whole numbers, fractions, decimals; calculate using the English and Metric system; compute algebraic equations; solve geometric formulas; apply mathematical knowledge to practical job related uses.

MEASURING — Example competencies: Measure within a 32nd inch using standard rule or scale; measure within 1 mm using a metric rule or scale; measure with a micrometer; measure with inside and outside calipers.

BLUE PRINT READING — Example competencies: Understand the alphabet of lines (object lines, section lines, hidden lines, etc.); read dimensions using the English and Metric system of measurement; read actual-size drawings and scale drawings; read various views in drawings such as orthographic projections, sectional views, and framing plans; understand common symbols and abbreviations.

HAND TOOLS — Example competencies: Identify and properly use hand saws, wrenches, various screwdrivers, chisels, drilling and boring tools, various pliers, vise grips, files, etc.

POWER TOOLS — Example competencies: Properly use a portable electric drill, saber saw, portable sander, circular saw.

STATIONARY EQUIPMENT — Example competencies: Properly use a radial arm saw, jointer, table saw, drill press, band saw, lathe, shaper, planer, milling machine, grinder, printing equipment.

MATERIALS — Example competencies: Identify sheetmetal guage (thickness); identify and properly use hot-rolled steel, cold-rolled steel, alloy steel, and nonferrous metals; identify and properly use plywood, building board, wood, plastic, fiberglass, various kinds of paper, etc.

ELECTRICITY — Example competencies: Properly use basic electrical test instruments; troubleshoot series and paralleled circuits with test instruments; identify basic electrical components such as resistors, capacitors, inductors, and transistors; read simple electrical and electronic schematics; check for open circuit, shorted circuit and grounded circuit using multimeter or continuity tester.

HYDRAULICS AND PNEUMATICS — Example competencies: Operate pneumatic power tools; operate hydraulic equipment.

FINISHES — Example competencies: Apply finishes with a suction feed gun, brush, roller, pad, etc.; apply protective coatings such as lacquer, varnish, synthetics, paints (oil and water base), etc.; prepare wood and metal surfaces for finishes; understand the electroplating process; perform mechanical treatments such as polishing and burnishing, understand the use of finishes on paper, wood, metals, etc.

FASTENERS — Example competencies: Identify fastener head types and their uses (flat, oval, pan, etc.); identify and use fastener thread types (external, internal, right-hand, left-hand), identify forms and their uses (American National Coarse, American National Fine, etc.); identify and properly use the family of bolts, nuts, washers, screws, nails, rivets, keys, keyseats, pins, staples.

BONDING — Example competencies: Perform soldering, brazing, welding; proper use of adhesive bonding agents such as thermoplastic material, thermosetting materials or a combination of both; proper use of adhesives such as white liquid glue, plastic resin glue, resorcinol resin glue, animal glue, etc.

COMMUNICATION — Example competencies: Write using complete sentences; fill out job applications; communicate verbally using proper English; read and comprenend assignments; read and understand parts and service manuals.

FREE ENTERPRISE SYSTEM — Example competencies: Understand how the individual fits into the free enterprise system; proper handling of personal finances; take personal pride in workmanship; motivate employees to work cooperatively with management; understand and appreciate the profit-loss needs of business/industry.

SAFETY — Example competencies: Proper use of all types of fire extinguishers; know and practice safety rules in two categories: a) general shop safety and b) personal safety rules; know basic first aid procedures; demonstrate good housekeeping and cleanup; demonstrate courtesy to other workers.

VITA

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