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PROGRAMS FOR VOCATIONAL-TECHNICAL EDUCATION
TEACHERS.

The Ohio State University, Ph.D., 1974
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ESSENTIAL DIMENSIONS OF AN INFORMATION SYSTEM TO FACILITATE AWARENESS OF BUSINESS AND INDUSTRY PROGRAMS FOR VOCATIONAL-TECHNICAL EDUCATION TEACHERS

DISSERTATION
Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By
Roy Lynn Butler, B.S., M.S.

The Ohio State University 1974

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CHAPTER I

THE PROBLEM AND ITS SETTING

Introduction

It is difficult for vocational-technical education teachers to stay abreast of changes in business and industry. As managers of learning experiences and conveyors of knowledge to students, it is imperative that vocational-technical education teachers be up-to-date about the work environment their students will encounter. Being aware of this situation and the changes occurring in the world of work, many businesses across the country have begun to provide access to business and industry programs, courses, and experiences to help vocational-technical education teachers keep up-to-date professionally, to expand their knowledge, and to improve their technical skills.

Such efforts are in line with the urging of the U.S. Chamber of Commerce for all businessmen to offer every resource, process, and technique at their command to help perfect efficient and productive public educational systems (U.S. Chamber of Commerce, 1970, 1973). Unfortunately, business and industry offerings for vocational-technical education teachers have not been adequately announced (Evans, 1971a).
Through a modified Delphi research approach, this study attempted to converge the opinions of experts from vocational-technical education and business and industry concerning the essential dimensions and feasibility of an information system to announce these opportunities. Such a system would have potential for providing a central register of information on business and industry personnel development programs, courses, and experiences available to vocational-technical education teachers.

Need for the Study

Vocational education leadership personnel have recognized the problems associated with obsolescence of teacher knowledge about business and industry for many years. Work experience prior to certification has been a requirement for most vocational-technical education teachers. It is through work experience that a person learns the skills and customs of the occupations to be taught; it provides a basis for instructional content; and, more importantly, it gives the teacher insight into the occupational environment for which students are being prepared (Barlow, 1971).

Despite the value of pre-service occupational experience, too little attention has been given to in-service occupational updating of vocational-technical education teachers. Further, the greatest amount of in-service education is accomplished on a purely voluntary and
individually planned basis by vocational-technical education teachers (Evans, 1971b). The same observation was made by Weaver (1943) three decades ago and he noted that vocational teachers often have a rather narrow awareness of the possibilities which might be arranged for credit to upgrade competencies.

Many opportunities exist for vocational-technical education teachers to update their knowledge about the world of work. Occupational experience programs for vocational-technical teachers with business and industry cooperative linkages have been identified in eleven universities (Beasley and Smiley, 1971). In addition, business and industry offer "high quality and extremely intensive instruction and some of the best vocational-technical teachers regularly take advantage of such opportunities to keep up-to-date" (Evans, 1971b:207). However, as was noted earlier, vocational-technical education teachers often have a limited awareness of these learning opportunities. To alleviate the awareness problem, Evans has emphasized:

... A nationwide communications network announcing the availability of applications for enrollment in industry-operated schools would be a tremendous forward step in in-service education (Evans, 1971b:208).

Others have advanced similar expressions of need (Ginsberg, 1971; Burt and Lessinger, 1970; Northern California Industry-Education Council, 1971). More recently, the National Advisory Council on Education Professions
Development (January, 1973) cited the need for a national "Directory of Training Opportunities" which would describe education professions development programs available in both public and private agencies to vocational education personnel. However, at this time, a network does not exist to assemble information about these learning opportunities, nor has an effort been made on the national level to establish one.

It is imperative that an investigation be conducted to determine the essential dimensions and feasibility aspects which should be considered in any effort to design a national information system to announce business and industry personnel development opportunities that are available to vocational-technical education teachers.

An information system capable of compiling such data could aid schools and colleges of education, as well as local education agencies, to become aware of business and industrial firms with which they might cooperate in both preservice and in-service education for vocational-technical education teachers. Knowledge of the availability of these learning opportunities for vocational-technical education teachers could prevent needless duplication of expensive physical plant and equipment, and, more importantly, provide needed education which would not otherwise be available in a given locality. An information system of this nature could potentially increase a vocational-technical education
teacher's awareness of in-service educational opportunities which offer direct involvement in business and industry. Business and industry could benefit by awareness of personnel development programs offered in other business concerns. Participation in business and industry could aid vocational-technical education teachers in guiding students into satisfying careers. Also, increased involvement of business and industry in providing in-service education could make them more aware of, and confident in, vocational and technical education programs. Finally, ascertaining the essential dimensions and feasibility of such an information system would provide a basis and direction for further developmental activity in this important area.

Statement of the Problem

The literature supports the need for more effective strategies of vocational-technical education teacher development, particularly as it relates to occupational updating. Vocational-technical education teacher participation in business and industry programs is one means of updating occupational competencies and an increasing number of these opportunities are available. However, most of these opportunities are not brought to the attention of vocational-technical education teachers outside of the immediate geographical area in which they are offered. The concept of a national information system is one strategy proposed by both
business and industry and vocational education leaders to alleviate the problem. However, the essential dimensions of such an information system have not been identified, nor has it been determined whether it would be feasible to operate an information system of this nature.

Since operation of the system would require cooperation between vocational educators and business and industry personnel, there is a need for studies to identify critical concerns of both parties. Figure 1 schematically portrays the study phases needed. The present study will accomplish Phases I and II shown on Figure 1. Identifying areas of agreement and disagreement among experts in business and industry and vocational education concerning the essential dimensions and feasibility of the basic system design will provide a basis and direction for follow-on studies in Phases III through V.

**Purposes and Objectives of the Study**

The primary purpose of this study was to identify and describe the essential dimensions of a national information system for acquiring, processing, and disseminating information about business and industry personnel development programs available to vocational-technical education teachers. A secondary purpose of the study was to determine the feasibility of operating the information system.
Figure 1.—Research and Development Needed to Operationalize an Information System to Facilitate Awareness of Business and Industry Programs for Vocational–Technical Education Teachers
The specific objectives of the study were:

1. To identify essential dimensions of the information system as perceived by business and industry personnel development specialists, state vocational-technical education personnel development specialists, and vocational-technical education teachers.

2. To identify the areas of agreement and disagreement between the above groups concerning essential dimensions which would need to be accommodated to operate the information system.

3. To determine the feasibility of operating the information system.

Answers were sought for the following questions to accomplish the above objectives:

1. What kinds of information should the information system operators acquire about business and industry programs for vocational-technical education teachers?

2. What problems would be encountered in acquiring information about business and industry programs for vocational-technical education teachers?

3. What services should the information system provide?

4. What products should the information system provide?
5. What major constraints would be encountered in operating the information system?

6. In what kind of agency should the central coordination take place?

7. When should an information system of this nature be established?

8. What would vocational-technical education and business and industry personnel do to either encourage or discourage the establishment of the information system?

9. What agreement and disagreement exists between business and industry and vocational-technical education personnel concerning the essential dimensions of the information system?

10. What value does business and industry and vocational-technical education personnel place on the information system in terms of its potential usefulness to their work?

11. How might such a system be financed?

12. Would it generally be feasible to operate the information system? More specifically, to what extent does business and industry, vocational-technical personnel development specialists, and vocational-technical education teachers have the need, desire, and capability to utilize an information system of this nature?
Delimitations

Delimitations specifying boundaries of this study included the following:

1. No attempt was made to establish or test the operation of the information system.

2. The study was limited to a purposively selected panel of respondents composed of vocational-technical education teachers, personnel development specialists in business and industry, and vocational-technical education professional development specialists.

Assumptions

The following assumptions were made in relation to this study:

1. In order to perform with maximum effectiveness, vocational-technical education teachers must have up-to-date knowledge about the business and industry environment their students may encounter.

2. The essential dimensions and feasibility of an information system to facilitate awareness of business and industry programs for vocational-technical education teachers can be appropriately identified through the use of an adaptation of the Delphi technique.
**Definition of Terms**

The following definitions are provided to clarify the usage of various terms in this study:

**In-service education** is a self-renewing educational process focused on professionally related needs and tasks which serve as a basis for improvement of instruction, understanding occupational and technological changes, and attainment of other identified objectives.

**Vocational-technical education personnel development specialists** are persons in decision-making or advisory roles relating to vocational teacher education and vocational education program improvement.

**Information system** involves two-way interaction processes which connect resource systems with user clientele.

**Personnel development activities courses, programs, and other experiential opportunities** which will serve to further develop and improve vocational-technical education teacher performance.

**Vocational and technical education teachers** refers to full or part-time vocational and technical education teachers employed in public high schools, area vocational and technical schools, or post-secondary institutions such as community or junior colleges.
Business and industry representatives refers to purposively selected business and industrial firms with training programs previously identified by other researchers.
CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

An intensive search was conducted to identify research and literature related to this study. The work of others is significant in terms of methodological contributions, as well as substantive findings. Most of the information contained in this section was obtained from *Research in Education*, *Abstracts of Research and Related Materials in Vocational and Technical Education*, and from the holdings of the Research Library in The Center for Vocational and Technical Education located at The Ohio State University.

The related literature is presented in the following order:

1. Business/industry and education cooperation.
2. College and certification credit for teacher participation in business and industry personnel development activities.
6. Designing information systems and some alternative approaches to determining essential dimensions.
7. A review of some existing business and industry personnel development information system mechanisms.
8. Consensus converging research techniques. Most of the last portion is devoted to discussing the Delphi Technique since it was used in the conduct of the study.

Business/Industry and Education Cooperation

Since the inception of Federal support for vocational-technical education in 1917 with the Smith-Hughes Act, various efforts have been made to increase interaction between business/industry and vocational-technical education. These efforts have been primarily directed toward improving vocational-technical education program offerings to increase each student's chances of finding and pursuing a satisfying and rewarding career.

This review focuses on cooperative activities between business/industry and education. Attention also is given to potential activities that leaders in business/industry, government, and education express as being needed and desirable.
Recent Federal Legislation

The Vocational Amendments of 1968 (Public Law 90-576) mandated a closer relationship between vocational-technical education and industry, business, agriculture, and the professions. Among the provisions (Title 3, Section 303 (a) (3), the law directed the U.S. Commissioner of Education to collect and disseminate business and industrial information for the improvement of education. Specifically, the U.S. Commissioner of Education was directed to "develop on both formal and informal bases, a close liaison for interchange of ideas and information with representatives of American business and with service, labor and other organizations, both public and private, to advance American education." (Vocational Education Amendments of 1968)

Following the direction provided by the law and precedents of the past, the U.S. Commissioner of Education has convened various regional meetings and supported the idea of working closely with advisory committees. However, the real potential of these kinds of combined efforts has seldom been realized and they have tended to underscore the need to develop greater cooperation and communication between public education and business/industry (Johnson, 1971; Finley, 1973).

Education Professions Development Act

The Education Professions Development Act (EPDA), Section 553, Part F, provided funds to augment existing
professional development programs, with special emphasis on satisfying the needs created by the Vocational Education Amendments of 1968. Administered by the National Center for Improvement of Educational Systems (NICES) in the U.S. Office of Education, annual grant awards are authorized to states to conduct personnel development activities where limited or no funds are otherwise available. These guidelines and the provisions of EPDA require each State Division of Vocational Education to carefully assess its professional development needs in vocational-technical education and to survey gaps which must be closed if the basic provisions of the 1968 Vocational Education Amendments are to be fulfilled. Thus, EPDA provided a basis for the State Division of Vocational Education to exert a stronger influence on the direction of vocational-technical education professional personnel development. Thirty-three states have now appointed Part F Coordinators to give direction to vocational education personnel development efforts.

The Center for Occupational Education at Raleigh, North Carolina conducted a national survey to identify the various activities that have evolved in the states as a result of EPDA (Shook 1973). The survey revealed that various states have conducted or are in the process of conducting a variety of programs involving various approaches to update the occupational competence of vocational-technical education teachers, as well as other personnel in
vocational education. Most of the programs are designed and operated by each state for their own personnel, however, many of the programs are open to selected out-of-state vocational-technical education personnel. None of the EPDA projects focus on developing an information system to give visibility to business and industry oriented personnel development opportunities which are available to vocational and technical education teachers.

The National Advisory Council on Education Professions Development (1973) recently recommended that each state develop ways to force colleges and universities to train vocational-technical education personnel in badly needed specialities. Using Federal money as a lever, the Council recommended that each state be permitted to receive Federal funds for vocational-technical personnel development only if it:

- Develops plans to certify the occupational competency of vocational-technical education teachers at the time of employment, and periodically thereafter.
- Develops reciprocity agreements for vocational certifications across state lines.
- Sets up a state unit with full time personnel to develop and plan vocational-technical education personnel development programs.
- Arranges for college and in-service credit for occupational credit for vocational-technical education professionals.
- Advertises all vacant vocational-technical education professional positions on a regional or nation-wide basis.
Makes sure there are agencies to provide large city systems, as well as regional systems for sparsely populated areas of a state, with in-service education for vocational-technical education personnel. (NACEPD, 1973)

Further, the Council recommended that state vocational-technical education personnel development units be funded on a consortium basis in order to provide vocational-technical education personnel development programs in new occupational fields, sparsely populated states, and in occupational fields that are too specialized to justify a program in each state.

The Council found geographic mobility of vocational-technical education personnel is very low and they recommend the above actions as a step toward scattering the best teachers across the country. At the same time, occupational experience gained in another part of the country may enable vocational-technical personnel to better prepare their students for geographic mobility which is inherent in many occupations and careers.

A Legislative Proposal for Occupational and Vocational Education, currently being drafted by Dr. William Pierce, Deputy Commissioner, Bureau of Occupational and Adult Education, U.S. Office of Education, combines the salient features of the Vocational Education Amendments of 1968, Part F of the Education Professions Development Act (EPDA), and the Education Amendments of 1972 into one authority. One section entitled "Special Projects for Innovative Purposes" states:
Grants under this section may be used for projects and activities such as (1) exchange of vocational education teachers and other staff members with skilled technicians or supervisors in industry, including mutual arrangements for both preserving employment and retirement status and other employment benefits during the period of exchange, and the development and operation of cooperative programs involving periods of teaching in schools, inviting vocational education, and of the experience in commercial, industrial, or other public or private employment related to this subject matter taught in such schools; (2) in-service training programs for vocational education teachers and other staff members . . .; (3) short term or regular session institutes, or other preservice and in-service training programs or projects designed to improve the qualifications of persons entering and re-entering the field of vocational education . . . (Pierce, 1974)

If enacted, this consolidation of laws should help build a stronger linkage between business and industry and vocational-technical education.

A Fragile Partnership

The relationship between the world of education and the world of business has been recently referred to as a "fragile partnership," despite all the efforts over the past half century to make it a strong one (Finley, 1973). This same notion was advanced nearly ten years earlier when business/industry and education conferees at a national meeting generally expressed the idea that advisory committees, and other projects have been too superficial, short-lived, and ineffective to improve business/industry and education communication and cooperation (Barnes, 1965). In the same vein, Johnson (1971) reported similar findings
from a series of 16 small unstructured conferences between businessmen and educators. Participants were usually at management levels in business or at administrative levels in education. A common thread of concern ran through all of the conferences: business, industry, and the schools have failed to interact closely; business and industry wants to interact more closely with the school and school personnel; educators are becoming more interested in the business and industrial world; and the failure to interact closely has contributed to the transition problems of youth from school to work.

Stanley (1973), a businessman, echoed the same concern regarding the lack of interaction between the education and business communities. He claims that today's students are not being prepared for tomorrow's world because of the failure of responsible businessmen and educators to seriously interact to improve educational programs. In answering the question "Why have educators and businessmen failed to interact?", he suggests:

The fault lies, as most faults do, with both parties in question. In the past, business had little use for the world of education because education has tended to be a mystical responsibility of the select few. Educators have tended to say, "We will do only what we think needs to be done, in ways only we can understand." Education has ignored the business world, too, largely because business has not been vocal enough in expressing its needs or active enough in making its resources available (Stanley, 1973:188).
Other reasons have been expressed to indicate why business/industry and education have failed to interact more closely. In a public policy statement, the National Association of Manufacturers (n.d.) claims the problem is two-pronged: (1) educators are hesitant about inviting industry to become actively involved in vocational education for fear of precipitating major change and (2) many industrial firms do not know how they can contribute to vocational education.

Some of the barriers to interaction are gradually receding. Industry has recently become more aware that educators are actively seeking help from the business community, particularly as the financial problems of education increase and the need for better student preparation for careers becomes more and more apparent (National Association of Manufacturers, 1973). However, it is important to remember that:

There (still) is a tremendous chasm between business and education. It is one of the tragedies of modern life. Education needs to accept at least 50 percent of the blame for this estrangement. (and) . . . If there is a real need in our society, it is that business and education work together. We should not be interested in placing blame, but in closing the gap (Johnson, 1971).

Further, the time, potential, and need for closing the gaps between public education and business/industry has never been greater (Darling 1972; Marland 1973).

"Gap" Closing Suggestions

The previous review suggests that new concepts surrounding business/industry and education interaction should evolve
to effect a new cooperative thrust. This assertion has been supported at a recent White House conference by Hodgson (1972:9) who concluded that "Above all, the next ten years must produce better bridges between the world of education and the world of work."

Most suggestions for closing the gap between business/industry and education appear to involve improving the occupational competence of vocational education, as well as other teachers, and getting students into the world of work.

An Imperative: Updating Occupational Knowledge of Vocational-Technical Education Teachers

Developmental efforts focusing on career education, the expanding role of vocational-technical education, and the need for usable, up-to-date occupational information by students have combined to highlight the inadequate knowledge educators generally possess about the world of work. Several leading educators have emphasized that educators, particularly teachers, need a more intimate knowledge about business and industry (Feldman, 1972; Harris, 1972; Hoyt, 1973). Strong (1971) believes the greatest challenge to in-service vocational teacher education planners is keeping teachers abreast of the rapid technological changes in their fields since new products, materials, equipment, and methods make occupational skills partially obsolete unless ways are found to update experience. In the same sphere of reasoning, one of the principal recommendations of a study
designed to analyze new skill content in selected occupations and to explore mechanisms for translating the new skill content into vocational-technical education curricula was that teachers should be recruited who are trained in the use of new equipment, materials, and processes which are coming into an occupation, and provisions should be made for occupational retraining of presently employed vocational-technical education teachers in business and industry (Stuart, 1972).

Technological developments and changes in occupational areas are rapid and certain to continue according to many experts. More specifically:

Changes in career requirements are becoming so rapid at every level that no one is immune from job obsolescence. This problem will intensify as the shift to a post-industrial, post-technological, international society continues (Amara 1972:81).

Similarly, Wenig and Wolansky (1972) concluded that it is imperative for vocational and technical educators to study job training programs and policies in industry with the intent of altering school curricula to enable students to make a better transition from school to work. Further, they recommended that research is needed on how to build better cooperative linkages between business/industry and vocational-technical education.

A much closer and viable relationship must emerge between business/industry and education to insure that facilities, equipment and instruction are kept current according
to Helsby (1972), otherwise, by the year 1990 occupational education presently conducted in secondary schools will increasingly become the responsibility of employers. In a similar vein, a recent and somewhat controversial report on vocational and career education stated:

Perhaps the most important thing that could come out of this analysis of work and education would be to draw educators out of the schools into the world of work . . . Without a thorough knowledge of this world, they will probably never be able to design a career education program that is responsive to the needs of young students and workers (O'Toole, et al. 1973:151-152).

Along this same line of reasoning, a leading educator has suggested:

In preparing personnel for the real world, both of education and human affairs, the school of education should become functionally related to other agencies which can be effectively used in developing professional knowledge and competence among teachers. The "tooling up" of schools of education to accomplish their objectives within the career education framework would be an extremely expensive process and much of the equipment and facilities which will be needed is duplicative of that which is available in other agencies (Goldhammer 1972:19).

He goes on to suggest that "on-site" experiences for teachers including not only in-class experiences, but experiences in a variety of youth-serving and regulatory agencies as well as experiences involving a variety of programs in professional fields in business and industry will be necessary.

It is instructive to review a current position paper on career development to further pinpoint the occupational
understandings needed by vocational-technical education teachers. Prepared by a joint commission of the American Vocational Association and the National Vocational Guidance Association, the position paper delineates distinct functions for various educators and specifically suggests the vocational-technical education teacher should:

1. Provide realistic educational and occupational information to students and staff based on knowledge of their occupational field and continuous contact with workers and work settings.

2. Identify and recruit resource persons in the employment community to assist in the school programs.

3. Provide exploratory experiences in vocational classrooms, labs, and shops for students not enrolled in occupational preparation programs, and assist those teachers who wish to incorporate "hands on" types of activities in their courses.

4. Identify basic and academic skills and knowledge needed to succeed in the occupations of their field and communicate this information to academic teachers and guidance specialists.

5. Assist academic teachers and guidance specialists in designing appropriate occupational experiences.

6. Provide students with information about vocational offerings and guidance specialists with information about the kinds of careers students can pursue.

7. Assist students enrolled in vocational programs to analyze and interpret their learning experiences for better understanding of self in relation to occupations and the world of work.

8. Plan and provide vocational instruction which prepares students to enter, adjust, progress, and change jobs in an occupational field.
9. Assist students in identifying a wide range of occupations for which their vocational instruction is applicable.

10. Encourage employers to assist in expanding student awareness of career opportunities.

11. Arrange observation activities or part-time employment for students and school staff to help them learn more about occupations and work settings.


If vocational-technical education teachers are to perform the above suggested functions, it is obvious that expanded and continuing contact with the world of work is a necessity.

A model has been developed that gives attention to a delivery system for comprehensive leadership development in vocational education. The model is designed to orchestrate separate but interwoven components which could be involved in the delivery of personnel leadership development programs:

The necessary resources were and have been available all along to assure the development of a comprehensive system. It is only now that the states are beginning to realize the need for a concerted effort through federal, state and local resources. Business, industry, government and the military need to be included in the system as potential resources (Schaefer and Ward, 1972: 38).
The need to systematize and orchestrate diverse elements into cooperative, coherent, and cohesive forces has been supported by many leading educators. This need was appropriately summed up when it was submitted that:

The too frequent "unsung" partners of the total vocational education effort have been business and industry. The coherence aspect of a functional personnel development system stems in a major way from the practices and technology that are employed at any point in time in the world of business and industry. To be embraced as a cooperative in the total effort has long been sought by the vocational profession. The realization of business and industry as a cohesive element-sticking together in the purpose and endeavor—has long eluded the profession. Role expectations of business and industry, as well as responsibilities and relationships in the process of personnel development, have been slow to be defined and evasive in clear definition. Yet here lies one of the most valuable resources yet imagined (Schaefer and Ward, 1972: 9).

**College and Certification Credit**

In the past, obtaining credit for participating in business and industry programs to update occupational competencies has tended to be a major problem for vocational-technical education teachers.

Lauda (1966) found inconsistency in the means used to grant credit for trade and industrial experience. Three prerequisites were required by most institutions: (1) enrollment in the institution; (2) sufficient trade or industrial experience; and (3) passing marks in one or more examinations of the candidate's vocational competency. A combination
of skill, written, and oral examinations were usually administered to determine credits. Industry was found to have only a minute part in determining the content of the examinations. Also, it was found that the State Department of Public Instruction rarely assumes an active role in the procedures used for granting such credit.

Despite the fact that in-service experiences in business and industry could substantially increase the expertise and competence of vocational education teachers, these kinds of in-service upgrading experiences rarely qualify for college or certification credit. A very valid point regarding this matter has been emphasized:

Even if teachers are convinced that technological updating is necessary to provide relevant instruction, they cannot be expected always to put aside financially rewarding activities to invest their time in upgrading activities that will not be financially rewarding (Taylor and Miller, 1971: 125).

Changes need to be made and they are being made in what is "acceptable" for college and certification credit. Overcoming institutional inertia and resistance to change as it affects teacher education is imperative. A more open system of providing occupational updating opportunities for vocational education teachers appears imperative:

Because the vocational teacher program finds itself as an inadvertent gatekeeper in the improvement and redirection of vocational education, it must be sensitive and responsive to new needs and directions in occupational education as it serves social and individual needs. The total vocational education
program must be capable of regeneration and self-renewal. This can be accomplished by a systematic program of leadership personnel development which includes teacher education (Taylor and Miller, 1971: 120).

The future promises changes in the education of teachers. For example, it has been noted:

New or nontraditional study has captured the imagination of many college and university faculties and administrations. This mood is also permeating the entire educational fabric. It is already possible to earn a collegiate degree by correspondence or by television. Many universities are accepting credit by examination. Others are preparing to evaluate work experiences for credit, and many institutions already participate in a wide variety of off-campus studies and enter into self-directed learning contracts with students. The import of these developments is to open the classroom, emphasize community-based learning, introduce independent study, and develop many options and styles of learning . . . (Robb, 1973: 20).

Another indicator of increasing flexibility is a unique innovation concerning the development of teachers in the State of Oregon. A recent change was initiated to standardize teacher certification and the manner in which teacher training programs are approved. The first state in the nation to do so, responsibility for teacher certification and approval of teacher training programs has been placed with a State Board of Education-appointed panel composed of 14 educators and three laymen in an effort to provide educators with tools that enable them to be accountable for their profession's performance.
Competency or Performance-Based Teacher Education

There is currently a strong move toward educating teachers for competency-based certification and recertification. This is a departure from the usual certification programs which give recognition primarily to the successful completion of courses considered necessary to acquire knowledge, skills, and attitudes to qualify for a teaching job. The concept of competency or performance-based teacher education opens the door to new approaches for validating knowledge considered essential to successful vocational-technical education teacher performance. In particular, it provides a rationale for basing certification and recertification, in part, on essential competencies gained from life experiences, job experiences, on-the-job training, and other occupational orientation experiences.

Trends in Occupational Updating

There has been a gradual movement of placing vocational education teachers within business and industry, but a critical need to develop new communication and partnership systems still exists (Keller, 1972). Conners (1972), President of the American Society for Training and Development, agrees that "some partnership efforts are being launched to utilize business and industry in the development of vocational education teachers, but the partnership is not strong enough to establish business and industry as more than a
silent, almost nonparticipative partner." The potential for more business and industry activity in the development of vocational education teachers is evident.

Four main trends and contributions that corporations are capable of providing for vocational and career education have been highlighted. The four contributions include: (1) Providing cooperative education experiences for students; (2) Operating schools in the corporation's area of interest to train workers; (3) Assisting school systems to develop specialized occupational elements; and (4) Providing continuing education for its own employees and for other interested persons. A corporation's continuing education efforts can contribute

... not just to formal education but to a solution of the basic career training problem, industry can provide continuing education not only for its own employees but for many others, as well. This is a natural extension of our internal training responsibility but goes beyond in two major ways; first by extending an employee outside his immediate job and, second, by making the company's special fields of competence available to interested people who work elsewhere (Knight 1972:80).

Further, it has been underscored that business/industry is very capable of providing learning experiences for in-service vocational-technical education teachers:

To the degree that it can contribute to the development of academic people you may generally be assured that industry will contribute. For example, industry can react positively to a request for help in training teachers ... come to industry and ask for assistance in training vocational teachers in almost any area and industry will respond quite positively. That is something it's capable of doing and doing well (Conners 1972:17).
Essentially the same conclusions were reached from a study of 248 companies participating in public education a decade ago:

In a day when knowledge is increasing at an alarming rate, many companies assume responsibility for helping teachers and college professors to keep up-to-date professionally, expand their knowledge and improve their skills. The kinds of programs offered indicate that business and industry view better prepared teachers and improved instruction as one important key to better schools (Argars, 1964).

School superintendents seem to favor placing vocational teachers in business and industry to update their occupational competence. For example, Welch (1971) found that 108 school administrators felt inservice training for vocational-technical education teachers should include keeping current with business and industry developments, if optimum practical arts and vocational education programs are to offered to high school students.

Despite apparent agreement on the desirability of vocational-technical teachers updating occupational knowledge by being involved for a period of time in business and industry, few have benefited from such experiences. Further, the opportunities for such experiences are not widely known.

A very perceptive article expressed the need for information and coordination of information on industry-education cooperation as it relates to teacher education. The article suggests a few cooperative activities are taking place between business and industry and education to update teacher understanding of the business world.
Some of these activities have been in existence for a number of years, but they are not widely brought to the attention of businessmen and educators outside the region in which they occur. More specifically:

For 18 years, principally in four or five northern states, summer programs for teachers have been conducted under the auspices of the National Community Resource Workshop Association. These programs involve a university, local business and industry, and of course teachers (K-12). The program places teachers of all disciplines into a workshop setting where either as individuals or as a team, a solution to a classroom educational problem is developed by utilizing resources found in the community. The resultant "teaching unit" is taken back to the classroom in the fall to enrich the normal course offering. Historically, elementary teachers, secondary level science teachers, and social studies teachers have been the principal participants (Hamilton, 1972).

The article was addressing industrial arts educators and suggested the relevance of such a program to them as one way to improve industrial arts instruction. However, as other literature in this review suggests, such activities could benefit all teachers since . . .

The serious and widening gap that exists between the skills required for gainful employment in a rapidly automating economy and the capacity of the present educational system to provide these skills is a major challenge facing education. As the need for more and better education has increased at a rapid rate, it has become essential to search for new and more effective means for education to meet the career development needs of students and the employment demands of industry (Ensign, 1972).

The Industry/School Exchange Program in Oklahoma (EPDA Industry/School Exchange, 1973) is aimed at keeping vocational-technical education teachers updated in the skills
they are teaching through participation with related industry and the actual application of the skills while on the job. It is anticipated this updating will cause participating teachers to align curriculum to meet the needs of industry and thereby make students more employable.

College credit is awarded and stipends are paid to participants throughout the southeastern half of the state for working three hours per week in an industry related to their teaching field. Undergraduate college credit is awarded through Southeastern State College, while graduate level credit is awarded through Oklahoma State University. A monthly stipend of forty-five dollars is paid to each vocational-technical education teacher during the four month semester.

It was felt vocational-technical education teachers in rural portions of southeastern Oklahoma especially needed this type of program, since necessary college credit to become recertified was much more difficult to obtain due to great distances from senior level colleges.

Presently ten schools have a total of twenty-two teachers participating in the industry/school program. The enrollment is steadily increasing and participant enthusiasm is at a peak. Monthly meetings give the participants a chance to discuss their problems and accomplishments with each other. A spin-off accomplishment has been favorable public relations and public understanding resulting from
participants working with and for industry.

Dunn, as reported by Katz (1973), reasoned that if students can bring new learning into the classroom after being placed in a work situation, then teachers could do the same. He conducted a survey by sending a questionnaire to 350 business and industrial firms in the Radford, Virginia area to find out whether they would be willing to become involved in Career Education programs by inviting teachers in for work experiences. Exactly 100 responded expressing a desire and willingness to cooperate. Prior to opening of school, sixteen teachers scheduled for Career Education assignments spent a week "work experience" in six different job situations. Their extra time was paid for by the school. Some teachers actually performed work duties, while others observed, in business and industries such as an iron foundry, hosiery plant, sewage disposal plant, auto shop, police station, building inspectors office, court, bank and hospital.

Career education calls for total involvement of everyone in the school, as well as business and industry, if a career development opportunity is to be provided for every person who is going to school. Thirty major corporations are helping with career education in Southern California:

Business involvement in career education occurs in five basic areas: work experience, career information programs, tutoring, teacher and counselor training, and aid to school administrators (Ugrin, 1973).
The teacher, counselor, and administrator phase of the business assistance program have been successful, as have the other areas of involvement. The teacher and counselor program was initiated:

. . . because many students are frustrated by the realization that the teachers and counselors advising them know little or nothing about the job, about the company, or about business. One of Project 70's aims is to make education and counseling more relevant by introducing the business world to as many of these teachers and counselors as possible. This is done in two ways: summer employment in jobs related to their teaching specialties and summer workshops, where they observe firsthand the business operations of various organizations (Ugrin, 1973).

A description of some on-going activities between New York industry and education illustrates how another state provides cooperative experiences for teachers and students. The industry-education coordinator made the following comment about these activities:

Just as I believe very sincerely in work experience for students, I believe in just as sincerely for teachers. Last year, we had a curriculum development project in which teachers were afforded an opportunity to spend one-half day in industry and another half-day developing related curriculum material. This project was carried on in five colleges. Three hundred teachers applied for this program and were rejected, not because they weren't qualified to participate, but because the programs just did not have sufficient capacity to handle them. Another activity we carried on last summer, and we're going to expand upon, is a summer tour of New York State industry for teachers and their families. A teacher provides his own transportation, accommodations and food, but a pre-arranged tour of industrial firms will be set up for him across the state. This summer we conducted these
in ceramic and mining technology, metal working, electricity, and transportation. We have ten established for next summer, and we'll be establishing more (Ullery, 1973).

Research on Business/Industry Training Programs for Vocational Teachers

A limited amount of research has dealt with business/industry training programs for vocational-technical education teachers. This research reveals some of the programs offered independently by business and industry, while others are developed and operated on a cooperative basis between universities and business/industry.

Business/Industry Training Programs for Vocational-Technical Education Teachers

Thirteen years ago, it was found that many industries had educational programs, some of which were restricted to employees, while others were open to the employees' families and the public:

Factories today have classrooms, organized programs of studies, faculties, textbooks and examinations, and even graduation exercises with diplomas. Educational budgets often rival those of good sized colleges, and expenditures per student are not infrequently two and a half or three times the national average for conventional institutions (Clark and Sloan, 1960: 97).

In a later study, the same authors investigated vocational education programs in retail establishments. They summarized their finds as follows:

There are classrooms in the stores, but not many. Even among the 36 largest retailers to which the present study is primarily directed, three reported no educational activities falling within the
definition adopted for study. And, as the stores decline in size, the percentage of establishments maintaining no formal training programs grows rapidly. Although there is a definite trend toward larger retail organizations in the United States, the shift is not sufficiently strong as yet to make retailing anything but a predominately small store operation. The total amounts of formal education conducted by retail establishments, therefore, is extremely limited (Clark and Sloan, 1962).

Oxe (1966) conducted a survey of eighty-one selected automobile manufacturers training programs and found that most were open to education personnel who took the initiative to learn about them and apply for acceptance.

More recently, Maxwell (1969) conducted a national field study to identify industrial training programs in which industrial education teachers could participate. He identified 39 different organizations with more than 70 different courses open to industrial education teachers in electronics, metal technology, power mechanics, and wood technology. A major conclusion of the study was that low-cost training opportunities are available at numerous locations and industry desires to assist in improvement of instruction in schools by updating teacher competence.

Shrader conducted a study to ascertain the status of technical training in factory-schools offered by selected industries for their own personnel and which might be available to industrial teachers for college or university credit. Data were secured from survey informational forms completed
by 178 industrial education department chairmen and 35 directors of major industry factory-school training centers. Shrader found that fifty-four colleges and universities cooperated with 83 major industrial training centers to offer credit for factory-school training. Respondents from industry and the cooperating institutions believed the factory-schools provided an excellent opportunity for industrial teachers to upgrade special skills. Despite agreement on the benefits, such training opportunities were seldom listed in college catalogs and bulletins were listed with non-descript terms such as "special problems" or "workshops."

As a result of the study, he concluded:

- Industrial teachers should be encouraged to take advantage of these cooperative factory-school training arrangements as an excellent means of updating technical competencies in specific areas of technology.
- Colleges and universities consider this training a complement to training within the industrial education departments and a valid means of earning college or university credit.
- Many additional industrial teachers would take advantage of these training opportunities if they were adequately publicized and promoted.
- Industrial educators and industrial teachers should be made aware of, and encouraged to investigate, factory-school training arrangements which parallel and augment their special teaching fields (Shrader, 1967: 192).

VanderKamp (1972) conducted a study to ascertain what kind of career education Milwaukee area business and industrial firms provided for their employees. She identified
79 industry training courses or programs for employees in their own establishments. Five different categories of personnel training programs were identified, namely: (1) Administrative and Supervisory; (2) Professional and technical; (3) Clerical; (4) Apprentices; and (5) Production and Maintenance. She did not attempt to find out whether these programs were open for vocational teachers to gain experience in business and industry. She did recommend, as a result of the study, that further studies are needed to determine the quality of business and industry training programs. In addition, she recommended that further study should be attempted to determine whether industry is willing and able to provide training which would improve career education programs in the schools.

Somers, et al. (1971) conducted a study on company training programs in Wisconsin. He found that 170 of the 248 business firm respondents had some training programs. Larger companies, with 500 or more employees, tended to have more training programs than smaller companies.

More recently, Redovich and Bedwell (1973) conducted a study of training programs sponsored by business, industry, labor, and government agencies in Wisconsin. The major purpose of the study was to examine the extent and scope of training programs carried out by Wisconsin employers. Additionally, the study was conducted to determine how vocational
technical education schools could assist these agencies with their training needs. During the conduct of the study, many suggestions were made to employer representatives to the effect that vocational-technical education teachers should be provided with opportunities to help them understand the employment needs of business and industry. At the same time, employers expressed a desire to know more about courses offered by vocational-technical schools.

**Industry/Education Centers**

The preceding literature suggests the need for a clearinghouse and a systematic interaction network between education and business/industry. Many leaders in business and education have expressed the criticality of this need. It has been reported that the Associated Organizations for Teacher Education and representatives of business and industry made the following joint recommendations:

1. A system should be developed for exchange of personnel between education and industry in order to enhance the process of mutual development of specifications for educational products consistent with the purposes of both groups.

2. Some coordinating agency should be established to bring education and industry together.

3. The production of instructional materials and equipment has reached a point where a joint effort must be organized in testing and development—a public school-university-industry interface.
4. Evaluation is a costly process and must be shared by both industry and education.

5. For industry to become involved on a serious basis, they need to have from education a description of the various roles that educators at various levels may be predicted to assume in the 1980's.

6. There is a need for a clearinghouse between education and industry (Burt and Lessinger, 1970: 158).

The Northern California Industry-Education Council (NCI-EC) recently approved a proposal to establish an Industry-Education Information Clearinghouse for the purpose of serving California career education efforts. The NCI-EC is currently seeking funds to underwrite the clearinghouse operation. Proposed functions of the NCI-EC Clearinghouse would include:

- Active solicitation of information.
- Creative dissemination of gathered information to those individuals who most need and will use such information (included will be teachers, students, industry-decision-makers and volunteers) through such means as work forums, conferences, mailings, and direct personal contact.
- Promotion of the Clearinghouse and its activities in order to stimulate use.
- Definition of Career Education needs such as curriculum and program materials, definitions and priorities.
- Creation of a library of materials for dissemination and referral among which might be included such items as samples of industry and educational programs, Career Education formats, audio-visual program presentations, evaluation materials and results, speakers' lists, staff training programs, scholarship, loan and award program lists.
- Coordination with other local, state and federal groups and agencies concerned with Career Education planning and development.
Identification of community needs within the schools and within the community at large that might be adequately and satisfactorily met through specific well-defined industry-education cooperative programs (NCI-EC Newsletter, 1971:1).

It has been concluded that there is a need to develop a national movement and a national center to encourage industry-education cooperation:

This Center is visioned as being located on a university campus for the purpose of conducting research as to the various opportunities, strategies and programs for developing partnerships between industry and education in order to enrich, expand, and improve public education. It could be the central repository, reference source, and dissemination agency for published and unpublished literature on the subject of industry education cooperation. It could provide the opportunity for business, public and educational administration students and for industry representatives and educators to pursue studies in the field, and through its graduates, have a multiplier effect on the numbers of people with expertise in the field of industry-education cooperation. The Center staff, its associates, and students could conduct special studies, hold regional and national seminars, and offer consultant services to schools, industry groups, and companies on various aspects of industry involvement in education-volunteer as well as profit (Burt and Lessinger, 1970: 158-159).

Further, Burt and Lessinger have concluded:

- Both industry and education must organize and achieve industry-education cooperation.
- Education must accept the responsibility for encouraging, inviting, guiding and initiating action to develop industry-education cooperative relationships.
- Industry and education must bridge the communications gap which exists between their two worlds before any in-depth, extensive and meaningful involvement of industry can take place in the field of public education (Burt and Lessinger, 1970: 9).
A Technology-Resource Center for Vocational-Technical Education was the subject of a research project supported by the U. S. Office of Education in 1964. The conceptualized Center was envisioned as being a place where vocational education teachers and other personnel could sharpen their technology and pedagogy through participation in seminars, institutes, conferences, and short courses. A report at the completion of the project emphasized:

- Virtually few opportunities exist at most institutions of higher education for updating vocational-technical educators in the new developments of industry and technology.
- If the rich promise of technological advancement is to be shared by all, adequate opportunities must be developed for updating teachers.
- Once vocational-technical teachers are employed, they are faced with a constant challenge of keeping pace with changes and new innovations in their respective fields.
- Students who graduate from vocational-technical curricula of the secondary and post-secondary schools, need the benefit of instructors and other educators who have kept attuned to such changes in present-day technology as a result of new innovations, automation, cybernation, and a tremendous number of recent developments, significant today in our world of work (Larson, 1965: 1).

Seven years later, reference was made to the potential of the Resource Center mentioned above. Development of a Resource Center of this nature was felt necessary since:

A missing link in the process of preparing education professionals is the lack of in-house opportunities for self-regeneration. Certification, life-long credentials, and tenure have tended to isolate the profession from pressures for continued professional improvement. Those who have sought means for increasing their instructional competence
within their own school systems have been offered sporadic short-term workshops. The fact that half the knowledge teachers will need to know ten years from now has not yet been discovered is a powerful force for creation of an ongoing, comprehensive organizational mechanism for inservice education. The principle of continuous renewal must take place as a foremost precept of the teaching profession, and appropriate structures should be created to insure its permanence (Schaefer, 1971: 137).

While discussing the initial and continuing preparation of vocational-technical teachers, Larson and Valentine (1973) mentioned the Technology-Resource Center for Vocational-Technical Education. They concluded that "the concept is timely and good, but the resources to finance such a Center are lacking."

During the past seven years, The Center for Vocational and Technical Education (CVTE) at The Ohio State University has engaged in a variety of research, development, and training activities related to the development of professional personnel for vocational-technical education. CVTE has gained considerable experience in defining and resolving critical problems relating to professional personnel development.

Miller (1970) reviewed the 1965-70 professional personnel development effort and noted that the CVTE . . .

. . . thrust in vocational teacher education has been concerned with certain program categories, namely: (1) recruitment and selection, (2) preparation, (3) placement, (4) organization and administration, and (5) evaluation. As these categories involved certain personnel to be served, such as (1) aides and supporting staff,
(2) vocational teachers, (3) teacher educators, (4) supervisors, (5) administrators, (6) curriculum specialists, (7) researchers, and (8) others . . . the majority of . . . activity has been within the program category of preparation (Miller, 1970: 22).

He went on to identify problems, project priorities, and suggest strategies needing attention during the period from 1971-1978 in the area of vocational-technical professional personnel development. Inservice development of vocational-technical education teachers was one important problem and priority, since vocational-technical education personnel experience difficulty maintaining and increasing subject matter and professional competencies.

In addition, he recommended studies should be conducted in a variety of methods to facilitate professional and technical updating of vocational-technical personnel. The need for such studies was amplified with this comment:

This is indeed an appropriate problem area for investigation. Various strategies must be identified and tested which will assist in the inservice development of personnel in vocational-technical education. The need is critical for maintaining and updating both the technical and the pedagogical skills of teachers as well as the competencies required by other professionals who work with instructional programs in vocational-technical education (Miller, 1970: 22).

Shane (1972) reached similar conclusions after conducting a study of futures planning and futures studies to determine techniques and methods which might have a bearing on education in the United States. The primary purpose of
the special study was to launch an inquiry to answer ques-
tions raised by Sidney P. Marland, Jr., then U.S. Commissioner
of Education. Marland wanted to know how the U. S. Office of
Education could make the best use of policy and futures re-
search. Shane reached a number of conclusions and recommended
a number of actions as a result of his six months study. One
suggestion was that business and industry would need to be-
come stronger partners with education in the future to offer
a lifelong, seamless learning continuum for the American
people. Further, he recommended to the U.S. Commissioner of
Education:

We should sponsor a study, or perhaps a continuing
center, to explore the flow of new developments in
the "Business-in-Education" field. The penetration
of education by business may well suggest important
new cooperative relationships among the school,
government agencies, and U.S. business (Shane, 1972:
13).

Shane also concluded that shared responsibility for
teacher preparation, both preservice and in-service, should
be encouraged between community agencies, teacher colleges,
and universities.

Summary

Various efforts have been launched to bring business/
industry and education together to develop and offer viable
vocational-technical education programs. Many of these
efforts have been quite successful, while others have been
rather fleeting and poorly used. To achieve not just a
"patchwork" of improvement, but a coherent design of
advancement and opportunity for vocational education students, educators must find ways to become more knowledgable about new business and industry ideas, practices, techniques, and requirements on a continuing basis. This will require multiple and coordinated approaches designed to fully use university resources, advisory committees, and business/industry based educational opportunities for vocational-technical education teachers. It has been pointed out that inservice vocational-technical education teachers, in particular, need to update their knowledge about business and industry.

There appears to be little doubt that interest exists to bring vocational-technical education teachers into closer contact with business and industry. Teachers, businessmen, and educational administrators tend to agree on the benefits that accrue to career preparation of youth when educators and businessmen interact. Youth seem to gain helpful career perspectives through cooperative vocational education programs, but these opportunities are too restricted to satisfy the demand. Businessmen seem to view vocational-technical education teachers as the group they want to work with, rather than students.

An increasing number of opportunities exist for vocational-technical education teachers to update their occupational competencies and understandings. However, these opportunities are not brought to the attention of vocational-technical education teachers outside of the regions in which
they occur. Concern about this situation has prompted leaders in both business/industry and education to suggest several organizational approaches to solve the problem. The need for a clearinghouse activity and an information network to announce the availability of business and industry learning opportunities for vocational-technical education teachers has been suggested and appears to be supported by leaders in both business/industry and education. However, the critical elements of such a system have not been established at this time.

**Information System Design**

Many investigators with diverse backgrounds have contributed techniques and ideas to create information systems and solve problems associated with them. These investigators have included mathematicians, educators, engineers, librarians, documentalists, and other scientific groups. Although the different technical backgrounds of investigators have provided a body of knowledge, one of the basic problems . . .

. . . affecting the area of system organization is the lack of either a general theory for design or, in lieu of such a theory, a broad base of qualified experience . . . Eventually some objective, quantitative measure for efficiency will be available, but at the present time one does not exist and most system design is based solely on the intuition and experience of the systems man. Unfortunately, the concept of integrated system design itself is a new one, and there is no reservoir of personnel trained in this type of work (Becker and Hayes, 1963: 230).
More recently, conferees who were discussing labor market information systems, claimed essentially the same thing:

"System" is a very tricky and difficult concept. And nobody really understands at the present time how to analyze and synthesize systems with any generality. Lacking a truly general model, we must focus on a particular class of systems to make progress in analysis. In other words, engineers have no general prescription for how to produce a new efficient system or how to revamp an existing one (Department of Industrial Engineering and Operations Research, 1970:10).

After studying the effectiveness of information systems, Smith (1972) concluded the design and analysis of information systems vary and no approach is uniformly accepted and applied.

**Systems Defined**

Despite the basic problems enumerated above, numerous attempts have been made to define "systems" with little specific agreement coming from these efforts:

The system concept is not new, but like every other concept man's present understanding, interpretation, and application of the concept reveals an evolution in its meaningful utilization (Miller, 1967).

Ryans (1963) defined an information system as an assemblage of interdependent elements or subsystems which function together as an entity to yield a product which is unique to that assemblage. In a later definition, Borko (1965) claims an information system consists of a collection of recorded information, custodians who organize and maintain the collections, retrieval procedures, and users. An operational definition of the term "system" has been stated by Kaufman
and Corrigan who claim a system is constituted from the sum total of separate parts that work independently and, at the same time, interact to achieve previously specified objectives.

The various definitions of systems in general and information systems in particular, represent structural and functional aspects. This is true of most system concept definitions and both are reflected in the techniques used to design new information systems, as well as in efforts to refurbish operating information systems.

Open and Closed Systems

Information systems, like other systems, are often categorized as either "open" or "closed" without regard to how they are defined. Open systems regularly exchange matter and energy with their environment, while closed systems are self-contained and are not affected by other systems or their environment. Regardless of whether a system is categorized as open or closed, they both exhibit similar system properties.

Universal System Properties

The similarity of system properties, mentioned above, has enabled system scientists to derive several universal system properties. Immegart and Pilecki (1973) claim such characteristics or properties can be used to contribute to the conceptualization of a system.
The universal system properties or characteristics and implications for each include:

1. **Tendency toward entropy.**—All systems, regardless of nature, size, or type, tend toward a state of randomness, disorder, inertia, or ultimate death. All systems, whether living, mechanical, or conceptual, are subject to use, wear and tear, and malfunction. Systems must strive through evolution, adaptation, and development to maximize their existence. "Dynamic existence" cannot be taken for granted; rather, it must be sought (Immegart and Pilecki, 1973:34).

2. **Existence in time-space.**—Systems are evolutionary and either grow or degenerate over a period of time. To understand any system one must look at its life history, but to do anything with the system one must project into the future. Those working with systems need to monitor and assess system action, but the focus of their concerns should be adapting the system for the future (Immegart and Pilecki, 1973:35).

3. **Boundaries and Interfaces.**—All systems have boundaries which are more or less arbitrary demarcations of that which is included within the system and that which is excluded. A boundary for a system can also be viewed as that point, or those points, beyond which the unique aspects of the system are no longer distinguishable. System boundaries in most cases are quite arbitrary and for analytic purposes are determined by the pragmatic considerations of utility, feasibility, and sensibility (Immegart and Pilecki, 1973:35).

Crossman (1970) believes the most important problem facing information system designers is distinguishing it from its environment (determining boundaries), since the characteristics of the environment are very important for system functioning. Further, he believes a system must be able to respond to externally set goals.
and objectives which the environment imposes.

In this regard, the implications concerning the establishment of boundaries for a system are numerous. Most importantly . . .

... with any system that lacks finite boundaries, mere definition and comprehension are difficult. ... to the degree that all those working with a system with fuzzy boundaries define and conceive of the system differently, concerted action will indeed be difficult. On the other hand, since system boundaries are at best arbitrary, to the degree that definitional and conceptual aspects of a system can be made explicit and agreed on, understanding in this regard will be facilitated. Also, to the degree that useful or feasible boundaries of a system can be established, system activity can be enhanced (Immegart and Pilecki, 1973:37).

They go on to point out problems relating to system environment:

Environment.—All systems have an environment which is everything outside the boundaries of the system. Environment . . . is contingent on the definition of the system and may vary as the system's boundary varies. Further, system environment is of two kinds: proximal, or that which the system is aware; and distal, or that which the system is unaware. Environment is important to all system activity since it has the potential to affect both the system and its functioning. . . . systems need to enlarge their proximal awareness . . . (Immegart and Pilecki, 1973:37).

Design Based on User Needs

Although there appears to be no best way to design an information system . . .

It is an unfortunate fact that many presently operating retrieval systems appear to have grown up with the minimum of planning and seemingly without detailed consideration of user requirements (Lancaster 1968:209).
Jones (1973) also believes that any new or greatly expanded information facility must be justified by user needs. Bearing this in mind ... . . . it would be worthwhile considering a sequence of procedures that, if vigorously employed in design, should result in an operating system that will be closely matched to the particular requirements of the users it is to serve (Lancaster 1968: 209).

More specifically, the following principal steps should lead to an optimum information system design:

1. Survey the characteristics and information requirements of the potential user group, including analysis of some typical requests;
2. Design and implement a prototype system;
3. Test the prototype;
4. Amend system design on the basis of the test results;
5. Put the system into full operation;

Similarly, attempts to design a labor market information system have included finding out . . . .

. . . what the demands are, what the needs are, what the uses are, and what the priorities are for information. And then we should find some way of melding that with the sources we must have in order to arrive at a feasible process of securing information, putting it in the format in which it can be used, and getting it to users at the right time (Heiler 1970:40).
The underlying emphasis is that labor market information systems ought to produce sufficient information to insure institutions and individuals can make the right choices for themselves. However, it appears the following kinds of questions are disturbing everyone in the field:

What do unemployed, or people seeking changes in their work, want in the way of information? Do we really know this? . . . What are the institutions at various levels of our society doing to utilize the data that are available? What are the data of highest priority which, if available, would be used to the best advantage? How can we conceptualize the parts of a system now which will be useful now and also will be compatible with a more comprehensive system later? (Epstein 1970:8)

Many experts in the field believe the user is central to the objectives, the program, and all activities connected with an information dissemination system:

An information dissemination system that dynamically interacts with information users concerns itself with dissemination activities, products, and the utilization of information. Therefore, the user of information and his information needs must be central to the design . . . (Taylor and Magisos 1971:23).

At the same time, it is acknowledged that many information dissemination systems start with a concept or product to be disseminated. However, it is still maintained a model should be focused on the user, his problems, and his information needs. Therefore, the ultimate goal of an information dissemination system is providing high quality services and products which meet the needs of users (Taylor and Magisos, 1971:61).
Methods of Determining User Needs

A variety of methods have been used to ascertain the dimensions of information dissemination user needs. The methods range from large empirical studies to use of less complicated smaller-scale methods such as opinions from panels of experts and ad hoc advisory committees composed of leaders and "high priority" user groups. Both large and small-scale methods can be used during the planning stages:

Leaders representing the substantive fields and levels of vocational-technical education may be selected for membership on an ad hoc advisory committee . . . (to) give valuable assistance in identifying users by their fields, roles, functions, information problems and needs (Taylor and Magisos, 1971:55).

The conceptualized model developed by Taylor and Magisos (See Figure 2) was utilized to develop a set of guiding statements for use in evolving a state information dissemination system for vocational-technical education. The guiding statements relate to establishing essential dimensions such as objectives, services, products and location of the information dissemination system.

Design Based on Essential Structural and Functional Dimensions

The procedures followed in ascertaining the essential dimensions of a job information delivery system for the Unemployment Insurance Section (UI) in the California
Picture 2.--Conceptualization of Information Dissemination System Elements Necessary to Serve Users
Department of Human Resources Development have been discussed and documented. The essential dimensions of the system are depicted in Figure 3. In an explanation of the design process, the designers pointed out:

We started out with a process and then we had to define what our goals were. By goals we mean a broad statement of what is to be done, what is to be accomplished. We used the term objectives to mean how you meet these goals. There are also the inputs (the various items that are needed; the processing of material; and how the information is delivered to our users) (Shiigi, 1970:19-20).

Information about the requirements of each cluster of the design was gathered from business/industry, employment counselors, and potential users. Through this process, the designers claim:

. . . we clearly defined our goals and specified who the users were going to be. We had to answer that question in order to find out what kinds of products we were going to develop—whether a product that would be given to job seekers on a handout basis, or whether it was always to go through an intermediary (Shiigi, 1970:19).

User studies can lead designers astray, since many efforts to identify information needs of users have missed their mark:

Of the many studies that have attempted to identify user information needs, none has probed sufficiently to yield anything more than statements of "nice to know" information . . . (Ely 1973:15).

Ely goes on to suggest that there are no uniformly acceptable procedures for determining information needs of information systems users. However, he further suggests a methodology with promise to solve the problem. Citing a study by Paisley and Mick (1972), he claims methodological
Figure 3.—The Job Information Delivery System
techniques using . . .

. . . The principle of multiple operationalism which holds that because each method has a unique set of error factors, several data gathering methods can best be used in a convergent validation framework (Ely 1973:15).

Information system design efforts which focus on essential structural and functional dimensions appear to aim toward a convergent type validation framework.

Carter and others (1965) recommended any design for a national information system must meet and be organized in light of the following groups of requirements:

1. Administrative and organizational requirements
2. User-oriented requirements
3. Internal system operation requirements
4. Requirements regarding the production and representation of documents
5. Requirements regarding dissemination and special services
6. Requirements for system evolution
7. Requirements for education and training
8. Research and development requirements

They go on to explain that these different groups of requirements were . . .

derived from the results of our analysis of user studies, previously proposed plans, the current system, the life cycle of documents in the scientific and technical document system, and statistical summaries. Additionally, the requirements were added to or modified as a result of our discussions with a number of well informed people in this area. As presented, they represent our judgement regarding the various problem areas.
that must be provided for in any satisfactory system design (Carter and others, 1965:4-7).

Expressing somewhat the same notion, Blackwell and associates suggest that:

... building a prototype is a tactic available to information system designers facing a relatively new and undefined task. A prototype allows experimentation with facets of the information system design, without all the inertias of a fully operating system (Blackwell and others 1970:16).

Similarly, Silvern and Brooks (1969) claim it is desirable to develop a flowchart model of an information system and then present the model as an interview-based stimulus to a small number of highly expert individuals who have direct contact with occupational education instructors and library documentation practices. Using responses from the experts, it is possible to reconceptualize the system before performing a simulation test to "debug" the model. A model for producing a model, developed by Silvern and Brooks, is portrayed in Figure 4.

Presenting an information system model to a small group of highly expert individuals, as suggested above, appears to relate to the Delphi Technique as an appropriate research approach.

Others believe user studies are part of a larger framework for designing information systems:

... the users needs is of crucial importance, since this analysis is the precursor of the actual information system design. In analyzing the user needs, we attempt to establish a priority listing by describing the needs and ranking
Figure 4.—Model for Producing a Model
each of them in their order of importance. A clue for the priority can be obtained from the frequency with which the potential user population has stated the need. It is recognized that it may not be practical to meet every expressed need, certainly not necessarily by the same technique. It is also recognized that the users may well not be able to conceive for themselves precisely how all their needs should be met, nor can they necessarily completely define all their information needs before an actual information system is available to them (Scheffler 1973:207).

Further, it is claimed that all too frequently information system designers proceed with designing an information system after conducting a user needs study, without interacting again with potential users. Increasingly...

... the user must be actively involved throughout the design phase ... selecting and implementing ... a rather unsophisticated model information storage and retrieval system with a small data base or data bases, and determining its effectiveness in meeting user needs ... will reveal important system design/information need factors which could not have been discovered ... in (numerous) user needs studies (Scheffler 1973:208).

Further, Scheffler believes the attitude of information system designers that the users need study terminates the users involvement until the full-blown system is operationalized has been a major pitfall in past information design efforts.

The determination of what functions the information system should perform is of primary importance to design. Bryan and King (1971) point out that one can obtain such decision-making information from a variety of sources,
however, some inconsistencies can be expected. These inconsistencies are often difficult to resolve, consequently...

... one feasible way of proceeding is to conduct group interviews among... the population which should be served by the system. In some instances this population is homogeneous and easily definable, but in others it may be so diverse as almost to defy definition. In spite of the difficulties, one must identify persons who have the knowledge and willingness to serve in a group interview... For a small system with homogeneous coverage of the literature, a single group of 8 to 10 persons might suffice. For larger, more heterogeneous systems, one might want to utilize a half dozen such groups... (the) objective is to reach a consensus of the group with respect to services (or products) that should be provided by the system (Bryan and King 1971:37-38).

Maintaining it is especially important to consider structure specifications and the user as an operator rather than as a passive recipient of information. Vallee and Askevold (1973) attempted to relate observations of operating data-based systems to generate characteristics and implications important to future design efforts. After conducting their study, they developed the following set of guidelines for designers of future information systems:

1. It is important not to set up a rigid system. It must be possible to alter components without drastically redesigning operating procedures as seen by the end-user.

2. The user's responsibility must be identified very early to allow him to shape those parts of the system, notably the interface, that are critical to his application...

3. Users should never be locked inside the retrieval language. Multi-level interaction must be facilitated, rather than hampered, by the system...
4. Implementation languages must be selected purely on the basis of ease of programming and inexpensive training.

5. The system should be independent of specific data features as possible, and it should be the user's responsibility to provide the data definition in terms of allowable types.

6. Clearly-defined editing facilities should be provided. Data entry and all related functions are often underestimated in the early design of data-base systems . . .

7. Finally, the system should not be optimized for an existing language, but instead the implementation language should be allowed to evolve (Vallee and Askevold, 1973:290).

They go on to point out that an adequate design strategy with real-life application should be tried very early since this . . .

would lead to complete calibration of the system. A second optimized version of the system would then be released. At the same time, the new concepts that may have emerged during the first series of applications would be gathered in a second level, used in expanding the applications, and so on. At each step in this "boot strapping" one would make a serious attempt to recognize and extract crucial functions. . . (Vallee and Askevold 1973:290).

Why Information Systems Fail

Information systems developed in the past have failed to satisfy users for a large variety of reasons and they can. . .

. . . be classified into major categories depending on the type of shortcoming as seen by the user, irrespective of cleverness of programming, development cost, or hardware ingenuity (Vallee and Askevold 1973:291).
The reasons why various information systems fail have been classified as follows:

1. **Many systems provide non-data.** Instances of this type failure are found in cases where development has preceded understanding, and where work . . . (was begun) without drawing inspiration from real-life applications. . .

2. **Many systems provide useless data.** In this class of system the entire development has usually taken place from the inside out, perhaps with some real "end-users" in mind, but with insufficient awareness of the type of decision-making such users experience. The information obtained from the system turns out to be trivial, overwhelmingly sophisticated, or both.

3. **Many systems provide usable data.** . . buried in noise. . . . every time a real-life question comes up, it takes (a long time) to go through the output to locate the real paydirt. . .

4. **Many systems provide relevant data in the wrong form.**

5. **Many systems provide relevant data, in legible form, but too late** (Vallee and Askevold 1973: 291).

In a study of information system user needs, it was concluded, among other things, that vocational-technical education teachers put emphasis upon current awareness and believed routine mailing of current information was most useful as a service. Further, it was found that "vocational-technical educators prefer direct, personal contact with familiar and convenient sources of information. At the same time, they were willing to travel for information needed to solve important problems in their work (Magisos 1971:43).

Equally important . . .
Information products should be designed for the intended users, with special attention to the functional role of the target audience and the intended use for the product. At this time it is apparent that teachers and counselors have current awareness needs and prefer routine dissemination, while researchers need indepth information (Magisos 1971:45).

Magisos also found that local and area school libraries, presently rated as not very adequate, should be given assistance in developing information resources and services for use by teachers and counselors since...

Local administrators, directors, counselors, and teachers obviously need and would use better information sources made available at the local and area school level (Magisos 1971:45).

Investigation of information product delivery suggests:

The vast audience of practitioners in vocational-technical education at the local level (i.e. teachers, counselors, local directors, administrators) is in need of better access to information products and services, especially preceding the beginning of school terms... during September, October and January (Magisos 1971:41).

Summary

Many investigators with diverse technical backgrounds have contributed techniques and ideas to create information systems and solve problems associated with them. Because of these diverse inputs, the literature does not suggest a uniformly accepted and applied approach to determining requirements and constraints critical to the design of an information system. A large amount of agreement exists concerning the use of user requirements and their needs as suggestive tools for designing an appropriate information system.
A second approach involves the use of a "mock-up" product or sample information publication to obtain potential user comments and to ascertain requirements and constraints critical to the design of an information system from these comments. A third approach involves consideration of structure, function, products, and services. The user, or potential user, in this research approach is viewed as part of a larger framework for designing an information system. This latter methodology normally involves the use of a purposively selected group of experts to further identify essential dimensions, help define them, and determine the constraints to operate the information system.

Existing Personnel Development Information Systems

In addition to many professional educational journals announcing the availability of business and industry learning opportunities on a sporadic basis, a few information networks have been established to systematically announce such learning opportunities for educators and other interested persons.

A prime example of an information network to announce in-service learning opportunities is one established by the Academy for Educational Development (Irwin 1973). The Academy publishes an annual index-type guide of seminars, workshops, conferences, internships, and fellowships available to college and university administrators. Special
attention is directed to announcing the existence of learning opportunities which can potentially increase college administrators capabilities to meet increasingly complex managerial responsibilities. The Guide does not include university degree programs and their component courses, nor does it list programs offered by professional associations at their annual meetings. Descriptions of seminars, workshops, conferences, internships, and fellowships are prepared and submitted by sponsoring agencies. The Academy for Educational Development then produces the Guide with no endorsement, criticism or other evaluation. The response to the Guide has been very positive and enthusiastic on the part of contributors and users.

Another example of a product resulting from a systematic information network is a directory designed to provide management and training officials throughout the Federal Government with up-to-date information on governmental agency training center offerings. The announced resources are used to provide training for Federal civilian employees and are intended to encourage closer cooperation between State, local, and nearby Federal agencies sharing common in-service training needs. Specifically, the directory serves as a resource document to create awareness and to comply with the Government Employees Training Act which requires a search for existing sources of government training prior to using non-government resources (Agency Training Centers for Federal Employees, 1970).
A third example product is published by a government agency to encourage independent self-development of employees. Course information, other than programmed instruction, available to engineers and scientists employed by the Federal government is catalogued and made available on the premise that motivating employees to undertake self-development training requires knowledge of existing opportunities. The catalog provides information about government and non-government sponsored in-service training at all employment levels in a variety of subject areas. Specific information on the course description, schedule, for whom offered, location, cost, and other general details are provided in the indexed catalog.

The National Training and Development Service (NTDS) in Washington, D.C., has recently published a management resource catalog, with periodic updates, to announce the existence of management training programs that are offered nationwide by private organizations. The resource catalogs are offered to take the guesswork and confusion out of analyzing and selecting management training programs. The catalog contents provide information about program designs, objectives, audiences, length of training, costs, and past client groups.

The Center for Venture Management (1970) has published a guide for small businessmen which focuses on chartering an experience bank. The experience bank guide encourages
small businessmen (those with from 15 to 500 employees) to
develop liaisons with nearby colleges, universities, and
vocational-technical schools. The purpose of these liaison
arrangements is for informal exchange of information about
new techniques and to discuss the needs of both business
and industry and education. Several experience banks cur­
rently provide member awareness of expertise which exists
in different geographical areas. Activities include ex­
change visits of businesses, materials, and other resources.

Job Bank Systems

Design-wise, a system that parallels the one envi­sioned in the current study is the job banks system. Oper­
ated under the auspices of the U. S. Employment Security
Administration, more than 110 Job Banks are now operating
in 32 states. Job Banks are systems that are designed to
bring people and jobs together by providing complete, cur­
rent, and computerized job opening information at centers
which are convenient to every jobseeker. Microfiche of
daily computer printouts on job openings provide jobseekers
with information such as type of work, salary, days and
hours of work, place of employment, education, and other
requirements. To facilitate easy reference and exact defi­
nition, each job opening is listed by Dictionary of Occupa­tional Titles code numbers. The Job Bank services are pro­
vided without cost to jobseekers and employers. Both bene­
fit from the wide exposure of job information.
The Job Bank operated by Maryland's Department of Employment and Social Services has offices in 24 localities throughout the state and handles approximately 16,000 job applicants per month. To make the task of matching job and applicant easier, the Job Bank utilizes computer output microfilm (COM), approximately 1,500 separate pieces of microfiche daily, and close to 200 microfiche readers.

Jobseekers can be counseled by employment interviewers who are well acquainted with the outlook, wage trends, employer expectations, and other job data for occupations in their specialized area. The Job Bank employment interviewers can tap the system by asking the computer to do a rapid search of the files for job orders or even for training opportunities which most closely match an applicant's characteristics.

The rapid progress being made with USES Experiments in computerized man-job matching systems has increased interest in the potential of applying the techniques to other settings.

Ullman and Huber (1973) conducted an intensive series of studies to assess the performance, structure, and direction of the Job Bank Program. Attention was focused on three objectives: (1) to assess the relative goal achievement of Job Banks; (2) to determine the optimal organizational configuration for Job Banks; and (3) to learn what effect feedback of performance results and recommendations had on program structure and direction.
As background for the study, the researchers attempted to determine a rationale for designing the Job Banks Program and concluded:

As far as we know, the decision to develop a national computer-aided job-matching network was based on no more information than that computer matching of men and women for social purposes had been successfully implemented. . . (along with) the administrations' desire to reduce unemployment and the unemployment problems of the disadvantaged (Ullman and Huber 1973:60).

The program started quickly without benefit of adequate study of essential design features. Potential users (both the unemployed and employers) were not consulted to any extent about system design and operation.

The failure to make a preliminary effort to "debug" the system before getting it into full operation contributed to negative overall goal achievement after one year of operation.

**Consensus Converging Techniques**

A number of different techniques have been utilized in the past to gain consensus or convergence of expert opinion regarding various problems and developmental efforts. Conferences, conventions, organizational efforts, fact-finding panels, and research have all been designed to identify, shape, or utilize the opinions of select people. In addition, other kinds of methods such as gaming, decision display panels, mapping, future histories, scenarios, and cross-impact matrices may be adequately refined in the
future to solve problems in general (Judd 1972:22). The Delphi Technique has become a widely used approach to converge opinions.

**Background**

The Delphi Technique was vitalized by Olaf Helmer in collaboration with Norman Dalkey at the Rand Corporation in the early 1950's (Helmer 1968). About ten years ago, a description of the technique was published and the procedures have been used since in a number of research settings. The original Delphi Technique was used by the Rand Corporation to predict long-range developments in science, population growth, automation, and developments and relationships surrounding future weapons systems (Gordon and Helmer, 1966).

The technique, which is built on the strength of informed intuitive judgment, is intended to gather expert opinion without bringing experts together in a face-to-face confrontation. This approach is presumed to prevent specious persuasion, individual willingness to abandon publicly held positions, and the "Band-wagon" effect of a majority argument. Because of the nature of the Technique, contact is generally made with a small group of experts through two to four successive questionnaires. Each questionnaire-round is designed to produce more carefully considered group opinions.
Modified or Adapted Delphi

It has been pointed out that few true Delphi studies are conducted, rather one normally conducts a "modified" or "adapted" Delphi (Weaver 1972). Pfeiffer has presented the following basic procedure of the Delphi Technique.

1. The first questionnaire may call for a list of opinions involving experienced judgment, say a list of predictions or recommended activities.

2. On the second round each expert receives a copy of the list, and is asked to rate or evaluate each item by some such criterion as importance, probability of success, and so on.

3. The third questionnaire includes the list and the ratings, indicates the consensus if any, and in effect asks the experts either to revise their opinions or else to specify their reasons for remaining outside the consensus.

4. The fourth questionnaire includes lists, ratings, the consensus and majority opinions. It provides a final chance for the revision of opinions (Pfeiffer 1968:152-157).

As noted earlier, variations to the original Delphi procedural format are common. Some Delphi studies start the first round with descriptions of events expected to take place in the future such as political, social, economic, and environmental conditions. Others start with a blank piece of paper and ask participants to prognosticate the future. Some have experts rate their own expertise for answering structured questions and weight the responses accordingly (Martino 1972). Several investigators have limited the number of reiterations (questionnaire rounds)
to two or three without any loss in accuracy (Bedford 1972, Dalkey 1969).

The original and modified Delphi is a process for eliciting and refining expert judgments about some area of concern. Individuals serving as respondents remain anonymous to each other, while their opinions from each questionnaire round are continuously synthesized and reiterated as controlled feedback by the Delphi research coordinator. The aim of the process is to either produce converging group consensus or a polarization of views (Gordon 1969; Helmer 1969).

Model Presentations

One aspect of the Delphi Technique, that of presenting a model, has seldom been used even though:

... an expert should be placed in the right conditions in order to perform well ... communication should be facilitated as much as possible.
... the prior formulation of an appropriate model (even a very tentative one of the operations-analytical kind) would serve to communicate the problem to him with clarity and receive his answer without risk of misinterpretation (Helmer 1967:5).

Gray (1970) utilized a model to focus the thinking of a Delphi panel of experts. Sandow (1972) believes models or plans are not used with the Technique as often as they should be. He has criticized Delphi studies since they usually are not focused against a plan and they are not linked to the present in any plausible way to allow respondents to assess a strategy in light of them. In response to
this perceived weakness, he has evolved an adaptation called the "Focus Delphi," which can be used by planners and others to solve long-term planning problems.

**Focus Delphi**

The Focus Delphi is a modification of the Delphi Technique and its specific purpose is to translate a forecasting tool into a device to assist planners. Specifically, the Focus Delphi can be used by planners to:

... assess their strategy options against the beliefs, attitudes, and consequences felt and seen by various members of their society (concerning) the value of planned goals (Sandow 1972:30).

In searching out but not forcing consensus information, three general assumptions underly the Focus Delphi:

1) ... planning addresses itself to the pursuit of goals. Further, goals cannot be assessed in isolation; rather they must include a description of the strategies to be pursued to arrive at the goal. ... (The planner) must tap ... (respondent) perceptions of the relative value of the goal and note the strategies they might bring to bear to enhance or retard the occurrence of the goal ...

2) ... goals are a class of future events. While Delphi treats future events as independent entities, an advocate can be identified for goals. ... A planner needs to know how people from various segments of the affected society might react to the projected goal and its strategy ...
3) ... for any institutional goal, not only the advocates, but also the affected population can be identified ... (and) each group would certainly have opinions and beliefs about any goal, each for differing and legitimate reasons ... (Sandow 1972:13).

The Focus Delphi is conducted the same as the original Delphi described by Helmer. However, Focus Delphi differs in a substantive way since ... 

1) ... participants are drawn from each population and interest group affected by the goal, not from some "expert group."

2) ... each group has its own inter-quartile range displayed on reiteration, rather than a blending of estimates for all groups.

3) ... the questions in the third round deal with perceptions of power (i.e., Which of the involved groups has the power to cause the event? ... What strategies might you, as a member of your affected group, bring to bear to enhance or retard the event's occurrence?) (Sandow 1972:13-14).

Identification of Respondent Groups

Identification of the respondent group or experts for a Delphi study constitutes one of the major problems of the Technique (Emmons and Kaplan 1971). Similarly, it has been suggested experts must be ... 

... selected wisely and much depends on how expert the experts are. Their proper selection presents many problems. There are difficulties in defining qualifications and measuring relative performance of experts. It is far from obvious what is meant—or should be meant—when somebody is labeled an "expert." Even given reasonable criteria of "expertness" it may not be easy to obtain adequate data for determining a person's degree of expertise (Helmer 1968:119).
Obviously, to select an appropriate Delphi response group, the investigator must decide upon and establish certain decision rules.

**Decision Rules**

Many variations of criteria, decision rules, and approaches have been used to select respondents for "modified" Delphi studies. Panels have been selected purposively, randomly, and by random samples. In a study concerning medicine in the 1990's, the participating panel of experts...

... was selected by an "expanding nucleus" technique. A small number of people from different fields of medicine and from the pharmaceutical industry were selected on a personal basis because they were known to have expert knowledge and to be generally forwardlooking. They were invited to join the panel and suggest other experts who should be invited. The people they suggested were approached in similar terms and the process continued until it was clear that the panel was sufficiently large and representative. At that stage new names were no longer solicited and the process was merely completed by inviting those who had already been suggested. Out of a total of about 80 people approached... 50 agreed to take part. In the few cases where the issue was raised, it was made clear that no payment to experts was envisaged (Teeling-Smith 1971:69).

Lee (1973) reported on a Delphi study conducted as a springboard for assessing and delineating the future roles of home economics. The study was conducted at the 1973 Annual Meeting of the American Home Economics Association (AHEA) and involved a two round adaptation. Twenty-five home economics leaders submitted statements reflecting their beliefs about
the future needs, responsibilities, opportunities, trends, and developments in home economics. This group of experts was nominated by state and national officers of the AHEA. It was felt the experts could provide representative views to incorporate in a first round questionnaire for presentation to the 450 Assembly of Delegate members. A 71 statement round-one questionnaire was derived and 81 percent of the Delegates responded. Sixty percent of the Round one respondents answered the Round two questionnaire. The results were used as a catalyst to create thinking and debate at the AHEA Annual Meeting.

In another Delphi study, a broad interpretation of what constituted an expert in educational technology was used. Possible participants with interests in education, communication technology, and a wide array of interests in other areas were identified. Procedurally . . .

A list of . . . names was compiled in a brainstorming session starting with lists of participants from telecommunications technology conferences, authors of educational technology studies, teachers, professors, administrators in both government and education, businessmen, consultants, students, and "average" people. A list of 123 names was assembled, including twenty-four names chosen randomly from various state school district directories. Each of these possible participants was sent a letter inviting their participation. . . Enclosed with this letter was a copy of Round One of the study. At this point, the selection of the panel was done by the experts themselves (Robinson 1973:65-66).

Forty-nine out of the original 123 Round One questionnaires were returned and this constituted the panel of experts
It appears that it is the responsibility of each investigator to set forth well reasoned decision rules to guide the selection of experts and to insure, to the extent possible, that they constitute a representative sample adequate to the intended generalization of the study.

Regardless of the decision rule applied to select a panel of experts, Martino (1972) has suggested the number of respondents in a typical Delphi study is usually limited to around 40 since large amounts of the data are difficult to encode and the data often does not lend itself to computer analysis.

Summary

The Delphi Technique has become a useful research approach to converge or polarize opinions of experts regarding various problems and developmental efforts. Contact is generally made with a small group of experts (normally around forty) through two to four successive questionnaires. Each "round" of questionnaires is designed to elicit and refine group opinions. The Round One questionnaire may provide content for the Round Two questionnaire by directing the panel members to respond to some problem, beginning with a blank sheet of paper, a model, specified goals and objectives or other appropriate means to focus thinking.

The panel of experts may be selected through various methods based on appropriate decision rules and the purpose of the study.
CHAPTER III

PROCEDURES FOR THE STUDY

Introduction

This study was descriptive and exploratory in nature. A two successive round Delphi survey research technique was used to collect data. This technique was selected over other research approaches since it offered the power to create some important elements of a debate in a relatively short period of time and within the economic means of the investigator.

In order to collect and analyze the data, it was necessary to select respondents, develop instruments, establish procedures for data collection, and ascertain appropriate methods of data analysis.

Selecting the Sample

The selection of leading practitioners for inclusion as respondents in this study was a difficult task. The investigator encountered many of the same problems, discussed earlier, in selecting Delphi team or panel members.

Selection of the panel members was made by the investigator, in consultation with members of his graduate committee and the staff of The Center for Vocational and Technical
Education at The Ohio State University. Panel members were purposively selected to assure inclusion of those who were in positions of responsibility and who had demonstrated an interest in industry-education cooperation, personnel development, or information system design and operation. It was felt such respondents would be able to relate to the information system under investigation either as: (1) a potential user; (2) as a potential contributor of information for the system; (3) a decision-maker in a role that could influence development of the system; or (4) as a consultant with a background in information system formulation and operation. An effort was also made to select respondents throughout the United States. Figure 5 shows the state location of respondents.

The panel of respondents selected for the study included: (1) fifteen vocational-technical education teachers; (2) fifteen business and industry representatives; and (3) fifteen vocational-technical education personnel development specialists.

**Instrument Development**

Preliminary drafts of data collection instruments were derived from a review of research and literature related to the study. The preliminary drafts and supportive materials were subjected to the scrutiny of participants in graduate research seminars held between February 16, 1973 and June 8, 1973 in The Center for Vocational and Technical
*Respondent

Figure 5.—State Location of Study Respondents
Education at The Ohio State University. The same drafts were reviewed by the investigator's graduate committee. Critical inputs were made by each individual and these were incorporated in the pilot test instrument.

Pilot Test

The pilot test materials (Appendix A) were distributed on February 1, 1974 to 21 individuals whose professional backgrounds included experiences in positions similar to those held by respondents selected for inclusion in the study. This group was requested to accomplish four tasks: (1) complete the opinionnaire; (2) record the required response time; (3) make marginal notes concerning questions not completely understood; and (4) list suggestions for improvement of the instrument. After the pilot test, it was felt the open-ended instrument would encounter a low response-return rate. Pilot test responses and further review of the literature enabled the investigator to generate the instrument in a more structured form. This instrument was subjected to a pilot test with ten staff members of The Center for Vocational and Technical Education and two business and industry representatives in the Columbus, Ohio metropolitan area. The instrument was revised and printed in booklet form (Appendix B).
Data Collection

The letterhead and logo of The Center for Vocational and Technical Education at The Ohio State University were used on the instrument and all correspondence to increase the response rate to both rounds of data collection. Initial mail contact with purposively selected respondents in the study was made with an advance letter on March 8, 1974. This letter briefly introduced the study and sought each respondent's cooperation (Appendix C). The Round One opinionnaire, a cover letter (Appendix D), and a self-addressed, stamped envelope were mailed to respondents on March 11, 1974. By March 22, 1974, nineteen respondents returned completed instruments, two wrote letters to indicate they would be unable to participate in the study, but expressed interest in receiving an abstract of the final report. One respondent's secretary wrote a letter to inform the investigator that the respondent was on leave and would not be back until later in the spring. This respondent was dropped from the study and replaced with another. A letter of appreciation was sent on March 22, 1974 to all respondents returning completed instruments (Appendix E). At the same time a follow-up letter (Appendix F), another Round One instrument, and self-addressed, stamped envelope were sent to all non-respondents. During the latter part of March and the first week of April 1974, the investigator attempted telephone contact with non-respondents to
encourage return of completed instruments. Contact was made with three non-respondents. One respondent indicated the instrument had been returned by mail. Two respondents indicated the completed instrument would be returned promptly. Round One data collection was terminated on April 11, 1974, with a ninety-one percent response rate. Eighty percent of the responses were considered usable for analysis purposes (See Table 1).

The Round Two instrument was mailed to forty-one respondents on April 15, 1974. A cover letter accompanied the instrument (Appendix G) to briefly refresh each respondent's mind about the need for completing the second round instrument. The Round Two instrument was followed up similar to Round One mailings in an effort to obtain maximum response rates. A thank-you letter was mailed to all those returning completed instruments (Appendix H). A follow-up letter and a return stamped postal card (Appendix I) were sent to all non-respondents on April 25, 1974. Two of the second round instruments were returned indicating the respective respondents were no longer with the business and industrial firm. Data collection with Round Two instruments was terminated on May 15, 1974. A response rate of 80 percent was obtained on the Round Two instrument, with 76 percent considered usable for analysis purposes (See Table 2). During the analysis of data, an additional Round Two instrument was received to make the response rate 83 percent.
<table>
<thead>
<tr>
<th>Respondent Group</th>
<th>Sample</th>
<th>Instruments Returned</th>
<th>Unusable Instruments Returned*</th>
<th>Usable Instruments Returned**</th>
<th>Percent Usable Instruments Returned</th>
<th>Percent Instruments Returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocational Personnel Development Specialists</td>
<td>15</td>
<td>15</td>
<td>0</td>
<td>15</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Vocational-Technical Education Teachers</td>
<td>15</td>
<td>14</td>
<td>0</td>
<td>14</td>
<td>93</td>
<td>93</td>
</tr>
<tr>
<td>Business and Industry</td>
<td>15</td>
<td>12</td>
<td>3</td>
<td>7</td>
<td>47</td>
<td>80</td>
</tr>
<tr>
<td>Totals</td>
<td>45</td>
<td>41</td>
<td>3</td>
<td>36</td>
<td>80</td>
<td>91</td>
</tr>
</tbody>
</table>

*Respondents returned instrument but did not fill in responses. Two enclosed their opinions about the problem under investigation. These comments are presented as a supplement to data analyzed from usable returns.

**Instruments were classified usable unless they were received too late to be included in data analysis or respondents failed to fill in responses.
<table>
<thead>
<tr>
<th>Respondent Group</th>
<th>Sample* Instruments Returned</th>
<th>Unusable Instruments Returned</th>
<th>Usable Instruments Returned</th>
<th>Percent Usable Instruments Returned</th>
<th>Percent Instruments Returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocational Personnel Development Specialists</td>
<td>15</td>
<td>12</td>
<td>0</td>
<td>12</td>
<td>80</td>
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<tr>
<td>Vocational-Technical Education Teachers</td>
<td>15</td>
<td>14</td>
<td>0</td>
<td>14</td>
<td>93</td>
</tr>
<tr>
<td>Business and Industry</td>
<td>11</td>
<td>7</td>
<td>2</td>
<td>5</td>
<td>45</td>
</tr>
<tr>
<td>Totals</td>
<td>41</td>
<td>33</td>
<td>2</td>
<td>31</td>
<td>76</td>
</tr>
</tbody>
</table>

*Four business and industry respondents indicated they did not want to be included in the second instrument mailing.
These data were not included in the final analysis.

The cover letter to each respondent requested that he/she add any omitted dimension and feasibility consideration regarding the information system. None of the respondents added dimensions or feasibility considerations.

Respondents were assured their responses would remain anonymous.

Data Analysis

Due to the nature of Delphi studies, any discussion of data analysis must be intermingled somewhat with data collection procedures. An effort has been made to present this section as an extension of the preceding section on data collection.

In the Round One opinionnaire, respondents were provided with the following concerning the information system under investigation: (1) an introduction; (2) a schematic of the information system; and (3) tentative objective and scope statements. Each respondent was requested to rate items on the basis of instructions provided in the opinionnaire. Also, respondents were encouraged to list additional dimensions and make comments about items on the opinionnaire. Respondent group means, standard deviations, frequencies, and percentage responses to each item were computed using the Statistical Package for the Social Sciences (SPSS), Version 5.01.
In the Round Two opinionnaire, the group mean for the applicable respondent group on each opinionnaire item was reported to each respondent along with a notation of the respondent's response to the Round One opinionnaire. Each respondent was asked to: (1) review their Round One response in relation to the response of their group; (2) re-rate each item on the opinionnaire; and (3) comment if their second response did not agree with the group response reported on the opinionnaire. Respondents were asked three additional questions that did not appear on the Round One opinionnaire. Specifically, respondents were asked what they would do to encourage establishment of the information system, what they would do to discourage establishment of the information system, and whether they would like for their name to appear in the appendices of the final report of this study. Round Two responses were analyzed with the SPSS program mentioned above to determine means, standard deviations, frequencies, and percentage responses by respondent groups. The Non-parametric Statistical Analysis Package (NPAR), modified for the IBM 360/75 computer at The Ohio State University, was used to convert group means to ranks and this analysis yielded Spearman rank-order correlations, along with Kendall's Coefficient of Concordance (W).

After reviewing responses and deciding loss of precision would be very minimal, the rating scale for seven of the questions was collapsed into three categories. Responses
to questions one through seven were analyzed based on the following collapsed scale:

Example:

\[
\begin{array}{ccc}
\text{low} & \text{medium} & \text{high} \\
1 & 2 & 3 & 4 & 5 & 6 & 7 \\
\end{array}
\]

The rating scale for questions eight through twelve was purposely structured different. Responses to these four questions were analyzed based on the following collapsed scale.

Example:

\[
\begin{array}{ccc}
\text{high} & \text{medium} & \text{low} \\
1 & 2 & 3 & 4 & 5 & 6 & 7 \\
\end{array}
\]

The mean and standard deviation were used to present these data in the next chapter. All the collected data are analyzed and presented in Chapter IV.
CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Introduction

The data analyzed and reported in this chapter are based on responses received from purposively selected vocational education personnel development specialists, vocational-technical education teachers, and business and industry representatives. The data were collected from a total of 36 Round One and 31 Round Two Delphi respondents.

Number, percentage, and group mean responses are reported on feasibility type questions in the first section of this chapter. The group mean and standard deviation are reported, along with rank order correlation coefficients regarding the dimensions of the information system.

The Spearman rank-order correlation coefficient is used to express the degree of association by comparing rankings of question items between respondent groups. Kendall's Coefficient of Concordance (W) has been used to describe the amount of agreement or consensus among respondent groups regarding the essential dimensions of the information system.
Data Presentation

The following presentation of data is based on responses to two successive Delphi opinionnaires. Round One data are based on usable returns from 15 vocational education personnel development specialists, 14 vocational-technical education teachers, and 7 business and industry representatives. Round Two data are based on responses from 12 vocational personnel development specialists, 14 vocational-technical education teachers, and 5 business and industry representatives.

The following definitions and abbreviations are presented here to assist the reader in understanding the tables and discussion that follows.

1. Standard descriptors, provided by Davis (1971) and shown in Figure 6, have been used to report the Spearman Correlation Coefficients for questions eight through twelve.

2. Round I, R1, and Round One refer to data collected on the initial opinionnaire.

3. Round II, R2, and Round Two refer to data collected on the second opinionnaire which was administered to the same respondent groups.
4. "The information system" as used in discussions of data refers to "an information system to facilitate awareness of business and industry programs for vocational-technical education teachers."

<table>
<thead>
<tr>
<th>Values of $r_s$</th>
<th>Descriptive Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ 1.00</td>
<td>A perfect positive association</td>
</tr>
<tr>
<td>+ .70 or higher</td>
<td>A very strong positive association</td>
</tr>
<tr>
<td>+ .50 to + .69</td>
<td>A substantial positive association</td>
</tr>
<tr>
<td>+ .30 to + .49</td>
<td>A moderate positive association</td>
</tr>
<tr>
<td>+ .10 to + .29</td>
<td>A low positive association</td>
</tr>
<tr>
<td>+ .01 to + .09</td>
<td>A negligible positive association</td>
</tr>
<tr>
<td>0.00</td>
<td>No association</td>
</tr>
<tr>
<td>- .01 to - .09</td>
<td>A negligible negative association</td>
</tr>
<tr>
<td>- .10 to - .29</td>
<td>A low negative association</td>
</tr>
<tr>
<td>- .30 to - .49</td>
<td>A moderate negative association</td>
</tr>
<tr>
<td>- .50 to - .69</td>
<td>A substantial negative association</td>
</tr>
<tr>
<td>- .70 or lower</td>
<td>A very strong negative association</td>
</tr>
<tr>
<td>- 1.00</td>
<td>A perfect negative association</td>
</tr>
</tbody>
</table>

Figure 6.—Descriptive Interpretation of Spearman Rank Order Correlation Coefficients
Source: Davis, 1971, p. 49
Feasibility of the Information System

One of the purposes of this study was to determine the general feasibility of an information system to facilitate awareness of business and industry programs for vocational-technical education teachers (hereafter referred to as "the information system"). Also, respondent groups were asked more specific feasibility-type questions encompassing:

1. Value of the information system in terms of its potential usefulness to their work.
2. Extent the information system would be used, if established.
3. Extent respondents would use the information system.
4. Need for the information system.
5. Operating constraints the system might encounter.
6. When the information system should be established.

Analysis of data and discussion of Round One and Round Two group responses to these feasibility questions follow. A summary of the total group response will be found following the discussion of each group's response. For analysis purposes, the rating scales were collapsed into three categories as discussed earlier.

Value of the information system in terms of its usefulness to respondents' work

Table 3 reflects Round One and Round Two group
opinions regarding how valuable the information system would be to each respondent group's work. Discussion of the data on this table follows.

Vocational Personnel Development Specialist Responses.— In Round One, eleven of the vocational personnel development specialists felt the information system would be highly valuable in terms of its potential usefulness to their work. Four felt the information system would be somewhat valuable to their work. The Round One group mean indicates vocational personnel development specialists felt the information system would be somewhat to highly valuable to their work. In Round Two, respondents were advised of the group's mean response to this feasibility question. After reviewing their response in relation to the group response, respondents in this group generally felt the information system would be highly valuable to their work.

Vocational-Technical Education Teacher Responses.— In Round One, the majority of vocational-technical education teachers indicated the information system would be somewhat to highly valuable to their work. Only one vocational-technical education teacher felt the information system would not be valuable. In Round Two, this respondent group shifted to express the information system would be somewhat valuable after reviewing their individual responses in relation to the mean of this particular group's response.
Business and Industry Responses. — In Round One, business and industry representatives were almost evenly divided regarding the value of the information system to their work. Slightly more, by one respondent, felt the information system would be highly valuable. In Round Two, this respondent group shifted to the somewhat valuable category after reviewing their individual response in relation to the group's mean response in Round One.

Summary

The total Round One responses of all groups indicate the information system would be somewhat to highly valuable to their work. Twenty of the 36 respondents felt the information system would be highly valuable to their work. Thirteen felt the information system would be somewhat valuable, while three indicated the information system would not be valuable to their work. The Round Two responses of this same group shows 15 out of the 31 respondents felt the information system would be highly valuable to their work, while 13 of the 31 respondents viewed the information system as having the potential of being somewhat valuable to their work. Three or approximately ten percent felt the information system held no potential value in relation to their work.

Feasibility of Operating the Information System

Respondents were asked how feasible they thought it
<table>
<thead>
<tr>
<th>Respondent Group</th>
<th>Extent of Value to Respondents</th>
<th>GROUP MEAN</th>
<th></th>
<th>Round I</th>
<th>Round II</th>
<th></th>
<th>Round I</th>
<th>Round II</th>
<th></th>
<th>Round I</th>
<th>Round II</th>
<th></th>
<th>Round I</th>
<th>Round II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Highly Valuable</td>
<td>Somewhat Valuable</td>
<td>Not Valuable</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>1. Vocational Personnel Development Specialists (a)</td>
<td>11</td>
<td>73.3</td>
<td>4</td>
<td>26.7</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>83.3</td>
<td>1</td>
<td>8.3</td>
<td>1</td>
<td>8.3</td>
<td>2.4</td>
<td>2.0</td>
</tr>
<tr>
<td>2. Vocational-Technical Education Teachers (b)</td>
<td>6</td>
<td>42.8</td>
<td>7</td>
<td>49.9</td>
<td>1</td>
<td>7.1</td>
<td>4</td>
<td>28.5</td>
<td>9</td>
<td>64.2</td>
<td>1</td>
<td>7.1</td>
<td>2.9</td>
<td>2.9</td>
</tr>
<tr>
<td>3. Business and Industry (c)</td>
<td>3</td>
<td>42.9</td>
<td>2</td>
<td>28.6</td>
<td>2</td>
<td>28.6</td>
<td>1</td>
<td>20.0</td>
<td>3</td>
<td>60.0</td>
<td>1</td>
<td>20.0</td>
<td>3.6</td>
<td>3.8</td>
</tr>
<tr>
<td>Totals</td>
<td>20</td>
<td>56.0</td>
<td>13</td>
<td>36.0</td>
<td>3</td>
<td>8.0</td>
<td>15</td>
<td>48.0</td>
<td>13</td>
<td>42.0</td>
<td>3</td>
<td>10.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) N = 15 for Round I; N = 12 for Round II
(b) N = 14 for Round I; N = 14 for Round II
(c) N = 7 for Round I; N = 5 for Round II
would be to operate the information system. Table 4 reflects both Round One and Round Two responses to this question. Discussion of the data on this table follows.

**Vocational Personnel Development Specialist Responses.**
This respondent group, in Round One, generally thought the information system would be moderately feasible to operate. None of this group felt it would not be feasible to operate the information system. Six or forty percent felt operation would be highly feasible. In Round Two, the majority (75 percent) of this group felt the information system would be moderately feasible to operate after reviewing their individual response in relation to the group mean response in Round One. Again, none of the respondents felt the information system would not be feasible to operate the information system.

**Vocational-Technical Education Teacher Responses.**
Round One responses from this group tended to coincide with personnel development specialists. The largest majority (ten) felt the information system would be moderately feasible to operate. One respondent felt the information system would not be feasible to operate, while three expressed the belief that the information system would be highly feasible to operate. In Round Two, vocational-technical education teachers tended to reaffirm their earlier opinion. The majority indicated the information system would be moderately feasible to operate. However, after considering Round One
responses, none of this group felt the information system would not be feasible to operate.

**Business and Industry Responses.**—Like other respondent groups, the business and industry representatives felt the information system would be highly to moderately feasible to operate. None of this group, like vocational personnel development specialists, felt it would not be feasible to operate the information system. Round Two responses of this same group reveals a slight shift to the opinion that the information system would be moderately feasible to operate.

**Summary**

The total Round One responses of all groups suggest the information system would be moderately feasible to operate. Twenty-two of the 36 respondents felt operation of the information system would be moderately feasible. Thirteen respondents felt the information system would be highly feasible to operate, while one felt operation would not be feasible. In Round Two, responses of all groups indicates the largest percentage felt the information system would be moderately feasible to operate. A lesser percent felt the information system would be highly feasible to operate, while none expressed the information system would not be feasible to operate.
<table>
<thead>
<tr>
<th>Respondent Group</th>
<th>Extent of Feasibility</th>
<th>ROUND II (N = 31)</th>
<th>GROUP MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Highly Feasible</td>
<td>Moderately Feasible</td>
<td>Not Feasible</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>1. Vocational Personnel Development Specialists (a)</td>
<td>6</td>
<td>40.0</td>
<td>9</td>
</tr>
<tr>
<td>2. Vocational-Technical Education Teachers (b)</td>
<td>3</td>
<td>21.4</td>
<td>10</td>
</tr>
<tr>
<td>3. Business and Industry (c)</td>
<td>4</td>
<td>57.2</td>
<td>3</td>
</tr>
<tr>
<td>Totals</td>
<td>13</td>
<td>36.0</td>
<td>22</td>
</tr>
</tbody>
</table>

(a) N = 15 for Round I; N = 12 for Round II
(b) N = 14 for Round I; N = 14 for Round II
(c) N = 7 for Round I; N = 5 for Round II
Extent Information System Would be Used

Table 5 shows responses to the question concerning the extent to which respondents felt the information system would be used, if established. Discussion of the responses to this question follows.

**Vocational Personnel Development Specialist Responses.** - This group of respondents, in Round One, felt the information system would receive some to high usage, if established. None of this group indicated, in their opinion, that the information system would not be used. Eleven felt the information system would be used some, while four thought it would be used to a high extent. Round Two responses of this group shows the majority believed the information system would be used to some extent. A lesser number felt the information system would be used to a high extent and none felt the information system would receive no usage.

**Vocational-Technical Education Teacher Responses.** - The Round One responses of this group coincided with vocational personnel development specialists, except for two respondents who felt the information system would receive no usage. Ten respondents in this group opinioned the information system would be used to some extent, while two felt it would be used to a high extent, if established. Round Two responses of vocational-technical education teachers indicates the group felt essentially the same way about how much the information would be used after they reviewed their
individual responses in relation to the group mean response in Round One.

**Business and Industry Responses.**—This group of respondents differed with vocational personnel development specialists and vocational-technical education teachers concerning the extent to which they thought the information system would be used, if established. The majority of business and industry representatives (5 out of 7) thought the information system would be used to a high extent. Two felt the information system would be used some and none of the business and industry representatives thought the information system would not be used, if established. In Round Two, this group reaffirmed its Round One opinion. The majority (4 out of 5) respondents felt the information system would be used to a high extent, if established.

**Summary**

The total Round One responses of all groups indicate the information system, if established, would be used some to a high extent. Twenty-three respondents felt the information system would receive some usage, fourteen indicated they thought the information system would be used to a high extent, and two did not believe the information system would be used at all. The total Round Two responses of all groups indicates little change in opinion. Twenty-one out of thirty-one respondents felt the information system would
receive some usage, while nine thought it would receive high usage, if established. Only one respondent expressed the belief that the information system would not be used.

**Extent Respondents Would Use Information System**

Table 6 shows responses to the question regarding the extent respondents to this study would use the information system. Discussion of the data on this table follows.

**Vocational Personnel Development Specialist Responses.**—Round one responses of this group indicates they would use the information system from some to a high extent. None of this group expressed non-use of the information system. Slightly more respondents indicated they would use the information system to some extent with close to the same number in this group indicating they would use it to a high extent. Round Two responses of this same group shows a large shift toward the opinion that the information system would be used to a high extent by vocational personnel development specialists.

**Vocational-Technical Education Teacher Responses.**—Over half of the respondents (eight) in this group indicated they would use the information system to a high extent. One vocational-technical education teacher would not use the information system, while five indicated they would use it to some extent. Round Two responses of this same group shows a shift toward the opinion they would use the information system to some extent. One vocational-technical
### TABLE 5

**EXTENT AN INFORMATION SYSTEM TO FACILITATE AWARENESS OF BUSINESS AND INDUSTRY PROGRAMS FOR VOCATIONAL-TECHNICAL EDUCATION TEACHERS WOULD BE USED**

<table>
<thead>
<tr>
<th>Respondent Group</th>
<th>Extent Information Would be Used</th>
<th>GROUP MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ROUND I (N = 36)</td>
<td>ROUND II (N = 31)</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Some</td>
</tr>
<tr>
<td>1. Vocational Personnel Development Specialists (a)</td>
<td>4 26.7</td>
<td>11 73.3</td>
</tr>
<tr>
<td>2. Vocational-Technical Education Teachers (b)</td>
<td>2 14.3</td>
<td>10 71.4</td>
</tr>
<tr>
<td>3. Business and Industry (c)</td>
<td>5 71.4</td>
<td>2 28.6</td>
</tr>
<tr>
<td>Totals</td>
<td>11 31.0</td>
<td>23 64.0</td>
</tr>
</tbody>
</table>

(a) N = 15 for Round I; N = 12 for Round II
(b) N = 14 for Round I; N = 14 for Round II
(c) N = 7 for Round I; N = 5 for Round II
education teacher expressed non-use, while four indicated they would use the information system to a high extent.

**Business and Industry Responses.** A wide range of Round One response was received from business and industry representatives regarding the extent to which they would use the information system. Three indicated high usage, one indicated some usage, and three indicated they would not use the information system. Round Two responses indicates this respondent group would use the information system to some extent, which is a shift from their Round One response.

**Summary**

The total Round One responses of all groups indicate eighteen (fifty percent) would use the information system to a high extent, fourteen would use it some, and four expressed that they would not use the information system. In Round Two, the group expressed essentially the same opinion regarding use of the information system. The respondent groups indicated they would use the information system from high to some extent.

**Extent of Need for the Information System**

Respondents were asked to indicate the extent to which they felt there was a need for the information system. Table 7 reflects the extent of need for the information system in the opinion of respondents to this study. Discussion of the data on the table follows.
### TABLE 6

**EXTENT RESPONDENTS WOULD USE AN INFORMATION SYSTEM TO FACILITATE AWARENESS OF BUSINESS AND INDUSTRY PROGRAMS FOR VOCATIONAL-TECHNICAL EDUCATION TEACHERS**

<table>
<thead>
<tr>
<th>Respondent Group</th>
<th>Extent of Respondent Use</th>
<th>ROUND I (N = 36)</th>
<th>ROUND II (N = 31)</th>
<th>GROUP MEAN</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>High  %</td>
<td>Some %</td>
<td>No  %</td>
<td>High  %</td>
</tr>
<tr>
<td>1. Vocational Personnel Development:</td>
<td></td>
<td>Vocational</td>
<td>46.7</td>
<td>8</td>
<td>53.3</td>
</tr>
<tr>
<td>Specialists (a)</td>
<td></td>
<td>Specialists</td>
<td>46.7</td>
<td>8</td>
<td>53.3</td>
</tr>
<tr>
<td>2. Vocational-Technical Education</td>
<td></td>
<td>Teachers</td>
<td>8</td>
<td>57.2</td>
<td>5</td>
</tr>
<tr>
<td>Teachers (b)</td>
<td></td>
<td>Teachers</td>
<td>8</td>
<td>57.2</td>
<td>5</td>
</tr>
<tr>
<td>3. Business and Industry (c)</td>
<td></td>
<td>Industry</td>
<td>3</td>
<td>42.9</td>
<td>1</td>
</tr>
<tr>
<td>Industry (c)</td>
<td></td>
<td>Industry</td>
<td>3</td>
<td>42.9</td>
<td>1</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td>Totals</td>
<td>18</td>
<td>50.0</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Totals</td>
<td>18</td>
<td>50.0</td>
<td>14</td>
</tr>
</tbody>
</table>

(a) N = 15 for Round I; N = 12 for Round II

(b) N = 14 for Round I; N = 14 for Round II

(c) N = 7 for Round I; N = 5 for Round II


<table>
<thead>
<tr>
<th>Respondent Group</th>
<th>Extent of Need</th>
<th>Extent of Need</th>
<th>GROUP MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ROUND I (N = 36)</td>
<td>ROUND II (N = 31)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Critical</td>
<td>Some</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>1. Vocational Personnel Development Specialists (a)</td>
<td>10</td>
<td>66.7</td>
<td>5</td>
</tr>
<tr>
<td>2. Vocational-Technical Education Teachers (b)</td>
<td>8</td>
<td>57.1</td>
<td>6</td>
</tr>
<tr>
<td>3. Business and Industry (c)</td>
<td>3</td>
<td>42.9</td>
<td>4</td>
</tr>
<tr>
<td>Totals</td>
<td>21</td>
<td>58.0</td>
<td>15</td>
</tr>
</tbody>
</table>

(a) N = 15 for Round I; N = 12 for Round II
(b) N = 14 for Round I; N = 14 for Round II
(c) N = 7 for Round I; N = 5 for Round II
Vocational Personnel Development Specialist Responses.- In Round One, none of the vocational personnel development specialists indicated there was no need for the information system. Ten respondents in this group felt a critical need exists for the information system and five expressed some need exists. In Round Two, ten (83.4 percent) expressed there was a critical need for the information system, while two felt some need existed. Once again, none of the respondents felt there was no need for the information system.

Vocational-Technical Education Teacher Responses.-In Round One, none of the vocational-technical education teachers indicated there was no need for the information system. Like vocational personnel development specialists, this respondent group generally felt some to a critical need exists for the information system. In Round Two, this respondent group basically reaffirmed their Round One opinions.

Business and Industry Responses.-Round One responses of this group generally agreed with vocational personnel development specialists and vocational-technical education teachers concerning the extent of need for the information system. Three business and industry representatives felt a critical need exists for the information system, while four respondents in this group felt there was some need for it. None of the business and industry representatives felt there was no need for the information system. Only one expressed some genuine doubts about the need for the
information system and this response appears on page 118. In Round Two, this respondent group generally reaffirmed their Round One opinions.

Summary

The total Round One responses of all groups indicate a critical need exists for the information system. None of the 36 respondents felt there was no need for the information system, while 15 felt there was some need for it. In Round Two, a large majority of respondents (22 out of 31) expressed the opinion that a critical need exists for the information system. Nine respondents in the second round expressed the opinion that some need exists, while none of the respondents checked the no need category.

Opinions on When the Information System Should be Established

Respondents were asked when the information system should be established. The options that could be checked, along with the Round One and Round Two responses to this question are on Tables 8 and 9. Discussion of the data on the tables follow.

Vocational Personnel Development Specialist Responses.—This respondent group, in Round One, generally indicated they felt the information system should be established as soon as possible or within the next two years. None believed the information system should never be established.
One respondent thought the information system should be established within the next four years. In Round Two, seven respondents in this group felt the information system should be established within the next two years, five expressed the opinion that the information system should be established as soon as possible, and none marked the other categories.

Vocational-Technical Education Teacher Responses.—This respondent group responded quite similarly to vocational technical personnel development specialists. However, a larger percentage felt the information system should be established as soon as possible. In Round Two, this respondent group largely shifted to the opinion that the information system should be established within the next two years.

Business and Industry Responses.—This respondent group felt the information system should be established as soon as possible or within the next two years. None felt the information system should never be established. In Round Two, this respondent group tended to reinforce their Round One opinions, but a slight shift is noted toward the opinion that the information system should be established within the next two years.

Summary

The largest percentage felt the information system should be established as soon as possible according to the total of all group responses in Round One. Closely behind was the opinion that the information system should be
<table>
<thead>
<tr>
<th>Respondent Group</th>
<th>As Soon As Possible</th>
<th>Within Next Two Years</th>
<th>Within Next Four Years</th>
<th>Never</th>
<th>Other</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocational Personnel Development Specialists</td>
<td>N: 7/36, %: 46.7</td>
<td>N: 6/36, %: 40.0</td>
<td>N: 1/36, %: 6.7</td>
<td>N: 0/36, %: 0</td>
<td>N: 1/36, %: 6.7</td>
<td>N: 15/36, %: 42.9</td>
</tr>
<tr>
<td>Vocational-Technical Education Teachers</td>
<td>N: 9/36, %: 64.3</td>
<td>N: 4/36, %: 28.6</td>
<td>N: 0/36, %: 0</td>
<td>N: 0/36, %: 0</td>
<td>N: 1/36, %: 7.1</td>
<td>N: 14/36, %: 40.1</td>
</tr>
<tr>
<td>Business and Industry</td>
<td>N: 3/36, %: 50.0</td>
<td>N: 3/36, %: 50.0</td>
<td>N: 0/36, %: 0</td>
<td>N: 0/36, %: 0</td>
<td>N: 0/36, %: 0</td>
<td>N: 6/36, %: 17.0</td>
</tr>
<tr>
<td>All Groups</td>
<td>N: 19/36, %: 54.3</td>
<td>N: 13/36, %: 37.1</td>
<td>N: 1/36, %: 2.9</td>
<td>N: 0/36, %: 0</td>
<td>N: 2/36, %: 5.7</td>
<td>N: 35/36, %: 100.0</td>
</tr>
</tbody>
</table>

*One respondent marked "Other" and indicated when the need for the information system is definitely established.*
TABLE 9

OPINIONS ON WHEN AN INFORMATION SYSTEM TO FACILITATE AWARENESS OF BUSINESS AND INDUSTRY PROGRAMS FOR VOCATIONAL-TECHNICAL EDUCATION TEACHERS SHOULD BE ESTABLISHED—ROUND TWO

<table>
<thead>
<tr>
<th>Respondent Group</th>
<th>As Soon As Possible</th>
<th>Within Next Two Years</th>
<th>Within Next Four Years</th>
<th>Never</th>
<th>Other</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>(N = 31)</td>
<td>N  %</td>
<td>N  %</td>
<td>N  %</td>
<td>N  %</td>
<td>N  %</td>
<td>N  %</td>
</tr>
<tr>
<td>1. Vocational Personnel Development Specialists</td>
<td>5 41.7</td>
<td>7 58.3</td>
<td>0 0</td>
<td>0 0</td>
<td>0 0</td>
<td>12 38.7</td>
</tr>
<tr>
<td>2. Vocational-Technical Education Teachers</td>
<td>5 35.7</td>
<td>9 64.3</td>
<td>0 0</td>
<td>0 0</td>
<td>0 0</td>
<td>14 45.2</td>
</tr>
<tr>
<td>3. Business and Industry</td>
<td>2 40.0</td>
<td>3 60.0</td>
<td>0 0</td>
<td>0 0</td>
<td>0 0</td>
<td>5 16.1</td>
</tr>
<tr>
<td>All Groups</td>
<td>12 39.0</td>
<td>19 61.0</td>
<td>0 0</td>
<td>0 0</td>
<td>0 0</td>
<td>31 100.0</td>
</tr>
</tbody>
</table>
established within the next two years. None of the respondents indicated the information system should never be established. In Round Two, a shift is discernible to the opinion that the information system should be established within the next two years. A lesser number (12 out of 31) felt the information system should be established as soon as possible. None of the respondents checked within the next four years, never or other.

**What Respondents Would do to Encourage Establishment of the Information System**

In Round Two, respondents were asked what they would do to encourage and discourage establishment of the information system. Following are the responses indicating actions respondent groups would take to encourage establishment of the information system. With the exception of minor editing, the comments are presented as expressed by respondents. Responses relating to what respondents would do to discourage establishment of the information system follow this presentation.

**Vocational Education Personnel Development Specialists:**

"I would try to identify a group to take leadership in designing and proposing it to funding agencies."

"I would survey a representative sample of AVA members. Depending on interest shown along with data from this study, write a proposal and seek funding initially for a feasibility or planning grant."
"I would suggest that the system be worked out with the use of state representatives on an advisory council balanced with large and small states."

"I would circulate the information on it to teachers and to business via state advisory committees."

"I would serve on a national or regional advisory committee, promote teacher participation, and disseminate information in our state. We need closer working relations with business and industry!"

"I would encourage action be taken on the state level to support such a program. If state approval were given, the local groups would move forward."

"We would consider giving credit under our "Externship" course—Three graduate credits as part of a Master's Degree Program."

"I would support and participate."

"I would help with input and disseminate output."

"I would work within professional organizations to promote their support."

"I would do whatever is appropriate upon the request from the administrators of the system."

"I would participate in this survey, I would vote to support it at AVA."

"I would work directly with the State Bureau of Vocational and Adult Education, The State Advisory Council, and Teachers."

**Vocational-Technical Education Teachers:**

"I would make the vocational educators in my state aware of the system through our Vocational Association newsletter and at our annual summer conference when we all get together."

"I would publish the information in our state newsletter."
"I would present the need to the ones who count in the educational field."

"I would provide information to help implement the program and disseminate information to all I would contact."

"I would circulate materials in a school district of 63,000 students that has a good number of vocational-technical education teachers."

"I would set up a public relations program for business, industry, and professional groups with meetings for planning."

"I would supply written endorsement."

"I would encourage the establishment of this system, but would like to see cost factors before I would endorse it."

"I would, as state representative of SBEA, supply information for the center, as well as see that information I received was placed in the hands of the proper people."

"I would submit any material requested and vote favorably if needed."

Business and Industry Personnel Development Specialists:

"I would forward the results of this opinionnaire to National Professional Organizations and State Departments of Education and solicit their assistance."

"I would refer the results of this study to the Educational Committee of our Industry Association."

"I would promote this system in the school I teach in and with my fellow instructors."

"I would consolidate this questionnaire input, then set up and organize a computer bank for reference and interim use."
What Respondents Would do to Discourage Establishment of the Information System

In Round Two, respondents were asked what they would do to discourage establishment of the information system. Almost without exception, respondents indicated they would do nothing to discourage establishment of it. Only two respondents attached qualifiers to their comments. One stated establishment of the information system would be discouraged if "the cost proved to be too high" and another felt establishment of the information system should be discouraged "if interest of potential users is very low."

Comments Made by Respondents Which Were Not Directly Related to Specific Opinionnaire Items

Several comments were made, both by those completing opinionnaires and by those returning unusable ones. Some comments were made on the opinionnaire while others were communicated via letter. The comments made on opinionnaires are reported in Appendix FF. The following excerpts from letter comments reflect a wide divergence of opinion. These responses have not been reported in the preceding section.

A vocational personnel development specialist commented:

"I truly believe this type of activity has a great potential."

A business and industry representative commented:

"A national information system for vocational education teachers to be aware of business and programs would serve no useful purpose whatsoever. As a matter of fact, I fear such a system might
well be counterproductive. I say this because I am convinced that the only meaningful communication on vocational education is that which takes place with regard to the potential labor market in which vocational students might have an opportunity to be employed. Even in that circumstance we find that good communication is very difficult to achieve. Because of this difficulty in achieving communication on a local basis, I am simply appalled at the prospect of trying to do so on a national scheme."

Another business and industry representative was unable to participate in the study, but made the following comment:

"Since the primary objective (of the information system) is to provide ready access to industry programs which are available to vo-tech teachers, I am sending you literature describing the nature, use and availability of our 131 vocational and 25 safety training courses. These were developed by (company name) and are being used within (company name) and by some 6,000 companies, vocational schools and government agencies. Perhaps you will want to make them part of . . . the information base you ultimately develop for teachers. . . . Please let me know if you need any additional information on our courses. It will be a pleasure to answer your requests."

Kinds of Information That Should be Acquired About Business and Industry Programs for Vocational-Technical Education Teachers

Respondents were asked how important it would be to acquire certain items of information about business and industry programs for vocational-technical education teachers. Tables 10 and 11 show responses of the groups to this question.
Vocational Personnel Development Specialist Responses.

In Round One, vocational personnel development specialists attached the least amount of importance to acquiring information about part-time employment possibilities, transportation available, briefs about sponsor's products, and recreation. They attached the most importance to acquiring information regarding purposes and objectives of activities, skills/competencies to be developed, dates of programs, names or title of programs, location(s) of programs and contact persons.

In Round Two, after considering their individual Round One responses with the Round One group responses, vocational personnel development specialists tended to reaffirm their earlier opinions regarding the kinds of information that should be acquired. Only slight shifts are noted with ranking remaining essentially unchanged.

Vocational-Technical Education Teacher Responses.

In Round One, this respondent group attached the most importance to acquiring information regarding dates, location, and costs of programs, purposes and objectives, content of programs, skills/competencies to be developed, and credit/certifications, opinions of ex-students about programs, and contact person(s) were viewed as information items of secondary importance. The least amount of importance was attached to acquiring information about recreation, part-time
employment possibilities, transportation available, and brief's about sponsor's products.

In Round Two, this respondent group expressed similar opinions to their Round One responses. However, more importance was attached to acquiring information about evaluation procedures and assignments/effort required by participants in business and industry programs for vocational-technical education teachers.

Business and Industry Responses.—This group, in Round One, indicated the most importance should be attached to acquiring information regarding purposes and objectives of business and industry programs for vocational-technical education teachers, content of programs, prerequisites, location(s) of programs. The least importance was attached to acquiring the following items of information: recreation, part-time employment possibilities, living/housing arrangements, transportation available, brief's about sponsor's products, and class size or number of participants in the programs.

Round Two responses of this group coincided strongly with opinions expressed in Round One. Greater emphasis, however, was attached to acquiring information about costs/fees to participants, while acquiring briefs about sponsor's products and information about ex-students opinions about programs lost favor with this respondent group.
Summary

According to the responses of all Round One group responses, the most importance was attached to acquiring information about the name or title of programs, date(s), location(s), contact person(s), costs/fees to participants, purposes and objectives of programs, content of program(s) and skills/competencies to be developed. Lesser importance was attached to obtaining information regarding the sponsoring organization, method of instruction, instructional staff qualifications, registration procedures, evaluation procedures, assignments/effort required by participants, materials/tools needed, prerequisites, credit/certificate, and behavioral objectives of programs. The least amount of importance was attached to class size or number of participants, part-time employment possibilities, transportation available, living/housing arrangements, recreation, opinion of ex-students about programs, and brief's about sponsors products.

In Round Two total group responses, essentially were the same opinions which prevailed for Round One. Greater emphasis was attached to acquiring information about skills/competencies to be developed than in Round One.

Table 11 represents the rank-order correlation coefficients comparing respondent rankings of dimensions of information that should be acquired about business and industry programs for vocational-technical education teachers.
## TABLE 10

KINDS OF INFORMATION THAT SHOULD BE ACQUIRED ABOUT BUSINESS AND INDUSTRY PRogramS FOR VOCATIONAL-TECHNICAL EDUCATION TEACHERS

<table>
<thead>
<tr>
<th>Kinds of Information</th>
<th>Voc. Education Personnel Development Specialists (b) (c)</th>
<th>Vocational-Technical Education Teachers (b) (c)</th>
<th>Business and Industry (b) (c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Mean</td>
<td>Standard Deviation</td>
<td>Item</td>
<td>Mean</td>
</tr>
<tr>
<td>R1</td>
<td>R2</td>
<td>R1</td>
<td>R2</td>
<td>R1</td>
</tr>
</tbody>
</table>

1. Name or title of program
2. Sponsoring Organization
3. Date(s) of Program
4. Location of Program
5. Contact person(s)
6. Costs/fees to participants
7. Purposes & Objectives of the activity

(a) Rating Scale: Low Importance Medium Importance High Importance

1 2 3 4 5 6 7

(b) Round One—Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7

(c) Round Two—Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5

(d) Round One N = 36  Round Two N = 31
<table>
<thead>
<tr>
<th>Kinds of Information</th>
<th>Voc. Education Personnel Development Specialists (b)(c)</th>
<th>Vocational-Technical Education Teachers (b)(c)</th>
<th>Business and Industry (b)(c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Item</td>
<td>Standard Mean Deviation</td>
<td>Item</td>
<td>Standard Mean Deviation</td>
</tr>
<tr>
<td></td>
<td>R1  R2</td>
<td>R1  R2</td>
<td>R1  R2</td>
<td>R1  R2</td>
</tr>
<tr>
<td>8. Method of Instruction</td>
<td>5.2 5.3</td>
<td>1.15 .99</td>
<td>5.9 5.9</td>
<td>1.00 .62</td>
</tr>
<tr>
<td>9. Instructional Staff Qualifications</td>
<td>5.3 5.7</td>
<td>1.35 .89</td>
<td>5.8 5.8</td>
<td>1.48 1.31</td>
</tr>
<tr>
<td>10. Assignments/Effort Required by participants</td>
<td>5.1 5.1</td>
<td>1.71 .90</td>
<td>5.7 6.1</td>
<td>1.14 .54</td>
</tr>
<tr>
<td>11. Evaluation Procedures</td>
<td>4.5 4.8</td>
<td>1.41 1.03</td>
<td>5.5 5.8</td>
<td>1.51 1.25</td>
</tr>
<tr>
<td>12. Content of Program</td>
<td>6.4 6.6</td>
<td>.91 .52</td>
<td>6.3 6.3</td>
<td>.91 .61</td>
</tr>
<tr>
<td>13. Class size or number of participants</td>
<td>4.0 3.6</td>
<td>1.56 .99</td>
<td>5.4 5.5</td>
<td>1.22 .94</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Low Importance Medium Importance High Importance
1 2 3 4 5 6 7
(b) Round One—Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7
(c) Round Two—Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5
(d) Round One N = 36 Round Two N = 31
<table>
<thead>
<tr>
<th>Kinds of Information</th>
<th>Voc. Education Personnel Development Specialists (b) (c)</th>
<th>Vocational-Technical Education Teachers (b) (c)</th>
<th>Business and Industry (b) (c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item (a) Mean</td>
<td>Standard Deviation R1</td>
<td>Standard Deviation R2</td>
<td>Item Mean</td>
<td>Standard Deviation R1</td>
</tr>
<tr>
<td>14. Registration Procedures</td>
<td>5.6 5.3 1.64 1.50</td>
<td>4.6 4.6 2.06 1.69</td>
<td>5.1 5.2 1.07 1.10</td>
<td>5.1 5.0 1.74 1.53</td>
</tr>
<tr>
<td>15. Material/tools needed</td>
<td>5.3 5.1 1.28 .67</td>
<td>5.7 5.9 .91 .73</td>
<td>5.7 5.8 1.11 .84</td>
<td>5.5 5.6 1.11 .81</td>
</tr>
<tr>
<td>16. Prerequisites</td>
<td>5.5 5.4 1.06 .90</td>
<td>5.4 4.9 1.82 1.64</td>
<td>6.0 6.0 1.00 .71</td>
<td>5.6 5.3 1.38 1.30</td>
</tr>
<tr>
<td>17. Part-time employment possibilities</td>
<td>3.5 3.5 1.25 1.00</td>
<td>4.5 4.6 1.98 1.34</td>
<td>4.0 3.8 1.63 1.64</td>
<td>3.9 4.1 1.63 1.34</td>
</tr>
<tr>
<td>18. Skills/Competencies to be developed</td>
<td>6.6 6.9 .51 .29</td>
<td>6.6 6.9 .63 .27</td>
<td>5.6 5.6 1.27 .55</td>
<td>6.4 6.7 .84 .59</td>
</tr>
<tr>
<td>19. Transportation Available</td>
<td>3.8 3.8 1.66 1.03</td>
<td>4.7 4.7 1.54 .99</td>
<td>4.1 4.2 1.35 1.30</td>
<td>4.2 4.3 1.57 1.10</td>
</tr>
<tr>
<td>20. Living Arrangements/Housing</td>
<td>4.7 5.0 1.71 1.41</td>
<td>5.3 4.8 1.73 1.47</td>
<td>4.0 4.0 1.41 1.41</td>
<td>4.8 4.7 1.69 1.44</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Low Importance 1  Medium Importance 2  High Importance 3
(b) Round One—Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7
(c) Round Two—Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5
(d) Round One N = 36  Round Two N = 31
## TABLE 10—Continued

<table>
<thead>
<tr>
<th>Kinds of Information</th>
<th>Voc. Education Personnel Development Specialists (b) (c)</th>
<th>Vocational-Technical Education Teachers (b) (c)</th>
<th>Business and Industry (b) (c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Item (a) Mean Standard Deviation (R1 R2)</td>
<td>Item Mean Standard Deviation (R1 R2)</td>
<td>Item Mean Standard Deviation (R1 R2)</td>
<td>Item Mean Standard Deviation (R1 R2)</td>
</tr>
<tr>
<td>21. Recreation</td>
<td>2.4 2.3 1.40 1.14</td>
<td>3.3 3.3 1.98 1.82</td>
<td>3.0 2.8 1.16 .45</td>
<td>2.9 2.8 1.62 1.47</td>
</tr>
<tr>
<td>22. Credit/Certificate</td>
<td>4.6 4.8 1.64 1.71</td>
<td>6.0 5.9 1.30 1.17</td>
<td>4.7 4.6 1.38 1.14</td>
<td>5.2 5.2 1.57 1.48</td>
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<tr>
<td>23. Behavioral Objectives of program</td>
<td>5.7 5.9 1.76 1.24</td>
<td>5.4 5.4 1.74 1.45</td>
<td>5.3 4.8 .95 .45</td>
<td>5.5 5.5 1.60 1.29</td>
</tr>
<tr>
<td>24. Opinion of Ex-Students about Program</td>
<td>3.5 3.8 1.30 1.34</td>
<td>5.9 5.9 1.03 .73</td>
<td>5.1 4.6 1.95 2.07</td>
<td>4.8 4.9 1.70 1.56</td>
</tr>
<tr>
<td>25. Brief about Sponsor's Product</td>
<td>2.7 2.4 1.23 1.08</td>
<td>4.1 4.0 1.33 1.30</td>
<td>4.4 4.0 2.15 1.87</td>
<td>3.6 3.4 1.63 1.50</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Low Importance Medium Importance High Importance

1 2 3 4 5 6 7

(b) Round One—Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7
(c) Round Two—Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5
(d) Round One N = 36 Round Two N = 31
### TABLE II

**CORRELATION COEFFICIENTS COMPARING RESPONDENT GROUP RANKINGS OF KINDS OF INFORMATION THAT SHOULD BE ACQUIRED ABOUT BUSINESS AND INDUSTRY PROGRAMS FOR VOCATIONAL-TECHNICAL EDUCATION TEACHERS**

<table>
<thead>
<tr>
<th>Respondent Groups</th>
<th>Round I</th>
<th></th>
<th>Round II</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vocational Education Personnel Development Specialists</td>
<td>Vocational-Technical Education Teachers</td>
<td>Vocational Education Personnel Development Specialists</td>
<td>Vocational-Technical Education Teachers</td>
</tr>
<tr>
<td>Vocational-Technical Education Teachers</td>
<td>rs = .64</td>
<td>rs = .70</td>
<td>rs = .80</td>
<td>rs = .72</td>
</tr>
<tr>
<td>Business and Industry</td>
<td>.77</td>
<td>.70</td>
<td>.82</td>
<td>.72</td>
</tr>
</tbody>
</table>

- Round I Average Spearman Rank Order Correlation Coefficient: $r_{sav} = .70$
- Round II Average Spearman Rank Order Correlation Coefficient: $r_{sav} = .78$
- Round I Kendall Coefficient of Concordance: $W = .80$
- Round II Kendall Coefficient of Concordance: $W = .85$

**Items Analyzed:** For each round and for each respondent group, twenty-five items were ranked using the mean values for each item reported in Table 10.
The average Spearman rank-order correlation coefficients reveal the association between rankings of respondent groups. The Round One average Spearman rank-order correlation is .70 representing an initial very strong positive association. Round Two average Spearman rank-order correlation is .78, again representing a very strong positive association.

The Kendall Coefficients of Concordance (W) express the extent of agreement among respondent groups concerning dimensions of information that should be acquired about business and industry programs for vocational-technical education teachers. The Round One Kendall Coefficient is .80, while the Round Two Kendall Coefficient is .85. The high value of W for both Rounds indicates respondents agreed to a high degree.

Problems Likely to be Encountered Acquiring Information

Respondents were asked the extent to which several areas represented likely problems that would be encountered in acquiring information (discussed in the preceding section) from business and industry. Table 12 is discussed first, followed by a discussion of the analyzed data on Table 13.
Vocational Personnel Development Specialist Responses.

Considering Round One responses of this group, they did not indicate any item listed on the opinionnaire would most likely be a problem to acquire. The group indicated all items would represent likely information acquisition problems as they relate to acquiring information about business and industry programs for vocational-technical education teachers from businesses and industries. Information acquisition problems with the highest ratings include: identifying business and industry programs, obtaining responses, getting complete information, updating information, information not readily available, details not known with sufficient lead time, restrictions on release of information, perceived benefits to business and industry and time/effort to compile information. Lesser ratings were given to the other potential problems, with the lowest ratings given to establishing contact with the right person, volume of available information, getting accurate information, inability to understand educational terminology, and lack of interest.

After considering their individual and group response on Round One, this respondent group felt establishing contact with the right person(s) would represent another likely information acquisition problem. Other Round One opinions remained essentially the same.
Vocational-Technical Education Teacher Responses. - The Round One responses of this group indicates they felt getting complete information would be a problem, along with establishing contact with the right person, identifying business and industry programs, getting accurate information, release of information, and time and effort to compile the information. The problems lack of interest, volume of available information, inability to understand educational terminology and perceived benefits to business/industry were rated as lowest potential problem areas by this respondent group.

In Round Two, this respondent group expressed basically the same opinions as those expressed in Round One. Establishing contact with the right person was viewed as a larger information acquisition problem, along with identifying business and industry programs.

Business and Industry Responses. - Analysis of this group's Round One response shows all items were viewed as "likely problems" that would be encountered in acquiring information about business and industry programs for vocational-technical education teachers from businesses and industries. Highest rating was given to updating information, getting complete information, and time/effort to compile information. Lowest ratings were given by this group to problems involving establishing contact with the right persons, volume of available information, inability
to understand educational terminology, perceived benefits to business/industry, information not readily available, and details about programs not known with sufficient lead time to facilitate announcement.

After considering their individual and group responses to Round One, this respondent group indicated the following would be greater information acquisition problems: identifying business and industry programs, establishing contact with the right person, perceived benefits to business/industry, inability to understand educational terminology, lack of interest, and details about programs not known with sufficient lead time to facilitate announcement. Other potential problems were rated lower than Round One.

Summary

According to responses of all groups in Round One, none of the items on the opinionnaire represented most likely information acquisition problems. However, all items were viewed as likely problems by the respondents. Highest ratings were assigned to likely problems: updating information, getting complete information, time/effort to compile information, release of information, and details about programs not known with sufficient lead time to facilitate announcement. Obtaining responses, identifying business and industry programs for vocational-technical education teachers, getting accurate information, and establishing contact with the right persons were identified.
by respondents as problems of secondary importance.

In Round Two, the total responses reveal that the time/effort required to compile information about business and industry programs would rate as the highest likely problems. This likely problem was followed closely by the problems of getting complete information, updating information, establishing contact with the right person, and identifying business and industry programs for vocational-technical education teachers.

Table 13 presents the rank-order correlation coefficients comparing respondent group rankings of problems likely to be encountered in acquiring information about business and industry programs for vocational-technical education teachers.

The average Spearman rank-order correlation coefficient for Round One is .62 representing a substantial positive association. Round Two average Spearman rank-order correlation is .46 representing a moderate positive association.

The Kendall Coefficients of Concordance (W) express the extent of agreement among respondent groups concerning problems likely to be encountered in acquiring information about business and industry programs for vocational-technical education teachers.

The Round One Kendall coefficient is .75 and the Round Two value is .64. Considering these two coefficients, it
<table>
<thead>
<tr>
<th>Problems</th>
<th>Voc. Education Personnel Development Specialists (b) (c)</th>
<th>Vocational-Technical Education Teachers (b) (c)</th>
<th>Business and Industry (b) (c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item(a)</td>
<td>Item Mean Standard Deviation R1 R2</td>
<td>Item Mean Standard Deviation R1 R2</td>
<td>Item Mean Standard Deviation R1 R2</td>
<td>Item Mean Standard Deviation R1 R2</td>
</tr>
<tr>
<td>1. Identifying business and Industry Programs</td>
<td>5.1 5.1 1.75 1.00</td>
<td>5.1 5.3 1.59 0.63</td>
<td>4.0 4.8 2.00 1.10</td>
<td>4.9 5.1 1.74 0.92</td>
</tr>
<tr>
<td>2. Establishing contact with the right person</td>
<td>4.6 5.1 1.68 0.67</td>
<td>5.3 5.6 1.82 1.22</td>
<td>3.7 4.8 1.60 1.10</td>
<td>4.7 5.3 1.77 1.03</td>
</tr>
<tr>
<td>3. Obtaining responses</td>
<td>5.1 5.3 1.39 1.16</td>
<td>5.0 4.7 2.08 1.59</td>
<td>4.1 3.8 1.22 1.30</td>
<td>4.9 4.8 1.66 1.45</td>
</tr>
<tr>
<td>4. Updating information</td>
<td>5.5 5.8 1.19 0.97</td>
<td>4.9 5.0 2.09 1.52</td>
<td>5.0 4.6 1.29 0.89</td>
<td>5.2 5.2 1.60 1.28</td>
</tr>
<tr>
<td>5. Getting complete information</td>
<td>5.7 5.7 0.97 0.78</td>
<td>5.4 5.1 2.06 1.39</td>
<td>4.7 4.2 1.38 1.10</td>
<td>5.4 5.2 1.55 1.21</td>
</tr>
<tr>
<td>6. Getting accurate information</td>
<td>4.9 4.8 1.44 0.62</td>
<td>5.0 5.0 1.88 1.62</td>
<td>4.0 3.6 1.63 1.67</td>
<td>4.8 4.7 1.66 1.38</td>
</tr>
</tbody>
</table>

(a) Rating Scale: 1 Least Likely 2 Likely 3 Most Likely
(b) Round One—Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7
(c) Round Two—Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5
(d) Round One N = 36 Round Two N = 31
<table>
<thead>
<tr>
<th>Problems</th>
<th>Voc. Education Personnel Development Specialists (b)(c)</th>
<th>Vocational-Technical Education Teachers (b)(c)</th>
<th>Business and Industry(b)(c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Item Mean</td>
<td>Standard Deviation R1 R2</td>
<td>Item Mean</td>
<td>Standard Deviation R1 R2</td>
</tr>
<tr>
<td>R1 R2</td>
<td>R1 R2</td>
<td></td>
<td>R1 R2</td>
<td></td>
</tr>
<tr>
<td>7. Volume of Available Information</td>
<td>4.3 3.9</td>
<td>1.40 .79</td>
<td>4.1 3.9</td>
<td>1.51 1.23</td>
</tr>
<tr>
<td>8. Perceived Benefits to Business/Industry</td>
<td>5.1 5.5</td>
<td>1.81 .80</td>
<td>3.9 3.9</td>
<td>1.90 1.66</td>
</tr>
<tr>
<td>9. Inability to understand education termino-</td>
<td>4.7 4.8</td>
<td>1.75 1.19</td>
<td>3.8 3.6</td>
<td>1.37 .93</td>
</tr>
<tr>
<td>logy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Information not readily available</td>
<td>5.1 5.2</td>
<td>1.49 .84</td>
<td>4.6 4.4</td>
<td>1.70 1.22</td>
</tr>
<tr>
<td>11. Time/effort to compile information</td>
<td>5.9 6.1</td>
<td>1.03 .79</td>
<td>5.6 5.5</td>
<td>1.74 1.23</td>
</tr>
<tr>
<td>12. Release of information</td>
<td>5.5 5.7</td>
<td>1.41 1.30</td>
<td>5.1 4.9</td>
<td>2.10 1.80</td>
</tr>
<tr>
<td>13. Lack of interest</td>
<td>4.9 4.9</td>
<td>1.62 1.62</td>
<td>4.3 4.1</td>
<td>2.46 1.32</td>
</tr>
<tr>
<td>14. Details about programs not known with suf-</td>
<td>5.9 5.8</td>
<td>.99 .58</td>
<td>4.9 4.6</td>
<td>1.82 1.50</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Least Likely 1 2 3 4 5 6 7 Most Likely

(b) Round One--Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7

(c) Round Two--Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5

(d) Round One N = 36 Round Two N = 31
### TABLE 13

**CORRELATION COEFFICIENTS COMPARING RESPONDENT GROUP RANKINGS OF PROBLEMS LIKELY TO BE ENCOUNTERED IN ACQUIRING INFORMATION ABOUT BUSINESS AND INDUSTRY PROGRAMS FOR VOCATIONAL-TECHNICAL EDUCATION TEACHERS**

<table>
<thead>
<tr>
<th>Respondent Groups</th>
<th>Round I</th>
<th>Round II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vocational Education Personnel Development Specialists</td>
<td>Vocational Education Teachers</td>
</tr>
<tr>
<td></td>
<td>$r_s$</td>
<td>$r_s$</td>
</tr>
<tr>
<td>Vocational-Technical Education Teachers</td>
<td>.50</td>
<td>.39</td>
</tr>
<tr>
<td>Business and Industry</td>
<td>.67</td>
<td>.69</td>
</tr>
</tbody>
</table>

- **Round I Average Spearman Rank Order Correlation Coefficient:** $r_{sav} = .62$
- **Round II Average Spearman Rank Order Correlation Coefficient:** $r_{sav} = .46$
- **Round I Kendall Coefficient of Concordance:** $W = .75$
- **Round II Kendall Coefficient of Concordance:** $W = .64$

**Items Analyzed:** For each round and for each respondent group, fourteen items were ranked using the mean values for each item reported in Table 12.
is apparent a relatively high amount of agreement existed concerning the information acquisition problems that might be encountered.

**Kinds of Information Services That Should be Developed**

Respondents were asked what development priority should be attached to certain information services. Table 14 presents responses to this question. It is discussed first, followed by a discussion of the analyzed data on Table 15.

**Vocational Personnel Development Specialist Responses.**—In Round One, this respondent group indicated the highest priority should be given to developing the following services: a telephone referral service to provide users with names of business and industry contact(s), computerized searches in response to inquiries, feedback on what participants gain from business and industry programs, and a consulting service on how to use the information system. Respondents in this group felt the least amount of development priority should be focused on a broker-type referral service where coordination of participant registration would be handled by an information referral specialist, with business and industry programs announced without providing a company name or company contact. Manual searches in response to inquiries, likewise, received a low priority development rating by this respondent group.
Round Two responses of this group did not change measurably from their Round One response to this question. Manual searches in response to inquiries was rated lower, while development priority relating to development of an on-line computer information bank received a higher rating in Round Two.

Vocational-Technical Education Teacher Responses.—The Round One responses of this respondent group reveals they felt the highest priority for development should be concentrated on a service that would provide feedback on participant gain from business and industry programs. A consulting service on how to use the information system was rated as the second highest priority development item. Manual searches in response to inquiries received the lowest priority development rating. Other potential services received close to the same development priority ratings, making them of secondary importance to this respondent group.

Round Two responses of this group tended to reaffirm earlier opinions expressed in Round One.

Business and Industry Responses.—In the response to Round One, business and industry representatives favored the development of an information service to provide feedback on what participants gain from business and industry programs as first priority. This service was followed by priority development indicated for a consulting service
on how to use the information system, computerized searches in response to inquiries, and a telephone referral service to provide users with names of business and industry contact person(s). Manual searches received by far the lowest development priority rating.

No discernible changes are evident in the Round Two opinions of this respondent group regarding the development priority that should be given to various information services. Slightly less emphasis was given to development of an on-line computer information bank.

**Summary**

The highest priority for information service development, based on the opinions of all respondents in Round One, should be focused on feedback regarding what participants gain from business and industry programs. A consulting service on how to use the information service was viewed as an item for secondary priority development, followed by a telephone referral service to provide users with names of business and industry contact person(s), and computerized searches in response to inquiries. The lowest development priority was assigned by Round One respondents to manual searches in response to inquiries.

In Round Two, the total response of all groups reveals minor changes to the priority for development of information services noted in Round One. The most notable change in priority was given to a service involving feedback on
what participants gain from business and industry programs. This particular service received a high priority development rating in Round Two.

Table 15 shows that most agreement existed between business and industry representatives and vocational personnel development specialists concerning the kinds of information services that should be developed to facilitate awareness of business and industry programs for vocational-technical education teachers. The Round One average Spearman rank-order correlation coefficient is .69 representing a substantial positive association and the Round Two average correlation is .91. The Round Two correlation moved to a very strong positive association.

The Kendall Coefficients of Concordance (W) express the extent of agreement among respondent groups concerning information services that should be developed to create more awareness of business and industry programs for vocational-technical education teachers. The Round One Kendall Coefficient of .79 and the Round Two Kendall Coefficient of .94 indicate the respondent groups expressed a strong amount of agreement on these variables.

Kinds of Information Products That Should be Developed

Respondents were asked what development priority should be given to certain information products to
TABLE 14

KINDS OF INFORMATION SERVICES THAT SHOULD BE DEVELOPED TO FACILITATE AWARENESS
OF BUSINESS AND INDUSTRY PROGRAMS FOR VOCATIONAL-
TECHNICAL EDUCATION TEACHERS

<table>
<thead>
<tr>
<th>Kinds of Information Services</th>
<th>RESPONDENT GROUPS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Voc. Education Personnel Development Specialists (b) (c)</td>
</tr>
<tr>
<td></td>
<td>Item (a) Mean Standard Deviation</td>
</tr>
<tr>
<td></td>
<td>R1 R2</td>
</tr>
<tr>
<td>1. Telephone referral service to provide business and industry with names of users who express interest in announced programs</td>
<td>4.2 4.5</td>
</tr>
<tr>
<td>2. Telephone referral service to provide users with names of business and industry contact person(s)</td>
<td>5.8 5.9</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Low Priority Medium Priority Top Priority
1 2 3 4 5 6 7
(b) Round One—Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7
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</thead>
<tbody>
<tr>
<td></td>
<td>Item Mean</td>
<td>Standard Deviation</td>
<td>Item Mean</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>3. Coordination of participant registration by information system referral specialist, with business and industry programs announced without providing contact names or company name</td>
<td>3.6 3.8</td>
<td>1.95 1.60</td>
<td>4.4 4.4</td>
<td>1.82 1.28</td>
</tr>
<tr>
<td>4. Computerized searches in response to inquiries</td>
<td>5.4 5.3</td>
<td>0.98 0.87</td>
<td>5.0 5.0</td>
<td>1.41 0.71</td>
</tr>
<tr>
<td>5. Manual searches in response to inquiries</td>
<td>4.2 3.8</td>
<td>1.74 1.22</td>
<td>3.9 4.3</td>
<td>1.83 1.07</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Low Priority Medium Priority Top Priority
1 2 3 4 5 6 7

(b) Round One--Vocational education personnel development specialists N = 15;
Vocational-technical education teachers N = 15; Business and Industry N = 7

(c) Round Two--Vocational education personnel development specialists N = 12;
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<th>Voc. Education Personnel Development Specialists (b)(c)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Item Mean Standard Mean Deiviation</td>
<td>Item Mean Standard Mean Deviation</td>
<td>Item Mean Standard Deviation</td>
<td>Item Mean Standard Deviation</td>
</tr>
<tr>
<td></td>
<td>R1 R2 R1 R2</td>
<td>R1 R2 R1 R2</td>
<td>R1 R2 R1 R2</td>
<td>R1 R2 R1 R2</td>
</tr>
<tr>
<td>6. On-line computer information bank</td>
<td>4.6 5.1 1.68 .90</td>
<td>5.1 4.9 1.39 .87</td>
<td>3.6 3.0 2.44 2.35</td>
<td>4.6 4.6 1.78 1.38</td>
</tr>
<tr>
<td>7. Feedback on what participants gain from business and industry programs</td>
<td>5.5 5.7 1.36 1.37</td>
<td>6.5 6.9 .52 .36</td>
<td>5.3 5.6 .76 .55</td>
<td>5.8 6.2 1.11 1.08</td>
</tr>
<tr>
<td>8. Data compilation for evaluation of information system</td>
<td>5.2 5.2 1.42 1.19</td>
<td>4.9 4.9 1.46 1.27</td>
<td>4.7 4.6 1.80 1.14</td>
<td>5.0 5.0 1.48 1.20</td>
</tr>
<tr>
<td>9. Consulting service on how to use system</td>
<td>5.3 5.3 1.18 .65</td>
<td>5.9 5.9 1.69 1.51</td>
<td>5.0 5.2 2.00 1.48</td>
<td>5.5 5.5 1.56 1.23</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Low Priority Medium Priority Top Priority
1 2 3 4 5 6 7
(b) Round One--Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7
(c) Round Two--Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5
(d) Round One N = 36 Round Two N = 31
### TABLE 15

CORRELATION COEFFICIENTS COMPARING RESPONDENT GROUP RANKINGS OF THE KINDS OF INFORMATION SERVICES THAT SHOULD BE DEVELOPED TO FACILITATE AWARENESS OF BUSINESS AND INDUSTRY PROGRAMS FOR VOCATIONAL-TECHNICAL EDUCATION TEACHERS

<table>
<thead>
<tr>
<th>Respondent Groups</th>
<th>Round I</th>
<th></th>
<th>Round II</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vocational Education Personnel Development Specialists</td>
<td>Vocational-Tech nical Education Teachers</td>
<td>Vocational Education Personnel Development Specialists</td>
<td>Vocational-Tech nical Education Teachers</td>
</tr>
<tr>
<td>Vocational-Technical Education Teachers</td>
<td>$r_s$ = .60</td>
<td>$r_s$</td>
<td>$r_s$ = .93</td>
<td>$r_s$</td>
</tr>
<tr>
<td>Business and Industry</td>
<td>$r_s$ = .76</td>
<td>$r_s$ = .71</td>
<td>$r_s$ = .87</td>
<td>$r_s$ = .92</td>
</tr>
</tbody>
</table>

Round I Average Spearman Rank Order Correlation Coefficient: $r_{Sav} = .69$
Round II Average Spearman Rank Order Correlation Coefficient: $r_{Sav} = .91$
Round I Kendall Coefficient of Concordance: $W = .79$
Round II Kendall Coefficient of Concordance: $W = .94$

**Items Analyzed:** For each round and for each respondent group, nine items were ranked using the mean values for each item reported in Table 14.
facilitate awareness of business and industry programs for vocational-technical education teachers. Table 16 presents responses to this question, followed by a discussion of correlation coefficients relating to responses by the respondent groups.

Vocational Personnel Development Specialist Responses.—Round One responses of this group reveals they felt the highest development priority should be given to the following information-dissemination products: master calendar of re-occurring programs; master calendar of long-term programs; master calendar of short-term programs; and a master calendar of programs available during traditional vacation periods. Secondary development priority was rated by this respondent group for: compendium of all program announcements each year; monthly newsletter announcing programs by state or geographic area, monthly master calendar for inclusion in established professional and trade journals, newsletters, etc.; and computer printouts based on individual users expressed needs. The lowest priority was given to development of: a standardized participant registration kit; an up-to-date film about the information system; and a bi-monthly newsletter with programs indexed by vocational area.

Round Two responses coincided strongly with Round One responses. Journal articles about available programs found slightly more favor with this respondent group in Round Two.
Vocational-Technical Education Teacher Responses.—Responses of this group to the initial opinionnaire shows they felt the most priority should be given to development of the following information-dissemination products: master calendar of programs available during traditional vacation periods; master calendar of reoccurring programs; monthly newsletter announcing programs by state or geographic area; and journal articles about available programs. Information-dissemination products rated a close second included: compendium of all program announcements each year; master calendar of short-term programs; master calendar of low or no-cost programs; monthly newsletter with programs indexed by vocational area; and computer printouts based on individual users' expressed needs. The lowest development priority was assigned to a bi-monthly newsletter with programs indexed by vocational area.

Round Two responses of this same group provided a sharper picture of the priority they believed should be given to information-dissemination products. Respondents rated the following as products needing top priority development to facilitate awareness of business and industry programs for vocational-technical education teachers: master calendar of re-occurring programs; master calendar of short-term programs; master calendar of low or no-cost programs; master calendar of programs available during traditional vacation periods; and monthly newsletter announcing programs
by state or geographic area. Secondary development priority was assigned to journal articles about available programs, while the lowest priority was again given to development of a bi-monthly newsletter with programs indexed by vocational area.

Business and Industry Responses.-In Round One, this respondent group gave the highest rating to development of an information-dissemination product that would provide a master calendar of re-occurring programs. This product was followed closely with the next highest development priority assigned to: compendium of all program announcements each year; master calendar of long-term programs; and journal articles about available programs. Like the other respondent groups, the least amount of priority was placed on development of a bi-monthly newsletter with programs indexed by vocational area.

Little change in opinion is discernible in Round Two. This respondent group primarily reaffirmed their earlier opinions after reviewing initial responses in relation to their groups response.

Summary
The total response of all groups in Round One reflects the opinion that highest priority should be given to development of a master calendar of re-occurring programs. Following closely with secondary priority ratings for development are: compendium of all program announcements each
year; master calendar of programs available during traditional vacation periods; monthly newsletter announcing programs by state or geographic area; and master calendar of long-term programs. The least amount of development priority was attached to a bi-monthly newsletter with programs indexed by vocational area. This was followed closely by low priority ratings to development of: an up-to-date film about the information system; and standardized participant registration kit.

Round Two responses reflected similar opinions to those expressed in Round One.

Table 17 shows rank-order correlation coefficients comparing respondent group rankings of information products that should be given priority development.

The Round One average Spearman rank-order correlation of .55 represents a substantial positive association. The Round Two correlation of .55 represents the same degree of association, suggesting that little change was made in respondents' initial ratings as compared to their second rating of information product development priority.

The Kendall Coefficients of Concordance reflects the amount of agreement between respondent groups concerning the development priority that should be given to the information products. The Round One Dendall Coefficient .70 suggests a relatively high amount of agreement exists among respondent groups regarding this question. The Round Two
<table>
<thead>
<tr>
<th>Kinds of Information Products</th>
<th>Voc. Education Personnel-Development Specialists (b)(c)</th>
<th>Vocational-Technical Education Teachers (b)(c)</th>
<th>Business and Industry (b)(c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Mean R1 R2 Standard Deviation R1 R2</td>
<td>Mean R1 R2 Standard Deviation R1 R2</td>
<td>Mean R1 R2 Standard Deviation R1 R2</td>
<td>Mean R1 R2 Standard Deviation R1 R2</td>
</tr>
<tr>
<td>1. Compendium of all program announcements each year</td>
<td>5.5 5.5 2.10 1.51</td>
<td>5.7 5.8 1.20 .89</td>
<td>5.4 5.2 .97 1.10</td>
<td>5.6 5.6 1.56 1.16</td>
</tr>
<tr>
<td>2. Master calendar of reoccurring programs</td>
<td>5.8 5.8 .94 .87</td>
<td>5.9 6.1 1.61 .77</td>
<td>5.7 6.0 .75 .71</td>
<td>5.8 6.0 1.19 .80</td>
</tr>
<tr>
<td>3. Master calendar of short-term programs (1 week or less)</td>
<td>5.7 5.8 .96 .87</td>
<td>5.6 6.1 1.95 1.03</td>
<td>4.3 4.2 1.80 1.92</td>
<td>5.4 5.7 1.63 1.30</td>
</tr>
<tr>
<td>4. Master calendar of long-term programs (over 1 week)</td>
<td>5.8 5.8 .94 .84</td>
<td>5.2 5.4 1.93 .93</td>
<td>5.0 5.0 1.41 1.58</td>
<td>5.4 5.5 1.48 1.03</td>
</tr>
<tr>
<td>5. Master calendar of low or no-cost programs</td>
<td>5.1 5.4 1.50 1.08</td>
<td>5.6 6.1 1.55 .77</td>
<td>4.3 4.2 1.50 .84</td>
<td>5.2 5.5 1.56 1.12</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Low Priority Medium Priority Top Priority
1 2 3 4 5 6 7

(b) Round One—Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7
(c) Round Two—Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5
(d) Round One N = 36 Round Two N = 31
<table>
<thead>
<tr>
<th>Kinds of Information Products</th>
<th>Voc. Education Personnel Development Specialists (b) (c)</th>
<th>Vocational-Technical Education Teachers (b) (c)</th>
<th>Business and Industry (b) (c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Item(a) Mean Standard Mean Standard Mean Standard Mean Standard</td>
<td>Item Mean Standard Mean Standard Mean Standard</td>
<td>Item Mean Standard Mean Standard Mean Standard</td>
<td>Item Mean Standard Mean Standard</td>
</tr>
<tr>
<td></td>
<td>RL R2 Deviation RL R2 Deviation RL R2 Deviation RL R2 Deviation RL R2 Deviation</td>
<td>RL R2 Deviation RL R2 Deviation RL R2 Deviation RL R2 Deviation</td>
<td>RL R2 Deviation RL R2 Deviation RL R2 Deviation RL R2 Deviation</td>
<td>RL R2 Deviation RL R2 Deviation</td>
</tr>
<tr>
<td>6. Master calendar of programs available during traditional vacation periods</td>
<td>5.7 5.7 1.20 1.07</td>
<td>6.1 6.0 1.44 1.18</td>
<td>4.4 4.4 1.72 1.14</td>
<td>5.6 5.6 1.50 1.23</td>
</tr>
<tr>
<td>7. Standardized participant registration kit</td>
<td>3.8 3.4 1.81 1.56</td>
<td>5.3 5.1 1.73 .86</td>
<td>3.7 3.6 1.98 1.82</td>
<td>4.4 4.2 1.91 1.54</td>
</tr>
<tr>
<td>8. Journal articles about available programs</td>
<td>4.8 5.2 1.32 .72</td>
<td>5.9 5.7 1.23 .99</td>
<td>5.0 4.8 1.16 .45</td>
<td>5.3 5.4 1.32 .88</td>
</tr>
<tr>
<td>9. Monthly newsletter announcing programs by state or geographic area</td>
<td>5.5 5.5 1.61 1.38</td>
<td>6.1 5.9 1.14 .95</td>
<td>5.3 5.6 1.50 .55</td>
<td>5.7 5.7 1.41 1.08</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Low Priority 1 Medium Priority 2 Top Priority 3 4 5 6 7
(b) Round One—Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7
(c) Round Two—Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5
(d) Round One N = 36 Round Two N = 31
### TABLE 16—Continued

<table>
<thead>
<tr>
<th>Kinds of Information Products</th>
<th>Voc. Education Personnel Development Specialists (b)(c)</th>
<th>Vocational-Technical Education Teachers (b)(c)</th>
<th>Business and Industry (b)(c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item(a)</td>
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<td>Mean R1 R2 Standard Deviation R1 R2</td>
<td>Mean R1 R2 Standard Deviation R1 R2</td>
<td>Mean R1 R2 Standard Deviation R1 R2</td>
</tr>
<tr>
<td>10. Computer printouts based on individual users expressed needs</td>
<td>5.4 5.2 1.51 1.34</td>
<td>5.4 5.1 1.39 1.21</td>
<td>4.6 4.4 1.81 1.67</td>
<td>5.2 5.0 1.52 1.32</td>
</tr>
<tr>
<td>11. Monthly master calendar for inclusion in established professional and trade journals, newsletters, etc.</td>
<td>5.5 5.5 1.19 1.17</td>
<td>5.1 4.9 1.35 1.23</td>
<td>4.4 4.4 1.27 1.09</td>
<td>5.1 5.1 1.29 1.03</td>
</tr>
<tr>
<td>12. Up-to-date film (15-20 minutes) about information system to present at local, state, and national meetings</td>
<td>4.1 4.1 1.39 1.24</td>
<td>5.0 4.5 1.88 1.51</td>
<td>4.3 4.2 1.98 1.79</td>
<td>4.4 4.3 1.71 1.42</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Low Priority Medium Priority Top Priority

1 2 3 4 5 6 7

(b) Round One—Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7

(c) Round Two—Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5

(d) Round One N = 36 Round Two N = 31
<table>
<thead>
<tr>
<th>Kinds of Information Products</th>
<th>Voc. Education Personnel Development Specialists (b) (c)</th>
<th>Vocational-Technical Education Teachers (b) (c)</th>
<th>Business and Industry (b) (c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item (a)</td>
<td>Mean R1 R2 Standard Deviation R1 R2</td>
<td>Item Mean Standard Deviation R1 R2</td>
<td>Item Mean Standard Deviation R1 R2</td>
<td>Item Mean Standard Deviation R1 R2</td>
</tr>
<tr>
<td>13. Monthly newsletter with programs indexed by each vocational area</td>
<td>5.2 4.6 1.74 1.08</td>
<td>5.5 5.8 1.40 1.05</td>
<td>4.3 4.0 1.50 0.71</td>
<td>5.1 5.0 1.59 1.22</td>
</tr>
<tr>
<td>14. Bi-monthly newsletter with programs indexed by vocational area</td>
<td>4.5 4.5 2.00 1.09</td>
<td>4.4 4.1 2.10 1.77</td>
<td>3.9 4.0 1.86 1.41</td>
<td>4.3 4.2 1.97 1.45</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Low Priority, Medium Priority, Top Priority

1 2 3 4 5 6 7
(b) Round One—Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7
(c) Round Two—Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5
(d) Round One N = 36 Round Two N = 31
<table>
<thead>
<tr>
<th>Respondent Groups</th>
<th>Round I</th>
<th>Round II</th>
<th>Round I</th>
<th>Round II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vocational Education Personnel Development Specialists</td>
<td>Vocational Educational Teachers</td>
<td>Vocational Education Personnel Development Specialists</td>
<td>Vocational Educational Teachers</td>
</tr>
<tr>
<td>Vocational-Technical Education Teachers</td>
<td>rs = .43</td>
<td>rs = .64</td>
<td>rs = .65</td>
<td>rs = .35</td>
</tr>
<tr>
<td>Business and Industry</td>
<td>rs = .65</td>
<td>rs = .58</td>
<td>rs = .67</td>
<td>rs = .35</td>
</tr>
</tbody>
</table>

Round I Average Spearman Rank Order Correlation Coefficient: rs_{av} = .55
Round II Average Spearman Rank Order Correlation Coefficient: rs_{av} = .55
Round I Kendall Coefficient of Concordance: W = .70
Round II Kendall Coefficient of Concordance: W = .70

Items Analyzed: For each round and for each respondent group, fourteen items were ranked using the mean values for each item reported in Table 16.
Kendall Coefficient of .70 suggests no change was made in the amount of agreement regarding this question.

**Kind of Agency That Should Coordinate The Information System**

Respondents were asked to indicate the kind of agency that should coordinate operation of an information system to facilitate awareness of business and industry programs for vocational-technical education teachers. Table 18 reflects Round One and Round Two responses to this question. Table 19 shows correlation coefficients relating to the amount of association and agreement regarding this question. Discussion of the data on these tables follow.

**Vocational Personnel Development Specialist Responses.** This respondent group expressed the opinion in Round One that a national educational research and development center would be the most desirable agency to coordinate operation of the information system. Other agencies listed as potentials on the opinionnaire were rated as desirable.

In Round Two, this respondent group reaffirmed its Round One opinion by again indicating a national educational research and development center, followed by a national professional education association, would be desirable coordinating agencies for the information system. Interestingly, a university setting was rated as the
lowest in terms of being a desirable coordinating agency for the information system.

Vocational-Technical Education Teacher Responses.—In Round One, this respondent group expressed the opinion that a state department of education would be a desirable coordinating agency for the information system. National professional education organizations was rated second desirable with a university and regional research laboratory serving multiple states rating the lowest in terms of being a desirable coordinating agency for the information system.

Round Two responses of this group adhered quite closely to Round One responses. Very little change in opinion is noted, except for the increase in rating concerning the desirability of a regional research laboratory serving multiple states for coordinating the information system. A national non-profit organization affiliated with business received a correspondingly lower rating. A university received an even lower rating as a desirable coordinating agency.

Business and Industry Responses.—In Round One this respondent group rated a university as the highest in terms of being a desirable coordinating agency for the information system. Interestingly, the other two respondent groups rated a university as the least desirable coordinating agency for the information system. None of the agencies listed on the opinionnaire were rated as most desirable by
listed on the opinionnaire were rated as most desirable by this respondent group.

In Round Two, ratings did not change substantially. National business and industry trade associations found slightly more favor with this group in Round Two.

Summary

The total Round One group responses shows that a national educational research and development center was viewed as a desirable coordinating agency for the information system. This agency rating was followed by a national professional education organization, state department of education, and a national non-profit organization affiliated with business. Of all agencies listed on the opinionnaire, a university was rated as the least desirable among the agencies considered desirable for coordinating the information system.

In Round Two, the totals of all respondent groups tend to confirm opinions expressed in Round One. National educational research and development centers rated as the top desirable agency. It was followed by the rating for a national professional education organization as a desirable coordination agency.

Table 19 shows Round One and Round Two rank-order correlation coefficients comparing respondent groups rankings of the kind of agency that should coordinate operation of the information system.
<table>
<thead>
<tr>
<th>Kinds of Coordination</th>
<th>Voc. Education Personnel Development Specialists (b)(c)</th>
<th>Vocational-Technical Education Teachers (b)(c)</th>
<th>Business and Industry (b)(c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Item Mean</td>
<td>Standard Deviation</td>
<td>Item Mean</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>1. National professional education organization</td>
<td>4.6</td>
<td>5.0</td>
<td>1.72</td>
<td>1.41</td>
</tr>
<tr>
<td>2. National educational research and development center</td>
<td>6.1</td>
<td>5.8</td>
<td>1.30</td>
<td>1.27</td>
</tr>
<tr>
<td>3. State department of education</td>
<td>3.1</td>
<td>3.4</td>
<td>2.17</td>
<td>1.31</td>
</tr>
<tr>
<td>4. National business and industry professional association</td>
<td>3.6</td>
<td>3.8</td>
<td>1.68</td>
<td>1.36</td>
</tr>
<tr>
<td>5. National business and industry trade association</td>
<td>3.7</td>
<td>4.0</td>
<td>1.58</td>
<td>1.41</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Least Desirable Desirable Most Desirable 1 2 3 4 5 6 7
(b) Round One--Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7
(c) Round Two--Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5
(d) Round One N = 36 Round Two N = 31
<table>
<thead>
<tr>
<th>Kinds of Coordination</th>
<th>Vcc. Education Personnel Development Specialists (b)(c)</th>
<th>Vocational-Techical Education Teachers (b)(c)</th>
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<th>All Respondent Groups (d)</th>
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<tr>
<td></td>
<td>Item Mean</td>
<td>Standard Deviation</td>
<td>Item Mean</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td></td>
<td>R1 R2</td>
<td>R1 R2</td>
<td>R1 R2</td>
<td>R1 R2</td>
</tr>
<tr>
<td>6. National non-profit organization affiliated with business</td>
<td>4.3 4.3</td>
<td>2.28 1.97</td>
<td>4.4 4.4</td>
<td>2.10 1.56</td>
</tr>
<tr>
<td>7. University</td>
<td>3.0 3.1</td>
<td>2.36 1.83</td>
<td>3.7 3.6</td>
<td>2.02 1.39</td>
</tr>
<tr>
<td>8. Regional research laboratory serving multiple states</td>
<td>4.2 4.2</td>
<td>2.57 2.04</td>
<td>3.9 4.3</td>
<td>1.92 1.44</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Least Desirable Desirable Most Desirable
1 2 3 4 5 6 7
(b) Round One--Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7
(c) Round Two--Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5
(d) Round One N = 36 Round Two N = 31
TABLE 19

CORRELATION COEFFICIENTS COMPARING RESPONDENT GROUP RANKINGS OF KIND OF AGENCY THAT SHOULD COORDINATE AN INFORMATION SYSTEM TO FACILITATE AWARENESS OF BUSINESS AND INDUSTRY PROGRAMS FOR VOCATIONAL-TECHNICAL EDUCATION TEACHERS

| Respondent Groups | Round I | | Round II |
|--------------------|---------| |---------|
|                     | Vocational Education Personnel Development Specialists | Vocational-Tech­nical Education Teachers | Vocational Education Personnel Development Specialists | Vocational-Tech­nical Education Teachers |
| Vocational-Technical Education Teachers | .29 | | .26 |
| Business and Industry | -.61 | -.75 | -.68 | -.76 |

Round I Average Spearman Rank Order Correlation Coefficient: $r_{s_{av}} = -.36$
Round II Average Spearman Rank Order Correlation Coefficient: $r_{s_{av}} = -.39$
Round I Kendall Coefficient of Concordance: $W = .09$
Round II Kendall Coefficient of Concordance: $W = .07$

Items Analyzed: For each round and for each respondent group, eight items were ranked using the mean values for each item reported in Table 18.
The average Spearman rank-order coefficient of -.36 for Round One and -.39 for Round Two indicate a moderate negative association between respondent groups concerning the kind of agency that should coordinate operation of the information system.

The most association or relationship of similar response patterns was between vocational education personnel development specialists and vocational-technical education teachers. Even this relationship was of a low positive association nature. Business and industry representatives differed sharply with other respondent groups on this question as evidenced by the substantial to very strong negative association.

Likely Sources of Funding for the Information System

Question 6 on the opinionnaire asked respondents to indicate certain agencies and/or agency arrangements representing likely sources of funding for the information system. Table 20 shows the respondent group responses to this question. This data will be presented first and followed by the analysis of correlations between respondent groups on this question.

Vocational Personnel Development Specialist Responses.- The Round One response of this group did not single out any most likely source of funding agency. All agencies listed
on the opinionnaire were viewed as "likely" funding sources. Among these likely sources, joint funding support provided through the American Vocational Association (AVA) and a business and industry professional and trade association was rated second highest by this respondent group, while public funds through a federal grant was rated as the highest likely source of funds for the information system. Funding of the information system by business and industry firms only, through cost recovery fees on a pro-rated basis to users, and by the U.S. Chamber of Commerce received the lowest rating among likely sources of funding for the information system.

In Round Two, vocational personnel development specialists expressed the opinion again that all agencies represented likely sources for information system funding. However, a foundation grant gained a higher rating along with joint support of the American Vocational Association and a business/industry professional and trade association, as likely sources of funding for the information system.

Vocational-Technical Education Teacher Responses.—In Round One, this respondent group clearly expressed the opinion that a likely source of funding for the information system could be arranged through a consortium of state departments of education and business and industry on a cost sharing basis. A foundation grant, public funds through a federal grant, and joint support of the American Vocational
Association (AVA) and a business/industry professional and trade association were all viewed as being likely funding sources for the information system by this respondent group. The U.S. Chamber of Commerce was felt to be the lowest among likely sources of funds for the information system.

In Round Two, this respondent group placed more emphasis on a foundation grant as a likely source of funding and expressed the opinion that a consortium of state departments of education and business and industry cost sharing represented the most likely source of funding for the information system.

Business and Industry Responses.—In Round One, this respondent group indicated all sources on the opinionnaire represented likely sources for funding the information. None of the sources were considered most likely sources for funds. Among the likely funding sources, a federal grant was viewed slightly more likely than a foundation grant, joint support through the American Vocational Association and business/industry professional and trade associations, and a consortium of state departments of education and business and industry cost sharing. The U.S. Chamber of Commerce, as well as support by business and industry firms only, were rated lowest among likely sources of funds for the information system by business and industry respondents.

These same opinions were substantially reaffirmed in Round Two. A foundation grant as a possible funding source
found slightly more favor with this group in Round Two.

**Summary**

The total of all group responses in Round One shows that all sources were considered as likely representatives of funding possibilities for the information system. The provision of funds through a federal grant was rated highest among likely funding sources for the information system, along with the possibility of funds being provided through joint support of the American Vocational Association (AVA) and business/industry professional and trade associations.

In Round Two, all respondent group ratings show that joint support of the American Vocational Association (AVA) and business/industry profession and trade associations was considered to be highest among likely funding sources. The possibility of funding through a foundation grant followed closely in second place in the opinion of all respondents. Public funds through a federal grant, represented the next likely source of financial support for the information system in the opinion of all respondents. The lowest rating of likely funding sources were considered to be the U.S. Chamber of Commerce, cost recovery fees charged on a pro-rated basis to users, and business and industry firms only.

Table 21 shows that most agreement or association existed between business and industry respondents and vocational personnel development specialists regarding financing possibilities or funding sources for the information system.
TABLE 20

LIKELY SOURCES OF FUNDING FOR AN INFORMATION SYSTEM TO FACILITATE AWARENESS
OF BUSINESS AND INDUSTRY PROGRAMS FOR VOCATIONAL-
TECHNICAL EDUCATION TEACHERS

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>Voc. Education Personnel Development Specialists (b)(c)</th>
<th>Vocational-Technical Education Teachers (b)(c)</th>
<th>Business and Industry (b)(c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Through a consortium of state departments of education and business and industry on a cost sharing basis</td>
<td>4.1 3.8 1.85 1.60</td>
<td>5.9 6.1 1.79 .99</td>
<td>4.4 4.4 1.90 2.07</td>
<td>4.9 4.9 1.96 1.78</td>
</tr>
<tr>
<td>2. By business and industry firms only</td>
<td>3.5 3.7 1.41 1.16</td>
<td>4.4 4.1 1.60 1.07</td>
<td>3.0 2.6 1.41 .55</td>
<td>3.8 3.7 1.56 1.14</td>
</tr>
<tr>
<td>3. By a foundation grant</td>
<td>4.7 5.3 1.99 1.07</td>
<td>5.1 5.6 1.73 .94</td>
<td>4.5 4.8 .83 .45</td>
<td>4.8 5.4 1.71 .95</td>
</tr>
<tr>
<td>4. Cost recovery fees charged on a prorated basis to users</td>
<td>3.7 3.8 1.99 1.82</td>
<td>4.0 3.9 1.92 1.10</td>
<td>3.4 3.2 1.62 1.10</td>
<td>3.8 3.7 1.86 1.40</td>
</tr>
<tr>
<td>5. Public funds through a federal grant</td>
<td>5.6 5.3 1.35 1.22</td>
<td>5.0 5.4 1.96 .85</td>
<td>4.6 4.6 1.62 1.14</td>
<td>5.2 5.2 1.67 1.05</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Least Likely Likely Most Likely
1 2 3 4 5 6 7
(b) Round One—Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7
(c) Round Two—Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5
(d) Round One N = 36 Round Two N = 31
### TABLE 20—Continued

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>Voc. Education Personnel Development Specialists (b) (c)</th>
<th>Vocational-Technical Education Teachers (b) (c)</th>
<th>Business and Industry (b) (c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Item (a) Standard Mean Deviation R&lt;sub&gt;1&lt;/sub&gt; R&lt;sub&gt;2&lt;/sub&gt;</td>
<td>Item Standard Mean Deviation R&lt;sub&gt;1&lt;/sub&gt; R&lt;sub&gt;2&lt;/sub&gt;</td>
<td>Item Standard Deviation R&lt;sub&gt;1&lt;/sub&gt; R&lt;sub&gt;2&lt;/sub&gt;</td>
<td>Item Standard Mean Deviation R&lt;sub&gt;1&lt;/sub&gt; R&lt;sub&gt;2&lt;/sub&gt;</td>
</tr>
<tr>
<td>6. By the U.S. Chamber of Commerce</td>
<td>3.6 3.5 1.60 .91</td>
<td>3.0 2.9 2.08 1.41</td>
<td>2.1 2.0 .69 .71</td>
<td>3.1 3.0 1.74 1.22</td>
</tr>
<tr>
<td>7. Through joint support of the AVA and B/I professional and trade</td>
<td>5.5 6.0 1.51 .74</td>
<td>5.4 5.6 1.22 1.02</td>
<td>4.4 4.2 .79 .45</td>
<td>5.2 5.5 1.31 1.03</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Least Likely 1 2 3 4 5 6 7 Most Likely

(b) Round One—Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7
(c) Round Two—Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5
(d) Round One N = 36 Round Two N = 31
**TABLE 21**

**CORRELATION COEFFICIENTS COMPARING RESPONDENT GROUP RANKINGS OF LIKELY SOURCES OF FUNDING FOR AN INFORMATION SYSTEM TO FACILITATE AWARENESS OF BUSINESS AND INDUSTRY PROGRAMS FOR VOCATIONAL-TECHNICAL EDUCATION TEACHERS**

<table>
<thead>
<tr>
<th>Respondent Groups</th>
<th>Round I</th>
<th></th>
<th>Round II</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vocational Education Personnel Development Specialists</td>
<td>Vocational-Tech­nical Education Teachers</td>
<td>Vocational Education Personnel Development Specialists</td>
<td>Vocational-Tech­nical Education Teachers</td>
</tr>
<tr>
<td>Vocational-Technical Education Teachers</td>
<td>.57</td>
<td>.63</td>
<td>.63</td>
<td>.74</td>
</tr>
<tr>
<td>Business and Industry</td>
<td>.90</td>
<td>.63</td>
<td>.75</td>
<td>.74</td>
</tr>
</tbody>
</table>

Round I Average Spearman Rank Order Correlation Coefficient: \( r_{Sav} = .70 \)

Round II Average Spearman Rank Order Correlation Coefficient: \( r_{Sav} = .71 \)

Round I Kendall Coefficient of Concordance: \( W = .80 \)

Round II Kendall Coefficient of Concordance: \( W = .80 \)

**Items Analyzed:** For each round and for each respondent group, seven items were ranked using the mean values for each item reported in Table 20.
The least amount of association is found between the responses of vocational-technical education teachers and vocational personnel development specialists on this question. The Round One average Spearman rank-order correlation coefficient .70 represents a very strong positive association for overall group responses. This coefficient changed very little in Round Two.

The .80 Kendall coefficient of concordance in both Round One and Round Two indicates a high degree of consensus or agreement exists among respondent groups concerning potential funding sources for the information system.

Constraints Likely to be Encountered in Operating the Information System

To obtain an indication of constraints the information system might encounter, data were collected regarding respondents opinions of several potential operating constraints to the information system. Both Round One and Round Two group responses are reported in Table 22. Correlation coefficients for responses to this question are presented in Table 23. Data will be discussed in Table 22 followed by a discussion of Table 23.

Vocational Personnel Development Specialist Responses.- In Round One, this group clearly indicated that obtaining operating funds represented a major constraint to operating the information system. Lack of a natural communication
link between business/industry and education, obtaining detailed information about business and industry programs on a continuing basis and time available for teachers to participate in business and industry programs were considered top medium constraints to operating the information system. Updating and deleting out-dated information, and the magnitude or scope of the effort were rated as medium constraints of lesser importance to operating the information system. Local level education policies were considered to constitute a minor constraint in the opinion of vocational personnel development specialists.

In Round Two, this respondent group generally confirmed their Round One opinions, with one exception. State level education policies were rated as higher among medium constraints to the operation of the information system.

Vocational-Technical Education Teacher Responses.—Round One responses of this group reveals they felt obtaining operating funding for the information system represented the only major constraints to its operation. All other constraint possibilities were rated as medium constraints. Time made available for teachers to participate in business and industry programs was rated as highest among the medium constraints, followed closely by the magnitude or scope of the effort, lack of a natural communication link between business/industry and education and obtaining detailed information about programs from business and industry on a
continuing basis. Local level educational policies received the lowest rating among medium constraints.

In Round Two obtaining operating funds again was considered a major constraint to operating the information system. Time made available for teachers to participate in business and industry programs was increased in rating to represent a major constraint to operating the information system after respondents reviewed their individual and group Round One responses.

**Business and Industry Responses**.—As a group, business and industry representatives expressed the opinion in Round One that all potential constraints listed on the opinionnaire represented medium constraints. Among these constraints, obtaining detailed information from business and industry about programs on a continuing basis was rated as the highest medium constraint. This constraint was followed by obtaining operating funds and magnitude or scope of the effort as the next highest medium constraints to operating the information system. In the Round One opinion of this respondent group, perceived threat to teacher colleges and universities represented the smallest medium constraint to operating the information system.

**Summary**

The Round One response of all respondent groups reveal that obtaining funding for the information system constitutes a major constraint to its operation. Other possible
constraints were rated as being medium in nature. The highest rated medium constraints were considered to be: obtaining detailed information about programs from business and industry on a continuing basis; lack of a natural communication link between business/industry and education; updating and deleting out-dated information; time made available for teachers to participate in programs; and magnitude or scope of the effort.

In Round Two, user interest was viewed as a more likely constraint to operating the information system.

Table 23 presents the rank-order correlation coefficients comparing respondent group rankings of constraints likely to be encountered in operating the information system.

The average Spearman rank-order correlations (.77 for Round One and .80 for Round Two) represent a very strong positive association. This suggests respondents differed little from their initial opinions in Round Two.

The high Kendall coefficients, .84 and .87 respectively, shows respondent groups agreed highly on their responses concerning possible constraints to operating the information system.
TABLE 22
CONSTRAINTS LIKELY TO BE ENCOUNTERED IN OPERATING AN INFORMATION SYSTEM TO FACILITATE AWARENESS OF BUSINESS AND INDUSTRY PROGRAMS FOR VOCATIONAL-TECHNICAL EDUCATION TEACHERS

<table>
<thead>
<tr>
<th>Constraints</th>
<th>Respondent Groups</th>
<th>Voc. Education Personnel Development Specialists (b)(c)</th>
<th>Vocational-Technical Education Teachers (b)(c)</th>
<th>Business and Industry (b)(c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Item (a) Mean</td>
<td>Item (a) Standard Deviation</td>
<td>Item (a) Mean</td>
<td>Item (a) Standard Deviation</td>
<td>Item (a) Mean</td>
</tr>
<tr>
<td></td>
<td>R1</td>
<td>R2</td>
<td>R1</td>
<td>R2</td>
<td>R1</td>
</tr>
<tr>
<td>1. Local level education policies</td>
<td>2.3 2.5</td>
<td>.97 .80</td>
<td>3.1 2.8</td>
<td>1.82 .98</td>
<td>3.4 3.2</td>
</tr>
<tr>
<td>2. Obtaining operational funding</td>
<td>6.3 6.3</td>
<td>.90 .62</td>
<td>6.1 6.4</td>
<td>1.33 .50</td>
<td>5.1 5.8</td>
</tr>
<tr>
<td>3. Magnitude (scope) of the effort</td>
<td>5.4 5.2</td>
<td>1.08 .72</td>
<td>5.1 5.1</td>
<td>1.69 1.17</td>
<td>5.1 5.0</td>
</tr>
<tr>
<td>4. User interest</td>
<td>3.8 4.4</td>
<td>1.94 1.31</td>
<td>4.8 5.0</td>
<td>1.53 .78</td>
<td>3.4 3.4</td>
</tr>
<tr>
<td>5. Perceived threat to teacher college and university</td>
<td>3.0 3.1</td>
<td>1.81 1.51</td>
<td>4.4 4.1</td>
<td>2.14 1.79</td>
<td>2.1 1.8</td>
</tr>
<tr>
<td>6. Sponsor control</td>
<td>3.9 3.8</td>
<td>1.40 1.19</td>
<td>4.6 4.6</td>
<td>1.34 1.15</td>
<td>3.3 2.6</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Minor Constraint | Medium Constraint | Major Constraint |
1 2 3 4 5 6 7
(b) Round One— Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7
(c) Round Two— Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5
(d) Round One N = 36 Round Two N = 31
### Table 22—Continued

<table>
<thead>
<tr>
<th>Constraints</th>
<th>Voc. Education Personnel Development Specialists (b) (c)</th>
<th>Vocational-Technical Education Teachers (b) (c)</th>
<th>Business and Industry (b) (c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item (a) Mean</td>
<td>Standard Deviation</td>
<td>Item Mean</td>
<td>Standard Deviation</td>
<td>Item Mean</td>
</tr>
<tr>
<td>--------------------------------</td>
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<td>---------------------------</td>
<td>-------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>R1 R2</td>
<td>R1 R2</td>
<td>R1 R2</td>
<td>R1 R2</td>
<td>R1 R2</td>
</tr>
<tr>
<td>7. Lack of natural communication link between business and industry and education</td>
<td>5.9 6.0 .99 .74</td>
<td>5.1 5.4 1.61 .85</td>
<td>4.6 4.8 1.99 1.79</td>
<td>5.3 5.5 1.51 1.06</td>
</tr>
<tr>
<td>8. Updating and deleting out-dated information</td>
<td>5.6 5.7 1.30 1.15</td>
<td>5.0 4.6 1.84 1.70</td>
<td>5.3 5.2 1.60 .84</td>
<td>5.3 5.1 1.56 1.43</td>
</tr>
<tr>
<td>9. State level education policies</td>
<td>3.7 4.3 2.15 1.23</td>
<td>4.2 4.3 1.68 .91</td>
<td>4.1 4.2 1.22 .45</td>
<td>4.0 4.3 1.79 .97</td>
</tr>
<tr>
<td>10. Time made available for teachers to participate in programs</td>
<td>5.9 5.8 .66 .72</td>
<td>5.6 6.1 1.56 .62</td>
<td>3.9 4.0 1.77 .71</td>
<td>5.3 5.6 1.49 .99</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Minor Constraint 1 Medium Constraint 2 Major Constraint 3 4 5 6 7

(b) Round One—Vocational education personnel development specialists N = 15; Vocational-technical education teachers N = 15; Business and Industry N = 7

(c) Round Two—Vocational education personnel development specialists N = 12; Vocational-technical education teachers N = 14; Business and Industry N = 5

(d) Round One N = 36 Round Two N = 31
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<tr>
<th>Constraints</th>
<th>Voc. Education Personnel Development Specialists (b) (c)</th>
<th>Vocational-Technical Education Teachers (b) (c)</th>
<th>Business and Industry (b) (c)</th>
<th>All Respondent Groups (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Obtaining detailed information about programs from business and industry on a continuing basis</td>
<td>Item(a) Standard Mean Deviation</td>
<td>Item Standard Mean Deviation</td>
<td>Item Standard Mean Deviation</td>
<td>Item Standard Mean Deviation</td>
</tr>
<tr>
<td></td>
<td>R1 R2 R1 R2</td>
<td>R1 R2 R1 R2</td>
<td>R1 R2 R1 R2</td>
<td>R1 R2 R1 R2</td>
</tr>
<tr>
<td></td>
<td>5.9 6.0 .79 .74</td>
<td>5.4 5.4 1.22 .75</td>
<td>5.6 5.6 .98 .89</td>
<td>5.7 5.6 1.00 .80</td>
</tr>
<tr>
<td>12. Informing business and industry teachers, and others about the information system</td>
<td>5.1 4.9 1.51 1.31</td>
<td>4.4 4.3 1.79 1.49</td>
<td>4.6 4.8 1.27 .45</td>
<td>4.8 4.6 1.56 1.31</td>
</tr>
<tr>
<td>13. Business and industry legal requirements</td>
<td>3.2 3.3 1.32 .99</td>
<td>3.9 3.8 1.77 1.48</td>
<td>3.1 2.8 1.22 .84</td>
<td>3.4 3.5 1.50 1.23</td>
</tr>
</tbody>
</table>

(a) Rating Scale: Minor Constraint Medium Constraint Major Constraint
1 2 3 4 5 6 7
(b) Round One—Vocational education personnel development specialists N = 15;
Vocational-technical education teachers N = 15; Business and Industry N = 7
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(d) Round One N = 36 Round Two N = 31
<table>
<thead>
<tr>
<th>Respondent Groups</th>
<th>Round I</th>
<th></th>
<th>Round II</th>
<th></th>
</tr>
</thead>
</table>
|                               |         | Vocational Education Personnel Development Specialists $r_s$ | Vocational Education Personnel Development Specialists $r_s$ | Vocational Education Personnel Development Specialists $r_s$ | Vocational-Tech- 
| Vocational-Tech-              |         | $r_s$                |          | $r_s$                | nical Education Teachers $r_s$ |
| Education Teachers            | .93     |                      | .92      |                      |
| Business and Industry         | .75     | .62                  | .85      | .65                  |

Round I Average Spearman Rank Order Correlation Coefficient: $r_{s_{av}} = .77$
Round II Average Spearman Rank Order Correlation Coefficient: $r_{s_{av}} = .80$
Round I Kendall Coefficient of Concordance: $W = .84$
Round II Kendall Coefficient of Concordance: $W = .87$

Items Analyzed: For each round and for each respondent group, thirteen items were ranked using the mean values for each item reported in Table 22.
CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter includes a brief summary of the purposes and procedures of the study. Research questions, findings, and conclusions are presented next, followed by recommendations in the last part of this chapter.

Summary

Purpose

The purpose of this study was to identify the essential dimensions and feasibility of an information system to facilitate awareness of business and industry programs for vocational-technical education teachers. The study was designed to use a descriptive and exploratory approach.

Objectives

Collection and analysis of data focused on meeting the following study objectives:

1. To identify essential dimensions of the information system as perceived by state vocational personnel development specialists, vocational-technical education teachers, and business and industry personnel development specialists.

2. To establish the degree to which consensus exists between the above groups concerning essential dimensions that would need to be accommodated to operate the information system; and
3. To determine the feasibility of operating an information system to facilitate awareness of business and industry programs for vocational and technical education teachers.

**Procedures**

To accomplish these objectives, answers were sought to research questions through the use of two successive Delphi opinionnaires. Following pilot tests and revision, the initial opinionnaire was administered by mail to a purposively selected group composed of 15 vocational personnel development specialists, 15 vocational-technical education teachers, and 15 business and industry representatives. The second opinionnaire was mailed to the same groups, with the exception of four business and industry representatives who declined to participate. Responses were obtained from 36 of the 45 first round respondents, which constituted an 80 percent sample. In the second round, 31 out of 41 responses were obtained for a 76 percent sample.

The study design called for the use of descriptive statistics. Frequencies, percentages, and correlation analysis were accomplished by using SPSS and NPAR computer programs at The Ohio State University Instruction and Research Computer Center.

**Findings and Conclusions**

Findings and conclusions regarding the information system are summarized in relation to the research questions.
The presentation is followed by findings and conclusions relating to the degree of consensus among respondent groups.

**Research Question:**
What value does business and industry and vocational education personnel place on the information system in terms of its potential usefulness to their work?

**Findings**

1. Vocational personnel development specialists felt the information system would be highly valuable in terms of its potential usefulness to their work.

2. Vocational-technical education teachers expressed the opinion that the information system would be somewhat valuable in terms of its potential value to their work.

3. Business and industry respondents felt the information system would be somewhat valuable in terms of its potential to their work.

**Conclusion**
Considering the total of all group responses, the information system would be somewhat to highly valuable in terms of its potential usefulness to respondents work.
Research Question:

How feasible would it be to operate the information system?

Findings

1. Vocational personnel development specialists felt the information system would be moderately feasible to operate.

2. Vocational-technical education teachers felt the information system would be moderately feasible to operate.

3. Business and industry respondents felt the information system would be moderately feasible to operate.

Conclusion

Considering all group responses, the information system would be moderately feasible to operate.

Research Question:

If established, to what extent would the information system be used?

Findings

1. Vocational personnel development specialists expressed the opinion that the information system would be used to some extent.

2. In the opinion of vocational-technical education teachers, the information system would be used to some extent.
3. Business and industry respondents expressed the opinion that the information system would be used to a high extent.

Conclusion

In the opinion of the majority of respondents, the information system would be used to some extent.

Research Question:

To what extent would study respondents use the information system?

Findings

1. Vocational personnel development specialists would use the information system to a high extent.

2. Vocational-technical education teachers would use the information system to some extent.

3. Business and industry representatives would use the information system to some extent.

Conclusion

Vocational education and business and industry personnel would use the information system to a high extent.

Research Question:

What is the extent of need for the information system?
Findings

1. In the opinion of vocational education personnel development specialists, a critical need exists for the information system.

2. Vocational-technical education teachers believe a critical need exists for the information system.

3. Business and industry feels some need exists for the information system.

Conclusion

Considering the total response of all groups in this study, a critical need exists for the information system.

Research Question:

When should the information system be established?

Findings

1. Vocational personnel development specialists felt the information system should be established within the next two years.

2. Vocational-technical education teachers believe the information system should be established within the next two years.

3. In the opinion of business and industry respondents, the information system should be established within the next two years.
Conclusion

Considering responses of all groups in this study, the information system should be established within the next two years.

Research Question 14:

What would business/industry and vocational education personnel do to either encourage or discourage establishment of the information system?

Findings

1. All groups would encourage establishment of the information system by: serving on an advisory committee, working with professional organizations to gain support for the system, help input and disseminate information, supply written endorsement, and promote the information system among colleagues and associates.

2. Respondent groups would support establishment of the information system with the only limitation being excessive cost.

Research Question:

What kinds of information should the information system operators acquire about business and industry programs that are open to vocational-technical education teachers?
Findings

1. Vocational personnel development specialists believe most importance should be focused on acquiring information regarding: name or title of programs, dates of programs, location(s) of programs, contact persons, skills/competencies to be developed, and purposes and objectives of activities.

2. Vocational-technical education teachers felt the following kinds of information should be acquired: dates, location, and cost of programs, purposes and objectives of programs, content of programs, skills/competencies to be developed, credit/certification, method of instruction, opinions of ex-students about programs, and contact persons.

3. Business and industry respondents felt the most importance should be placed on acquiring information about: location(s) of programs, purposes and objectives, prerequisites, content of programs, and costs/fees to participants.

Conclusion

Considering responses of all respondent groups, information should be acquired about: name or title of programs, date(s), location(s), contact persons, costs/fees to participants, purposes and objectives of the program, content
of program(s), skills/competencies to be developed, and sponsoring organization. If possible, the following additional items of information should be acquired about business and industry programs that are open to vocational-technical education teachers: method of instruction, instructional staff qualifications, registration procedures, evaluation procedures, assignments/effort required by participants, materials/tools needed, prerequisites, and credit/certification.

Research Question:

What problems would be encountered in acquiring information about business and industry programs that are open to vocational-technical education teachers?

Findings

1. Vocational personnel development specialists felt the following major problems would be encountered such as the following: identifying business and industry programs, obtaining responses, getting complete information, updating information, information not readily available, details about programs not known with sufficient lead time to facilitate announcement, restrictions on release of information, perceived
benefits to business and industry, and time/effort to compile the information.

2. Vocational-technical education teachers felt getting complete information, establishing contact with the right person, identifying business and industry programs, getting accurate information, release of information, and time/effort to compile the information would all constitute major problems.

3. Business and industry respondents indicated the greatest information acquisition problems would center around: identifying business and industry programs, establishing contact with the right person, perceived benefits to business/industry, inability to understand educational terminology, lack of interest, and details not known with sufficient lead time to facilitate announcement of programs.

Conclusion

Considering all group responses, the following would represent likely problems that would be encountered in acquiring information about business and industry programs for vocational-technical education teachers: time/effort to compile information, getting complete information, updating information, establishing con-
tact with the right person, and identifying business and industry programs.

Research Question:

What kind of information services should the information system provide to facilitate awareness of business and industry programs for vocational-technical education teachers?

Findings

1. Vocational personnel development specialists felt highest priority should be devoted to developing the following information services: a telephone referral service to provide users with names of business and industry contacts, computerized searches in response to inquiries, feedback on what participants gain, and a consulting service on how to use the information system.

2. Vocational-technical education teachers indicated the highest development priority should be placed: on a service that would provide feedback on participant gain from business and industry programs, and on a consulting service on how to use the information system.

3. Business and industry respondents believed emphasis should be placed on developing: services to provide feedback on what participants gain from business and industry programs,
a consulting service on how to use the information system, computerized searches in response to inquiries, and a telephone referral service to provide users with names of business and industry contacts.

Conclusion

Considering the total of all group responses, the highest priority for information services should be focused on: a service to provide feedback on what participants gain from business and industry programs, a consulting service on how to use the information system, computerized searches in response to inquiries, and on a telephone referral service to provide users with names of business and industry contacts.

Research Question:

What information products should the information system provide to facilitate awareness of business and industry programs for vocational-technical education teachers?

Findings

1. Vocational personnel development specialists indicated the highest priority should be placed on developing a: master calendar of re-occurring programs, master calendar of long-term programs,
master calendar of short-term programs, master calendar of programs available during traditional vacation periods, compendium of all program announcements each year, monthly newsletter announcing programs by state or geographic area, monthly master calendar for inclusion in established professional and trade journals and newsletters.

2. Vocational-technical education teachers felt consideration should be given to focusing the highest development priority on information-dissemination products such as: master calendar of re-occurring programs, master calendar of short-term programs, master calendar of low or no-cost programs, master calendar of programs available during traditional vacation periods, monthly newsletter announcing programs by state or geographic area, and journal articles about available programs.

3. Business and industry respondents felt emphasis should be placed on developing: a master calendar of re-occurring programs, compendium of all program announcements each year, master calendar of long-term programs, and journal articles about available programs.
Conclusion

The total of all group responses suggests the highest development priority should be placed on the following information-dissemination products: a master calendar of re-occurring programs, a compendium of all program announcements each year, a master calendar of programs available during traditional vacation periods, a monthly newsletter announcing programs by state or geographical area, and a master calendar of long-term programs.

Research Question:

What kind of agency should coordinate operation of the information system?

Findings

1. Vocational personnel development specialists indicated the most desirable coordinating agency for the information system would be a national educational research and development center. This was followed closely by a national professional education association.

2. Vocational-technical education teachers felt either a state department of education or a national professional education association would be the most desirable coordinating agency for the information system.
3. Business and industry respondents indicated a university would be the most desirable coordinating agency, followed by a national business and industry trade association.

Conclusion

The most desirable coordinating agency, according to the total of all group responses, would be ranked as: (1) a national educational research and development center, (2) a national professional education organization, (3) a state department of education, and (4) a national non-profit organization affiliated with business.

Research Question:

How might such an information system be financed?

Findings

1. Vocational personnel development specialists felt the following represented likely funding sources for the information system: public funds through a Federal grant, joint funding support provided through the American Vocational Association (AVA) and business and industry professional and trade associations, and a foundation grant.

2. Vocational-technical education teachers felt funding for the information system could be
provided through: a consortium of state departments of education and business and industry on a cost sharing basis, a foundation grant, public funds (Federal grant), joint support of the American Vocational Association (AVA) and business/industry professional and trade associations.

3. Business and industry viewed the following as likely sources of funding: a Federal grant, a foundation grant, joint support through the American Vocational Association (AVA) and business/industry professional and trade associations, a consortium of state departments of education and business and industry on a cost sharing basis.

Conclusion

The total of all group responses suggests the most promising funding sources would be: a Federal grant, a foundation grant, or joint support through a professional vocational education association and business/industry professional and trade associations.

Research Question:

What major constraints would be encountered in operating the information system?
Findings

1. Vocational personnel development specialists clearly felt obtaining operating funds represented the most major constraint to operating the information system. Other problems representing medium constraints, in the opinion of this group, included: lack of a natural communication link between business/industry and education, obtaining detailed information about business and industry programs on a continuing basis, time available for teachers to participate, updating and deleting out-dated information, magnitude or scope of the effort, local level educational policies, and state level educational policies.

2. Vocational-technical education teachers felt the major constraints to operate the information system would be obtaining operating funds, and time made available for teachers to participate in business and industry programs.

3. Business and industry respondents did not identify major constraints, but felt that all potential constraints listed on the opinionnaire represented medium constraints to operating the information system. The highest rated medium constraints included: obtaining
detailed information from business and industry about programs on continuing basis, obtaining operating funds, and magnitude or scope of the effort.

Conclusion

Overall group responses suggest the one major constraint to operating the information system would be obtaining operating funds. Other constraints of a "medium-sized" nature appear to be: obtaining detailed information about programs from business and industry on a continuing basis, lack of a natural communication link between business/industry and education, updating and deleting out-dated information, time made available for teachers to participate in business and industry programs, magnitude or scope of the effort, and user interest.

The extent of relationship between respondent groups and agreement among respondent groups was determined through the use of frequencies, percentages and correlation coefficients. Analysis of these data yielded findings relative to the amount of consensus regarding essential dimensions and feasibility of the information system.

Findings

1. Respondent groups tended to agree that the
information system would be highly valuable to their work.

2. Respondent groups tended to agree that the information system would be moderately feasible to operate.

3. Respondent groups tended to agree that the information system would be used some to a high extent.

4. Respondent groups tended to agree that they would use the information system from some to a high extent.

5. Respondent groups tended to agree that a critical need exists for the information system.

6. Respondent groups tended to agree that the information system should be established within two years.

7. Respondent groups expressed agreement that they would encourage establishment of the information system in a variety of supportive ways.

8. Respondent groups agreed they would not discourage establishment of the information system.

9. Respondent groups agreed to a high degree regarding the kinds of information that should be acquired by the information system.
10. Respondent groups agreed to a high degree regarding the kinds of information services that should be provided.

11. Respondent groups expressed substantial positive agreement on the kinds of information products that should be developed.

12. Respondent groups expressed a moderate amount of agreement regarding the kind of agency that should coordinate operation of the information system.

13. Respondent groups expressed a high degree of agreement concerning potential funding sources for the information system.

14. Respondent groups agreed highly concerning possible constraints to operating the information system.

Conclusions

The high degree of consensus among respondent groups suggests the information system could potentially be established and operated with a minimum of difficulty. It also appears that business/industry representatives and vocational education personnel could work harmoniously to further refine the feasibility aspects and essential dimensions during pilot test operation of the information system.
Recommendations

The following recommendations are based on the findings and conclusions reported in this study. These recommendations for action and additional research have possible significance for vocational education researchers, teacher educators, teachers, state supervisors, information-dissemination specialists, school administrators, and business and industry representatives.

1. Consideration should be given to using the findings of this study as a basis for developing the information system and proposing operation of it on a pilot test basis. During the pilot test funding period, further research and evaluation should be conducted to identify technical, administrative, and user feasibility problems.

2. Funding proposals for operating the information system on a pilot test basis should be submitted within the next two years to a federal vocational-technical education agency, an appropriate foundation, and/or to professional vocational education associations and business/industry trade and professional vocational education associations.
3. Operation of the information system on a pilot test basis should be coordinated by a national educational research and development center.

4. The findings of this study should be discussed at national vocational education meetings, national industry-education meetings, and at business/industry professional and trade association meetings. Such discussions could further: test and refine the dimensions of the information system; explore various feasibility aspects; and create additional dimensions that would be important to pilot test operation of the information system. More specifically, the following alternatives are suggested as being worthy of further exploration:

a. A "reality check" should be made to further determine actual support and cooperation from business and industry, as they both relate to operation of the information system.

b. Vocational education teacher salary and certification credit incentives, as they both relate to participation in business and industry programs, should be determined. The extent to which business and industry participation is encouraged through such incentives should also be determined.
c. The qualitative and evaluative dimensions relative to the kinds of programs the information system should announce needs to be more sharply defined. More specifically, a determination needs to be made concerning the types of opportunities (i.e., occupational familiarization vs economic or actual work experiences) that are most appropriate for inclusion in announcements of business and industry programs for vocational-technical education teachers.

d. The degree to which information system products and services ought to be limited to vocational-technical education teachers, rather than to other teachers as well, should be defined.

e. The extent to which vocational-technical education and other teachers are now participating in business and industry programs should be determined.

f. The conditions and circumstances under which vocational-technical education and other teachers become interested in participating in business and industry programs needs to be determined.
Recommendations based on study of related literature and observation by the author during the conduct of this study and not connected directly with collected data include:

1. Ultimately, consideration should be given to expanding the information base of the information system to include not only programs that are available in business and industry for vocational-technical education teachers, but also public service programs (i.e., government, professional and trade associations) that will facilitate greater career understandings by teachers.

2. Consideration should be given to expanding the information base of the information system to include announcements of position vacancies for professional vocational-technical education personnel at all levels throughout the United States.

3. Federal legislation should be enacted into law to make funds available for pilot test operation of the information system and its expanded features mentioned above.
MEMO

TO: [Redacted]  February 1, 1974
FROM: Roy L. Butler (Phone: Extension 214)
SUBJECT: Pilot Test Instrument for Dissertation Study

I need your help. Attached is an instrument I plan to use to collect responses from a Delphi panel composed of Business/Industry and Vocational Education representatives. The nature of the study is explained in the attached.

You can help in this pilot test by:

1. Assuming you are a __________________________

2. Filling in your responses to the questions/statements, based on your assumed role. Please indicate how long (in minutes) it took to respond on the front of the instrument.

3. Reviewing the instrument and noting any points that are unclear to you. Also, please feel free to make any additions or deletions that you feel would be helpful.

4. Returning the completed instrument to me by February 7th or sooner if possible.

I will deeply appreciate your help.
ESSENTIAL DIMENSIONS OF AN INFORMATION SYSTEM TO FACILITATE AWARENESS OF BUSINESS AND INDUSTRY PROGRAMS FOR VOCATIONAL-TECHNICAL EDUCATION TEACHERS

Pilot Test Instrument

Purpose

The primary purpose of this study is to identify the essential dimensions of an information system to announce business and industry personnel development programs which are available to vocational-technical education teachers. A secondary purpose of the study is to determine the feasibility of establishing the information system.

Directions

After reading a short introduction and reviewing a tentative schematic of the information system, you are asked to identify the essential dimensions, which in your opinion, should be considered in any effort to design the information system. You are also asked to consider the feasibility of the information system and indicate your general opinions about certain aspects of such a potential system.
Please complete the attached instrument and return it in the enclosed stamped envelope as soon as possible. Your inputs are needed and your prompt reply will be greatly appreciated.
Introduction

Each year American business and industrial firms extend opportunities for vocational-technical education teachers to participate in workshops, service school courses, clinics, factory mobile training, and other instructional programs. These learning opportunities enable vocational-technical education teachers to sharpen their understandings of the world of work in general, and their competencies in occupational specialties in particular. Vocational-technical education teachers who participate in these programs are able to more thoroughly prepare their students who are potential business and industry employees. Despite the value of this education, there is no information network to facilitate awareness of these important learning resources. Consequently, many vocational-technical education teachers are not aware of these opportunities.

Current and past literature develops a need for a national information system to acquire, process, and deliver information about these learning opportunities for vocational-technical education teachers. However, the essential dimensions and the feasibility of establishing such a system are not known.

A tentative schematic of such an information system is presented on the following page, along with tentative objective and scope statements.
SCHEMATIC OF INFORMATION SYSTEM TO FACILITATE AWARENESS OF BUSINESS AND INDUSTRY PROGRAMS FOR VOCATIONAL-TECHNICAL EDUCATION TEACHERS

INFORMATION ACQUISITION

- National, State and Local Trade Associations
- National, State and Local Iss. (e.g., Manufacturers, Suppliers, Jobbers, and Retailers)

INFORMATION PROCESSING

Selection

- Catalog, Index Information by Occupational Cluster, Type of Activity, Location, etc.
- Computer Input

INFORMATION PRODUCTS & SERVICES

- Cumulative Publication
- Cumulative Indexes
- Publication of special indexes
- Search and telephone referral service

INFORMATION DISSEMINATION

- Institutions in Colleges and Universities, Community and Junior Colleges, State Education Departments, Local Public Education Agencies, Private Schools

- Businessmen
- Others
Objective: The primary objective of this information system would be to provide ready access to information about personnel development activities (i.e., instructional programs, orientation tours, etc.) in business and industry which are open to vocational-technical education teachers to update their occupational competencies.

Scope: The information base for the system would be derived from descriptions of personnel development activities, obtained from business and industrial firms throughout the United States, which are open to vocational-technical education teachers in the fields of vocational agriculture, business and office education, distributive education, health occupations education, home economics education, technical education, trade and industrial education, and the related field of industrial arts education.

Your response to the following statements will help determine the essential dimensions which should be considered in any effort to design the information system. You are also asked to consider the feasibility of the information system and indicate your general opinions about certain aspects of such a potential system.
1. Please list one to ten endings to the following statement. No particular order of importance is required. Please be as brief as possible.

"In order for vocational-technical education teachers and others to make decisions about the appropriateness of participating in a business and industry personnel development program, the following kinds of information are needed about such programs . . .

* ________________________________
* ________________________________
* ________________________________
* ________________________________
* ________________________________

2. What problems would be encountered in obtaining the above information from business and industry? List one to five problems.

* ________________________________
* ________________________________
* ________________________________
* ________________________________
* ________________________________
3. Please list one to five endings to the following statement. No particular order of importance is required. Please be as brief and specific as possible.

"Various information services could be offered by the information system, however, the greatest energies and resources should be devoted to the following services . . .

* ____________________________
* ____________________________
* ____________________________
* ____________________________
* ____________________________

4. Please list one to five endings to the following statement. No particular order of importance is required. Please be as brief and specific as possible.

"Various information products could be prepared by the information system operators, however, the greatest energies and resources should be devoted to the following types/kinds of information products . . .

* ____________________________
* ____________________________
* ____________________________
* ____________________________
* ____________________________
5. What major constraints would be encountered in operating the information system? Please list one to five constraints.

* __________________________________________________________________________
* __________________________________________________________________________
* __________________________________________________________________________
* __________________________________________________________________________
* __________________________________________________________________________

6. In what kind of agency should central coordination of the information system take place?

* __________________________________________________________________________
* __________________________________________________________________________
* __________________________________________________________________________
* __________________________________________________________________________
* __________________________________________________________________________

7. When should an information system of this nature be established?

* __________________________________________________________________________

8. What would you personally do to either encourage or discourage the establishment of the information system?

a. To encourage the establishment of the information system,
   I would __________________________________________________________

b. To discourage the establishment of the information system,
   I would __________________________________________________________
9. How valuable would a publication designed specifically to announce the existence of business and industry personnel development activities that are open to vocational-technical education teachers be to you? Please "X" through one of the circles on the following scale.

0 0 0 0 0 0 0 0 0 0 0 0
Highly Valuable Not Valuable

10. How might such an information system be financed? Please list one to five ways.

* __________________________________________________________________________
* __________________________________________________________________________
* __________________________________________________________________________
* __________________________________________________________________________
* __________________________________________________________________________

11. How feasible do you think it would be to operate the information system?

0 0 0 0 0 0 0 0 0 0 0 0
Highly Feasible Moderately Feasible Not Feasible

12. Please indicate any dimensions that have been overlooked, which in your opinion, would be essential to the design of the information system. Please be as brief as possible.
An Exploratory Survey to Identify the Essential Dimensions and Feasibility of a National Information System to Facilitate Awareness of Business and Industry Programs for Vocational-Technical Education Teachers
Instructions:

The cover letter, a short introduction, tentative schematic drawing, and objective and scope statements are presented to enable team members to gain a focused perspective of the problem this study addresses. These materials should be read before responding to opinionnaire items.

Space is provided for you to list and rate additional considerations that are important in your opinion. The dimensions of the information system are tentative and, therefore, not exhaustive. Some dimensions and feasibility considerations may have been overlooked. Your judgement as to omissions will be appreciated.

Please respond to all opinionnaire items and use the enclosed addressed, stamped envelope to return your completed opinionnaire. In order to meet the study data processing schedule, return of the completed opinionnaire is requested within five (5) working days.
Introduction

Each year American business and industrial firms extend opportunities for vocational-technical education teachers to participate in workshops, service school courses, clinics, factory mobile training, seminars, conferences, and other learning opportunities. These learning opportunities enable vocational-technical education teachers to sharpen their understandings of the world of work in general, and their competencies in occupational specialities in particular. Vocational-technical education teachers who participate in these programs are able to more thoroughly prepare their students who are potential business and industry employees. Despite the value of this education, there is no information network to facilitate awareness of these important resources. Consequently, many vocational-technical education teachers are not aware of available opportunities.

Current and past vocational education and business/industry literature supports the need for a national system to acquire, process, and deliver information about these learning opportunities for vocational-technical education teachers. However, the essential dimensions and the feasibility of establishing such a system are not known.

A tentative schematic drawing of such an information system is presented on the following page, along with tentative objective and scope statements. Please review the page and proceed on to the opinionnaire items.
Objective: The primary objective of this information system would be to provide ready access to information about business and industry programs (e.g. workshops, service school courses, orientation tours, seminars, conferences) which are available to vocational-technical education teachers to update their occupational competencies.

Scope: The information base for the system would be derived from descriptions of programs, obtained from business and industrial firms throughout the United States, which are available to vocational-technical education teachers in the fields of agri-business and natural resources, business and office education, distributive education, health occupations education, home economics education, technical education, trade and Industrial education, and the related field of industrial arts education.
What kinds of information should the information system operators acquire about business and industry programs that are open to vocational-technical education teachers? Please indicate how important it would be to acquire the following items of information. Circle the appropriate number for each item.

<table>
<thead>
<tr>
<th>INFORMATION ACQUISITION DIMENSION</th>
<th>low importance</th>
<th>medium importance</th>
<th>high importance</th>
<th>COMMENTS (Note number comment refers to)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Name or title of program</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. Sponsoring organization</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Date(s) of program</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Location(s) of program</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5. Contact person(s)</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Cost/fees to participants</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Purposes and objectives of the activity</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8. Method of instruction</td>
<td>1 2 3 4 5 6 7</td>
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<td></td>
<td></td>
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<tr>
<td>9. Instructional staff qualifications</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Assignments/effort required by participants</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>11. Evaluation procedures</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
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<tr>
<td>12. Content of the program</td>
<td>1 2 3 4 5 6 7</td>
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<tr>
<td>13. Class size or number of participants</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14. Registration procedures</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15. Material/tools needed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>16. Prerequisites</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>17. Part-time employment possibilities</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>18. Skills/competencies to be developed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19. Transportation available</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20. Living arrangements/housing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>21. Recreation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>22. Credit/certificate</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>23. Behavioral objectives of the program</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>24. Opinion of ex-students about program</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>25. Brief about sponsor's products</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>26. Other</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Several problems would likely be encountered in acquiring the information listed in question 1 (above). Please indicate the extent to which the following statements represent problems that would likely be encountered in acquiring the information from business and industry. Circle the appropriate number for each item.

<table>
<thead>
<tr>
<th>INFORMATION ACQUISITION DIMENSION (PROBLEMS)</th>
<th>least likely problem</th>
<th>likely problem</th>
<th>most likely problem</th>
<th>COMMENTS (Note number comment refers to)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identifying business and industry problems</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
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<tr>
<td>2. Establishing contact with the right person</td>
<td>1 2 3 4 5 6 7</td>
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<tr>
<td>3. Obtaining responses</td>
<td>1 2 3 4 5 6 7</td>
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<tr>
<td>4. Updating information</td>
<td>1 2 3 4 5 6 7</td>
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<tr>
<td>5. Getting complete information</td>
<td>1 2 3 4 5 6 7</td>
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<td></td>
<td></td>
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<tr>
<td>6. Getting accurate information</td>
<td>1 2 3 4 5 6 7</td>
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<td></td>
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<tr>
<td>7. Volume of available information</td>
<td>1 2 3 4 5 6 7</td>
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<tr>
<td>8. Perceived benefits to business and industry</td>
<td>1 2 3 4 5 6 7</td>
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<tr>
<td>9. Inability to understand educational terminology</td>
<td>1 2 3 4 5 6 7</td>
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<tr>
<td>10. Information not readily available</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
11. May not want to devote necessary time and effort to compile information
   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

12. May not want to release some of the information
   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

13. Lack of interest
    | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

14. Details about programs not known with enough lead time to facilitate announcement
    | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

15. Other
    | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
    | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
    | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
    | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Please continue on the next page
### SECTION B: INFORMATION SERVICES

What information services should the information system provide? Please indicate the development priority that each of the following services should receive. Circle the appropriate number for each item.

<table>
<thead>
<tr>
<th>INFORMATION SERVICES DIMENSION</th>
<th>low priority</th>
<th>medium priority</th>
<th>top priority</th>
<th>COMMENTS (Note number comment refers to)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Telephone referral service to provide business and industry with names of information system users who express interest in announced programs</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Telephone referral service to provide information system users with names of business and industry program contact person(s)</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Coordination of participant registration by information system referral specialist, with business and industry programs announced without providing contact name or company name</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Computerized searches in response to inquiries</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manual searches in response to inquiries</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------------</td>
<td>---</td>
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<td>---</td>
</tr>
<tr>
<td>6.</td>
<td>On-line computer information bank</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7.</td>
<td>Feedback on what participants gain from business and industry programs</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>Data compilation for evaluation of information system (e.g. number of programs announced, number of participants)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9.</td>
<td>Consulting service on how to use system</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10.</td>
<td>Other</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Please continue on the next page
What information products should the information system provide? Please indicate the development priority that each of the following products should receive. Circle the appropriate number for each item.

<table>
<thead>
<tr>
<th>INFORMATION PRODUCTS DIMENSION</th>
<th>low priority</th>
<th>medium priority</th>
<th>top priority</th>
<th>COMMENTS (Note number comment refers to)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Compendium of all program announcements each year</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. Master calendar of recurring programs</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. Master calendar of short-term programs (1 week or less)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. Master calendar of long-term programs (over one week)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. Master calendar of low or no-cost programs</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. Master calendar of programs available during traditional vacation periods</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. Standardized participant registration kit</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. Journal articles about available programs</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
9. Monthly newsletter announcing programs by state or geographic area

10. Computer print-outs based on individual users expressed needs

11. Monthly master calendar for inclusion in established professional and trade journals, newsletters etc.

12. Up-to-date film (15-20 min) about the information system to present at local, state, and national meetings

13. Monthly newsletter with programs indexed by each vocational area

14. Bi-monthly newsletter with programs indexed by each vocational area

15. Other

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<td>9</td>
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<td>11</td>
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<td>15</td>
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</tr>
</tbody>
</table>
What kind of agency should coordinate operation of the information system? Please indicate preference by circling the appropriate number for each statement.

<table>
<thead>
<tr>
<th>CENTRAL COORDINATION AGENCY</th>
<th>least desirable</th>
<th>desirable</th>
<th>most desirable</th>
<th>COMMENTS (Note number comment refers to)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. National professional education organization</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. National educational research and development center</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. State Department of Education</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. National business and industry professional association</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. National business and industry trade association</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. National non-profit organization affiliated with business</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
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<tr>
<td>7. University</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Regional research laboratory serving multiple states</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Other:</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
How might such an information system be financed? Please indicate to what extent each of the following represents a likely source of funding for the information system. Circle the appropriate number for each item.

<table>
<thead>
<tr>
<th>FINANCING POSSIBILITIES</th>
<th>least likely</th>
<th>likely</th>
<th>most likely</th>
<th>COMMENTS (Note number comment refers to)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Through a consortium of State Departments of Education and business and industry on a cost sharing basis</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. By participating business and industry firms only</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. By a foundation grant</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Cost recovery fees charged on a pro-rated basis to users</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Public funds through a federal grant</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. By the U. S. Chamber of Commerce</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Through joint support of the American Vocational Assn. and business and industry professional and trade assn.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Other:</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SECTION E: OPERATION CONSTRAINTS AND FEASIBILITY

What major constraints would be encountered in operating the information system? Please indicate to what extent you think the following items would be a constraint to operating the information system. Circle the appropriate number for each item.

<table>
<thead>
<tr>
<th>OPERATING CONSTRAINTS</th>
<th>minor constraint</th>
<th>medium constraint</th>
<th>major constraint</th>
<th>COMMENTS (Note number comment refers to)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Local level education policies</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Obtaining operational funding</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Magnitude (scope) of the effort</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. User Interest</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Perceived threat to teacher colleges and universities</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Sponsor control</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Lack of a natural communication link between business and industry and education</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Updating and deleting out-dated information</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. State level education policies</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td>---</td>
</tr>
<tr>
<td>10. <strong>Time made available for teachers to participate in programs</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11. <strong>Obtaining detailed information about programs from business and industry on a continuing basis</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12. <strong>Informing business and industry, teachers, and others about the information system</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13. <strong>Business and industry legal requirements</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14. <strong>Other:</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Please continue on the next page
How feasible do you think it would be to operate the information system? Circle one number below that reflects your opinion.

<table>
<thead>
<tr>
<th>Highly Feasible</th>
<th>Moderately Feasible</th>
<th>Not Feasible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What value would you place on the information system in terms of its potential usefulness to your work? Circle one number below that reflects your opinion.

<table>
<thead>
<tr>
<th>Highly Valuable</th>
<th>Somewhat Valuable</th>
<th>Not Valuable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
If established, to what extent would the information system be used? **Circle one number below that reflects your opinion.**

<table>
<thead>
<tr>
<th>High Usage</th>
<th>Some Usage</th>
<th>No Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If established, to what extent would you use the information system? **Circle one number below that reflects your opinion.**

<table>
<thead>
<tr>
<th>High Usage</th>
<th>Some Usage</th>
<th>No Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
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<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
To what extent is there a need for the information system? Circle one number below that reflects your opinion.

<table>
<thead>
<tr>
<th>Critical Need</th>
<th>Some Need</th>
<th>No Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When should the information system be established? Select the one answer that most clearly represents your opinion.

- As soon as possible
- Within the next two years
- Within the next four years
- Never
- Other: _______________________

Would you like to receive an abstract of the final report of this study?

Yes ______
No ______

Thank you for completing this opinionnaire. Your help is greatly appreciated.
APPENDIX C
March 8, 1974

In a few days, you will receive an opinionnaire which is being sent to a select group of 45 leaders in business, industry, and vocational education. The opinionnaire is designed to collect and analyze insights of leaders like you concerning the essential dimensions of an information system for vocational-technical education teachers. The feasibility of the information system is also to be determined in the study.

Your assistance with this effort will be greatly appreciated.

Sincerely yours,

Roy L. Butler
Research Associate

RLB/nl
March 11, 1974

Several days ago, you received an advance notice concerning this study and the attached opinionnaire. The purpose of the study is to identify what should be included in the design of a national information system to facilitate awareness of business and industry programs for vocational-technical education teachers. The study also seeks to determine the feasibility of the information system. Conducted as part of a doctoral program, the study is under the general direction of Dr. Robert E. Taylor, Director of The Center for Vocational and Technical Education.

A modified version of the Delphi research technique is being used to obtain responses from 45 leaders in business, industry, and vocational education. Using this research technique, each team member receives two opinionnaires. The first opinionnaire is enclosed. The second opinionnaire will be quite similar and should come to you in about one month. The second opinionnaire will include the results of the first. At that time, you will have the opportunity to indicate whether you concur with the opinions of the other team members.

Instructions for responding to the opinionnaire are provided for each item. Please be assured your responses will be anonymous and will be treated collectively in the analysis.

An addressed, stamped envelope is enclosed to expedite the return of your completed opinionnaire. In order to meet a data processing schedule, return of the completed opinionnaire is requested within five (5) working days.

Your cooperation is critical to the conduct of this study and your assistance will be greatly appreciated.

Sincerely yours,

Roy L. Butler
Research Associate

RLB/kk

Enclosure
Dear

Your completed opinionnaire concerning the information system for vocational-technical education teachers has been received. Thank you for taking time from a busy schedule to provide the needed help. You will be interested in knowing that other team members have also shown a genuine interest in the study.

The second opinionnaire, which will be quite similar to the first, should come to you in approximately one month. It will contain the results of the first and will give you the opportunity to indicate whether you concur with the opinions of other team members about the information system.

Your assistance with this effort is greatly appreciated.

Sincerely yours,

Roy L. Butler
Research Associate

RLB/n1
Dear

On March 11, 1974, copies of the enclosed opinionnaire and letter were mailed to you. As of today, I have not received your completed opinionnaire. Your opinions are critical to the successful conduct of this study. It is also essential that I receive your opinionnaire in the near future in order to meet the data processing schedule. Please enter your responses on the enclosed opinionnaire and return it within two (2) working days. An addressed, stamped envelope has been enclosed to expedite the return of your completed opinionnaire. If you have returned the opinionnaire, please disregard this letter and accept my sincere appreciation for your cooperation.

Your help will be greatly appreciated.

Sincerely yours,

Roy L. Butler
Research Associate

RLB/nl
Enclosure
April 15, 1974

Dear

Enclosed is the second opinionnaire concerning an information system to facilitate awareness of business and industry programs for vocational-technical education teachers. You will recall completing a first opinionnaire and that the study design called for a second opinionnaire which reflected your opinions, along with those of other respondents. Your second professional contribution to the study is now needed. Directions for responding are included within the opinionnaire.

An addressed, stamped envelope is enclosed to expedite the return of your completed opinionnaire. In order to meet a data processing schedule, return of the completed opinionnaire is requested within five (5) working days.

Your continued cooperation is critical to the successful conduct of this study and your assistance is greatly appreciated.

Sincerely yours,

Roy L. Butler
Research Associate

RLB/nl

Enclosure
APPENDIX H
Dear,

Your second completed opinionnaire concerning an information system for vocational-technical education teachers has been received. Thank you for taking time from a busy schedule to help with this study.

As promised, I will send you an abstract of the final report in about one month.

Again, thanks for your help. Please accept my very best wishes for an enjoyable spring and summer season.

Sincerely yours,

Roy L. Butler
Research Associate

RLB/nl
On April 15, 1974, the second opinionnaire concerning an information system to facilitate awareness of business and industry programs for vocational-technical education teachers was mailed to you. As of today, I have not received your completed opinionnaire. Your response to the second opinionnaire is critical to the successful conduct of this study. It is essential that I receive your opinionnaire in the very near future to meet the data processing schedule. Please enter your responses on the opinionnaire and return it within two (2) working days. If you did not receive the opinionnaire or have misplaced it, please use the enclosed, stamped postal card to let me know or call me collect at (614) 486-3655 or at (614) 486-913. If you have returned the second opinionnaire, please disregard this letter and accept my sincere appreciation for your cooperation.

Your help with this study is greatly appreciated.

Sincerely yours,

Roy L. Butler
Research Associate

Enclosure
BIBLIOGRAPHY


