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ABSTRACT

The interrelationships and problems areas existent in the dissemination and utilization of the results of research and development efforts in vocational education are explored. The problem areas relate to the responsibilities of the various education agencies, the specificity and types of information or products to be disseminated, target audiences, dissemination techniques, and documentation of utilization. Recommendations offered to alleviate some of the problems are: (1) Develop a taxonomy for identifying and describing research results, (2) define target audiences and their specific information needs, (3) analyze personal and socio-psychological factors involved, (4) develop a process for evaluation of research before dissemination, (5) reexamine procedures for inclusion in information systems, (6) implement a system of regional centers responsible for dissemination and utilization, (7) reexamine federal and state policy, and (8) explore alternative delivery systems for encouraging utilization. A bibliography is included. (RG)

An Analysis of Dissemination and Utilization of Vocational Education Research and Development Efforts

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> *At the rate at which knowledge is growing, by the time a child born today graduates from college, the amount of knowledge in the world will be four times as great. By the time that child is fifty years old, it will be 32 times as great, and 97 percent of everything known in the world will have been learned since the time he was born.*

In education in general and vocational-technical education specifically, wave after wave of new information is thrust upon us year after year. The results of this influx of data and information is an accelerated replacement of old knowledge with new, faster intellectual data processing, and the disquieting realization of the impermanence of data and knowledge itself. Due to the increased amount of knowledge production, added dissemination of a particular bit of knowledge over that of years gone by, and increasing numbers of methods by which knowledge may be disseminated, knowledge may become meaningless as we know it today. Knowledge may become increasingly transitory. Instead of dispensing our heritage to students, educators will conceivably be forced to teach students how to gather information accurately and quickly for their changing environmental and intellectual situations.

As far as the dissemination and utilization of research and development in vocational-technical education is concerned, only a few short years ago a study concluded that one of the greatest needs to be attacked by Research Coordinating Units was that of improving the dissemination systems. However, more recently, Project Baseline reported that,

> All of the Research Coordinating Units provide information dissemination services in response to specific requests or in the form of mailings of reports and documents. Most units publish, periodically, a newsletter containing reviews of recent research and development projects and other information related to change and innovation. In addition, many units publish bibliographies and compile abstracts of research in specific areas of interest. Although data on the total number of users benefiting from this dissemination is lacking, it is safe to assume that it is a large percentage indeed of the educators across the nation. . . . Although hard data on the actual impact of these dissemination systems to educators across the nation defies collection, to say nothing of measurement, there can be little doubt that the impact is there. Perhaps one of the best examples of this impact is career education. The present status of this concept, in terms of interest, discussion, program implementation, and program modification, is due to basic research performed with vocational education money. One of the major conduits to which information about this research flows has been the dissemination network established through the efforts of Research Coordinating Units across the nation.

Basically, it has been assumed that the Research Coordinating Units have been responsible for the dissemination and utilization of the results of research and development efforts. RCU's have acted as depositories for state research findings and as a request center for information on national projects. By actively serving as a linkage system between local education agency personnel and technical systems, RCU's have attempted to provide up-to-date information

critical to innovation and utilization of research and development efforts.

Definitions

In order to proceed with an intelligent discussion of dissemination and utilization of vocational education research and development efforts, it is important that we have a basic understanding of terms that will be used throughout the rest of the paper. Therefore, the following definitions for use in this paper are set forth:

DISSEMINATION - The sending of information either about the results of the products of research and development or the methods and materials being demonstrated. Included are all forms of information transmission as by consultation or face-to-face communication, telephone calls, individual letters, newsletters, bulletins, brochures, booklets, manuals, films, recordings, exhibits, brief conferences, and short meetings--but only when the information is about research, development, or demonstration.

RESEARCH UTILIZATION - The utilization of research with respect to putting research and development results to good use in the development of activities concerned with teaching in the classroom. It also means action by which it is endeavored to put research results in such a form that they can generally be put into practice. Thus, this kind of action tries to direct research results toward guiding principles, suggestions for methods or procedures, recommendations and other similar means for program development.

Strategies for Dissemination and Utilization Efforts

A number of models for the dissemination and utilization of research and development efforts in vocational-technical education have been developed. In addition, a number of models have been developed in the general field of education as well as other agencies such as the Agricultural Extension Service, Department of Labor, professional organizations and other agencies. One need only to look at some of the sources included in this bibliography to identify a host of models that have been developed.

Basically, models developed and then used by vocational educators are based upon the Agricultural Extension model. Components of the model in vocational-technical education include a central resource agency (ERIC) and a series of state linking agencies known as Research Coordinating Units. Some states have taken the model one step further and implemented local linking agents. These range from three local agencies spread across the state such as that in Tennessee to a much larger number, 14, as used in Florida. Other states have variations of the model and include more or less local contact agencies. Still other states have dovetailed their vocational-technical education dissemination efforts with that of the State Department of Education, such as that as exemplified in the state of New York.

Agencies Responsible for Dissemination

Basically, the agency responsible for the dissemination of vocational-technical education research and development

efforts is the state education agency. In almost every case this responsibility has been delegated to the Research Coordinating Unit serving vocational-technical education.

In some states, the Research Coordinating Units have taken full responsibility for dissemination and utilization. Other states have channeled funds through the RCU to other agencies and essentially have purchased dissemination services. Some states have developed dissemination programs in selected subject matter areas and not used R & D funds for that purpose. Most of those latter efforts have been joint efforts between the state vocational education agency and vocational-technical teacher education institutions.

In isolated instances local education agencies have assumed a role for dissemination. However, most of the activities in this area can be traced to a research or demonstration project that included, as an integral component, funds specifically set aside for the reproduction and dispersement of materials.

Utilization

The utilization of research and development efforts has presented a vastly different picture. Although the utilization component of dissemination and utilization has been recognized as an underdeveloped area, few states have developed plans to systematically utilize R & D results.

By default, utilization has been the exclusive responsibility of the state education agency, with a few exceptions being identified at the National level. Local agencies occasionally develop a plan for their own utilization but

seldom, if ever, develop a plan to promote utilization of R & D efforts in other agencies. Scope of responsibility and resources available to local education agencies usually necessitate that mode of operation.

Target Audiences

The parameters for the dissemination and utilization of vocational education R & D efforts have been inadequately identified and seldom, if ever, defined. One of the primary reasons for that is the nature of vocational R & D efforts and its close relationship to the total broad field of education. While some persons responsible for vocational education view the field as an integral part of a total educational program, others hold the view that vocational education is a separate discipline in and of itself. As a result, confusion exists with respect to just who dissemination and utilization systems should serve. Those who suggest that dissemination and utilization systems should serve anyone interested, are unaware of the knowledge explosion itself and the number of persons interested. Those who suggest that a system should provide specific information and help are also unaware of the knowledge explosion and are also naive about the costs and management (relative to logistics) problems involved.

Typically, target audiences have been defined by one of two major methods. One way to define target audience is on the basis of the function of the clientele being served. One example of that method is the one in which state level administrators and supervisors, teacher educators, research and development

personnel, local directors of vocational education, local administrators (other than local directors) and supervisors, and teachers have been identified. (Occasionally there are subcategories identified within the major categories listed here.)

The second most common way to define target audiences is in terms of the subject material within which the individual is primarily concerned. Specifically, the writer is referring to the subject matter areas of agriculture, business and office, trade and industrial, etc. More recently some states are moving toward the 15 U.S.O.E. career education clusters as a basis of defining subject matter area.

Both methods of defining target audiences have advantages and disadvantages and both meet certain needs. A system that combines both methods has been used in some cases and, although it improves specificity it has the inherent weakness of fostering the "tunnel vision" concept. Schematically, a combined method may be shown as that in Figure 1.

In addition to the problem of "tunnel vision," this scheme also has the problem of duplication. For example, in a dissemination system, does the local director have to receive everything about all subject areas? An immediate second concern here is who makes the decision about what should be disseminated to whom?

In summary with reference to target audiences, it should be noted that most states have used one or more methods for identifying target audiences. Because of the lack of a scientific approach to identifying target audiences

Function Area

Subject Material Matter	State Administrator	Teacher Educator	Local Director	Teacher	Etc.
Agriculture					
Business Office					
Trade & Industry					
Etc.					

Figure 1

A Classification Scheme for Identifying Target Audiences

and because of individual differences, no one system can or should be advocated at this time. Even though some respectable work in this area has been done, notably at the Center for Vocational and Technical Education located at the Ohio State University, the state of the art is not well enough advanced to be able to identify a specific generalizable target audience classification system at this time.

Techniques for Dissemination and Utilization

A wide variety of techniques for dissemination and utilization of the results of vocational education research and development efforts has been put into practice. Some techniques have been developed and implemented to a greater degree than others, and there are some potentially beneficial techniques that have yet to be given a try. An item of major concern at this point is that most techniques have been concerned with and concentrated upon the dissemination mode with little attention given to the utilization mode.

In considering techniques of dissemination, one might group the techniques by the relative extent of their use. Following is an abbreviated list to illustrate the point:

Extent of Use of Dissemination Techniques

Dissemination Techniques	Extensive Use	Some Use	Little or no Use
	Newsletters (Mass Mailing)	Individual Letters	Manuals
	Brochures	Face-to-face Communication	Films
	Bulletins	Telephone Calls	Recordings
	Microforms	Booklets	Group Meetings
		Exhibits	

A casual inspection of the above list will quickly reveal that those techniques that are extensively used are those that are relatively easy to develop, occasionally eye-catching in nature, easy to handle because of automated equipment, and, unfortunately, difficult to change, update, and keep current. Further, it can be seen that as the amount of time and other resources needed to develop a technique increases, the extent of uses decreases. (Note that it is recognized that a number of techniques listed under "Some," or "Little or No Use," are also difficult and expensive to produce and keep updated.) The important concern here is that the situation exists in spite of the fact that diffusion research has indicated that those techniques, listed under "Some" or "Little or No Use," are more effective.

One might list a number of seldom used techniques such as the use of video tapes or telewriters. It appears, however, that vocational educators have "taken the easy way out," and made extensive use of those techniques, that are easy to use while giving little consideration to the effectiveness of such techniques.

When one moves to the area of techniques used to encourage the utilization of the results of vocational education R & D efforts, a different picture emerges. Unfortunately, the picture is unclear, because utilization of the results of research is tied into both the dissemination system and the on-going everyday process of education. In addition, it is difficult to determine when something is being utilized.

Specifically, it is difficult to determine if the results of X research activity was considered in the decision making process that yielded Y change. On the other hand, there are some results that can be identified and in use, such as new curriculum guides or materials, new administrative organizational patterns, citations of data from research reports, etc. A question here is, "just when is something utilized?"

Documentation of the utilization of R & D efforts is difficult to do, for some reasons indicated above, and is seldom done in a way that is of value. However, some documentation has been summarized and is included here for illustration purposes. (Miller and Miller, 1974.)

A Sampling of Projects Funded under VEA, Parts C, D, and I

Project Title	First Funded	Original Impact	Current Impact
Aviation Mechanics Project California	1965	Nationwide survey resulted in change of requirements for instruction by FAA.	150 certified aviation schools in U. S., 18 other countries using revised curriculum.
World of Construction - World of Manufacturing Ohio	1965	Complete curriculum in each area including all materials, daily behavioral objectives, field tested in six States.	Programs taught in all 50 states, 3 provinces of Canada, American Dependent Schools in Germany, France, and Italy. 420,000 students 2,200 schools.
VIEW: Vital Information for Education and Work California	1965	Provided information on microfiche about course offerings and jobs available to students in San Diego County, CA.	VIEW projects in 34 States and Guam, over 7,000,000 students receiving information.
TERC: Technical Education Research Centers Massachusetts	1965	Nationwide survey to determine availability of biomedical equipment technology programs, development of curriculum.	Four major technical curricula being taught in a total of 33 States, also providing technical assistance and curriculum development in 20 other areas.
T4C: Technology for Children New Jersey	1965*	Hands-on experience and career awareness for 572 children in one school district.	50,000 children in 40% of the school districts i New Jersey. Also in New York. Workshops held in at least six other States
Conference on Implementing Career Development Theory and Research through Curriculum Virginia	1966	Fifty participants from several States discussed career development as a personal growth process. This conference helped provide the background for Sidney Marland's 1971 statement supporting career development theory.	"Career Education" being presented to children in all 50 States. In pilot year, less than 1,500,000 children K-12 were involved Nationwide. Withi two years, over 1,200,000 children in one State alone were in pre-secondary guidance and pre-vocational programs and in secondary Vocational Education.

Table 1 - Continued

Project Title	First Funded	Original Impact	Current Impact
CVIS: Computerized Vocational Information System Illinois	1967	Provided vocational guidance information to students on a 1-1 dialogue with computer basis.	Over 10,000 student uses at original site. 75+ schools adopting this program. Consortium members in 38 States, and 2 other countries.
V-TECS: Vocational-Technical Education Consortium of States Georgia	1968	Performance objectives determined for occupational areas, task analysis procedure developed.	Task analysis catalogs developed for over 200 jobs titles. In Florida alone, 246 industrial and 65 technical programs. Expanded to include six other States, with three more expected to join this year.
Occupational Training Information System (OTIS) Oklahoma	1968	Provided manpower demand and supply information to Vocational and Technical Education administrators.	Information to several State agencies concerned with manpower planning, follow-up of vocational students after one, three, and five years. Personnel training information.
Program Review for Improvement, Development, and Expansion (PRIDE) in Vocational Education Ohio	1970	Initiated in eleven (11) of Ohio's 104 Vocational Education Planning Districts.	Completed program review for 90 planning districts, will have the rest complete within two years. Unemployment rate for vocational program graduates one-fourth the National average for that age group.
SPAN: Systems Program Approaching Non-unemployment of Vocational Students Tennessee	1970	Job Guidance and Placement center including co-op work experience, elementary instructional television series for career exploration.	SPAN being implemented throughout Memphis. Tennessee legislature has passed a bill requiring all high schools to provide Vocational Education opportunites for at least 50% of the students Statewide.

*Originally funded by State of New Jersey and Ford Foundation because no provisions were made in the Vocational Education Act of 1963 for pre-vocational elementary level programs. Funded under the 1968 Amendments in many areas of New Jersey by 1970.

Table 1 - Continued

Project Title	First Funded	Original Impact	Current Impact
Vocational Follow-up System Minnesota	1970	Data gathering instruments developed to provide information on student population, program termination, and student and employer follow-up.	Follow-up data on student from all thirty-three (3 area vocational schools Minnesota provided to State agencies and area school directors, used i program planning and evaluation.
Mountain Plains Project Montana	1971	Twelve families in pilot project. Total family career education including home management and job training, for disadvantaged families.	Currently enrolling between 199 and 210 families, 480 families have completed the program.
Forecasting Guide: Employment/Enrollment; A Management Information System Project Washington	1971	Development of a method of analyzing and displaying employment and enrollment information.	Highly reliable planning information source used by major State and local educational agencies throughout Washington. Directly influences State Plan. Over 100 occupations analyzed.
Curriculum for Planning (Project Next Step) Utah	1971	Planning guide developed for local school districts. Combined with 5-State project on curriculum planning funded through two other USOE agencies.	Hundreds of workshops conducted in many States to train educators in methods of conducting needs assessments. State wide commitment to career education in number of States.
Toward Accountability Arizona	1971	New guidance and counseling program piloted in 16 schools with 8,200 students.	Systematically planned and evaluated, objectives based instructional and counseling activities. Methods for measuring outcomes in affective domain determined. Expanding throughout distri

Table 1 - Continued

Project Title	First Funded	Original Impact	Current Impact
Bread and Butterflies Agency for Instructional Television	1972	Personnel from 34 States wrote portions of career development program - some VEA funded, most using State funds.	Complete program availab being used throughout many States and in selected locations in othe of the 34.

Source: Data as compiled from telephone interviews with project directors and from final reports of projects.

It is noted that documentation of the utilization of R & D efforts is focused upon those projects funded (1) at the national level, (2) with specific demonstration or implementation objectives to begin with, or (3) at a significant level through state agencies. Conspicuous by its absence is the documentation of the utilization of the tremendous amount of R & D work conducted at the local level or through grants and contracts by state agencies.

In another vein, it should be noted that some states have used resources to document the impact (or utilization) of R & D efforts. Of special note are those studies completed in Illinois, Pennsylvania, and Wisconsin.

Techniques for encouraging utilization build upon and extend from those techniques of dissemination discussed previously. In addition, however, special efforts for utilization are made through the use of demonstration grants (primarily at the national, regional, and state level), utilization or implementation conferences, workshops, or mini-grants at the local level. In addition, a number of RCUs, such as the one in Tennessee, keep relatively accurate records of the use of various R & D products. Numbers of requests, characteristics of users (in terms of whether they are teachers, administrators, etc.), numbers of copies of research report requests, the use to be made of the requested information or service and related documentation is collected, analyzed and utilized to improve the impact of the total R & D effort.

The Role of Dissemination and Utilization

By virtue of the fact that dissemination and utilization are being considered in one paper, one could conclude that the two are inseparable. And, in fact, that is the case. Dissemination in and of itself is of no value unless there are other expected outcomes. And, utilization cannot occur without dissemination. Further, both can occur in varying degrees.

Dissemination as a Component

The system for the dissemination of the results of R & D efforts in vocational-technical education is in place in the United States. The components of that system include the Division of Research and Demonstration of the BOAE, USOE, the two National Centers at The Ohio State University and North Carolina State University at Raleigh, the 56 Research Coordinating Units in the 50 states and territories and regional research and development centers and regional resource centers as in existence in such states as Florida, New York, and Tennessee. The system uses a variety of techniques for dissemination, varying from the use of newsletters, to conferences and workshops, to exhibits and microforms. The system is internally compatible, meaning the techniques used in one state may be used in another state or nationwide. As a general rule, all the linkages are in place although to a much more refined level in some areas than in others. The dissemination system is effective

primarily because the formal and informal communication linkages are functional and because the system is internally compatible. The system is effective because it takes only a relatively short span of time for an item of information (or the results of a R & D project) to enter the system and spread to or be in the hands of vocational-technical personnel at the local educational agency level. Some dissemination system personnel (in Tennessee, for example) feel that the dissemination system may be so effective that there is little left to be disseminated. At this point the reader should be aware that the writer has not passed judgment on what is being disseminated. (That is another concern to be dealt with later.)

Even though the dissemination system itself is effective, there are some components of that system that bear further scrutiny. For example, there is no planned process for analyzing and implementing new and innovative dissemination processes or techniques. There is a lack of control of the quality and value of the products being disseminated. There is a lack of the use of a variety of dissemination techniques. There is duplication of efforts between agencies and to clients being served. Some clients receive information with too much specificity while others receive information that is too general in nature. Many dissemination efforts are ill-timed in the sense that clients receive information too late to be included in decision-making

processes or before the user recognizes a need for the information. And, finally, packaging of information (or other products) to be disseminated is often inappropriate.

Utilization as a Component

Systems for the utilization of the results of R & D efforts are, essentially, non-existent. As was mentioned in preceding sections of this paper, some of the components of a utilization system are in place at the national level. In addition, there are components in place at the state level scattered across the country. Unfortunately, these components that are in place at the state level are basically those that have been developed by special interest groups and the special interests of individuals, and are in there as a result of a systematic plan aimed at encouraging the utilization of R & D efforts.

As the work of Clark, Guba, Hopkins, Brickell and others points out, there is need for a rational division of labor among the dissemination and utilization tasks. Unfortunately, because of the lack of (1) a well-defined system, (2) adequate resources, (3) personnel skilled in a science of product utilization, (4) a taxonomy for use with R & D products, the practice of using the results of R & D efforts receives little attention in the total research and development community.

Selected Characteristics of Dissemination and Utilization Systems

One of the primary characteristics of dissemination and utilization systems is that there exists a separation of labor between the dissemination and utilization components of the system. This separation of labor is currently best exemplified in vocational-technical education by the system utilized by The Center for Vocational and Technical Education at The Ohio State University where there is a component in the operational structure of the Center entitled "Product Utilization." The basic responsibility of that section is simply the utilization of research and development results of the Center. In addition, some state Research Coordinating Units themselves have attempted to implement product utilization sections as part of their total operation. (For example, the Tennessee Research Coordinating Unit had a staff person whose function was to encourage the utilization of R & D efforts and whose title was Coordinator of Product Utilization.)

With the division of labor in mind, the two separate components, dissemination and utilization, can be discussed separately.

Dissemination

Briefly, characteristics of an effective dissemination system will include the following:

(1) Specific objectives of the dissemination component of the system;

(2) Well-defined target audiences;

(3) A classification system for clients in the target audiences;

(4) The use of a large variety of dissemination techniques;

(5) Rapid turn-around on requests for information;

(6) A variety of packaging schemes used for the same kind of information;

(7) A mechanism which will permit the dissemination of information either upward, downward, or horizontally as linkage systems are defined on a national level to local level continuum;

(8) Adequate resources which will permit the dissemination of information in the form and quantities desired by target audiences.

Utilization

An effective utilization component of a dissemination and utilization system will contain most of the following characteristics:

(1) A well-defined role and scope statement of the product utilization section;

(2) Policy statements in all research and development programs that require that utilization components be included in any R & D effort;

(3) Adequate financial resources;

(4) Personnel skilled in the use of diffusion strategies (change models) and who have communication skills appropriate for the clients to be served;

(5) Resources that can be moved from one place to another and are concentrated in various geographic locations for short intensive periods of time;

(6) A system for classifying and describing the results of research and development efforts.

Summary and Analysis

As one begins to look at the dissemination and utilization of the results of research and development efforts in vocational and technical education several problem areas become evident. First of all, there is a problem among the several education agencies with respect to who is responsible for the dissemination and utilization of R & D results, where overlap exists in those responsibilities and the extent to which dissemination and utilization should take place. Secondly, there is a problem in vocational education today in deciding exactly what should be disseminated, to whom that should be disseminated, how that should be disseminated, and who should be responsible for seeing that the information (or product) is utilized after the dissemination activity has taken place. Thirdly, problems exist

in terms of the specificity and types of information (or product) to be disseminated. For example, the teacher education institutions, in some cases, do an excellent job of disseminating curriculum and instructional materials information without regard or concern for the material to be researched specifically. On the other hand, RCUs have a tendency to disseminate materials and information that is much more research specific in nature. Fourthly, major problems exist in the area of classifying target audiences and research products, neither of which has an effective classification system made to expedite the use. Next, it seems that one of the major problems with total dissemination and utilization systems is the fact that the utilization components have been neglected in the research and development process itself. A possible reason for this is the fact that one can immediately see the results of a dissemination system itself whereas the utilization of results may not become evident for a considerably longer period of time. Finally, it has become evident that the dissemination and utilization function has become a responsibility of everyone involved in vocational-technical education which in essence means that no individual group or agency has the responsibility for developing appropriate systems.

In order to alleviate some of the problems related to dissemination and utilization systems some or all of the following problems should be addressed:

(1) There is need to immediately develop a taxonomy for identifying and describing the results of vocational education research and development efforts.

(2) There is need to immediately further define target audiences and their specific information needs.

(3) There is need to immediately explore the problem area of how one moves from the awareness, interest, trial, and evaluation stages into the adoption (or rejection) stage. Efforts in the area should include an analysis of linkages, motivation, and personal and socio-psychological factors.

(4) There is need to develop a process for evaluating the relative value of research and development results before they are included into systems for dissemination.

(5) There is need to reexamine current practices and procedures for including information into such systems as ERIC, AIM and ARM.

(6) There is need to consider the implementation of a system of regional centers whose prime responsibilities and personnel are aimed at the dissemination and utilization of research and development results.

(7) There is need to reexamine federal and state policy with respect to the amount of effort that should be devoted to dissemination and utilization efforts and how those efforts and systems can be improved.

(8) There is an urgent need to provide resources and explore alternative delivery systems for encouraging the utilization of research and development products.

In conclusion, it must be said that, for the current state of the art, dissemination and utilization systems are very effective in this nation when it comes to dissemination and utilization of the results of vocational education research and development efforts. However, since the knowledge explosion is upon us, it behooves vocational education personnel to move forward in order that they may keep up with dissemination and utilization needs as it becomes more important for educators to consider much more information in the decision-making process.

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