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ABSTRACT

This final report describes a project conducted to design a comprehensive information system (termed SYSTEM) for identifying, selecting, and disseminating relevant military curriculum materials to civilian vocational and technical education programs. Chapter I discusses the need for a centralized SYSTEM and gives project objectives. Chapter II contains overviews of the project's five major components: Review of existing information systems and linkages, development of strategies and procedures for selecting military materials, selection and acquisition of relevant materials, survey of civilian secondary and postsecondary schools which have experience using military curriculum materials, and the actual design of the SYSTEM which would include acquisition and selection, materials preparation and referencing, duplication and distribution, and user services. (The five project components are presented in more detail in five separately abstracted appendixes which are available separately.) Chapter III discusses general project management activities and concerns, and Chapter IV contains recommendations for implementation of the SYSTEM. A brochure about the project and a bibliography are included. (LMS)

Military Curriculum Materials Utilization in Vocational Education

Final Report

Wesley E. Budke, Project Director

The Center for Vocational Education
The Ohio State University
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Columbus, Ohio

June 1976
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ACKNOWLEDGEMENTS

Military curriculum materials seem to have great potential for use in civilian vocational and technical education programs. General awareness of and knowledge about these materials should create the necessary interest and enthusiasm on the part of educators to tap this great resource. We sincerely hope that our study and collection of the curriculum materials, our investigation of the problems and issues surrounding the use of military curriculum materials in civilian schools, and our suggestions for making these materials more accessible and applicable will be an important step toward their utilization.

Special words of appreciation are expressed to the many representatives of the training branches of the U.S. Air Force, Army, Coast Guard, Marine Corps, and Navy who provided full cooperation in identifying and collecting military curriculum materials, and also the the vocational and technical educators who responded to our many questions about use of the materials. And finally, thanks goes to the many consultants from state departments of education, curriculum coordination centers, local schools, and information systems who assisted us in charting our course by providing sound advice based upon their experience and current need.

Special recognition is also due the following project staff for their dedication and for always looking for one more alternative: Earl B. Russell and Paul E. Schroeder, Research Specialists; Earnestine A. Dozier, Program Assistant; Susan A. Mauer, Technical Assistant; L. Sue Keith, Graduate Research Associate, Roseann Pavlick and Deborah K. Roof, Secretaries.

Wesley E. Budke
Project Director

PREFACE

This document is the final report of the "Department of Defense Curriculum Materials Utilization in Vocational Education" project conducted by The Center for Vocational Education at The Ohio State University. The purpose of the project was to design a SYSTEM for identifying, selecting, and disseminating relevant military curriculum materials to civilian vocational and technical education programs. The project scope of work included five major components: (1) the review of existing information systems and linkages, (2) the development of strategies and procedures for selecting military materials, (3) the selection and acquisition of relevant military curriculum materials, (4) a survey of civilian secondary and post-secondary schools which have experience using military curriculum materials, and (5) the actual design of the SYSTEM.

The final report provides a general summary of all of the project's activities that contributed to the design of the SYSTEM. It provides the reader with a brief description of the purpose and objectives of the project and the major component activities (their purpose and objectives, methodologies, findings, and products). It also describes the relationships among project components, activities and their overall relationship to the SYSTEM design.

More in-depth information about the activities of each project work component is appended in the following documents:

Review of Existing Information Systems and Networks: Applicability to the Design of the SYSTEM

Military Curriculum Materials Identification, Selection, and Acquisition Strategies and Procedures

Index of Military Curriculum Materials Related to Civilian Vocational Programs

Utilization of Military-Developed Curriculum Materials in Civilian Vocational Programs: A School Survey

A System to Provide Military Curriculum Materials to Civilian Vocational and Technical Educators

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SUMMARY

This U.S. Office of Education-sponsored project was initiated to design a SYSTEM for providing military-developed curriculum materials to civilian vocational and technical educators. Large investments of taxpayers' funds have been used to develop many high quality curriculum materials for training in military occupations, many of which correspond to civilian vocational education programs. However, to date no centralized, comprehensive, and convenient mechanism has been developed for sharing these military-developed curriculum materials with civilian educators. In an attempt to satisfy this need, The Center for Vocational Education at The Ohio State University was contracted to develop an optimum SYSTEM for identifying, evaluating, and disseminating curriculum materials developed by the military to the nation's civilian vocational programs. The SYSTEM must serve and be responsive to the needs of secondary, post-secondary, and proprietary vocational education programs in each of the states and territories, utilizing linkages with existing national, state, and local information systems.

In order to accomplish this scope of work, the project was organized into five major components:

1. A review of existing information systems and linkages.

2. Development and validation of curriculum materials selection strategies and procedures.

3. Identification, selection, and acquisition of relevant military curriculum materials.

4. Survey of civilian secondary and post-secondary vocational education programs to identify problems with the acquisition and use of military curriculum materials and to determine the need for additional materials.

5. Design of a prototype SYSTEM for making military curriculum materials readily available to civilian vocational educators.

Analysis of Existing Information Systems

Thirteen information systems were selected for review on the basis of their scope of work and geographic coverage. The analysis revealed that a number of national information systems provide some type of service to vocational educators relating to military-developed curriculum materials, but that

the efforts are uncoordinated and unsystematic as far as a comprehensive collection of civilian-related military curriculum materials is concerned. It was concluded that a centralized SYSTEM needs to be designed, bringing together current activities, people, facilities, and products and services from existing information systems, and adding its own products and services when necessary.

Curriculum Materials Selection

Strategies and procedures employed to select military curriculum materials represented another set of activities leading to the design of the SYSTEM. Obtaining military curriculum materials served to (a) establish a substantial collection for early dissemination when the SYSTEM is implemented, and (b) provide a laboratory for formulating procedures for working with the various military commands and installations. When this project began, the feasibility of systematically obtaining military curriculum materials from each of the five major military branches (Air Force, Army, Coast Guard, Marine Corps, and Navy) was unknown. In addition, the curriculum areas in which these materials should be collected were also unknown. Therefore, surveys of state vocational curriculum coordinators and deans of instruction in post-secondary vocational and technical programs were surveyed to determine curriculum materials priorities. Based upon these priorities, strategies and procedures were established for selecting military course materials identified in military formal schools catalogs, curriculum outlines, plans of instruction, and programs of instruction. A set of considerations were then applied to selecting material within a course based upon its relevance to civilian vocational and technical education and upon cost and duplication considerations. Finally, selections were made to provide a wide range of military course materials types and levels to aid in conceptualizing the SYSTEM design. As a result of these selection approaches, approximately 100 military resident courses and approximately 350 military correspondence courses were collected.

The School Survey

To determine the major problems and issues involved in acquiring and using military curriculum materials in civilian vocational programs, a survey was conducted of vocational and technical educators who use military curriculum materials. The survey identified their views regarding characteristics which a centralized system for providing military curriculum materials should possess. The majority of the 175 respondents to the survey taught within the trade and industrial education and health occupations areas in secondary and post-secondary schools. In addition, 80 percent of the respondents were former military personnel. Even with a predominant military background among respondents, most of them indicated that they used military-developed curriculum materials as a supplement to their regular course of study, rather than as a total package.

SYSTEM Design

The major component of the project dealt with the design of the SYSTEM and specification of alternatives to the SYSTEM. With the variety of inputs from the analysis of information systems, experiences in acquisition and selection of military curriculum materials, the school survey, and consultant inputs, a SYSTEM design was developed based upon the concept of a centralized, national SYSTEM for providing military curriculum materials to civilian vocational and technical educators. The major components of the SYSTEM design are: (1) Acquisition and Selection, (2) Materials Preparation and Referencing, (3) Duplication and Distribution, and (4) User Services. Specific operational and implementation procedures are presented. It was recommended that the SYSTEM be allowed a minimum of a five-year trial period with field studies to determine acceptability of the materials and SYSTEM services, that six to eight professional person years be devoted to staffing the SYSTEM during each of the first three years, and that the concept of a self-supporting SYSTEM not be explored until after the third year of operation. A related recommendation to enhance a systematic acquisitions process from the military sector to the SYSTEM is that a Department of Defense or congressional level regulation be established for automatic submittal of civilian-related military curriculum materials to the centralized SYSTEM as they are developed by the military.

General Project Activities

Several general activities were also conducted as input to each of the previously described project components. A number of consultants from varying levels and backgrounds were secured at various times throughout the project to critique work and to make recommendations for next steps. In addition, a wide range of professional literature sources were used to publicize the project. Largely as a result of this publicity, approximately 100 letters and telephone calls were received by project staff from practitioners who were seeking to obtain military-developed curriculum materials. Finally, project staff visited a number of national information systems, school systems, and military installations in each of the five military services during the project.

Slide/Tape Presentation

To help communicate the activities and recommendations of the project to officials in the U.S. Office of Education, a slide/tape presentation was developed. The presentation is approximately 15 minutes long, is highly graphic, and provides an overview of all project activities.

CHAPTER I

INTRODUCTION

The Center for Vocational Education at The Ohio State University under a one-year contract with the Curriculum Development Branch, U.S. Office of Education, designed a SYSTEM[1] for delivering relevant military curriculum materials[2] to civilian vocational education programs in the nation. This final report is a summary of the activities undertaken to design such a SYSTEM.

The format of this report is somewhat unusual in that it contains overviews of several complete activities and products. These activities occurred in five major components of the project: (1) a review of existing information systems and linkages; (2) the development of strategies and procedures for identifying, selecting, and acquiring military curriculum materials; (3) the identification, selection, and acquisition of relevant military curriculum materials; (4) a survey of use of military-developed curriculum materials in civilian secondary and post-secondary vocational education programs; and (5) design of the SYSTEM. The interrelationship among the five components are shown in Figure 1. The activities in each component resulted in reports which are appended to this document for readers who wish to explore the work in greater detail.

Need for a SYSTEM

The United States military is one of the foremost agencies conducting manpower training in this country and throughout the world. The American taxpayer has made a large financial investment in the development of validated programs of instruction in a substantial number of occupational areas, including many which are common to civilian vocational and technical education programs. Military instructional specialists have been foremost among the leaders in educational technology for many years.

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[1]SYSTEM in capitals, refers to the physical facilities, financial assets, personnel, and procedures which when designed, tested, operated, evaluated, and revised will identify, acquire, and disseminate military curriculum materials (developed by the Department of Defense and the Coast Guard) to civilian education programs.

[2]Curriculum materials are meant to include courses of study, lesson plans, audiovisual aids, student-use materials, and other instructional materials.

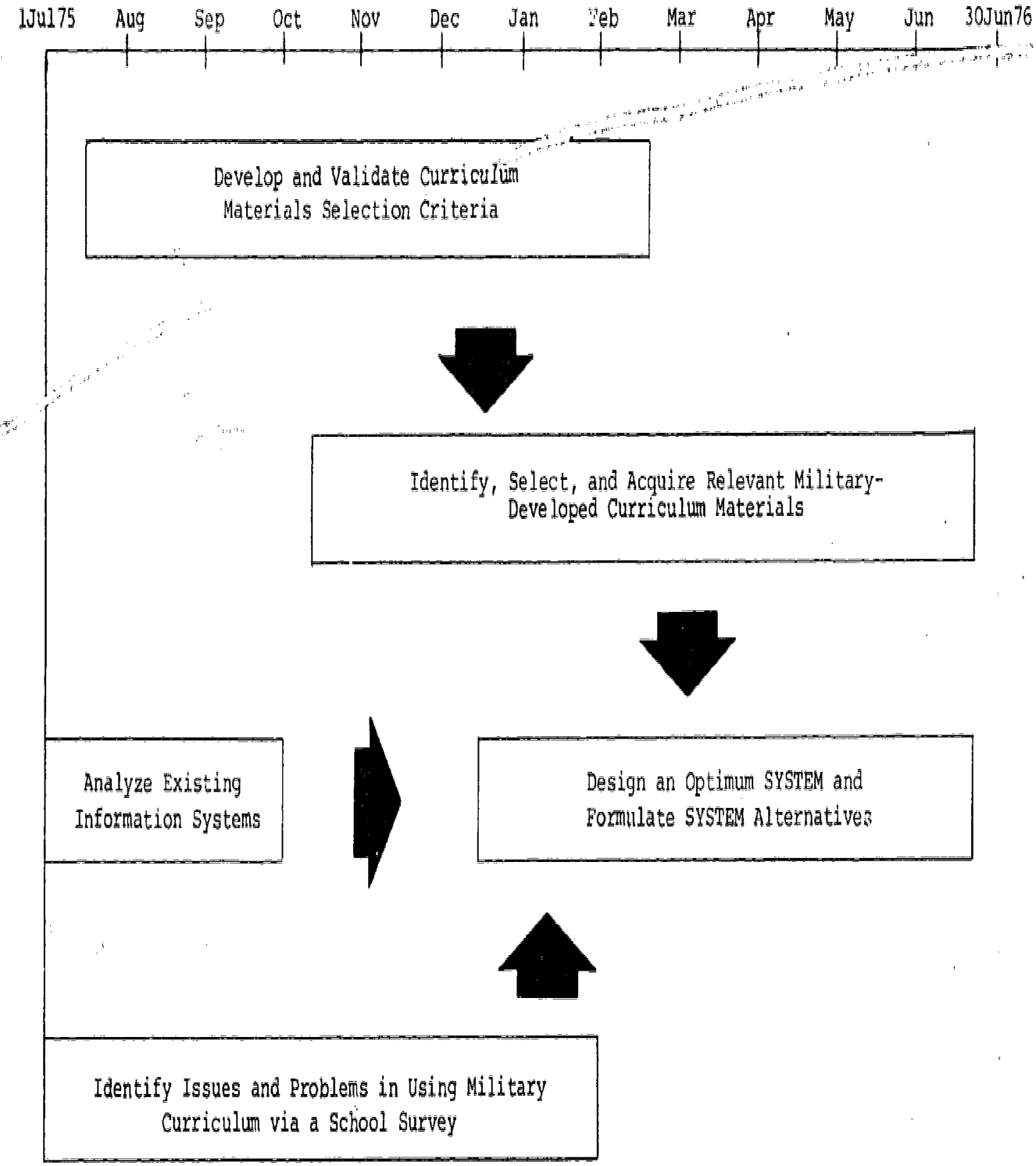


Figure 1. Summary Component Network
Military Curriculum Materials Utilization in Vocational Education

More specifically, there are a number of conditions within civilian vocational and technical education and in military job preparation programs that together suggest a need for a centralized system or repository for curriculum materials developed by the various military branches.

First, civilian vocational teachers have a continuing need for high quality curriculum materials. Teachers never really "arrive" with the ultimate in a curriculum, but rather are always in need of improvements of their curricula in one way or another. Their needs include a variety of media formats to facilitate individualized instruction as well as group instruction. A wealth of military-developed curriculum materials exists and most civilian vocational and technical educators are not cognizant of this fact.

Second, many military and civilian job preparation programs are in the same occupational area. Examples of some of these areas include mechanics, construction, electronics/electricity, health, and food preparation. The range of skill levels covered in these and other occupational areas in military job preparation programs are similar or comparable to secondary and post-secondary civilian vocational programs.

Third, the U.S. military is frequently the forerunner in training personnel for new and emerging occupations. Although sometimes originating in areas dealing with weapons systems or space programs, occupations related to laser technology, jet aircraft, and nuclear power represent areas of growing demand by employees in the civilian sector.

Fourth, the military has been able to concentrate more resources upon rigorous development of instructional materials than the civilian sector. Huge expenditures of taxpayers' money have been made to employ a wide range of specialists to develop instructional programs. Examples of the kinds of specialists used by military training units include curriculum theorists and researchers, job analysts, educational technologists, media experts, illustrators, and writers. The number and differentiation of personnel in these specialized areas has not generally occurred in civilian curriculum development programs. If civilian educators can take advantage of the high quality developmental work resulting from efforts of these teams of specialists in the military, the cost-effectiveness of the public investment in military course development will be increased when relevant military course materials are readily available to civilian vocational teachers.

Fifth, the diffusion of performance-based education in the civilian sector would be enhanced by widespread use of military curriculum materials. A large and growing number of military courses are based on carefully stated behavioral objectives resulting from systematic job analyses. It is reasonable to believe that widespread use of these military materials would improve the effectiveness of vocational and technical instruction in the civilian sector. Related to anticipated improvements in civilian instruction, the relatively sophisticated technology underlying military curriculum materials could more readily be diffused to civilian course developers as well.

As an outgrowth of the above conditions, a dependable, permanent mechanism is needed to make military-developed curriculum materials available to civilian vocational and technical educators. To be most effective, such a SYSTEM should: (a) be centralized to facilitate access to the greatest number of available materials in the most convenient way; (b) interact directly with teachers and be subject to modification based upon teacher feedback regarding their satisfaction with the materials and services provided; (c) have capacity to handle the various media formats comprising military curriculum materials; and (d) be continuously updated with new and revised materials as they are needed by teachers and as they are available from the military.

Project Objectives

This project provides additional groundwork for facilitating and encouraging the use of relevant military-developed curriculum materials in civilian vocational and technical education programs. The framework for designing a system included the need for assessing curriculum materials priorities within civilian vocational education programs, identifying and selecting materials based upon educator-developed criteria, identifying problems civilians had experienced with the acquisition and use of military materials, formulating plans for dissemination of information about military materials within a centralized national system, and examining ways of providing ready access to military curriculum materials at a reasonable cost. This project built upon earlier projects in which the U.S. Office of Education encouraged the nation's vocational and technical educators to use various types of curriculum materials developed by the military.

Specific objectives of the project were:

1. To develop an optimum SYSTEM for identifying, evaluating, and disseminating curriculum materials developed by the military to the nation's civilian vocational programs. The SYSTEM must serve and be responsive to the needs of secondary, post-secondary, and proprietary vocational education programs in each of the states and territories, utilizing linkages with existing national, state, and local information systems.

2. To develop alternatives to the recommended SYSTEM which may be used by the U.S. Office of Education in determining implementation strategies.

The specific methodologies used within each project component, as well as descriptive product summaries and general project activities, are discussed in Chapter II.

CHAPTER II

OVERVIEW OF PROJECT ACTIVITIES AND ACCOMPLISHMENTS

Five major work components were involved in this project. The components were: (1) a review and analysis of existing information systems; (2) development and validation of curriculum materials selection strategies and procedures; (3) the identification, selection, and acquisition of those military curriculum materials that are relevant and appropriate for use in civilian educational training; (4) a survey of use of military-developed curriculum materials in civilian public and private secondary and post-secondary vocational and technical school programs; and (5) the design of a prototype SYSTEM for making military curriculum materials readily available to civilian vocational educators. The activities in each component resulted in a report, plan, or product (see Appendices A-F). The following section provides a summary description of the activities involved in each of the components. The flow chart on the following page shows the major tasks and relationships among activities in each component and may serve as an overview of the narrative which follows.

Review of Information Systems

One of the first components undertaken by project staff was the identification and review of existing information systems. The primary purpose of the review was to identify information systems which may be used in delivering military curriculum materials to civilian vocational and technical educators. The review was also conducted to identify potential linkages with existing information systems.

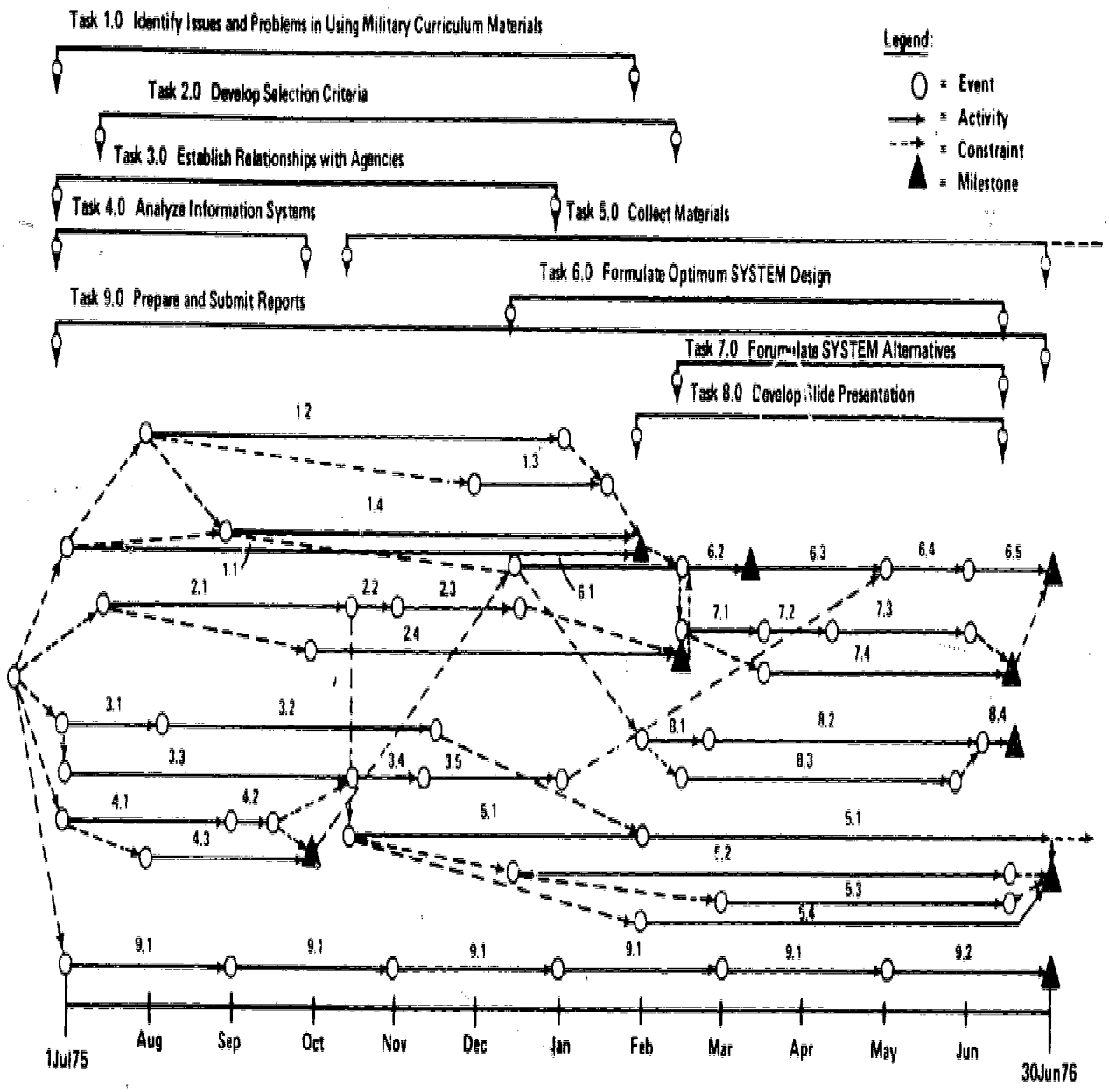
A report entitled *Review of Existing Information Systems and Networks: Applicability to the Design of the SYSTEM* details the activities of this work component. The report includes an overview of 13 information systems; a review of 9 system components; and conclusions, implications and recommendations based on findings of the review (see Appendix A).

Information systems were selected for study which met one or more of the following criteria:

1. They processed Department of Defense information.
2. They processed curriculum materials.
3. They provided services and/or products on a national, regional, or state level.

Summary Activity Network–Time-Phased

MILITARY CURRICULUM MATERIALS UTILIZATION IN VOCATIONAL EDUCATION



Activities Inventory

1.1 - Identify and review reports of military curriculum materials use.

1.2 - Conduct a survey of schools using military curriculum materials.

1.3 - Tabulate and analyze the data.

1.4 - Prepare and submit status report.

2.1 - Develop tentative materials selection criteria.

2.2 - Validate materials selection criteria with panel.

2.3 - ...ation of materials selec-

2.4 - Prepare and submit status report to sponsor.

3.1 - Secure support of primary military liaison in Washington.

3.2 - Obtain on-site briefings on materials availability and acquisition procedures.

3.3 - Identify linking educational agencies.

3.4 - Identify and convene project advisory committee.

3.5 - Brief key agencies regarding potential involvement.

4.1 - Describe characteristics of existing information systems.

4.2 - Describe potential SYSTEM linkages to existing resource linking and clientele systems.

4.3 - Prepare and submit status report.

5.1 - Obtain priority military curriculum materials.

5.2 - Process curriculum materials.

5.3 - Develop indexes to the collection.

5.4 - Prepare and submit status report.

6.1 - Analyze input from components 1.0, 2.0, and 4.0.

6.2 - Prepare and submit a plan for determining an optimum SYSTEM and alternatives.

6.3 - Determine SYSTEM operating and facilitating component options.

6.4 - Recommend optimum SYSTEM.

6.5 - Prepare and submit a SYSTEM MODEL.

7.1 - Determine factors affecting the SYSTEM.

7.2 - Establish minimum system standards.

7.3 - Formulate alternatives and/or compromises to the SYSTEM.

7.4 - Prepare and submit SYSTEM alternatives report.

8.1 - Determine content of slide/tape presentation.

8.2 - Prepare the slide/tape presentation.

8.3 - Design a utilization strategy for the slide/tape presentation.

8.4 - Submit to the sponsor.

9.1 - Prepare and submit bi-monthly progress report.

9.2 - Prepare and submit final technical report.

4. They acquired information from sources nationwide.

5. They provided varied information-media reproduction services and catalog or index products.

Using the established criteria, the following 13 information "systems" were selected for review and study:

1. Abstracts of Instructional and Research Materials in Vocational and Technical Education (AIM/ARM)

2. Aerospace Education Foundation (AEF)

3. American Council on Education (ACE)

4. Curriculum Management Centers (CMCs)

5. Defense Documentation Center (DDC)

6. Educational Resources Information Center (ERIC)

7. National Audiovisual Center (NAC)

8. National Information Center for Educational Media (NICEM)

9. National Technical Information Service (NTIS)

10. Naval Institute, U.S. (NI)

11. Research Coordinating Units (RCUs)

12. Westinghouse Learning Corporation (WLC)

13. Xerox University Microfilms, Curriculum Materials Clearinghouse (CMC)

Written description of these systems were reviewed, telephone inquiries were made, and visitations were made to the Aerospace Education Foundation, the Naval Institute, and the American Council on Education.

A brief overview was written for each of the systems. The overview included information on funding sources, scope of information coverage, information input sources, products and services, and user groups. In addition, each system was reviewed in terms of its operational factors, or components. The areas were:

1. Geographic Acquisition and Distribution Coverage and Type of Information Acquired

2. Primary Users

3. Media Classification

4. Information Acquisition

5. Information Selection

6. Information Processing

7. Information Storage

8. Products and Services

    a. Retrieval/Search

    b. Reproduction/Dissemination

9. Management Structure

    a. Management

    b. Funding Sources

The conclusions drawn from the review of the 13 information systems are:

1. The context in which most of the information dealt with and collected by each of the 13 systems is unique in most cases, with some overlap of "producer/supplier" types (e.g., military, education, scientific, technical).

2. The nature or types of information collected by the systems vary, with all systems covering educational/training (curriculum/instructional) types of information to varying degrees.

3. Considerable differences exist in the types of products and services provided users by the systems, depending on the type of information collected and the types of coverage, products, services, and users which each system is intended to deal.

4. The users of the systems vary considerably depending upon the nature of the information-producers "covered" by each system, the nature of the information collected by each system, and the defined/limited user groups to which systems are open.

5. Each system has some capacity to satisfy the information needs of users interested in utilizing military-produced educational/training information.

This report also points out that an entirely new information system need not be developed to serve the information and curriculum materials needs (military-developed curriculum materials) of vocational and technical educators and trainers. "Instead, a centralized SYSTEM needs to be designed, pulling together current activities, people, facilities, and products and services from existing information systems, and adding its own products and services when necessary. Such a SYSTEM does not now exist, but is necessary in order that vocational educators and trainers can have ready access, in a timely and uncomplicated manner, to curriculum materials developed by the military."

Selection Strategies and Procedures

The activities in this component include identification of curriculum materials priorities and the establishment of tentative strategies and procedures for identifying, selecting, and acquiring military-developed curriculum materials related to these priorities. These activities are fully described in a document entitled, *Military Curriculum Materials Identification, Selection, and Acquisition Strategies and Procedures* (see Appendix B). It reports (1) how curriculum priority areas were determined, (2) specified strategies for selecting curriculum materials, and (3) procedures for identifying, selecting, and acquiring military curriculum materials.

Identification of Curriculum Priorities

Since it was practically impossible for project staff to immediately acquire military-developed course materials in all relevant curriculum areas, the identification of curriculum needs priorities served as a starting point for determining the occupational areas in which curriculum materials were to be collected. Recommendations of priority areas were requested (via mailed surveys) from two groups of educators. One group was the state vocational curriculum coordinators or curriculum liaison representatives who were responsible for coordinating and managing curriculum development. The other group was deans of instruction of post-secondary institutions, representing vocational or technical schools, technical institutes, junior or community colleges, business or commercial schools, and trade schools.

State curriculum coordinators prioritized 15 major occupational areas needing curriculum materials and the post-secondary educators identified 9 major occupational areas. The curriculum priority areas identified by these two groups were: (1) building and construction trades*, (2) engine mechanics (auto, diesel, and marine)*, (3) health*, (4) electronics/electricity*, (5) food service, (6) machine shop*, (7) air conditioning and refrigeration*, (8) drafting*, (9) clerical, secretarial*, (1) general agricultural, (11) general home economics, (12) fire control and law enforcement, (13) data processing*, (14) art, and (15) grounds/landscaping. (Priorities noted with an asterisk were identified via the post-secondary survey.)

With the exception of food service and data processing, the same priority areas appeared in the top nine curriculum areas in both surveys.

Material Selection Strategies

In advance of awarding this project contract, an internal document was developed by the Department of Defense and the U.S. Office of Education. The document, entitled "Joint Memorandum of Understanding" was established to insure cooperation between the contractor (The Center for Vocational Education) and the Department of Defense in compiling the collection of military-developed curriculum materials. It also specified the responsibilities of both the contractor and the Department of Defense. The memorandum is Exhibit A of this report.

With the establishment of the "Joint Memorandum of Understanding," project staff developed and used three different sets of factors to select military curriculum materials. These were for selecting: (1) a range of types of curriculum materials needed for SYSTEM design; (2) courses relevant to the curriculum priority areas identified; and (3) relevant material within a course.

Several project activities provided a basis for the strategies and procedures used. One activity was the review of selection and processing procedures used by other agencies. It included a review of AIM/ARM selection and processing procedures; the American Council on Education's document entitled, *1974 Guide to the Evaluation of Educational Experiences in the Armed Services* (Miller and Sullivan, 1974); the U.S. Office of Education standard occupational classification system; and the selection procedures used by the Aerospace Education Foundation and the U.S. Naval Institute in compiling Air Force and Navy curriculum materials.

Selection criteria and procedures were also requested for review from the Oklahoma Curriculum Management Center and from the Media Center, College of Education, Clemson University. The information gathered from these agencies assisted project staff in the development of tentative strategies for selecting military curriculum materials. Project staff modified these strategies after being tested with the military services.

Selecting materials needed for SYSTEM design. Curriculum materials selection factors were developed to assist project staff in conceptualizing the design of the SYSTEM. These factors helped the signer become aware of reproduction problems, understand various instructional delivery systems and teaching techniques used, and insure general representation of the variety of military curriculum materials. The factors included securing: (a) sample of training materials from each of the five service branches, (b) similar courses across all military services, (c) examples of materials in all media formats, and (d) courses for use in each of the vocational education service areas.

Selecting courses relevant to curriculum priorities. Factors were also established for selecting military training courses for review and possible acquisition. For selection, each course should: (a) relate specifically to one of the identified curriculum priority areas, (b) be basic or the initial course in a series of courses, (c) contain very few instructions specific to the military mission, and (d) not require highly specialized, expensive training materials.

Selecting materials within a course. Selection factors were used in determining which training materials were required within a particular course. Factors considered were: (a) duplication quality and feasibility; (b) the importance of the material to the actual delivery of the instructional program; (c) copyrighted implications of the materials; and (d) cost of the materials.

Materials' Identification, Selection, and Acquisition Procedures

Initially, project staff established a set of procedures to identify, select, and acquire military curriculum materials from each service (Air Force, Army, Marine Corps, Coast Guard, and Navy). The procedures were to be tested with the military services, modifications were to be made, and a more permanent set of procedures recommended. Those procedures used during the developmental stages of the SYSTEM follow. The project staff:

1. Identified the kinds of materials needs. The two surveys previously mentioned provided the priority areas in which curriculum materials were needed.

2. Assigned *Dictionary of Occupational Titles* and U.S. Office of Education terms and codes to the subject matter with the curriculum priority areas.

3. Developed a list of military job titles with civilian counterparts. This was done by correlating (using the *Military-Civilian Occupational Source Book*) the standardized terms and codes of the Department of Labor and U.S. Office of Education with the military MOSs, AFSCs, and ratings.

4. Reviewed the course listings in the *Formal Schools Catalog* from each of the services. Based on the short course description contained in the "Catalog," courses were selected which trained for civilian jobs, were basic courses, and related to at least one of the curriculum priority areas.

5. Requested and reviewed plans of instruction (POIs) or curriculum outlines for courses (those selected in 4 above) from the appropriate branch of the service. The review provided more information about the course, its objectives, and material requirements.

6. Selected and ordered printed and audiovisual materials from selected courses.

7. Acquired military curriculum materials. This was done through a written request to the appropriate military service's contact person or coordinator. The letter contained a listing of the desired non-commercial and audiovisual materials; the letter was forwarded to the appropriate training site to complete the request. The services either filled the order or required personal visitation by project staff.

After the SYSTEM has become fully operational, maintenance will consist of identifying and acquiring new and revised military curriculum materials. Therefore, it was recommended that a congressional or Department of Defense regulation be established requesting each branch of the military to routinely send a copy of all new and revised civilian-related curriculum material to the SYSTEM for review and possible inclusion in the collection. Other activities recommended for SYSTEM maintenance and expansion are as follows:

1. Acquire and make available curriculum materials in lower priority areas and emerging areas needing instructional materials.

2. Acquire and make available materials of a more technical nature (beyond that of basic courses) in the higher priority areas.

3. Conduct an in-depth task analysis of individual courses and compare the tasks performed on military and civilian jobs. This procedure would help determine if military curriculum materials actually trained for civilian occupations.

4. Continually update military curriculum materials as reflected in priority area needs indicated by the users of the materials. Communicate with business and industry to determine the training requirements for emerging occupations.

Collection of Military Curriculum Materials

The purpose of establishing a collection of military curriculum materials is to provide a nucleus of materials which the SYSTEM could make available when implemented and to test and revise procedures for identifying, selecting, and acquiring curriculum materials from the military. Experience resulting from these activities would be used as input in designing the SYSTEM. Criteria were established for selecting these military curriculum materials and the procedures for identifying priority areas in which materials should be collected were developed. The product of this component's efforts is an index of the military curriculum materials collected during the course of this project. The index is entitled, *Index of Military Curriculum Materials Related to Civilian Vocational Programs*, and it may be found in Appendix C of this report. The report provides abstracts of the military resident courses collected listings of non-resident correspondence courses, and listings of courses where materials collection was incomplete. Also included in the document is a cross-reference index of resident and correspondence courses by U.S. Office of Education cluster and by military service branch.

Survey of Civilian Schools' Use of Military Curriculum Materials

This project component was responsible for investigating teacher experiences and satisfaction with military-developed curriculum materials. The major activities were (1) a review of previous studies on acquisition and utilization of military curriculum materials, and (2) a school survey of civilian vocational and technical educators with experience using military-developed curriculum materials.

The report of this activity is entitled, *Utilization of Military-Developed Curriculum Materials in Civilian Vocational Programs: A School Survey* and can be found in Appendix D.

Literature Review

A review of the literature indicated that military curriculum materials can be adapted for use in civilian vocational and technical education programs. It also points out that advantages as well as potential problems exist with the use of these materials. Several studies had been conducted which acquired and/or reviewed military materials for applicability to civilian educational training. However, very little had been done to make the civilian community aware of the availability of the materials, to provide easy access to the materials, or to gather feedback from educators who had experience with acquiring and using the materials. For this reason, a school survey was conducted.

School Survey

The major purposes of the school survey were to determine civilian vocational and technical educator experiences with the acquisiton and use of military curriculum materials and to identify desirable characteristics of a SYSTEM designed to provide these materials to civilian educators. Specific objectives of the survey were:

1. To identify characteristics of personnel using military-developed curriculum materials in civilian vocational programs;

2. To determine whether existing information systems/sources are being used by civilian vocational educators to acquire curriculum material;

3. To identify criteria used by vocational educators for selection of military-developed curriculum materials;

4. To determine the extent to which existing information systems/sources are used by civilian vocational educators to *obtain* military developed curriculum materials;

5. To determine the types, sources, and cost of military-developed curriculum materials being used in civilian schools;

6. To identify problems and issues encountered by civilian schools in the *use* of military-developed curriculum materials;

7. To identify problems and issues encountered by civilian schools in *obtaining* military-developed curriculum materials; and

8. To determine the priority occupational areas in which curriculum materials are needed.

Survey methodology. The population for the study consisted of educators with experience using military curriculum materials in civilian public and private secondary and post-secondary vocational and technical programs in the United States. The sample consisted of 123 civilian schools in 40 states which were using or had used military curriculum materials. The sample was selected

by making telephone contact with schools referred by a number of sources. The sources included previous survey respondents, lists from other agencies providing military curriculum materials to civilian educators, consultants, and verbal and written communications in response to the project's article in professional journals.

To remain in the sample, each school contacted by telephone was required to: (a) have staff with experience using military-developed curriculum materials, (b) give verbal agreement to participate in the survey, (c) identify a contact person for the school, (d) determine the number of questionnaires to be mailed, and (e) provide appropriate mailing information. One hundred and seventy-five educators from 88 schools responded to the survey.

A mailed survey questionnaire and visitations to selected sites were used to collect data. The appropriate number of questionnaire forms were sent to the identified contact person at each school for distribution. The purpose of the school visits was to interview teachers and administrators to gather more in-depth information on how military curriculum materials are used in civilian vocational and technical schools. Criteria used to select schools for visitations included: willingness to host a visit, agreement on an interview schedule, varied types of curriculum materials used, type of school, and variety of sources used to request materials. These criteria were also used when selecting four sites (three civilian schools and one state department of vocational education) for pilot testing the survey instrument.

The *Statistical Package for the Social Sciences* (Nie, Bent, and Hull, 1970) was used as the source for data analysis. One hundred seventy-five of the 357 returned questionnaire forms contained useable data and represented 88 secondary and private and public post-secondary schools (vocational-technical, technical institutes, junior or community colleges, four-year universities or colleges) in the United States. Data were coded, keypunched, and then tabulated at The Ohio State University Computer Center. Frequencies, percentages, and measures of central tendency were computed. Information gathered during visitations to the 13 selected sites (12 schools and one state department of vocational education) was summarized in terms of the problems, ideas, concerns, and recommendations expressed by educators participating in the site visits. Information gathered at each site was also presented as a case study for that particular site.

Major findings and conclusions. The major findings and conclusions of the survey are: (1) the large majority of the respondents using military-developed curriculum materials had military experience, used military material in trade and industry areas, were middle-aged males, and were from post-secondary institutions; (2) most respondents selected and acquired military-developed curriculum materials directly from the military services (primarily developed by the Air Force, Army and Navy), and on the basis of low cost and non-availability from other sources, and not on the availability of audiovisual and support materials; (3) most of the respondents indicated that the greatest problem in obtaining materials was identification of their source--too expensive materials was not a major factor relative to the other factors; (4) civilian users of military-developed curriculum materials used them

primarily as supplements or references, used printed more than audiovisual or hardware, and most often used materials acquired from the military or Superintendent of Documents; (5) many of the respondents indicated that absence of support material was the major limiting factor in the use of military-developed curriculum materials; and (6) SYSTEM characteristics were viewed by respondents in the following order of importance: full description of material, ability to purchase portions of a course, maximum of 2-3 weeks turn around in filling orders, technical assistance in using material, and responsiveness to user suggestions in changes in the SYSTEM.

SYSTEM Design

All project activities described previously served as major ingredients for the design of the SYSTEM and its alternatives. The major activities involved in the conceptualization of the SYSTEM are: (1) the development of a SYSTEM design, (2) the development of SYSTEM operating procedures, (3) the recommendation of SYSTEM implementation strategies, and (4) the recommendation of SYSTEM alternatives.

These activities are described in detail in *A SYSTEM to Provide Military Curriculum Materials to Civilian Vocational and Technical Educators* (see Appendix E of this report). This document is divided into four chapters: (1) SYSTEM Design, (2) Component Development and Operating Procedures, (3) Implementation of the SYSTEM, and (4) SYSTEM Alternatives. An overview of each of the chapters is provided in the following discussion.

SYSTEM Design

Four interrelated components provide the basic structure for the SYSTEM, which when working cooperatively will provide military curriculum materials and services to vocational and technical educators. The components are: (1) Acquisition and Selection, (2) Materials Preparation and Referencing, (3) Duplication and Distribution, and (4) User Services.

The SYSTEM, through these components, will establish appropriate formal working relationship with other information agencies (e.g., the Aerospace Education Foundation, the U.S. Naval Institute, the National Audiovisual Center, the National Technical Information Service, the Superintendent of Documents, Educational Resources Information Center, Abstracts of Instructional and Research Materials in Vocational and Technical Education, and the National Network of Curriculum Management Centers). The relationships among the SYSTEM and other agencies and information systems, civilian educators, and the military are shown in Figure 2.

The User Services and Duplication and Distribution components serve as the major links with civilian educators, while the Acquisition and Selection component works closely with the technical training areas of the military services and with other information systems. A general description of each SYSTEM component follows.

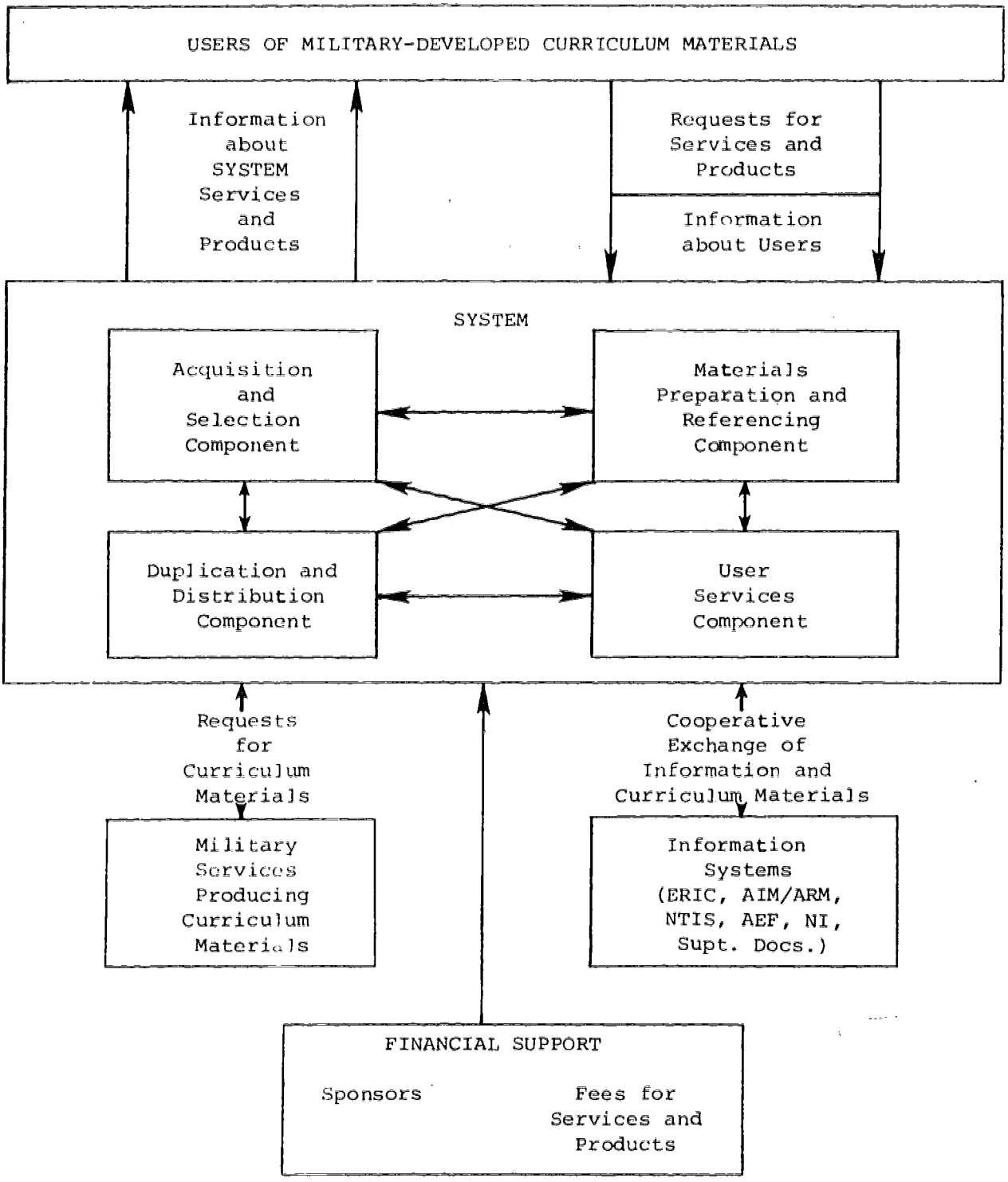


Figure 2. SYSTEM Design

Acquisition and selection. This SYSTEM component is primarily reponsible for the identification, selection, and acquisition of relevant military curriculum materials for use in civilian vocational and technical education programs. It is necessary that this component establish well defined working relationships with the military (as well as with other SYSTEM components) in order to be aware of the needs of its users and to have the capability to meet those needs. In fact, the efficiency of this component is dependent upon accurate information on user needs (from the User Services component) and clear and direct lines of communication with appropriate centers within each military service.

Materials preparation and referencing. The responsibilities of the Materials Preparation and Referencing component include (a) codifying and modifying the military curriculum materials selected as appropriate for use in civilian schools; (b) indexing courses by *Dictionary of Occupational Titles* code (DOT code), Department of Defense number (DOD number), and U.S. Office of Education cluster (USOE cluster); and (c) preparing catalogs which describe the various courses available through the SYSTEM. This component is also responsible for preparing curriculum packages that civilian educators can easily understand and use. The Materials Preparation and Referencing component should also work very closely with the User Services component which receives feedback on users' satisfaction with the materials prepared.

Duplication and distribution. The Duplication and Distribution component is responsible for duplicating military curriculum materials and distributing those materials to civilian educators upon request. This component comes in direct contact with the user though filling and mailing orders. It is also responsible for SYSTEM bookkeeping, maintaining and storing master copies of materials, and maintaining an inventory of curriculum materials which can be used to fill orders.

User services. The User Services component is responsible for negotiating orders for materials, assessing user satisfaction and needs, providing technical assistance, distributing materials catalogs and SYSTEM promotional materials, and referring users to other information agencies or systems for materials unavailable through the SYSTEM. All requests for materials and services will be made through the User Services component, thus giving this component direct contact with the user.

Internally, the User Services component serves as the nerve center of the entire SYSTEM. It provides information on users' needs to the Acquisition and Selection component and information on users' satisfaction with materials and the SYSTEM to the Duplication and Distribution and the Materials Preparation and Referencing components.

Component Development and Operating Procedures

Operating procedures for SYSTEM components were developed and recommended for use in implementing and pilot testing the SYSTEM. The suggestions were based on project staff's experiences with information systems, experiences with

this and other related projects, and based on consultants' recommendations. The operating procedures are described as they relate to the four major components and their activities (see Appendix D, Chapter II). Figure 3 gives the detailed flow of materials through the SYSTEM.

Implementation of the SYSTEM

To facilitate an orderly development and implementation of the SYSTEM, it is recommended that a minimum of *five years* of operation be allowed to give the SYSTEM a fair assessment. There is a need to develop awareness and understanding of military-developed curriculum materials among civilian vocational and technical educators and a need to acquire firsthand information on the acceptability of the material as well as the formats of material desired. It is further projected that the SYSTEM will require differentiated staff of *six to eight* members and require annual funding of *$225,000 to $275,000* at least through the first three years. An additional one-time investment of $50,000 should be made for a revolving fund to accommodate the development of a materials inventory. It will be necessary to *subsidize* the SYSTEM during the first five years to provide for the extensive acquisition, processing, and dissemination activities required in implementation. Exploration of the possibilities of it becoming a self-supporting SYSTEM should occur after the third year of operation.

SYSTEM Alternatives

Alternatives to the recommended SYSTEM design and implementation plans consist of two approaches: reducing or increasing the scope of work. These alternatives do not permit changes in procedures, inputs, or outputs in terms of their structure, because the four components are essential if the SYSTEM is to function at any level of effort.

Increases in the scope of work would provide for more assistance in helping vocational and technical educators become aware of and adapt the military curriculum materials as well as expand field study activity to gather additional information on user needs. Reduction in the level of SYSTEM support would result in the availability of fewer materials and perhaps no audiovisuals, and removal of technical assistance and field study of user needs. To preserve the integrity of the SYSTEM, most alternatives would necessarily increase or decrease the level of user services (technical assistance and diffusion activities).

Slide/Tape Presentation

In addition to the project activities already described, a slide presentation on the overall activities of the project was developed. The presentation is a summary of the project's activities and products. It includes a general introduction on prior involvement with military curriculum materials; an overview of the major project components; discussion of all data used in conceptualizing the SYSTEM as well as a description of the capabilities of the SYSTEM; the SYSTEM design and alternatives for implementation; and recommendations for implementation of the SYSTEM. The slide script is in Appendix F.

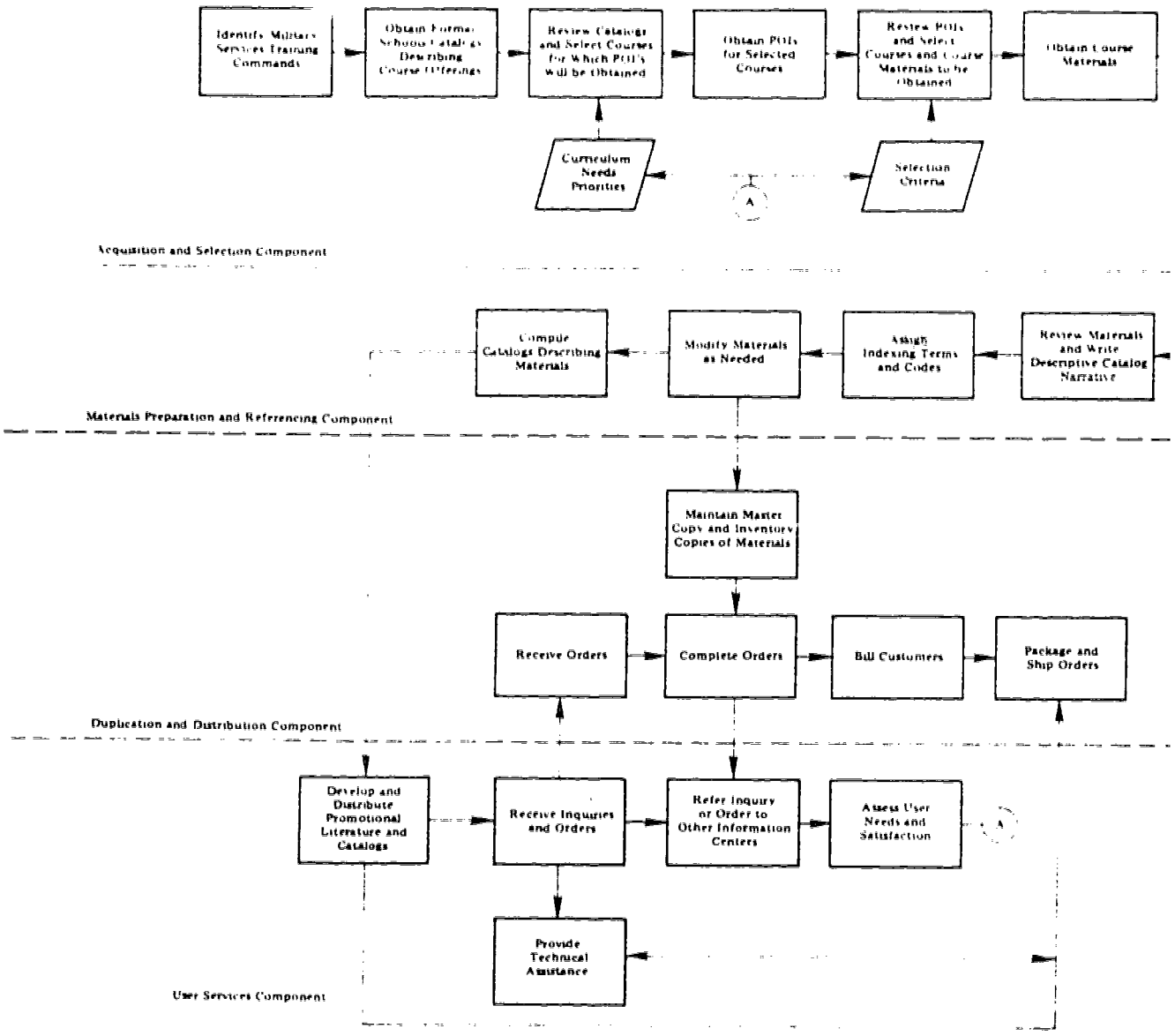


Figure 3. SYSTEM Flow Chart

CHAPTER III

PROJECT MANAGEMENT ACTIVITIES AND CONCERNS

Several types of more general project activities supported the work in the individual components. These general activities included involvement of consultants; publicity; and contacts with individuals and agencies via letters, telephone conversations, and personal visits. In addition, as the day-to-day project activities were carried out, several substantive concerns emerged, related to the acquisition, reproduction, and dissemination of military curriculum materials.

Consultants

Six in-depth meetings were held throughout the project with individuals having unique backgrounds and perspectives related to curriculum materials and information systems. Fifteen individuals provided suggestions and recommendations for design of the SYSTEM. Backgrounds of these consultants included teachers, local and state level administrators of vocational education, curriculum specialists, and information specialists.

The consultants were:

1. Mrs. Dee Wilder
   Information Specialist
   Tennessee Vocational Education Research Coordinating Unit
   Knoxville, Tennessee

2. Mr. Alan D. Stoller
   J. D. Zellerbach Middle School
   Camas, Washington

3. Dr. Ben Hirst
   Executive Director, Vocational-Technical Education
   Consortium of States (V-TECS)
   Atlanta, Georgia

4. Mr. James L. Blue
   Director of Northwest Curriculum Coordination Center
   Olympia, Washington

5. Curriculum Coordination Center Directors:

a. William Daniels
Northwestern Curriculum Management Center
Washington State Commission for Vocational Education
Olympia, Washington

b. James Becket
Western Curriculum Coordination Center
Vocational Education Section
Department of Education
Sacramento, California

c. James E. Wall
Southeast Curriculum Coordination Center
Mississippi State University
Mississippi State, Mississippi

d. Joseph F. Kelly
Northeast Curriculum Coordination Center
Bureau of Occupational and Research Development
Division of Vocational-Technical Education
New Jersey Department of Education
Trenton, New Jersy

e. Rebecca Douglas
East Central Curriculum Management Center
Springfield, Illinois

f. Robert Patton
Midwest Curriculum Coordination Center
Curriculum Instructional Materials Center
State Department of Vocational and Technical Education
Stillwater, Oklahoma

6. SYSTEM Design Consultants:

a. Andrew Watson
State Area Vocational-Technical School
Harriman, Tennessee

b. David Gailey
Division of Vocational Education
State Department of Education
Salt Lake City, Utah

c. Margaret Rowe
Program Chairman
Des Moines Area Community College
Ankeny, Iowa

d. Frederick L. Champagne
Assistant Director
Board of Cooperative Educational Services
Hudson Falls, New York

e. Robert L. Clinkscale
Director
Vocational and Adult Education
East Cleveland City Schools
East Cleveland, Ohio

7. Joel H. Magisos
Associate Director for Information and Field Services
The Center for Vocational Education
The Ohio State University
Columbus, Ohio

Publicity

Much of the project publicity activity was directed toward a national sample of vocational and technical educators who are or were using military-developed curriculum materials. Most of the items published in various journals and newsletters requested that persons experienced with the use of military curriculum materials in civilian vocational programs contact the project staff. The Center for Vocational Education released two project announcement. The first was an article in the September 1975 issue of the *Centegram* (see Exhibit B), a newsletter going to approximately 14,000 educators, and a descriptive project brochure (see Exhibit C) which was distributed to approximately 600 persons via the mail and personal contacts.

In addition, information was sent from the project to a number of professional publications resulting in announcements appearing the following journals and newsletters:

1. *The Monitor*, December 1975, a publication of the American Industrial Arts Association

2. *Education Daily*, September 30, 1975

3. *The Canadian Vocational Journal*, November 1975

4. *School Shop*, December 1975

5. *NASSP Bulletin*, December 1975 (National Association of Secondary School Principals)

6. *National Report for Training and Development*, October 31, 1975 (American Society for Training and Development, Incorporated)

7. *The Beacon*, July 1975 (American Vocational Education Research Association)

8. *Manpower and Vocational Education Weekly*, October 1, 1975

9. *Career Education Reviews*, October 1, 1975

10. *Education U.S.A.*, December 1975

11. *Washington Counseletter*, November 1975

Contacts

Due largely to the substantial coverage of the project in professional newsletters and journals, most of the contacts made were by letter. Approximately 80 letters were received from individuals representing a variety of agencies from local schools to large corporations. Most persons who wrote either requested military curriculum materials from the project asked for information on how to obtain military curriculum materials, or identified persons and schools which may have experience with using military curriculum materials. Although the project had no capacity to respond to requests with materials per se, most of the writers were referred to specific military agencies, the Aerospace Education Foundation, or the U.S. Naval Institute, depending upon the nature of the individual request.

Approximately 20 telephone calls were received by the project staff from individuals around the country who had seen announcements in professional literature and wanted to know more about the project or how to obtain military materials.

During the project, staff members visited a large number of military and educational agencies including 21 military installations representing all 5 military services, 17 public and proprietary schools, 2 military associations, and a number of other educational agencies and associations. The following locations were visited by one or more members of the project staff.

1. California

American Vocational Association Convention (Anaheim)

San Diego State University (San Diego)

Compton Adult School (Compton)

Port Hueneme Naval Construction Training Center (Port Hueneme)

San Diego Naval Training Center (San Diego)

2. Florida

Pensacola Naval Air Station

3. Illinois

Chanute Air Force Base

Lewis University (Lockport)

4. Indiana

Military Testing Association 17th Annual Conference (Indianapolis)

5. Maryland

Naval Institute (Annapolis)

Naval Academy (Annapolis)

Aberdeen Proving Grounds Army Post

6. Massachusetts

American Society for Information Science (Boston)

7. Missouri

Ft. Leonard Wood

8. New York

Dutchess Community College (Poughkeepsie)

9. North Carolina

U.S. Coast Guard Aircraft and Supply Center (Elizabeth City)

Camp Lejeune Marine Corps Training Base (Jacksonville)

Camp Johnson (Jacksonville)

10. Ohio

Cuyahoga Valley Joint Vocational School (Brecksville)

Rickenbacker Air Force Base (Columbus)

Grove City High School (Grove City)

Terra Technical College (Fremont)

North Central Technical College (Galion)

11. Tennessee

Memphis Naval Air Station (Memphis)

12. Texas

Community College of the Air Force (San Antonio)

Randolph Air Force Base (San Antonio)

Texas State Technical Institute (Waco)

Lackland Air Force Base (San Antonio)

Sheppard Air Force Base (Wichita Falls)

13. Utah

State Vocational Education Director (Salt Lake City)

State Coordinator of Post-Secondary Programs (Salt Lake City)

Westminster College (Salt Lake City)

Utah Technical College (Provo)

Utah Technical College (Salt Lake City)

Weber State College (Ogden)

Utah State University (Logan)

Jordan High School (Salt Lake City)

14. Virginia

Yorktown Coast Guard Station

Fort Monroe

Fort Lee

15. Vermont

Randolph Vocational Center (Randolph)

16. Washington, D.C.

U.S. Coast Guard Training and Education Division

Project Officer

Aerospace Education Foundation

American Council on Education, Office of Educational Credit

Chairman, Armed Services Joint Education Liaison Directors of Recruiting (JELDOR)--Commander John Brame

USOE, Division of Research and Demonstration

National Audiovisual Center

Marine Corps Headquarters

Curriculum Coordination Center Directors Meeting

Department of Defense (Pentagon)

17. Wisconsin

Lakeshore Technical Institute (Cleveland)

Problems and Concerns

Several problems, issues, or concerns emerged as project staff were able to establish contacts with the military services, review the content and format of the military curriculum materials, and explore possible dissemination strategies. These concerns include:

1. Audiovisual materials are difficult to identify and acquire from the military. Permission must be secured to use films and videotapes that are not classified, but are not now available to civilian educators through film catalogs.

2. Audiovisual materials are very expensive to duplicate; therefore, other means of making them available need to be further explored (National Audiovisual Center, Military Film Libraries, and commercial vendors).

3. Much of the military curriculum material contains commercially produced and copyrighted excerpts (some of which cannot be readily identified), thus necessitating copyright releases before duplicating.

4. A systematic means of identifying and acquiring new and revised military curriculum material is needed. It is recommended that federal legislation be enacted or a Department of Defense regulation be effected requesting all services to place the SYSTEM on the distribution list for all new or revised civilian related curriculum material.

5. It will be extremely difficult to predict demand for military curriculum materials by civilian vocational and technical educators; therefore,

it may be expensive to print on demand. A revolving fund of some type should be established in order to print ahead of demand and develop an inventory of materials.

6. Field trials have been conducted which establish the adaptability and effectiveness of military-developed curriculum materials in civilian vocational and technical education programs; however, there is little information available on the acceptability of the materials by civilian educators. Additional study needs to be conducted to determine the acceptability of the materials in their original format and in a modified format. This activity should occur during the first three years of the SYSTEM operation to provide input to policy formation and dissemination strategies.

CHAPTER IV

RECOMMENDATIONS

The major result of this project's efforts was the design of a SYSTEM to make military curriculum materials available to vocational and technical education programs. It was *recommended* that the SYSTEM be implemented under the following conditions. The SYSTEM should be implemented so that it:

1. Contains the four major components as designed;

2. Makes printed materials available initially, followed by audiovisual materials;

3. Makes course materials available in part as well as a total curriculum package and continuously acquires updates of these materials;

4. Provides military curriculum materials at a price which is competitive with similar materials available in the civilian sector;

5. Conducts a field study of potential users of the military curriculum material to determine its acceptability;

6. Assesses the needs of its users on a continuous basis as a part of the field study activities;

7. Creates user awareness and utilization of these materials;

8. Works cooperatively with other information systems in the sharing of availability information on military curriculum materials;

9. Is provided a minimum five-year operating period;

10. Is staffed with six to eight members with differentiated abilities and experiences; and

11. Is supported by an annual budget of $225,000 to $275,000 through at least the first three years of operation and with an additional one-time investment of $50,000 for a revolving fund to accommodate the development of a materials inventory.

In addition to these conditions for implementation, it is recommended that the Department of Defense develop military policy and procedures which call for making at least one copy of newly-developed military curriculum

materials (print and nonprint) available immediately upon release to the SYSTEM for review and possible inclusion in the collection. An alternative to this would be the establishment of congressional legislation which would require that at least one copy of the materials be sent to the SYSTEM. The purpose of such an action is to insure that the SYSTEM operate efficiently and effectively, for the success of the SYSTEM is dependent upon the easy acquisition of materials which meet the needs of its users. The Department of Defense may also consider financial contributions to support the SYSTEM since its responsibility for providing materials directly to civilian educators will be minimized once the SYSTEM is in operation.

EXHIBITS

EXHIBIT A

Joint Memorandum of Understanding

JOINT MEMORANDUM OF UNDERSTANDING

Subject: DOD Curriculum Materials Utilization in Vocational Education

1. This memorandum outlines the responsibilities of the U.S. Office of Education (USOE) and the Department of Defense (DOD) or their legal representatives in accomplishing the objectives of USOE RFP 75-83. The subject RFP was issued by USOE in anticipation of awarding a contract for the design of a system with alternative approaches for identifying, evaluating and disseminating curriculum materials developed by the DOD for utilization by the nation's civilian educational programs through linkage with existing national, state and local systems. It is the desire of the DOD to cooperate in programs which will facilitate such utilization of curriculum materials developed by the DOD. The USOE and DOD recognize the value of the instructional and cost benefits to be derived by the nation from civilian institutional adoption/adaptation of DOD instructional materials and techniques. Matters which arise during the conduct of the proposed contract that are not covered by this memorandum will be mutually resolved by the primary parties within budgetary constraints.

2. Definitions

   a. Available Curriculum Materials. Those print and nonprint materials that can be made available for the duration of the contract without reprinting or reproduction. Copyrighted and classified material is excluded. Final determination of the availability of curriculum materials will be made by the military department concerned.

   b. Program of Instruction or Plan of Instruction (POI). For the purpose of this agreement, a document(s) which spells out the learning objectives of the course and identifies needed support materials and instructional methodology keyed to the objectives.

   c. Department of Defense (DOD). Includes the active elements of the military departments of the Army, Navy, Marine Corps, and Air Force.

3. Responsibilities

   a. Pursuant to Attachment F of RFP 75-83, USOE or its legal representative (contractor) will:

      (1) Use the American Council on Education's "Guide to the Evaluation of Educational Experiences in the Armed Services" insofar as possible as a source for identifying and selecting potential courses for review.

(2) Within the terms of the contract, prior to submitting a request to DOD, attempt to obtain available curriculum materials from existing information and retrieval systems such as ERIC Clearinghouses, American Council on Education, National Audiovisual Center, and other federal agencies or institutions.

(3) After identifying those course materials that are not available from existing information and retrieval systems, forward a request for the materials by *course name* (or specific course topics) to the appropriate service representative as shown in paragraph b.(4) below with a copy to the Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs) OASD (M&RA).

(4) Review and select, at the training site, those curriculum materials determined by the appropriate services as *not available, i.e., one of a kind materials* or those which cannot be made available without reproduction or reprinting.

(a) The USOE or its representatives will arrange for reproduction and packaging for shipment of all material selected at the training site. Requests to visit training sites will be coordinated with the appropriate service representative prior to travel.

(b) The USOE or its representative will reimburse the appropriate service for requested course materials which must be reproduced or printed solely to satisfy the requirements of the curriculum materials utilization project. The decision to reproduce requested material that is not otherwise available, for the sole purpose of supporting the project, will be made by service personnel and will be accomplished consistent with available time and resources.

(5) Return to the appropriate military department, on termination or completion of the contract or of directly related follow-up undertakings, all curriculum related material provided by the military department, other than that for which the departments have been reimbursed. Curriculum materials, if required for the DOD mission, will be returned to DOD on call.

b. The Department of Defense or its service representative will:

(1) Make determinations regarding availability of requested curriculum materials.

(2) Provide on request, available curriculum material for specified courses, pursuant to 3a(2), when not available, within the terms of the contrac , through other existing information and retrieval systems.

(3) Assist on a reim able basis and as requested, consistent with available time an sources, in the reproduction of course materials that are not available. (See paragraph 3a(4), (b)).

(4) Provide a point of contact within each military department to serve as service representative. The initial service representatives are as follows:

Army	Major Robert E. Lanzotti DCS Personnel (DAPE-MPT) Room 2A712, Pentagon Washington, D.C. 20330
Navy	Mr. Dale Thurman CNO (OP 991 C1) Room 1220 DCT-1 Washington, D.C. 20350
Marine Corps	Major D. D. Dorman Mil Trng & Ed Branch HQMC Code MTMT Washington, D.C. 20330
Air Force	Colonel T. S. Ford Chief, Education Div Director of Personnel Prog Hdqts USAF Room 4C240 Washington, D.C. 20330

For matters concerning the project as a whole, contact:

USOE	Miss Mary V. Marks, Chief Dr. Ned Logan Curriculum Development Branch, BOAE Room 5036, ROB#3 7th & D Streets, S.W. Washington, D.C. 20202
DOD	LCol L. G. Junkman OASD (M&RA) Room 3B930 The Pentagon Washington, D.C. 20230
Department of Defense	Office of Education

/s/ WILLIAM F. PIERCE

Donald W. Srull
Deputy Assistant Secretary of Defense for Manpower Requirements and Analysis (DASD/MR&A)

William F. Pierce
Deputy Commissioner for Occupational and Adult Education

EXHIBIT B

Centegram Article

CENTERGRAM

Volume X, No. 9 September, 1975

MILITARY CURRICULUM MATERIALS UTILIZATION IN VOCATIONAL EDUCATION

The Center has recently received a contract from the U.S. Office of Education to design a prototype system for delivering relevant military (Air Force, Army, Coast Guard, Marine Corps, and Navy) curriculum materials to private and public vocational programs. A large number of curriculum materials which are of potential value to vocational programs in public secondary and post-secondary schools, post-secondary proprietary schools, business, and industry have been developed by the military. However, no centralized operating system exists to identify, acquire, evaluate, and disseminate these materials.

The components of the project include: (1) an analysis of existing information systems and linkages; (2) a survey of 100 civilian secondary and post-secondary vocational education programs to identify problems with the use of military training materials and to determine the need for additional materials; (3) design of a prototype system for making military curriculum materials readily available to civilian vocational educators; and (4) the identification and acquisition of relevant military curriculum materials.

The Center is anxious to communicate with persons in secondary and post-secondary vocational schools, businesses, and industries concerning their experiences with military curriculum materials. Please relate any of these experiences or names of persons having experience with military training material to Wesley E. Budke at The Center.

Career Education Mini-Conferences to be Conducted

The Center for Vocational Education will conduct twenty-five mini-conferences in Columbus, Ohio from September 1975 through April 1976. The project entitled "Career Education Mini-Conferences: Seeking Consensus on the Scope and Sequence for K-12 Career Education" is funded by a grant from the Office of Career Education, U.S. Office of Education.

These meetings will occur in three phases with Phase I consisting of twelve conferences for career education practitioners. In the first four conferences, forty-eight teachers and others directly involved in instruction will prepare reports on the scope and sequence of K-12 career education according to K-3, 4-6, 7-9, and 10-12 grade levels. Subsequently, twelve evaluation specialists, twelve counselors, twelve business/labor/industry representatives, and twelve parents will meet in four separate conferences to prepare reports on scope and sequence problems associated with major organizational aspects of K-12 career education. Also in Phase I, forty-eight representatives for handicapped persons, women, gifted and talented persons, and minority groups will meet in four sessions. They will prepare reports on the scope and sequence of K-12 career education for these special segments of the population. These conferences will be held in September-November 1975.

Last year's mini-conference participants, state coordinators of career education, and the National Education Association nominated the persons who will attend Phase I. Their nominations were forwarded to the Office of Career Education where the final 144 conference participants were selected. Although participants for the conferences have been selected, observers are welcome. Anyone wishing to attend as an observer should request a registration form from Dr. Richard J. Miguel at The Center.

Phase II will consist of a total of five mini-conferences. The first four will involve coordinators of career education in the fifty states, Puerto Rico, and Washington, D.C. They will review, comment upon, and make recommendations concerning the consensus reports prepared during the first four conferences of Phase I. Then six conceptualizers will convene at the fifth meeting to review, discuss, and make recommendations concerning the reports prepared by the state coordinators. These conferences will be held in January-February 1976.

A publication of The Center for Vocational Education
The Ohio State University, 1960 Kenny Road, Columbus, Ohio 43210

EXHIBIT C

Project Brochure

The Center

The mission of The Center is to increase the ability of diverse organizations to solve educational problems relating to individual career planning and preparation. The Center fulfills its mission by:

- Generating knowledge through research
- Developing educational programs and products
- Evaluating individual program needs and outcomes
- Installing educational programs and products
- Operating information systems and services
- Conducting leadership development and training programs

THE CENTER FOR VOCATIONAL EDUCATION
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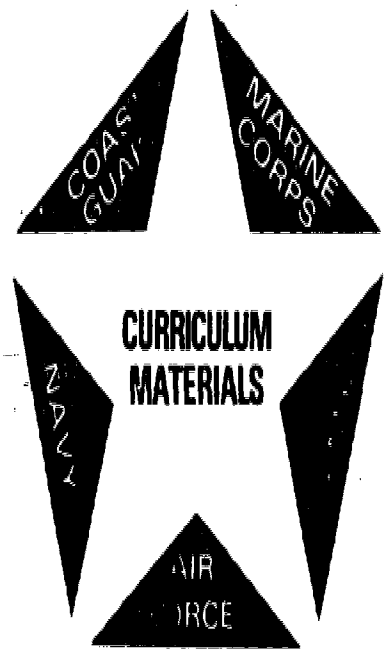
Tel: (614) 486-3655
Cable: CTVOCED OSU Columbus, Ohio

Military Curriculum Materials Utilization in Vocational Education



THE CENTER FOR VOCATIONAL EDUCATION
THE OHIO STATE UNIVERSITY

MILITARY CURRICULUM MATERIALS UTILIZATION IN VOCATIONAL EDUCATION

The Center for Vocational Education at The Ohio State University recently was awarded a contract to design a prototype system for delivering relevant military (Air Force, Army, Coast Guard, Marine Corps, and Navy) curriculum materials to public and private vocational programs. This project is supported by the Curriculum Development Branch, Division of Research and Demonstration, Bureau of Occupational and Adult Education of the U.S. Office of Education.

Background

The military has developed a large number of curriculum materials which are of potential value to vocational programs in public secondary and post-secondary schools, post-secondary proprietary schools, and business and industry. Unfortunately, no centralized operating system exists to identify, acquire, evaluate, and disseminate these materials. Efforts by other agencies have (a) demonstrated the usefulness of selected military-developed curriculum materials, (b) determined the existence of a much larger body of potentially useful materials, (c) identified selected sources of materials, and (d) reported on accessing and dissemination feasibility. However, the problem remains that the Nation's civilian schools still do not have the ease of access to these materials needed to facilitate and encourage their use.

Purpose

In order to facilitate and encourage the use of relevant military-developed curriculum materials in civilian educational programs and provide easy access to the materials, this project will develop a SYSTEM which will assess the need for curriculum materials by civilian vocational education programs, identify and select materials based upon educator-developed criteria, make information about these materials accessible through a national information system in which educators have confidence, and provide ready access to the curriculum materials at a reasonable cost.

The project is comprised of the following components:

1. An analysis of existing information systems and linkages.
2. A survey of 100 civilian secondary and post-secondary vocational education programs to identify problems with the use of military training materials and to determine the need for additional materials.
3. Development and validation of curriculum materials selection criteria.
4. The identification, selection, and acquisition of relevant military curriculum materials.
5. Design of a prototype system for making military curriculum materials readily available to civilian vocational educators.

Comments, Suggestions, and Questions

To help us establish priorities for selecting curriculum materials and designing selection criteria, it is necessary that we have feedback from those schools, businesses, and industries who have used military materials. If you are acquainted with military material either through review or actual application in public or proprietary schools, please let us hear from you.

In addition, your comments and suggestions concerning the design and operation of an "information system" to serve your curriculum/instructional needs are always welcome. Direct inquiries and comments to:

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BIBLIOGRAPHY

This bibliography supports major project activities, particularly the review of existing information systems (Appendix A) and the school survey (Appendix D).

Aerospace Education Foundation. *Vocational Instruction Systems of the Air Force Applied to Civilian Education.* Washington, DC: Aerospace Education Foundation, 1971.

American Library Association. *1974 Directory of Government Document Collections and Librarians.* Chicago, IL: American Library Association, 1974.

Benton, Mildred. *Federal Library Resources, A User's Guide to Research Collections.* New York, NY: Science Associates/International Inc., 1973.

Brandhorst, Wesley T. "Managing the ERIC Data Base." (Paper presented at the session on "Information Data Centers," FIPS/FJCC, Anaheim, CA, December 5, 1972). (ED 069 303)

Brown, George W.; Miller, James; and Keenan, Thomas A., eds. *EDUNET: Report of the Summer Study on Information Networks.* New York, NY: Interuniversity Communications Council (EDUCOM), 1967.

Brown, Michael W., and Callahan, W. Thomas. *The All Volunteer Navy and the Schools: Recommendations for Integration of Navy Careers into Career Education.* Silver Spring, MD: Operations Research, Inc., February 12, 1973.

Brown, Michael W. et al. *Coordination and Integration of Military Education with National Career Education. Phase I: Career Development in Selected Occupations.* Silver Spring, MD: Operations Research, Incorporated, October 22, 1973.

Carter, Launor F. *National Document-Handling Systems for Science and Technology.* New York, NY: System Development Corporation, 1967.

Center for Educational Media. *Index to Vocational and Technical Education (Multimedia).* Los Angeles, CA: Center for Educational Media (NICEM), University of Southern California, 1975.

Civil Service Commission, U.S. *Interagency Training Catalog of Courses, Pamphlet T-9.* Washington, DC: Bureau of Training, U.S. Civil Service Commission, July 1973.

Clemmons, Jesse S. "Roles and Objectives of State Research Coordinating Units as Perceived by RCU Directors and State Directors of Vocational Education." (Paper presented at the National Conference of Research Coordinating Unit Personnel, Denver, Colorado, March 17, 1975).

Cuadra, Carlos A.; Luke, Ann W.; and Harris, Jessica L., eds. Vol. 9 of *Annual Review of Information Science and Technology*. Washington, DC: American Society for Information Science, 1974.

Cuadra, Carlos A., and Bates, Marcia J., eds. *Library and Information Service Needs of the Nation. Proceeding of a Conference on the Needs of Occupational, Ethic, and Other Groups in the United States*. Washington, DC: National Commission on Libraries and Information Science, 1974. (ED 101 716)

Debons, Anthony, and Montgomery, K. Leon. "Design and Evaluation of Information Systems." Vol. 9 of *Annual Review of Information Science and Technology*. Edited by Carlos A. Cuadra, Ann W. Luke, and Jessica L. Harris. Washington, DC: American Society for Information Science, 1974, pp. 25-56.

Department of Defense. *Department of Defense Military/Civilian Occupational Source Book*. Universal City, TX: Armed Forces Vocational Testing Group, July 1975.

Department of Health, Education, and Welfare, U.S. *New Thrusts in Vocational Education*. Washington, DC: U.S. Department of Health, Education, and Welfare, March 1971.

Educational Resources Information Center. *ERIC Processing Manual*. Washington, DC: National Institute of Education, July 1974. (ED 092 164)

Embry, Johnathan D.; Brandhorst, Wesley T.; and Marron, Harvey. *Survey of ERIC Data Base Search Services*. Washington, DC: Educational Resources Information Center, National Institute of Education, July 1974.

Faibisoff, Sylvia, and Ely, Donald. *Information and Information Needs*. New York, NY: School of Library Service, Columbia University, 1974. (ED 100 311)

Harris, Jessica L. "Document Description and Representation." Vol. 9 of *Annual Review of Information Science and Technology*. Edited by Carlos A. Cuadra, Ann W. Luke, and Jessica L. Harris. Washington, DC: American Society for Information Science, 1974, pp. 81-118.

Herner, Saul, and Vellucci, Mathew J., eds. *Selected Federal Computer-Based Information Systems*. Washington, DC: Information Resources Press, 1972.

Highway Research Board. *Action Plan for a National Network of Transportation Research Information Series (TRISNET)*, DOT/TST-74-12. Washington, DC: Committee on Transportation Research Information Systems, Highway Research Board. (PB 239 313/OGA)

Howerton, Paul W., ed. *Management of Information Handling Systems.* Rochelle Park, NJ: Hayden Book Company, Inc., 1974.

Huber, Jake. *The Role of the National System of Research Coordinating Units in the Research-to-Practice Continuum.* Reno, NV: Nevada Occupational Research Coordinating Unit, June 1973. (ED 080 688)

Kruzas, Anthony T., ed. *Encyclopedia of Information Systems and Services.* Ann Arbor, MI: Edwards Brothers, 1974.

Lavin, Richard J. *Building Linkage and Support Capabilities at the Local Education Level.* Chelmsford, MA: Merrimack Education Center, 1974. (ED 100 384)

Lewis, Wiley B. *Army Publications Identified for Their Potential Value in Public School Vocational Education Programs.* Blacksburg, VA: Curriculum Materials Development, College of Education, Virginia Polytechnic Institute and State University, June 1972.

Lewis, Wiley B., and Lewis, Annabelle M. *Utilization of Military Information in Public School Vocational Education Programs.* Blacksburg, VA: Curriculum Materials Development, College of Education, Virginia Polytechnic Institute and State University, June 30, 1971.

Luckner, Barbara A., and Zane, Lawrence F. H., eds. *Familiarization and Dissemination of Selected Vocational-Technical Curriculum and Resource Materials. Final Report.* Honolulu, HI: Department of Curriculum and Instruction, Hawaii University, June 1974. (ED 101 142)

Martyn, John. "Information Needs and Uses." Vol. 9 of *Annual Review of Information Science and Technology.* Edited by Carlos A. Cuadra, Ann W. Luke, and Jessica L. Harris. Washington, DC: American Society for Information Science, 1974, pp. 3-24.

McEwen, Hazel E. *Federal Information Processing Standards Index.* Washington, DC: National Bureau of Standards, December 1, 1974, (COM-75-50111/4GA; C 13-C13.52:12-2).

Miller, Jerry W., and Sullivan, Eugene J., eds. *Guide to the Evaluation of Educational Experiences in the Armed Services.* Washington, DC: Commission on Educational Credit, American Council on Education, 1974.

Miller, Ronald F., and Fighe, Ruth L. "Library and Information Networks." Vol. 9 of *Annual Review of Information Science and Technology.* Edited by Carlos A. Cuadra, Ann W. Luke, and Jessica L. Harris. Washington, DC: American Society for Information Science, 1974, pp. 173-220.

National Association for State Information Systems in Conjunction with the States, The. *Information Systems Technology in State Government. 1974-1975 NASIS Report.* Lexington, KY: The National Association for State Information System in Conjunction with the States, 1975.

National Commission on Libraries and Information Science. *A National Program for Library and Information Services.* 2nd Draft (Rev.) Washington, DC: National Commission on Libraries and Information Science, September, 1974. (ED 095 856)

National Technical Information Service. *Directory of Computerized Data Files and Related Software Available from Federal Agencies.* Washington, DC: National Technical Information Service, U.S. Department of Commerce, March 1974.

Newfield, John W. *A System for Evaluating Document Based Educational Information Systems.* New Orleans, LA: Department of Elementary and Secondary Education, Louisiana State University, August 1974.. (ED 095 874)

Nisos, Michael J. "Sharing Air Force Educational Know-How." *Air Force Magazine.* Washington, DC: Air Force Association, October 1973.

Pearson, Karl. *Requirements for a Comprehensive Education Information System.* (National Institute of Education contract no.: NIE-C-009) Santa Monica, CA: System Development Corporation (SCD), (In progress project description).

Polinere, Jean-Paul. *Using and Improving National Information Systems for Development.* Paris, France: United Nations Educational, Scientific, and Cultural Organization, 1974.

Rogers, William, Jr., and Nisos, Michael J. *An Inventory of U.S. Navy Courses Suitable for Use in Training Civilian Personnel in Basic Technical Skills.* Annapolis, MD: U.S. Naval Institute, 1975.

Saracevic, Tefko, ed. *Introduction to Information Science.* New York, NY: R. R. Bowker Company, 1970.

Schipma, Peter B., ed. *Four-Year Summary Educational and Commercial Utilization of a Chemical Information Center.* The Larc Reports, Part I (Volume 7, Issue 1). Tempe, AZ: The Larc Association, Inc., 1974.

Schipma, Peter B., ed. *Four-Year Summary Educational and Commercial Utilization of a Chemical Information Center.* The Larc Reports, Part II (Volume 7, Issue 2). Tempe, AZ: The Larc Association, Inc., 1974.

Shelburne, James C., and Groves, Kenneth J. *Education in the Armed Forces.* New York, NY. The Center for Applied Research in Education, Inc., 1965.

Spicer, Michael W. *A Comparative Analysis of Five Regional Reference and Information Networks.* Columbus, OH: The Ohio State Library, August 18, 1972. (ED 071 667)

Steiger, Jo Ann M. *The ERIC System and Practitioner Needs.* McLean, VA: Steiger, Frank and Smith, Inc., July 1975.

Stoller, Alan D. *Instructor's Index of U.S. Navy and Air Force Materials for Teaching Basic Electricity.* Washington, DC: Bureau of Research, U.S. Office of Education, August 1968.

_____. *Making U.S. Navy Training Aids Available for Use in Manpower Training Programs, Community Colleges and Schools for Occupational Training. Final Report.* Portland, OR: Northwest Regional Educational Laboratory, May 1970.

Straubel, James H. *The Evaluation of Three U.S. Air Force Instructional Systems within Civilian Education. Final Report.* Washington, DC: Aerospace Education Foundation, December 31, 1969.

_____. *Inventory of U.S. Air Force Vocational Course Materials for Possible Adaptation to the Civilian School System.* Washington, DC: Aerospace Education Foundation, January 1971.

_____. *Planning Grant for a Central Clearinghouse through which Air Force Vocational/Technical Courses May Be Made Available to Civilian School Systems.* Washington, DC: Aerospace Education Foundation, July 31, 1971.

_____. *Planning Grant for a Central Clearinghouse through which Air Force Vocational/Technical Courses May Be Made Available to Civilian School Systems. Final Report.* Washington, DC: Aerospace Education Foundation, July 1971.

Summers, Edward G. *Canadian Educational Information: Some Perspectives and Sources on Systems Design.* Vancouver, British Columbia, Canada: British Columbia University, 1974. (ED 101 747)

_____. *Information and Bibliographic Needs in Canadian Education.* Vancouver, British Columbia, Canada: Britich Columbia University, May 1974. (ED 101 746)

Sutton, Gerard. *Information Storage and Retrieval Scientific Report No. ISR-22.* Ithaca, NY: Department of Computer Science, Cornell University, November 1974. (ED 101 718)

United States Office of Education. *Design of a System, with Alternative Approaches, for Identifying, Evaluating, and Disseminating Curriculum Materials Developed by the Department of Defense for Utilization of the Nation's Civilian Educational Programs through Linkage with Existing National, State and Local Systems.* RFP 75-83. Washington, DC: United States Office of Education, Department of Health, Education and Welfare, April 1975.

Vilentchuk, Lydia. *Guidelines on the Conduct of a National Inventory of Scientific and Technological Information and Documentation Facilities.* Paris, France: United Nations Educational, Scientific, and Cultural Organization, 1975.

Weisman, Herman M. *Information Systems, Services, and Centers.* New York, NY: Becker and Hayes, Inc., 1972.

_____. *The Role of the Information Center in the National Commission on Libraries and Information Science Program for the Improvement of National Information Services. Related Paper No. 13.* Washington, DC: National Commission on Libraries and Information Science, November 1974. (ED 100 397)

Westinghouse Learning Corporation. *Learning Directory. 1972-73 Supplement.* New York, NY: Westinghouse Learning Corporation, 1973.

Wijo, Osmo A. "System Models of Information, Communication and Mass Communication: Re-evaluation of Some Basic Concepts on Communication." (Paper presented at the Annual Meeting of the International Communication Association, Montreal, Quebec, Canada, April 25-28, 1973). (ED 078 465)

Xerox University Microfilms. *Curriculum Materials Clearinghouse.* Ann Arbor, MI: Xerox University Microfilms, 1975.

_____. *Curriculum Publishing Service.* Ann Arbor, MI: University Microfilms, 1975.

Youry, Mary E. *User Needs in Documentation and Information. A Bibliography with Abstracts.* Washington, DC: National Technical Information Service, January 1975. (NTIS/PS-75/189/IGA.)

Zunde, Pranas. *Scientific and Technical Transfer for Education (STITE). Research Report No. 1.* Atlanta, GA: School of Information and Computer Science, Institute of Technology, July 1973. (ED 095 867)

_____. *Scientific and Technical Transfer for Education (STITE). Research Report No. 2.* Atlanta, GA: School of Information and Computer Science, Institute of Technology, December 1973. (ED 095 868)

_____. *Scientific and Technical Transfer for Education (STITE). Research Report No. 3.* Atlanta, GA: School of Information and Computer Science, Institute of Technology, June 1974. (ED 095 869)

APPENDICES