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ABSTRACT

The final report describes the work performed by Riverside Research Institute (RRI) for the New York State Education Department in regard to the Reporting and Evaluation System for Occupational Education (RESOE). A brief introduction is followed by a section dealing with RESOE's design, development, and operation, and including general discussions of improving management of occupational education, and detailed discussions of RESOE's two stages. State 1 consists of the establishment of computer maintained enrollment, followup, and other files which comprise the foundation of the RESOE information-processing capability. Stage 2 aims at developing RESOE into a useful instrument in support of management by evolving RESOE into a versatile tool for program planning at State and local levels. The final section contains detailed discussions of activities performed to date: Stage 1 activities regarding dissemination and implementation, and the RESOE brochure; and Stage 2 activities including statistical methods associated with followup mailing methods, the details of the Instructional Support and Evaluation System (ISES) for occupational education, and potential attendance subsystems and remote data entry systems. An appendix contains a flow chart of the overall process, and examples of forms, envelopes, and other materials used in RESOE implementation. (JR)

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THE COORDINATION OF PROGRAM PLANNING AND EVALUATION SYSTEMS FOR OCCUPATIONAL EDUCATION: THE DEVELOPMENT AND IMPLEMENTATION OF THE REPORTING AND EVALUATION SYSTEM FOR OCCUPATIONAL EDUCATION (RESOE)

Submitted to:

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and

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F/290-5-00

PREFACE

During the past year, a Reporting and Evaluation System for Occupational Education (RESOE) has been further developed and implemented in a total of five of New York State's occupational planning regions. RESOE implementation begins by establishing flexible, computer-maintained student files for each participating education agency. These files are used to generate mandated reports for the State, and are available to meet other local, State, and Federal reporting and evaluation requirements in occupational education.

The manner in which RESOE has been received by occupational directors and their guidance personnel has been gratifying. They have appreciated the underlying system concepts described in this report. They have appreciated that the system is here now, and ready to respond to many of their needs.

Many occupational educators throughout New York State have actively cooperated with the State Education Department's Office of Occupational Education and Riverside Research Institute (RRI) to develop and implement RESOE. Their commitment to RESOE's implementation in their respective education agencies made orderly implementation possible. Their willingness to devote thought and effort to specifying their management information requirements, and to provide constructive criticism, has enabled RRI to improve RESOE so that the needs of education agencies can be served better.

All who have provided this valued support cannot be cited here; however, RRI wishes to acknowledge the substantial contributions of the occupational administrators and guidance coordinators listed below who were designated to work directly

with RRI personnel implementing RESOE in their education agencies.

Region 1

Nassau BOCES

Mr. James F. Wilde, Program Associate of Occupational Education

Vocational Education and Extension Board (VEEB)

Mr. Alfonso N. Fleri, Coordinator of Veterans' Training

Region 2

New York City

Mr. George Quarles, Chief Administrator, Office of Career Education

Mr. Norman Elliott, Director (Acting), Bureau of Business and Distributive Education

Mr. Norman Watnick, Assistant Director, Bureau of Business and Distributive Education

Region 8

Broome, Delaware, Tioga BOCES

Mr. James McElhatten, Administrative Assistant

Delaware, Chenango, Madison, Otsego BOCES

Mr. Robert Harold, Administrative Assistant for Program and Personnel

Green, Delaware, Schoharie, Otsego BOCES

Mr. Raymond J. Schoberlein, Director of Occupational Education

Region 9

Tompkins, Seneca, Tioga BOCES

Mr. Duane K. Ash, Guidance Coordinator

Cayuga BOCES

Mr. Charles Little, Director, Adult Education

Syracuse City School District

Mr. Hans Lang, Director, Occupational Education and Continuing Education

Oswego BOCES

Mr. Ronald Service, Director of Guidance

Onondaga BOCES

Mr. Charles West, Guidance Coordinator

Cortland-Madison BOCES

Mr. Francis Streeter, Director of Occupational Education

Region 10

Livingston-Steuben-Wyoming BOCES

Mr. George Couture, Director of Occupational Education

Monroe BOCES #2

Mr. Francis J. Day, Director of Occupational Education

City School District of Rochester

Mr. Edgar J. Hollwedel, Director of Occupational and Continuing Education

Ontario-Seneca-Wayne-Yates BOCES

Mr. Elliott Johnson, Director of Occupational Education

Monroe County BOCES #1

Mr. John McCormick, Assistant Superintendent

Genesee-Wyoming BOCES

Mr. Dale Post, Coordinator of Occupational Education

Region 11

Schuyler-Chemung-Tioga BOCES

Mr. George Dennis, Director of Occupational Education

Steuben BOCES

Mr. Rudolph Schneider, Director of Vocational Education

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I. INTRODUCTION

This final report describes work performed by Riverside Research Institute (RRI) for the New York State Education Department (SED), Office of Occupational Education (OOE) under Contract C54490.

The report consists of three chapters: this brief introduction, a discussion of the general nature and background of RRI's work in support of occupational education, and a detailed description of work performed under the contract. In addition, an appendix is provided that contains a flow chart of the overall process, and examples of forms, envelopes and other materials used in RESOE implementation.

II. BACKGROUND AND GENERAL NATURE OF THE WORK

RRI's work for SED's Office of Occupational Education has the primary purpose of providing improved means of managing occupational education.

A. Improving the Management of Occupational Education

Management consists of three interrelated functions: planning, implementation and information processing. Work performed by RRI this year has involved design, development, and operation of the information-processing component for managing occupational education. This component is called the Reporting and Evaluation System for Occupational Education (RESOE).

Currently, RESOE is being developed to support two management processes associated with occupational education; Targeting and Instructional Support and Evaluation.[1] Both processes

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[1] The Targeting and the Instructional Support and Evaluation System (ISES) are discussed in detail in various reports and other documents prepared by RRI for OOE. In particular, see the following reports:

The Coordination of Program Planning and Evaluation Systems for Occupational Education, Volume II: A Targeting System for Occupational Education; final report submitted to Dr. Robert S. Seckendorf, Assistant Commissioner for Occupational Education, SED, March 1972.

The Coordination of Program Planning and Evaluation Systems for Occupational Education, Volume III: Monitoring System for Occupational Education; final report submitted to Dr. Robert S. Seckendorf, Assistant Commissioner for Occupational Education, SED, March 1972.

In this report, reference is made to Targeting in Chapter III, Section B, Part 1, "Statistical Studies Associated with Follow-up," and to ISES in Chapter III, Section B, Part 2, "ISES."

are intended to tailor occupational programs to improve the match between skills acquired by students and skills actually required for employment. Targeting matches programs offered in occupational education to the spectrum of available jobs; the Instructional Support and Evaluation System matches the content of specific programs to the needs of specific jobs. Operation of these two processes is likely to be supported by the State, but local agencies are expected to operate, contribute to, participate in, and benefit from them. Furthermore, because of the flexible computer processes used in RESOE, RESOE also will be capable of supporting a variety of other decision-making processes at state and local levels.

An important design objective of RESOE is to provide an "automated," cost-effective means of generating mardated reports of various kinds, for example, reports of student enrollment for use in Part 2 of the "New York State Plan for the Administration of Occupational Education" submitted to the Board of Regents and the U. S. Office of Education.[2] Much of RRI's work to date has involved developing such basic information-handling capabilities that represent the "foundation" of RESOE.

Figure 1 schematically summarizes this brief discussion of the relationships between RESOE and the planning function.

B. RESOE Development and Implementation

The development and implementation of RESOE is proceeding in two stages. Stage I involves developing methods of processing information necessary for fulfilling mandated reporting

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[2] According to the terms of the Higher Education Act of 1965, Part F (Public Law 89-329) and the Vocational Education Amendments of 1968 (Public Law 90-576).

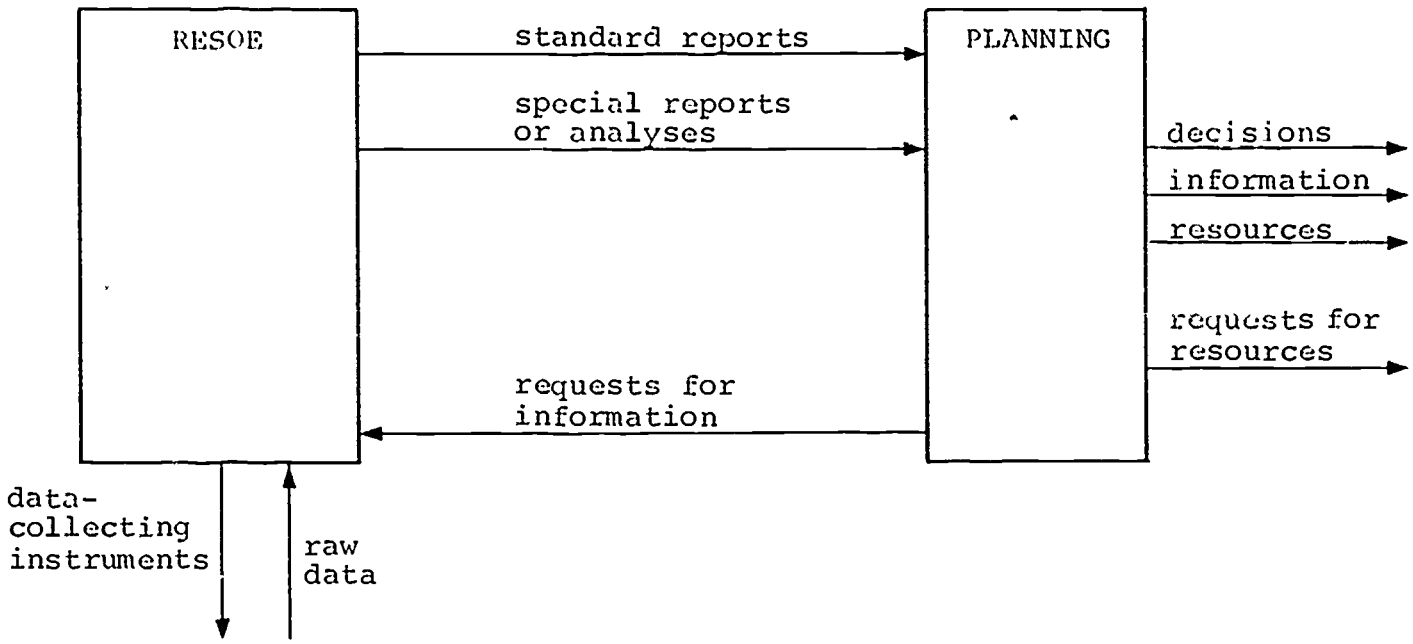

FIG. 1 RESCE AND PLANNING

requirements on occupational education enrollments and completions. Stage II involves adding capabilities to RESOE to provide flexible, cost-effective data processing support for program planning at state and local levels.

1. Stage I

RESOE information processing applications are made possible by a computer-based, record-keeping system that contains files of several kinds.

The first files to be developed are individual student files for storing "enrollment" information and "follow-up" information. "Enrollment" files contain information on currently enrolled students; "follow-up" files contain information on former students who have graduated from or have otherwise terminated occupational education. Concurrent with development of student files, local agency files are developed for storing information on local agency programs and classes. Stage I work[3] to date has dealt primarily with establishing these files. File establishment involves implementing procedures for obtaining information from students, and entering the information into computer storage.

Once information for each student is entered into a file, any subset of data elements for each student can be withdrawn for aggregation with equivalent subsets from the files of other students. Thus, reports (presenting numbers of students in any category definable from the filed information) or

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[3] The details of work performed are presented in Chapter III, Section A, of this report.

During 1972, the previous contract year, these files were established for students and agencies in Region 9 and part of Region 1 (Nassau County). In addition, a pilot effort was

statistical analyses (involving any parameters on file) can be generated. Information does not need to be acquired for each display or analysis because, to the extent possible, required information is contained in existing discrete files. As new needs for data arise, data acquisition procedures and existing files can be expanded to meet these needs.

Although RESOE ultimately will include the full set of files necessary for standard State and local program planning, and will include optional sets specified by local users. RESOE file development has begun with establishing "enrollment" and "follow-up" files for meeting mandated[4] reporting requirements associated with preparation, approval and submission of the "State Plan for the Administration of Occupational Education" to the U. S. Office of Education. Various procedures were used previously for obtaining and processing this information, but they have proven to be inadequate in a variety of ways.

The previously used procedures had two serious deficiencies. Information was not obtained in the classroom and consequently data were inaccurate; information was provided in an "aggregated" form (numbers of students in various broad

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conducted in New York City to test the feasibility of establishing equivalent enrollment files within the special constraints existing in that large and complex school system.

During 1973, this contract year, these basic files were established in Regions 8, 10, and 11, and they were maintained in Regions 1 and 9. The pilot study of the previous year in New York City led to full-scale establishment of student enrollment files in 1973.

[4] According to the Higher Education Act of 1965, Part F (Public Law 89-329) and the Vocational Education Amendments of 1968 (Public Law 90-576).

categories) and consequently, the data often were not useful for purposes other than the specific report for which they were obtained. RESOE was designed to correct these inadequacies. Individual student data are obtained, and files maintain data in a "disaggregated" form. Thus, standard reports can be prepared readily, but a capability exists to prepare non-standard or unanticipated reports using part or all of the same data.

RESOE Stage I "enrollment" and "follow-up" files contain information for each student. Enrollment files contain information on each student currently enrolled in each occupational program in each local agency. Similarly, follow-up files contain information on each formerly enrolled student.

Enrollment files contain student name, sex, ethnicity, level (adult or secondary), type (regular, disadvantaged, or handicapped), program name (and code), program type (regular or cooperative), and, for adult students, the students' purpose in taking occupational education. Each student is identified by an identification number, and his class and local agency are specified. This information is used to prepare state-wide and local enrollment reports. In addition, some categories of information, such as student address, currently are included because of widespread interest in them by local administrators.

Information in follow-up files includes student name and current educational or occupational activity. This information is combined with information in each student's enrollment file to prepare state-wide and local follow-up reports.

Figure 2 summarizes these basic Stage I processes.

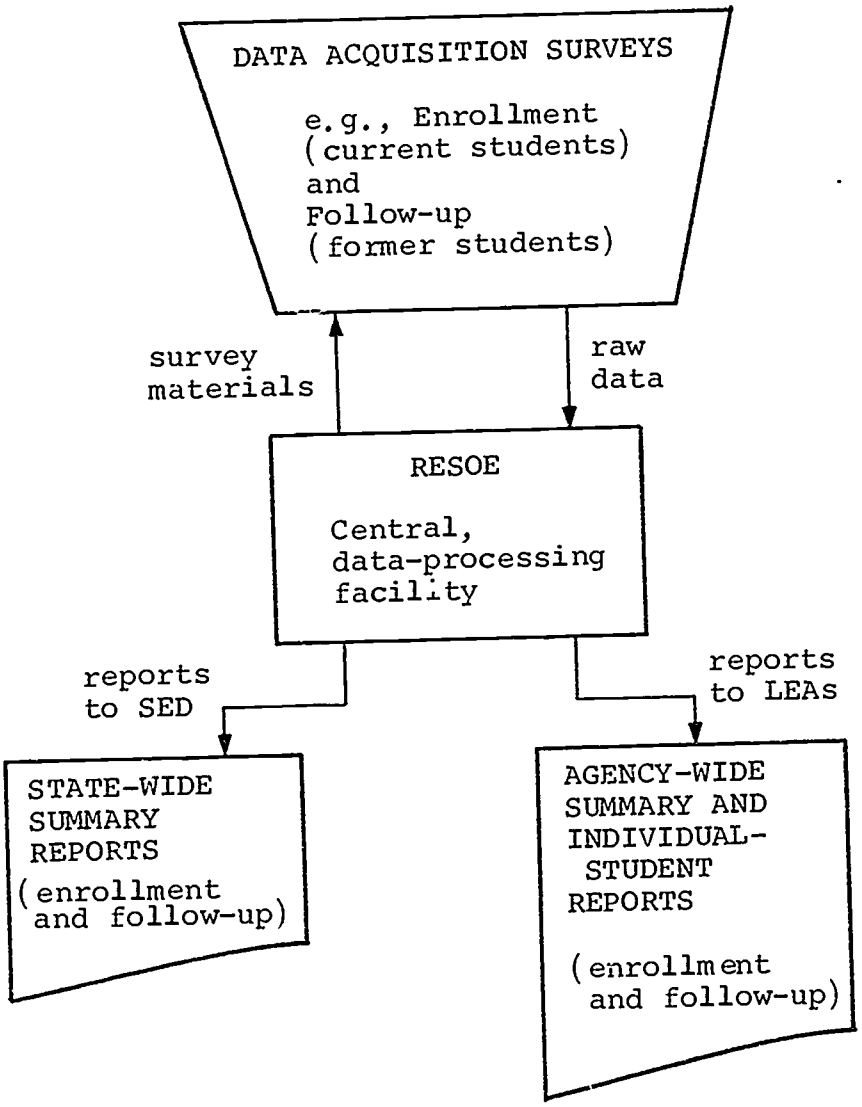

FIG. 2 RESOE STAGE I PROCESSES

A central facility (RRI at present) prepares and distributes materials used in the enrollment and follow-up surveys (forms or questionnaires, ins ructions, envelopes). Students or former students enter information on forms or questionnaires. Forms or questionnaires are returned to the central facility where information is entered into computer files.

Using the filed information, the computer prepares state-wide summary reports for SED, agency-wide summary reports for local education agencies (LEAs, including BOCES and school districts) and reports for each LEA which list individual students and pertinent information for each occupational education student at the local agency. (The general process depicted in summary form here is explained in detail for enrollment and follow-up later in Chapter III, Section A, of this report.)

2. Stage II

As stated earlier in this report, Stage I represents the foundation of the RESOE information processing capability. Stage II represents additional capabilities that make RESOE a complete, functioning subsystem. Stage II is intended to develop RESOE into a useful instrument in support of management by evolving RESOE into a versatile tool for program planning at State and local levels.

In RRI's original proposal[5] for work to be done this contract year, some effort was to be devoted to developing

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[5] The Coordination of Program Planning and Evaluation Systems for Occupational Education, proposal submitted to Dr. Robert S. Seckendorf, Assistant Commissioner for Occupational Education, January, 1973.

Stage II activities. The original work plan was modified[6] in response to an OOE request to accelerate effort to refine Stage I this year, and to prepare for implementing Stage I processes state-wide by 1974. (That is, Stage I processes are to obtain and process enrollment information throughout the State in the school year 1974-75.) To accommodate this shifted emphasis in work, OOE suggested that some of the effort devoted to Stage II work be reduced during the current contract year.

In particular, Monitoring[7] and Targeting efforts were reduced. The basic concept and design for Targeting had been developed by RRI and described in a 1972 RRI report[8] to SED. The basic design for Monitoring in occupational education also had been developed and described in a 1971 report[9] to SED. Although this work was not developed as thoroughly as the targeting concept and design, RRI has acquired considerable experience in the information processing aspects of Monitoring

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[6] See the progress report submitted to Mrs. Florence Sutler dated May 14, 1973.

[7] "Monitoring" was the term first used in the early phases of RRI's work for OEE and has been replaced by the term Instructional Support and Evaluation Subsystem (ISES), which currently is a more accurate, descri tive term (See page 2 of this report).

[8] The Coordination of Program Planning and Evaluation Systems for Occupational Education, Volume II: A Targeting System for Occupational Education; final report submitted to Dr. Robert S. Seckendorf, Assistant Commissioner for Occupational Education, SED, March 1972.

[9] The Coordination of Program Planning and Evaluation Systems for Occupational Education, Volume III: Monitoring System for Occupational Education; final report submitted to Dr. Robert S. Seckendorf, Assistant Commissioner for Occupational Education, SED, March 1972.

in a project performed for the Guilderland (New York) Central School District. The Guilderland project involved designing and implementing an information-handling system to support instruction of mathematics and reading. This system is called an Instructional Support System (ISS) and is described in several RRI reports and proposals.[10,11] During this year the concept of ISS in occupational education was described in a report[12] prepared by RRI for SED.

Subsequently, based on experience explaining RESOE to local educators throughout the State, RRI and OOE perceived the need to develop a brochure[13] to provide information on RESOE to local educators who are to implement RESOE in their agencies during the 1974-75 school year. Accordingly, to accommodate the work required to prepare the brochure in time for it to be used in disseminating RESOE during the early part of 1974, the inventive aspects of inferential statistical efforts and the detailed trade-off analysis associated with

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[10] The Coordination of Program Planning and Evaluation Systems for Occupational Education, Volume III: Monitoring System for Occupational Education; final report submitted to Dr. Robert S. Seckendorf, Assistant Commissioner for Occupational Education, SED, March 1972.

[11] The Development of an Instructional Support System. Renewal proposal, submitted to the Guilderland Central School District Number 2, Guilderland, New York, 1972.

[12] Improving the Management of Instruction in Occupational Education, Concept Paper submitted to Dr. Robert S. Seckendorf, Assistant Commissioner for Occupational Education, SED, September, 1973

[13] The rationale underlying this perception and the concept and evolution of the RESOE brochure are discussed later, in Chapter III, Section A, of this report.

the attendance "package" were postponed by agreement with the contract monitor.[14]

As a consequence of these two revisions in RRI's work plan, Stage II efforts this year have focused on the following tasks:[15]

- Formulating design concepts associated with monitoring, termed Instructional Support and Evaluation System (ISES); reviewing and evaluating existing efforts within SED related to ISES for occupational education;
- Performing statistical studies related to follow-up that are limited to interpreting the results of follow-up mailing method experiments;
- Describing the existing requirements for attendance data and methods of obtaining and processing them; formulating preliminary functional specifications of an attendance "package" for use in occupational education;
- Undertaking a demonstration of data entry using remote terminals to examine the human performance aspects of remote data entry, in particular, the feasibility of reducing the error rate in entered data (and consequently, editing costs) by transferring editing and error correction functions to local agency personnel.

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[14] See the letter to Mrs. Florence Sutler, dated November 8, 1973.

[15] The work performed is discussed in detail in Chapter III, Section B, of this report.

III. WORK PERFORMED THIS CONTRACT YEAR

This chapter describes the work performed this year in two sections. Section A is devoted to a detailed discussion of work related to Stage I; Section B describes work related to Stage II in terms of concepts, design specifications, and analyses.

A. Stage I

This section of the Final Report describes RESOE Stage I dissemination activities, data processing operations, brochure preparation, and remote terminal demonstration during the past contract year.

1. RESOE Stage I Dissemination Activities

During the past contract year, introductory meetings were held at Regions[16] 8, 10, and 11 to explain RESOE purposes and procedures to BOCES and school district superintendents. Presentations at these meetings were given by Dr. Robert Seckendorf and Mrs. Florence Sutler of OOE with support from RRI. At each introductory meeting, superintendents expressed interest in and provisional support of RESOE, and each superintendent designated a "coordinator" (a person to assume responsibility for implementing RESOE in agencies under the superintendent).

Following the introductory meetings, implementation meetings were held at the BOCES in Regions 8, 10, and 11, and

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[16] The names and locations of agencies in regions in which RESOE has been implemented are provided in the Preface, pages iv to vi.

the City of Rochester. These meetings were held for the purposes of introducing designated coordinators in local agencies to existing RESOE Stage I capabilities and to anticipated RESOE (Stage I and Stage II) capabilities. At these meetings, coordinators were asked to implement basic RESOE processes (establishing individual student files) in their respective regions. Their responsibility[17] as coordinators for this first year of implementation in Regions 8, 10, and 11 includes the following primary functions:

- Designating a counterpart to the RESOE coordinator at the district or school level;
- Acting as RESOE liaison with RRI/SED;
- Acting as liaison with affiliated local in distributing and collecting RESOE enrollment forms.

These regional implementation meetings typically were attended by occupational education directors, guidance counselors, and representatives from RRI and SED. Informal openended discussions were invited after a more formal RESOE presentation was made. The meetings were successful, particularly in two important respects: regional educational managers learned about RESOE capabilities, and what they should do to implement basic RESOE processes; they were able to obtain answers to their questions, make suggestions and otherwise influence the implementation of RESOE in their respective regions.

During the current contract year, plans for RESOE Stage I operations were formulated to include the remaining

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[17] See Appendix A for a more detailed description of what this responsibility entails.

regions in the State (Regions 3, 4, 5, 6, 7, 12, 13, and part of Region 1). Two types of meetings were planned: introductory, "kick-off" regional meetings to introduce BOCES and city superintendents to RESOE, and shortly thereafter, regional implementation meetings with designated BOCES or city RESOE coordinators to operationalize RESOE procedures in their localities.

2. RESOE Stage I Implementation Activities

Implementation during this past contract year concerned basic Stage I RESOE enrollment and follow-up procedures.

a. RESOE Enrollment

The overall enrollment procedure is described below in terms of its two constituent phases: data acquisition and data processing.

1.) Data Acquisition

Enrollment materials were produced and distributed in Regions 1, 2, 8, 9, 10, and 11. These materials included enrollment forms, instructions, envelopes and covering letters.[18]

Secondary and adult occupational students were included in RESOE enrollment.

Slightly different enrollment procedures were implemented for Region 1 (Nassau County), Region 2 (New York City), and Regions 8 through 11 ("upstate" areas including the cities of Rochester and Syracuse).

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[18] See Appendix B for samples of RESOE enrollment materials used during the past contract year.

a.) Procedures in Regions 8, 9, 10, and 11

Figure 3 depicts the enrollment data acquisition procedures used in Regions 8, 9, 10, and 11. Except for details, this procedure was equivalent to that used in other regions.

Labelled envelopes containing enrollment materials were sent to specific classes in each school or BOCES in Regions 8 through 11. Information for labelling was obtained in the following manner.

During the spring and summer of 1973, BOCES and the cities of Rochester and Syracuse provided RRI with pre-enrollment information that listed occupational education classes for each BOCES or local school. Each course to be given was identified by program title, level (adult or secondary), program type (regular or cooperative), and the teacher assigned to each class.

This pre-enrollment information was entered into computer files and subsequently was printed by the computer on the label of each envelope. In this way each envelope could be sent to a specific class, and all class-associated information required for subsequent data processing was presented on the envelope label. In addition, to accommodate new classes, several extra envelopes having only local agency name and location code printed on the label were sent to each school and BOCES. In the case of new classes, a school or BOCES official entered missing information on these partially labelled envelopes prior to forwarding them to classrooms.

In the classroom, teachers read the instructions, distributed enrollment forms to students, supervised the completion of forms, collected forms and returned them in the envelope to the designated school or BOCES official.

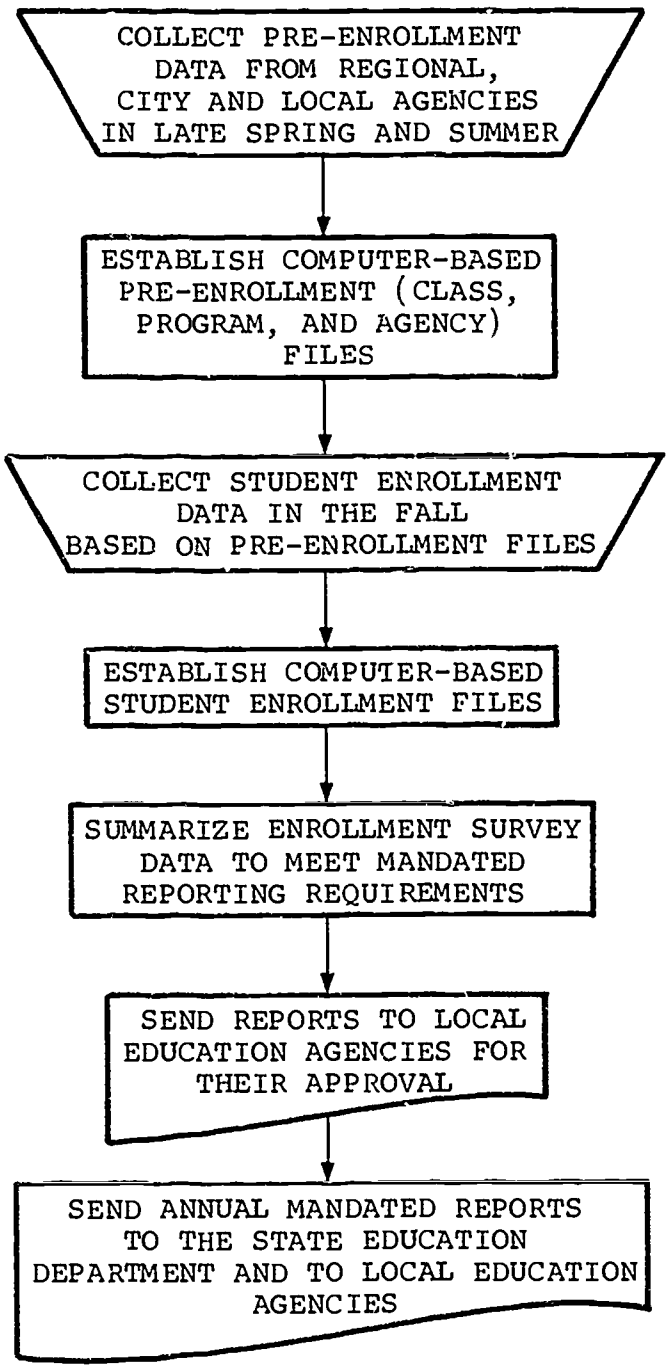

FIG. 3 SEQUENCE OF STEPS IN RESOE'S BASIC STUDENT ENROLLMENT PROCESS

In Rochester and Syracuse, a city occupational education director distributed materials to local schools, and, upon completion of the forms, returned the materials to RRI. In the case of BOCES-served areas, the BOCES occupational education coordinator performed these tasks.

b.) Procedures in Region 1

BOCES in Region 1 (Nassau County) utilized RESOE pre-enrollment and enrollment procedures. However, because the BOCES and school districts have not yet developed an effective manner of implementing RESOE processes in local schools, local schools in this region continued to use OEP-1 forms[19] for enrollment this year. RESOE enrollment procedures used by the BOCES in Region 1 were the same as those in Regions 8 through 11.

c.) Procedures in Region 2

In Region 2 (New York City), the overall approach was similar to that used in other regions. However, minor differences existed because of local requirements. For example, smaller and simpler forms and envelopes were used in New York City than were used in Regions 1 and 8 through 11. Enrollment envelopes did not contain preprinted class- or program-related information; this information was provided by an administrator in each school. Student names did not appear on enrollment forms submitted to RRI.

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[19]OEP-1 forms are used to obtain secondary and adult level enrollment data in the Occupational Education Data System (OEDS) that RESOE is to supplant.

New York City provided RRI with pre-enrollment information necessary to distribute enrollment materials to schools and other educational agencies in Region 2. Distribution information consisted of names of schools and other agencies within the city that were to receive enrollment materials, and the quantities of materials to be received by each.

2.) Data Processing

Data obtained through RESOE enrollment procedures are being used to produce two kinds of reports.

One kind of report, referred to as "OEDS-style," will present aggregated individual student data in a format equivalent to the format used in OEP-1 forms. Aggregated data in this format then will be merged with data obtained using OEP-1 forms (used in regions where RESOE is not yet implemented) and incorporated into the state-wide OEDS secondary- and adult-level enrollment report. The Office of Occupational Education at SED will receive the state-wide enrollment data aggregated from RESOE and OEP-1 forms. In addition, each local agency also will receive a report of this kind. However, "OEDS-style" reports sent to each local agency will be based on data pertinent only to students enrolled at the local agency.

The second kind of report is designed to provide local agencies with individual student enrollment information for program management, guidance, and administrative purposes. This kind lists individual students by each occupational classroom and by agency; it presents information pertaining to each student (such as address, telephone number, grade level, employment status, etc.); it summarizes individual student data in tables for each class and agency student listing.

A student will be listed for each class in which he is enrolled; thus in these reports, individual students may be counted more than once.

In summary, the Office of Occupational Education at SED will receive enrollment data obtained using RESOE enrollment materials and OEP-1 forms in an enrollment report that aggregates data for all occupational students in the State. Each local agency will receive "OEDS-style" reports that aggregate data for students in that agency, and reports that present individual student data and aggregate these data in summary tables.

The general data processing procedures discussed above were used in all regions. However, in New York City, a minor additional task has been undertaken by RRI at the request of Mr. Norman Elliott, the RESOE coordinator in New York City. Mr. Elliott requested enrollment data from some New York City educational agencies offering courses related to occupational education, but that were not "occupational" in the sense of the SED definition. These data are not to be included in the state-wide report but are being processed separately, at RRI's expense, for use by occupational education administrators in New York City.

b. RESOE Follow-Up

RESOE follow-up was performed in local agencies in which enrollment processes and files had been established during the preceding year; these agencies are in Regions 1 and 9. The overall follow-up procedure is described below in terms of its two constituent phases: data acquisition and data processing.

1.) Data Acquisition[20]

RESOE follow-up data were obtained in Region 1 (Nassau County) and Region 9 (Syracuse and environs). However, differences existed in the manner of obtaining data.

a.) Procedures in Region 9

Figure 4 depicts follow-up procedures used in Region 9.

In Region 9, follow-up questionnaires were mailed to former students (graduating and non-completing students). Follow-up data were obtained on these questionnaires from individual students.

Information necessary for mailing the questionnaires and for relating follow-up data to data already in enrollment files was obtained during the spring of 1973. Occupational education students were asked to enter information pertaining to their expected address and activities on a form entitled "Student Address Form." This information was compiled in a printout that was sent to school and BOCES officials in the region for approval, verification, and error correction.

Questionnaires were mailed to former students using three mailing modes: first-class, hand-stamped; first-class, machine-stamped; and third-class (bulk rate). These three mailing modes were used to compare questionnaire return rates as a function of mailing mode. Third-class and first-class, machine-stamped modes were used randomly in about

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[20] See Appendix B for samples of RESOE follow-up materials used during the past contract year.

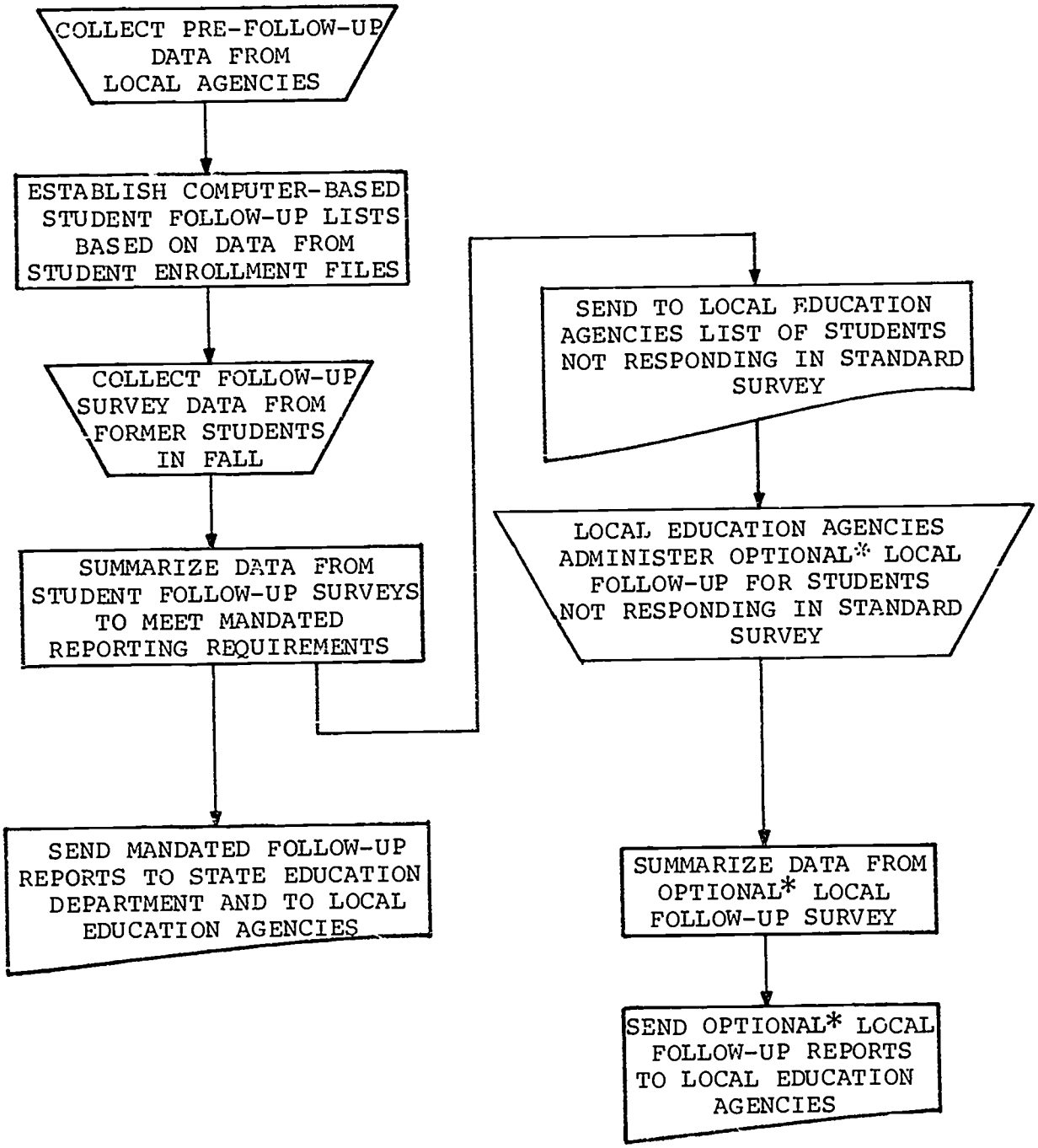

FIG. 4 SEQUENCE OF STEPS IN RESOE'S BASIC STUDENT FOLLOW-UP PROCESS (*OPTIONAL ACTIVITIES UNDERTAKEN AT LEA COST)

one-third of the mailings; equal numbers of mailings were made using these two modes. Based on this experiment, future surveys that may be required can be conducted using the most "cost-effective" mode.

In an attempt to insure an adequate return of questionnaires, former students not returning their completed questionnaires by a certain date were sent a second questionnaire. The effectiveness of the second mailing in increasing the overall return rate will be measured. Based on these measurements, future surveys can be conducted using the more "cost-effective" method, i.e., the single or double mailing.

b.) Procedures in Region 1

In Region 1 (Nassau County), follow-up data were obtained via a questionnaire prepared and distributed by the Nassau BOCES. This questionnaire utilized the format and specific questions of the RESOE questionnaire. As a consequence, data processing procedures for RESOE and Nassau BOCES forms is identical. However, because the Nassau BOCES (not RRI) mailed questionnaires to former students in Region 1, no mailing experiments were performed in this region.

2.) Data Processing

Two general kinds of reports (analogous to those prepared from enrollment data) are being prepared based on data obtained from follow-up questionnaires. The first kind will present aggregated data in a format equivalent to that used in OEP-2 forms[21] using "unduplicated" counts of former stu-

[21]OEP-2 forms are used to obtain secondary and adult level completions data in the Occupational Education Data System (OEDS) that RESOE is to supplant.

dents. These aggregated data then will be incorporated, with data obtained on OEP-2 forms (used in regions where RESOE has not been implemented), into the state-wide follow-up report. The second kind will be prepared for local agencies and will present individual student data in lists organized by classroom and agency, and will aggregate the data in summary tables for each list. The state-wide aggregation will be submitted to the Office of Occupational Education at SED; each local agency will receive two kinds of reports on students enrolled in the agency: reports presenting aggregated data in the style of OEP-2 forms, and reports presenting data on individual students with summary data tables at the end of each list.

Data obtained in the spring and those obtained through the follow-up survey are being examined to compare student employment and education expectations of last spring with their actual activities of this fall. These comparisons can provide a basis for estimating the validity of expectation or "placement" data obtained prior to graduation. If placement data appear to correlate positively with follow-up data, placement or expectation data may provide a means of increasing the confidence of estimates regarding the activities of former students in cases where follow-up questionnaire returns are low or sampling techniques are used in the follow-up survey.

In addition to reports based on returned ques ionnaires, local agencies will be sent a computer printout that lists former students (with their addresses and telephone numbers) from whom questionnaires have not been received. Local agencies also will be sent a set of follow-up questionnaires that are blank except for student mailing labels. Using these questionnaires, local agency personnel, at their

option, may extend the follow-up survey. For example, they might use the telephone numbers given on the printout to interview former students using the telephone while entering responses on the appropriate blank questionnaire. Alternatively, they might choose to mail the questionnaires to students.

Data pertaining to the mailing mode and mailing number experiments described above will be presented to the Office of Occupational Education upon analysis of the data.

c. OEP Form Distribution and Data Processing

RRI performed data processing of enrollment (OEP-1 and OEP-4[22]) and follow-up (OEP-2 and OEP-5[22]) data for all secondary and adult and post-secondary students who were not included in RESOE enrollment and follow-up surveys. In addition, in October, RRI distributed OEP-2 and 3 forms to educational agencies in regions currently using RESOE for enrollment procedures (OEP-1 forms to LEAs in Region 1), and OEP-3 forms to regions currently using RESOE enrollment and follow-up procedures.

Figure 5 depicts procedures used to distribute OEP forms and process OEP data.

RRI distributed OEP-1, OEP-2, and OEP-3 materials directly to local agencies in regions in which RESOE activities currently are being pursued, i.e., in Regions 1, 2, 8, 9, 10,

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[22]OEP-4 and OEP-5 forms respectively, are post-secondary level equivalents to OEP-1 and OEP-2 forms described earlier. OEP-3 forms obtain personnel data for personnel not included in the Basic Education Data System (BEDS) at the secondary and adult levels, and OEP-6 forms are the post-secondary level equivalent to OEP-3 forms.

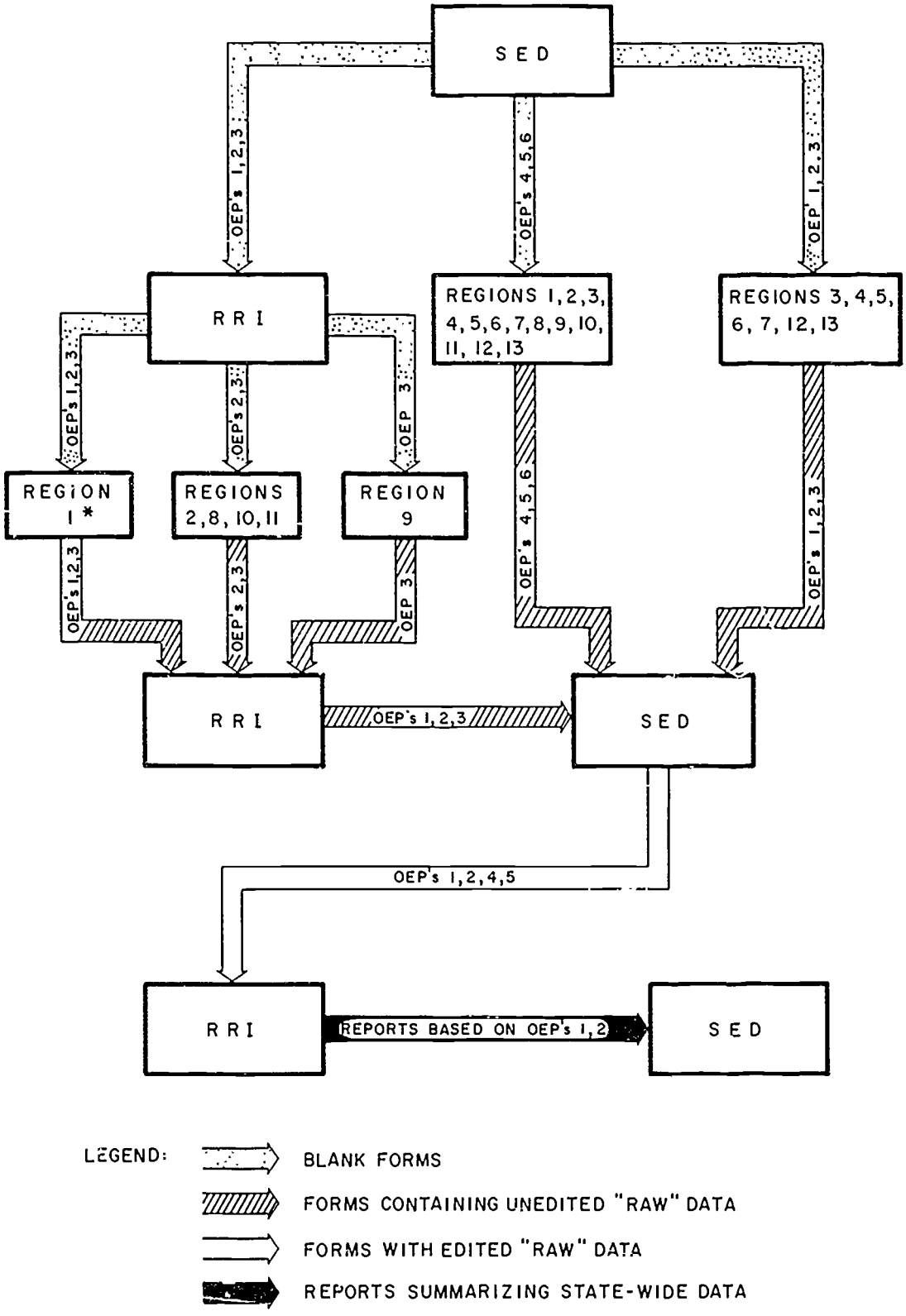

FIG. 5 DISTRIBUTION, DATA ENTRY, EDITING AND DATA PROCESSING OF OEP FORMS 1 THROUGH 6

(* LOCAL SCHOOLS ONLY; BOCES IN REGION 1 UTILIZED RESOE MATERIALS)

and 11. Specifically, Region 1 received OEP-1 and OEP-2 for use in local schools (but RESOE materials were used in BOCES) and OEP-3 forms for use in local schools and BOCES; Regions 2, 8, 10, and 11 received OEP-2 and OEP-3 forms; Region 9 received only OEP-3 forms. (SED distributed OEP-4, OEP-5, and OEP-6 forms to all post-secondary facilities in these regions.) The purpose of RRI's distributing OEP forms in these regions was to prevent confusion that might arise if local agencies were to receive a variety of materials intended to serve ostensibly identical purposes. RRI sent only those specific materials that each local agency required to fulfill its reporting requirements. Redundancy was eliminated, and the resulting potential for confusion was reduced.

RRI is processing data obtained on OEP-1, OEP-2, OEP-4, and OEP-5 forms throughout the State. SED is sending to RRI OEP-1 and OEP-2 forms used in regions other than 1, 2, 8, 9, 10, and 11, and all OEP-4 and OEP-5 forms. RESOE data will be incorporated by RRI into state-wide enrollment and follow-up reports.

3. RESOE Brochure

In light of the shift of emphasis to Stage I implementation, the "Layman's Guide," a document previously prepared to aid in disseminating RESOE concepts and operations, did not appear to be sufficiently simple or direct for effectively describing RESOE Stage I processes to a readership primarily consisting of educators in local agencies. In addition, the "Layman's Guide" was intended to be a user's guide regarding ways to utilize the full spectrum of flexible data processing capabilities in RESOE based upon SEED; using the basic Stage I processes does not require such knowledge. Consequently,

RRI's work plan was revised upon agreement with the contract monitor to develop a new document focused on Stage I for use in dissemination. Accordingly, preparation of this document, referred to as the "RESOE Brochure," has begun and will be completed presently.[23]

The RESOE Brochure is intended to be an instrument for aiding dissemination of RESOE on the BOCES and school district level. It is directed toward a readership consisting mostly of local educators at the secondary and adult levels of occupational education (administrators primarily, but also teachers). In addition, it is likely to be read by parents and students, by educators at the State level or in post-secondary institutions, by members of the executive or legislative branches of the State government, and by members of federal agencies or state agencies in other states. Focused on the primary readership, but with this broad potential readership in mind, the Brochure is being designed to attract and hold the attention of the entire spectrum of readers, and to inform them regarding the significance, general concept, and mode of operation of RESOE with emphasis on Stage I processes.

B. Stage II

Work has been performed this year on developing RESOE capabilities associated with functions intended to support program management in occupational education or to upgrade basic Stage I processes. Effort has been directed toward the following activities: developing design concepts for an Instructional Support and Evaluation System for Occupational

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[23] As of the date of printing this final report, "mechanicals" of the Brochure have been submitted to OOE for printing.

Education (ISES), developing statistical methods for analyzing and extending the usefulness of follow-up data, developing design concepts for an attendance system, and undertaking a demonstration and feasibility test of data entry using a remote terminal.

1. Statistical Methods Associated with Follow-up Mailing Methods

Follow-up questionnaires were mailed to former, secondary and adult, occupational education students using three mailing modes in an initial mailing. Former students who did not reply to the initial mailing were sent a second questionnaire. In addition, some former students, not included in the standard, follow-up, mailing file established in the spring, were sent questionnaires at the request of educational administrators. This section[24] addresses the return rates associated with these mailings.

a. Return Rate as a Function of Mailing Mode

In the first mailing, a total of 6,732 questionnaires were sent to former students and 1,733 were completed by the recipients and returned to RRI. Thus the overall return rate was 26%.

The questionnaires were sent using three methods of mailing: first-class, machine-stamped; first-class, hand-stamped; and third-class or bulk rate. In the first-class,

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[24]This section discusses mailing and return aspects of the follow-up survey only; it does not address the student data derived from the survey. These data and analyses of them will be present in separate comprehensive reports as soon as the analyses are completed.

machine-stamped mode, 3,945 questionnaires were sent, and 992 were completed and returned; thus the return rate was 25%. In the first-class, hand-stamped mode, 1,401 questionnaires were sent, and 387 were completed and returned; thus the return rate was 28%. In the bulk-rate mode, 1,486 questionnaires were sent, and 354 were completed and returned; thus the return rate was 25%.

Although the differences in return rate may not be significant, the first-class, hand-stamped mode has the highest return rate.

b. Return Rate Increase as a Function of the Second Mailing

The mailing of questionnaires to former students who did not reply in the first mailing increased the overall return rate significantly.

In the second mailing, 4,999 questionnaires were sent (by the first-class, machine-stamped mode for convenience), and 864 were returned; thus the return rate for the second mailing alone was 17%. However, the second mailing increased the overall return rate (as number of former students replying per number of former students sent questionnaires) to 39%.

c. Effect of Undeliverable Questionnaires

Several questionnaires were returned to RRI by the postal service marked "undeliverable." Although the total undeliverable questionnaires was 788, data currently are not available to identify the number of individuals to whom questionnaires were not deliverable. Some former students may have been sent more than one questionnaire either because they were sent questionnaires in two mailings or because they were sent more than one questionnaire as a result of having been enrolled

in more than one program. (However, the latter consideration also implies that fewer than 6,732 individuals were sent questionnaires. Because some individuals received more than one questionnaire, return rates are actually higher than those calculated based on the numbers of questionnaires sent and returned.)

In the extreme case in which the assumption is made that questionnaires were undeliverable to 788 former students (i.e., that 6,732 minus 788 individuals were sent questionnaires), the overall return rate (taking both mailings into account) was 44%.

d. Special Follow-up Mailings

Questionnaires sent, completed and returned by former students in response to special requests of educational administrators (in contrast to standard RESOE procedures) are not included in the discussion above. The total number of questionnaires sent in this category is 588. Of these, 31 were completed and returned; thus the return rate in this category is only 5%, significantly less than the return rate for questionnaires sent through standard procedures.

e. Tentative Conclusions

The following tentative conclusions can be drawn from the data given above:

1.) The difference between mailing modes was slight, therefore, because the cost of bulk mail is far less than that of first-class mail, bulk mail would be the most cost-effective mailing mode in future mailings.

2.) The second mailing increased the return rate significantly (ignoring the effect of "undeliverables," it increases the rate from 26% for the first mailing alone to 39%

in combined mailings); however, the cost for two mailings is very nearly double the cost of a single mailing. Because doubling the cost does not double the return rate, the second mailing is not cost-effective in terms of return rate alone; on the other hand, simple return rate may not be an appropriate or comprehensive criterion for effectiveness.

f. Data Summary

The table below depicts the results described above.

Mailing	Number Sent	Number Completed and Returned	Percent Returned
First(machine-stamped)	3,945	992	25
First(hand-stamped)	1,401	387	28
First(bulk)	1,486	354	25
First(total)	6,732	1,733	26
Second(total)	4,999	864	17
Overall(gross, i.e., including "undeliverables")	6,732	2,597	39
Overall(net, i.e., discounting "undeliverables")	5,944	2,597	44
Special	588	31	5

2. ISES for Occupational Education[25]

An Instructional Support and Evaluation System (ISES) for occupational education can provide a means for more effectively using instructional resources. ISES can do this by providing support for managing (i.e., designing, implementing, evaluating, and redesigning) occupational programs in terms of their objectives and content, and by providing support for managing (i.e., planning, monitoring, controlling, and replanning) delivery of instruction in the classroom.

ISES efforts, as discussed in this report, include the following two major components:

- Program analysis and design;
- Information processing.

Program analysis and design strives to identify discrete occupational education programs and their component subprograms, to formulate program objectives in terms of terminal objectives and their component intermediate objectives, and to design modular curricula in terms of their module objectives, instructional content, activities, criterion-referenced tests and resources. Information processing is required to put the

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[25] The discussion of this section draws upon experience gained by RRI in work performed for the Guilderland Central School District since 1971 in developing an instructional support system for reading and mathematics. (See for example The Development of an Instructional Support System, renewal proposal, submitted to the Guilderland Central School District Number 2, Guilderland, New York, 1972.) It also draws upon a concept paper prepared for Dr. Robert Seckendorf in September of 1973 entitled, Improving the Management of Instruction in Occupational Education in New York State.

design into operation by recording data and by providing analyses necessary to support decisions regarding classroom instruction, classroom resource allocation, student guidance and student placement.

This section discusses the general concept of ISES for occupational education, briefly reviews systems currently used in occupational education in New York State, draws some conclusions regarding the current situation, and based upon these conclusions, makes recommendations for future work.

a. Concepts for Developing ISES in Occupational Education

A general goal that ISES for occupational education shares with other processes within occupational education is to improve the effectiveness of occupational education programs. ISES improves program effectiveness by providing a means for designing, implementing, evaluating, and monitoring programs to improve attainment of terminal, program objectives. Associated with this goal, ISES possesses the following objectives:

- To provide an explicit mechanism for formulating and evaluating terminal objectives associated with occupational education programs;
- To provide an explicit mechanism for designing curricula in terms of their overall modular structure and the contents of individual modules;
- To provide procedures for acquiring and processing data on teaching activities, instructional resources, and criterion-

referenced test scores, and for preparing reports based on these data to support local management of the delivery of instruction;

- To provide procedures for monitoring and evaluating programs and their component modules;
- To provide documentation of student performance for student placement and certification;
- To provide students (and parents) with current information regarding students' progress based on measurement of student progress towards intermediate performance objectives.

The first two objectives are associated with program analysis and design; the remaining objectives are associated with information processing.

1.) Steps in Program Analysis and Design

Meeting the objectives associated with program analysis and design requires taking three steps.

a.) First Step: Defining Terminal Objectives

ISES program analysis and design begins with identifying the skills required for entering specific occupations, or equivalently, defining terminal, program objectives. The specific set of skills required for a particular occupation comprises a set of terminal objectives for the educational program intended to train students for that occupation. Some of the specific skills comprising the set for a given occupation are unique to that occupation; some are common

to a few, closely related occupations; some (reading or simple arithmetic skills, for example) are common to all occupations.

Program design needs to be based on information concerning the requirements for obtaining jobs. One way[26] of obtaining information for the design of a program (i.e., its terminal objectives) is to obtain it from persons actively engaged in the occupation for which that program trains students. Thus program design elicits information from employers and employees (e.g., through their labor unions). For each program, a formal group might be established consisting of selected individuals (educators, employers, and union representatives) whose experience and capability are required to formulate terminal objectives. A consensus then can be reached on a provisional definition of terminal objectives for the program.

Program design of this type generally proceeds most effectively by iteration. Using existing data, a design is adopted, and subsequent to implementation, data can be obtained to improve the design. As the refined design is implemented, more data become available and the design is refined further.

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[26]For example, an alternative approach is discussed in Part IV of the proposal for the development of Targeting and ISS in Occupational Education submitted by SED to the U.S. Office of Education. The alternative discussed in that proposal involves professional job analysts (to "cluster" jobs having commonalities) and professional occupational education program designers (to formulate terminal and intermediate objectives). Job analysts and program designers obtain information from existing literature or from persons having pertinent knowledge.

This process of iteration never completely ceases because job requirements generally can be expected to change with time. Thus, even if a set of objectives were adequate at a given point in time, changes in job requirements subsequently might make the design obsolete.

b.) Second Step: Modularizing Programs

Although the initial list of terminal objectives is obtained by consensus among various groups, the second step in program analysis and design primarily involves occupational educators. The second step consists of breaking down terminal objectives into sets of specific skills or intermediate objectives (sometimes called instructional, performance, or behavioral objectives). This process is likely to be performed best by occupational educators.

For the purpose of delivering instruction within a program, the skills or intermediate objectives comprising the program are organized into units of instruction, called modules, in which closely related skills are taught using instructional resources that are related to each other. Modules within a program must be logically connected to each other, and must relate to the terminal objectives of the program.

Figure 6 depicts the concept of a "branching tree of modules" for occupational education. At the base of the "tree," students enter a module in which skills necessary for all occupational programs are provided. The student progresses upward through the "tree" by taking modules that are increasingly more specialized as the "tips of the branches" are approached. By the time a specific "tip" is reached, students will have acquired the full set of skills necessary for entering a particular occupation.

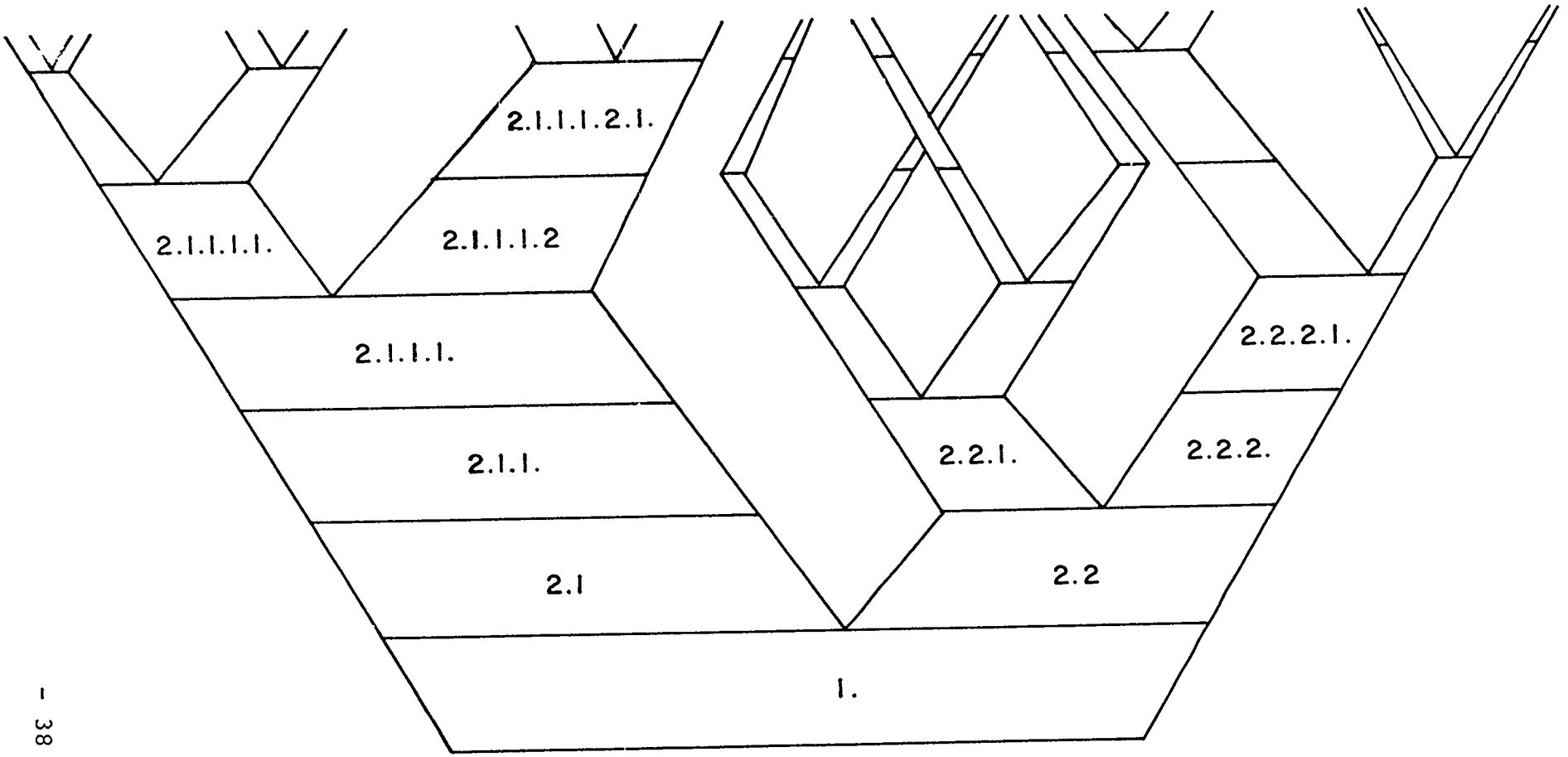

FIG. 6 "BRANCHING TREE" MODULAR CURRICULA

c.) Third Step: Establishing Standards and Measures

The third step in the anlaysis and design process is development of standards and measures of effectiveness for program evaluation. Evaluation data indicate how well objectives are being achieved. Evaluation data are related to terminal (program) objectives and intermediate (module) objectives. Evaluation data provide a means of accountability, in terms of these objectives, at the SED, LEA, and classroom levels.

Evaluation data pertain to effectiveness. In addition, data pertaining to costs are required. These might be expressed in terms of cost per student, cost per graduate, cost per initial placement, and cost per wage-earner over the long-term.

To monitor the delivery of instruction and the mastery of skills, criterion-referenced measures of effectiveness must be defined for intermediate objectives. Skills check lists might be an instrument for entering data regarding skills mastery into a computer to record student progress. In cases where skills are not acquired, the computer can provide teachers with information regarding available alternative instructional methods that might facilitate mastery.

2.) Steps in Implementing Information Processing

Implementing the information processing component of ISES can be based, to a considerable degree, upon procedures developed for use in the Guilderland Central School District to support the delivery of instruction in reading and

mathematics curricula.[27] Software, hardware, and instruments currently used need to be modified to tailor them to the special features of occupational education. In general, these modifications are straightforward and can proceed in parallel with program analysis and design. However, two new information processing procedures not required in the Guilderland Central School need to be developed for occupational education.

Procedures developed for use in the Guilderland schools do not include procedures for specifying the optimal point of entry into a program for a secondary student wishing to make a change of programs or for an adult with work experience wishing to acquire new skills. These procedures need to be developed. They would be used to assess skills possessed by the person entering a program and compare them with skills associated with the terminal objectives of that program. Based upon this information, the point of entry into the program would be determined so that modules are taken that provide only skills not yet acquired by the student. Such procedures require specifying the component skills of each program in a codified way so that the correspondence of skills taught in different occupational programs can be recognized.

Procedures for scheduling also are required. Scheduling of modules having different lengths is quite difficult. Computerized scheduling techniques are needed to permit flexibility in module design and to take full advantage of the potential for increasing cost-effectiveness.

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[27] The Development of an Instructional Support System, renewal proposal, submitted to the Guilderland Central School District Number 2, Guilderland, New York, 1972.

In addition to providing information to be used directly by educators, the information handling component of ISES provides a means of monitoring the system. Administrators are given evidence that the system is operating according to specifications, i.e., that student plans are being formulated, that schedules are being devised, that resources are being allocated, that students are being instructed, tested and passed from module to module according to plan, that documentation is occuring, and that students are being placed in jobs matching their acquired skills.

3.) Overview of the Advantages of Modularized Curricula

A major advantage in modularizing curricula is the improved efficiency of utilizing educational resources that modularization makes possible. Modules defined for separate programs may contain many common skills. Where redundancy exists between modules of different programs, a single, common module can be defined that provides instruction for all programs to which it is applicable. (See Fig. 6, page 38.) Thus a single module might be utilized in programs having different terminal objectives. Resources necessary for delivering instruction in different programs can be shared through the use of these resources in a module common to several programs. Common use of resources leads to cost reductions.

A second advantage in modularizing curricula is that students do not have to commit themselves to a particular occupation prematurely, for example, they do not have to make an unalterable decision at the time of their entry into occupational education. Rather, they can proceed towards a preferable occupation with continual options of making choices regarding the occupation they wish as they elect increasingly more specialized modules.

A third advantage is that program changes near the end of a program (changes that might require the student to master a substantial number of skills within the newly elected program) can be undertaken in an efficient manner because a mechanism is provided for explicitly identifying required skills. Guidance counselors and students readily can plan "re-tracking" in which only modules required to provide skills required by the newly elected occupation are taken by the student. In addition, individuals who wish to change occupations after having been employed for some time can profit from the modular curriculum design. Such individuals are likely to possess skills acquired during their period of employment and to possess greater maturity, motivation and responsibilities than secondary level students. Consequently, the optimal retraining program for such individuals can be determined by special tests and can utilize special modules that take advantage of these students' maturity and experience, and that minimize temporary losses in their earning power.

4.) Summary of the ISES Concept

The ISES concept briefly described above has the following three important characteristics:

- Iterative methods are used for determining terminal, program objectives (equivalent to job entry requirements), and for determining intermediate instructional objectives;
- Methods are provided for managing programs and instruction, and for iterative module design based on data;

- Iterative methods are provided for setting standards for and measuring student performance and program effectiveness.

Attaining the goal of comprehensive instructional management requires developing a system based on the concept that incorporates all three characteristics.

b. Review of Agriculture Curriculum Modularization and ESCOE

Within SED, two activities related to ISES currently exist. These are the modularization of the agriculture curriculum and the development of the Evaluation Service Center for Occupational Education (ESCOE). In this section, these two activities are briefly described and critiqued in terms of the ISES concepts discussed above.

1.) Agriculture and Curriculum Modularization[28]

An approach to curriculum modularization, compatible in some respects to the approach implicit in the ISES concepts discussed earlier, has been undertaken in the agriculture curriculum.

This work began in 1967 and currently is being carried on under the direction of Mr. Lee Traver, Chief of the Bureau of Agricultural Education in the Office of Occupational Education at SED. Initial work consisted

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[28]The discussion of this section is based upon a meeting with Mr. Lee Traver, Chief of the Bureau of Agricultural Education, and upon written materials provided to RRI by Mr. Traver. The purpose of this brief discussion is to provide an overall critique of the current approach and thus it considers only those characteristics deemed most relevant to that critique. Other published materials on agriculture curriculum modularization describe the approach in detail.

primarily of partitioning the agriculture curriculum into five major areas. This partitioning was intended to provide a framework for defining programs of instruction in which closely related sets of skills are taught. Although the initial approach was not modularized as defined in the discussion of the ISES concept earlier in this report, it represented a first step towards modularizing an occupational curriculum.

The second step was to revise the partitioning of the agriculture programs to include seven (rather than five) major areas, to define modules more explicitly, and to conduct pilot studies. During the 1970-71 school year a pilot program was instituted in two BOCES. Encouraged by the results of the first pilot program, a second pilot program was undertaken during the 1971-72 school year in which nine BOCES and the Salem School District participated. However, subsequent to these two pilot programs, BOCES and school districts only have been informally using and evaluating the work.

The curriculum center in SED has supported this work by providing funds (under VEA-68[29]) to compensate educators participating in the design of modules. The Instructional Materials Service at Cornell University also has supported the work by providing lists of instructional materials, and helping to guide and advise educators involved in module design.

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[29]Vocational Education Amendments of 1968, Public Law 90-576.

a.) Approach Used in Modularizing the Agriculture Curriculum

The agriculture program has been divided into seven general areas termed "major groups." Within each major group, several occupational areas were defined, and, within each area, specific occupations were defined.

Committees consisting of educators (teachers, guidance personnel, and administrators) and advisors (employers and union representatives) compiled sets of terminal objectives for each specific occupation. The involvement of employers and workers active in the field was encouraged. However, their role was viewed as providing advice rather than actively participating in specifying terminal objectives. In practice, the involvement of noneducators ranged from active decision-making at one extreme to informal review at the other. The ISES concepts discussed earlier strongly advocate active participation of noneducators as one alternative method for selecting terminal objectives.

After terminal objectives were established for agricultural occupations, a modularized curriculum was designed for each occupation. The first step was specifying modular units of instruction comprising the program for each job. The modules were constrained to accommodate thirty hours of instruction and to be largely independent or "free-standing" (in the sense that having one module as a prerequisite for another was avoided) to permit freedom in scheduling. Given these constraints, qualified educators designed modules in terms of a general description, units of instruction (topics), objectives (intermediate or performance objectives), content, teaching methods, student application activities, evaluation

procedures, and resource materials. These terms have the following meanings:

- Units of instruction (topics) are subdivisions of module content in instructional terms. (The current process calls for defining these units in advance of defining performance objectives; logically, however, the objectives ought to be defined prior to prescribing aspects of instruction intended to lead to attainment of objectives.)
- Performance objectives are definitions of measurable capabilities the student is to develop as a result of taking the module. (Defining these capabilities logically should be the first design effort in module design; however, in the current approach, objectives are defined after the units of instruction are specified. In the current process, objective definitions also state where are under what conditions the student is to acquire skills, and the level of mastery expected.)
- Content refers to the explicit components of a unit of instruction. For example, in a module entitled "Feeding Dairy Cattle," the units of instruction are "Digestive Tract and

Processes," "Available Feeds," "Nutritional Needs of Springing Heifers and Dry Cows," "Nutritional Needs of Milking Cows," and "Feeding Practices"; content elements for the first unit might be "anatomy" and "physiology." (Although these are appropriately part of the module design, they should be developed systematically by basing them upon the objectives defined for the module. In the current method, dependence of content upon objectives is not clearly identified.)

- Teaching methods, student application activity, and available resource materials are self-explanatory, closely related components of module design.
- Evaluation procedures are methods to be used to determine student achievement. A variety of "tests" have been prescribed for use in each module for measuring mastery of skills defined in the objectives. These are criterion-referenced tests; the objectives serve as the criteria.

As students enter the agriculture program, a guidance counselor explains the modularized curriculum, the major groups, the occupational areas and the terminal objectives associated with each career. The student and counselor then formulate a training plan in terms of modules to be taken

and, when necessary, the sequence in which they are to be taken. Based upon the plans devised for all students, schedules are planned for the year; schedules are arranged to permit teaching those modules elected by the greatest number of students. Thus, the system is very sensitive to the needs of students.

An additional attribute of the method currently used is that the explicit definition of module content in instructional terms makes clear to teachers the subject matter of the module; a teacher can recognize areas in which his background is strong and others in which it is weak. Thus a teacher can take steps to reinforce his capabilities in areas of relative weakness.

b.) Significant Discrepancies

This section addresses the most significant discrepancies between the currently used approach and the proposed ISES concept. Attention is given to those characteristics that appear to be significant in terms of standards or criteria derived from the ISES concept. This brief critique is intended to provide a basis for specifying the first steps of iteration required to develop ISES from current efforts within SED.

i. Module Length

A significant constraint on the approach that has been used in agriculture is that modules are designed with a single length: thirty hours of instruction. The purpose of imposing the constraint is to minimize the difficulty of scheduling. Scheduling fixed length modules is difficult; scheduling variable length modules appears to be impractical without computer assistance. Lacking cost-effective methods of scheduling variable length modules, work on the

agriculture curriculum had to proceed within the constraint of single-length modules.

Using single-length modules imposes a limit on flexibility in module design. A module that could be shorter than thirty hours currently might have to be "stretched" or combined with elements of a related module to form a single module of thirty hours duration.

ii. Module Interdependence

A consequence of the constraint of single-length modules is that modules are designed to be "free-standing" or independent. Such free-standing modules can be scheduled randomly because of minimal interdependence among modules. However, because modules are free-standing, improvements in program efficiency that could result from the sequenced, "branching tree" approach (described in the earlier sections discussing ISES concepts) may not be realized.

iii. Module Evaluation and Redesign

The lack of explicit mechanisms for evaluating and redesigning modules also represents a significant discrepancy between the current approach taken in ESCOE and the ISES concept. At present, evaluation forms are provided to students and educators to record comments on the modular approach and on individual modules. These materials provide information that can support evaluation and redesign to some extent, but they are limited because they provide insufficient objective information.

As stated in the ISES concept, measurement techniques are needed to evaluate the effectiveness of modularization, the validity of terminal objectives, the utility of intermediate objectives, and the effectiveness of

other components of modules. As in all system designs, measures of effectiveness should be related directly to objectives. Performance should be compared to objectives using measures related to the objectives; such objective-based measures need to be formulated for the modularization approach, each program, and each module.

iv. Monitoring Mechanisms

Explicit procedures for monitoring have not been developed in the current, agricultural modularization effort. According to the ISES concept, ways should be provided to verify that student applications are distributed, received, and processed; that counselling is occurring; that individual student programs are being planned; that schedules are being devised; that resources (personnel, equipment, supplies, and facilities) are being allocated and utilized in delivering instruction; that students are attending, acquiring skills, and proceding from module to module; that work to formulate and revise terminal and intermediate objectives is being performed.

v. Procedures for Formulating Terminal Objectives

The final discrepancy is the manner in which terminal objectives have been formulated. According to the ISES concept, the selection of terminal objectives needs to be based on knowledge of the skills required in occupations. One way to obtain this knowledge is to formally involve noneducators active in the fields for which students are being trained throughout the processes of defining terminal objectives. These noneducators have an intimate and thorough understanding of job requirements and can provide useful information and judgements pertinent to terminal objectives. Given

this information, educators can better understand requirements of employers and translate these requirements into suitable terminal and intermediate, program objectives.

2.) ESCOE[30]

The Evaluation Service Center for Occupational Education (ESCOE) has been developed with the intent of improving the efficiency of delivering occupational instruction at the local level. Work in ESCOE currently emphasizes the creation of banks of objectives for courses of instruction.

a.) Overall Approach

ESCOE is intended to serve as an aid to teachers and as an accountability instrument. It is intended to perform its functions flexibly, to accommodate wide variation in local usage, and to evolve iteratively towards an optimal system.

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[30]The discussion of this section is based upon a meeting with Dr. Louis Cohen, Chief of the Bureau of Occupational Education Research, and upon the following written materials provided to RRI by Dr. Cohen: Massachusetts and New York Evaluation Service Center for Occupational Education (planning document; published May, 1970); Evaluation Service Center for Occupational Education (final report submitted to Massachusetts and New York Departments of Education by the University of Massachusetts Center for Occupational Education; June, 1972); The Compatability of ESCOE with Other New York State Education Department Instruction, Resource and Information Systems (report prepared by the Institute for Educational Development in cooperation with the New York State Education Department Bureau of Occupational Education Research; November, 1972).

The purpose of this brief discussion in this section is to provide an overall critique of the current approach, and thus it considers only those characteristics of the approach deemed most relevant to that critique. The published materials cited above describe ESCOE in detail.

To realize these intentions, the approach used in ESCOE has been to elicit from educators (teachers and administrators) suggested objectives, tests, and resources for courses of instruction. Primary emphasis to date has been placed on developing a bank of objectives; secondary emphasis has been placed on developing a bank of test items associated with objectives; tertiary emphasis has been placed on developing a bank of instructional resources (models, filmstrips, texts, slide sets, etc.) associated with the objectives. However, substantial effort has been devoted only to ojective bank development.

Bank development proceeds by asking educators to submit descriptions of suggested, useful objectives, tests, and resources to ESCOE.

Educators are asked to define the overall objective of a course, describe the overall topic comprising the course, list and define subtopics, and finally formulate specific subobjectives associated with each subtopic. (Presumably, these subobjectives are equivalent to intermediate objectives described in the earlier section discussing the ISES concept.) At the same time, educators provide lists of tests and resources appropriate for each subobjective. Information acquired in this manner is assigned a code number beginning with a number corresponding to a U.S. Office of Education occupational program code number and ending with six digits that identify the topic and subtopics of the course.

After code assignment, the information provided by educators is entered into a computer file. A subsequent request for information regarding objectives, tests, or resources is translated into codes for the appropriate topics

and subtopics comprising the request. The computer is interrogated and printouts are generated that contain all information in the files (i.e., lists of subobjectives, tests, or resources) pertinent to the request.

In addition to the Bureau of Occupational Education Research, other education-related offices and bureaus within the State currently are involved in ESCOE operations. For example, the Educational Programs and Studies Information Service (EPSIS) typically receives requests for information regarding objectives, tests, or resources, and forwards these requests to the Office of Research and Evaluation. The Special Education Instructional Materials Center (SEIMC) has participated in cataloging resources relevant to specific subobjectives. The computer of the Computer Based Research Unit (CBRU) system, housed within the Curriculum and Evaluation Center of the State University College of Buffalo, has been used to store and retrieve ESCOE information.

b.) Significant Discrepancies

Several discrepancies appear to exist between the approach taken in ESCOE and the ISES concept discussed earlier. Discrepancies discussed below do not represent deficiencies in an operating system (i.e., deficiencies that might be eliminated in time through iteration) but discrepancies between ESCOE and ISES on the conceptual level. This discussion recognizes that although ESCOE is a development effort, pursued largely on an informal basis, the existing banks of information within ESCOE (particularly objective banks) represent a valuable resource for ISES program analyses and design.

i. Program View; Terminal Objectives

In ESCOE, a view of instructional programs tailored to achieve specific terminal objectives is

not taken. Instruction is viewed as consisting of a set of individual, independent courses, and objectives are defined for courses without reference to integrated programs or terminal objectives. Consequently, potential improvements in the efficiency of delivering instructions may not be realized. The ISES "branching" tree of modules and its attendant benefits are precluded because of the absence of a program-oriented perspective.

ii. Procedures for Formulating Objectives

As well as lacking terminal, program objectives, the ESCOE approach relies soley upon educators to formulate course objectives. No explicit mechanism exists for providing the educators who are responsible for objective formulation with information on job market requirements. As discussed earlier in the section on agriculture curriculum modularization, one way to obtain information necessary for formulating terminal objectives is to obtain it from employers and organizations of employees active in the field for which objectives are being formulated.

iii. Evaluation Procedures

Evaluation mechanism designs appear to be absent in ESCOE. Evaluation methods only appear as tests to be used in conjunction with subobjectives within each course. Presumably, tests specified in association with subobjectives might provide a basis for evaluating course effectiveness; however, little attention appears to have been given to test development and validation.

iv. Monitoring Mechanisms

No design has been developed for monitoring instruction and no attention has been given to the need for reports to teachers or for recording of student achievement or objectives. Consequently, no mechanism for monitoring is apparent and no hardware or software have been specified to support the monitoring process.

c.) Development Plan

A programmatic plan for developing and implementing ISES needs to be formulated. The plan should take into account the attributes and shortcomings of existing work in agriculture curriculum modularization and ESCOE, and should permit building from the strengths of these efforts toward an integrated instructional support and evaluation system that can serve the needs of occupational education.

i. Elements of the Plan

A significant shortcoming of the current efforts is that they are uncoordinated. They are pursued as independent ventures. Neither gains from the other, and no way exists to anticipate and avoid duplication of effort and cost. The two efforts could be integrated by establishing a single entity to coordinate them and to promote efficient and effective progress towards further defining and realizing the ISES concept.

Effort might be focused on one or a very small number of programs. Because of the work already performed in the agriculture program, and work in ESCOE on the practical nursing program, these two programs are obvious possible candidates.

As stated earlier in the discussion of ISES concepts, design proceeds from the formulation of terminal objectives, to the translation of terminal objectives into intermediate objectives. The set of intermediate objectives then is partitioned into subsets of objectives for which related resources and instructional methods are needed. These subsets of related intermediate objectives are used to define modules, and the dependencies of one subset (or module) upon acquisition of skills associated with other subsets (or modules) defines a sequence in which modules are to be taken.

Using the agriculture program as an example, work already performed can provide a starting point for defining terminal objectives. Individuals involved in agriculture could be involved in reviewing and approving tentative terminal objectives and in contributing alternatives to those already formulated, modifying those deemed suitable, and suggesting new ones. (However, in the future, formulation of terminal objectives might actively involve noneducators from the outset.)

ESCOE banks of agriculture-related objectives could be examined to identify candidate intermediate objectives for each terminal objective. The existing coding system for each ESCOE intermediate objective might be suitable for sorting existing objectives; if the existing coding system is inadequate for sorting purposes, an alternative might be devised.

Concurrent with design effort directed towards program objectives, module objectives, module contents and module interrelationships, design effort also must be directed towards measures of effectiveness for evaluating the modularization approach, programs and modules. Having

defined the measures, procedures for obtaining and evaluating data must be developed, and formal procedures for redesign must be established.

Monitoring processes also must be designed so that a means exists to ascertain that actions intended to be taken in an operating system actually are taken.

Software, remote data entry hardware, data entry instruments (e.g., test score sheets), and reporting instruments (e.g., skills mastery reports and module completion reports) also must be specified and designed.

To take full advantage of the potential benefits of ISES, a mechanism for scheduling variable length modules needs to be developed. Such a scheduling method eliminates the constraint of fixed-length modules. At this juncture, program analyses and design faces a "trade-off" decision. The advantages to be gained by developing a scheduling mechanism may not outweigh those to be gained by proceding with implementation of fixed-length modules. A preliminary investigation may be required to make the decision; for example, existing scheduling "packages" might be examined. A variety of scheduling "packages" currently are available. One of these may be suitable or adaptable, or design of a new "package" may be required.

Formal evaluation and redesign processes, formal monitoring processes, software, hardware, instruments, and scheduling methods would be applicable to all programs. They are required whether a single program is modularized or all programs are modularized. Thus they must be developed even though the cost may be high, in order to proceed with establishing ISES concepts for the programs in which initial

work takes place. As additional programs become modularized in the future, the costs for developing these processes and methods become distributed among all the programs and the "per program" costs become lower.

ii. Summary

Figure 7 depicts the developmental process discussed above.

3. Attendance Subsystem

This section discusses the potential of incorporating attendance procedures into RESOE.

RESOE is based on a unit-file record-keeping system. A file is established for each student and updated periodically. Attendance systems have equivalent characteristics. Integrating required attendance operations with RESOE operations may streamline both operations by avoiding duplication of effort. Combining the two operations can proceed from either of two perspectives: currently used attendance procedures for file creation and updating might replace corresponding, currently used RESOE procedures; RESOE might be expanded to include attendance operations.

Integrating existing attendance and RESOE operations potentially leads to two benefits. Expensive and time-consuming "manual" procedures now commonly used (particularly in small local agencies) for collecting and processing attendance data can be replaced by a more efficient, rapid, computerized procedure; RESOE student files can be revised continuously and automatically.

a. Current Situation

In this section, the current situation is described

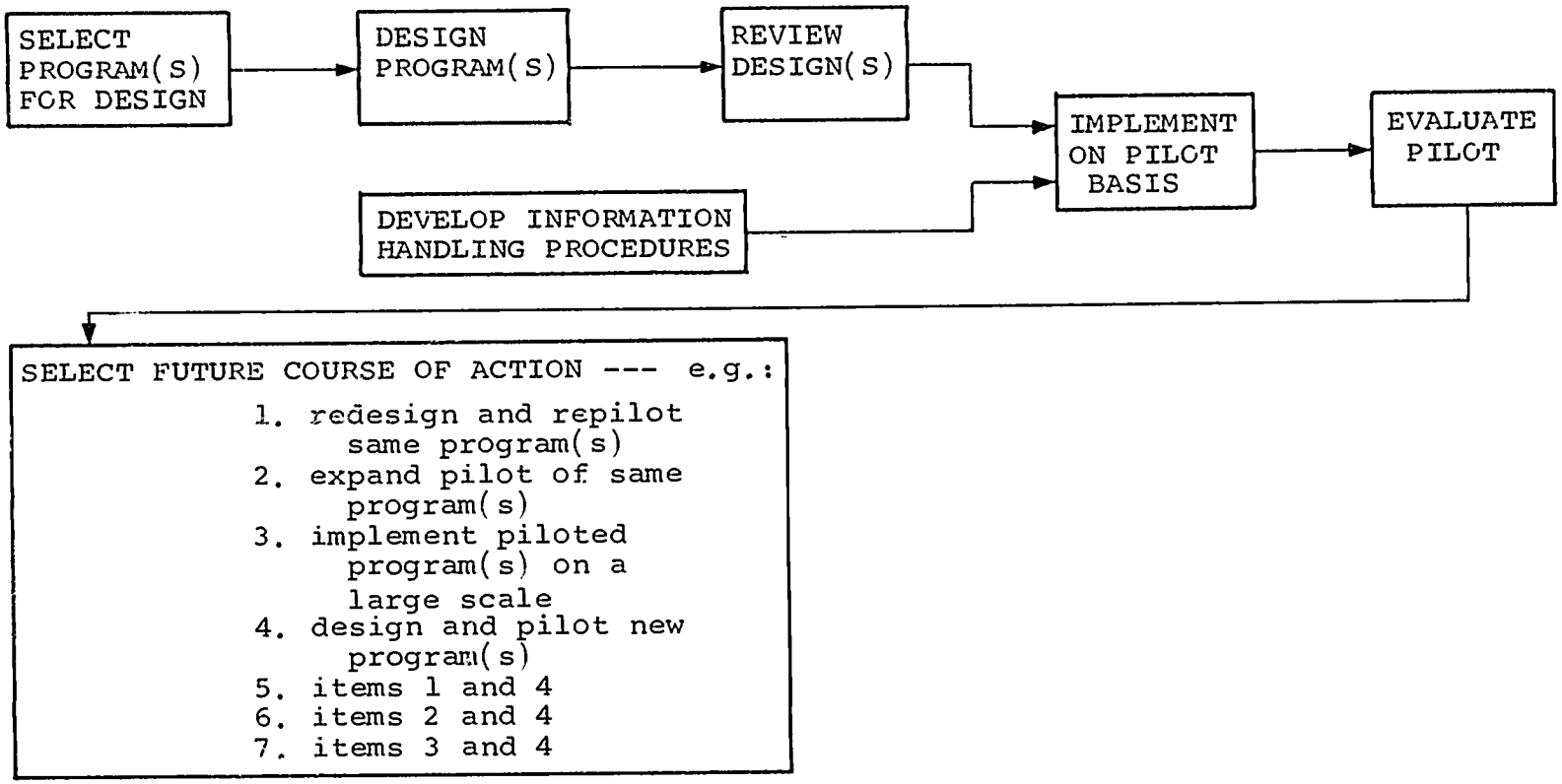

FIG. 7 STEPS IN DEVELOPING ISES

in two parts. First, local uses of attendance data briefly are reviewed. Second, an overview is provided of current methods of acquiring and reporting attendance data.

1.) Uses of Attendance Data

Local agencies are required to obtain and record attendance data for the following general purposes[31]:

- To submit Weighted Average Daily Attendance (WADA) reports in order to receive State Aid funds;
- To obtain data necessary to perform mandated student supervision and counselling services.

State Aid funds are apportioned among local agencies by using a formula involving attendance data as the critical variable. Daily attendance data are compiled into reports at standard intervals (four-week or five-week). An official record of daily attendance must be maintained. Traditionally, the class register has been used as this legal record, but computer files now may be used. In the latter case, a computer printout becomes the official document.

Local agencies are required to maintain cognizance of individual student attendance so that, when necessary, they can provide counselling for students or take legal action against parents. One or more members of the local agency staff are designated attendance officer. Persons having

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[31]See "Legal Information Concerning School Attendance," a report prepared by the SED Bureau of School Social Services, revised September, 1970.

the responsibilities of attendance officer rely upon attendance data and other information to take action (counselling or legal) in cases of illegal absence, and to investigate suspicious absences or patterns in absences to ascertain whether counselling or legal action are in fact required. (In addition, attendance officers typically assume responsibilities associated with maintaining a census of school-age children in the school district, and maintaining records of student employment, issuing work permits, etc.[32])

To support attendance officers in local schools, most BOCES provide attendance reports to local schools every day. These reports provide attendance data on students attending the BOCES from each local school affiliated with the BOCES. In a typical BOCES, each day consists of a morning and afternoon session, and reports are prepared for local schools at the end of each session.

b. Current Methods of Obtaining and Reporting Attendance Data

This section briefly describes two currently used procedures for collecting and processing attendance data. This description is based on information provided by personnel associated with a small number of BOCES in Regions 8, 9, 10, and 11, and with the City of Rochester School District. The situation existing in these BOCES seems to be typical of small-

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[32]See "Legal Information Concerning School Attendance," a report prepared by the SED Bureau of School Social Services, revised September, 1970.

and medium-sized BOCES throughout the State. The situation in the City of Rochester is an example of a modern, efficient, computerized individual student file, record-keeping system that obtains and processes a variety of data, including attendance data, for a variety of reporting and analytic purposes. (The City of Syracuse and the large Nassau County BOCES use similar systems.)

1.) The Situation in BOCES

BOCES attendance procedures rely heavily upon manual effort. An occupational education teacher in a BOCES typically provides data each day on students attending his class by filling out a form or a computer card. The form (for an entire class) or computer card (for each student) then is transported to a central office within the BOCES.

If a form is used, a secretary or clerk (in one BOCES, a nurse) transfers data from each class to a central log for the BOCES and a daily attendance report for each affiliated school. Information may be transferred to the school verbally over the telephone, or by carrying a report on the bus that returns students to their home school.

If a computer card is used, cards are sorted by machine into groups for each school. The sorted cards are then manually examined to enter information into the BOCES log and prepare daily reports for each school.

Data on students attending BOCES are submitted to affiliated schools each day so that attendance officers in each school can be appraised of their students' attendance in a timely fashion.

In many cases, school and BOCES attendance data are processed by a data-processing BOCES to prepare standard (four-week or five-week) attendance reports in compliance with "State Aid" requirements.

2.) The Situation in the City of Rochester School System

The Rochester school system is using a unit-file system of student record-keeping that is analogous in many respects to RESOE. (As stated earlier, the City of Syracuse and the Nassau County BOCES use similar systems.) A file is established for each student upon entry into a Rochester school. The student is identified by a seven-digit number that is retained throughout the student's enrollment. (A student returning to a Rochester school after transferring out of the system is reassigned his original identification number.) The file for each student contains his location in the school system, personal information, grades, attendance, and other data. The file can be expanded (or contracted) as new needs for data are perceived (or existing ones are deemed obsolete).

Prior to the beginning of each school year, schedules and class assignments are made for each student. The system is sufficiently flexible to accommodate changes that may occur subsequent to the opening of school. (Typically, class assignments for about 25% of the students must be changed after school opens.)

In each school, an attendance register is kept for each instructional period. This is an official document that never leaves the school. Teachers enter attendance data in the register during each period. At the end of the five-week attendance period, a secretary in the school office

transcribes attendance data from the register to a form that is readable by a mark-sense optical scanner. (Rochester uses eight five-week attendance periods that coincide with its grading periods.)

Attendance data are entered into individual student files in the computer using an optical scanner. Periodic attendance reports then are generated from these data in compliance with "State Aid" requirements. In addition, and even more important to educators in the system, attendance data, as well as other data items in individual student files, routinely are incorporated into reports specified by school administrators in Rochester.

3.) Summary of the BOCES and Rochester Procedures

This cursory examination of BOCES procedures associated with acquiring and processing attendance data indicates that the manual procedures being used in small BOCES and satisfying local needs are adequate for preparing WADA reports. However, a centralized, computerized procedure that is less costly than current, labor-consumptive methods might be acceptable to BOCES.

The procedures used in the City of Rochester school system employ modern, efficient, computerized methods. Much of the experience gained in Rochester might be applied to developing a RESOE-related attendance package.

Recalling the two perspectives mentioned at the beginning of this discussion, the perspective in which attendance procedures are added to RESOE is applicable to the small BOCES, and the perspective in which RESOE relies upon existing attendance procedures for RESOE file creation and updating is applicable to the City of Rochester and equivalent

facilities. In the former case, small BOCES would gain from the replacement of labor-intensive procedures with RESOE-based, computerized procedures for obtaining and processing attendance data. In the latter case, RESOE and personnel in the schools gain by utilizing existing procedures to support RESOE and therefore to reduce duplicative effort.

c. Design Specifications

Design specifications for a RESOE attendance package can be drawn from two views. In one view, specifications are based on the requirements of local agencies. In the other view, specifications are based on the needs of RESOE for a mechanism to update enrollment files.

1.) Specifications Based on Local Agency Needs

The RESOE attendance package must be able to support local WADA report preparation and student supervision and counselling. To do this, the package must perform the following functions:

- Daily acquisition of attendance data;
- Periodic processing of attendance data to provide standard individual student attendance reports for use by attendance officers within local agencies. (In the case of BOCES, reports to local schools must be generated daily);
- Periodic (four-week or five-week) and yearly processing of attendance data to provide standard periodic WADA reports for obtaining State Aid funds;

- Periodic data analyses for local attendance officers to reveal patterns (temporal or "interstudent") in absences, in order to detect individual student problems that may require counselling.

2.) Specifications Based on the Needs of RESOE

The general need of RESOE is for a simple, cost-effective method to keep enrollment files current. An attendance package seems to be ideal for satisfying this need because local needs for improved methods of acquiring and processing attendance data can be satisfied simultaneously with satisfying the needs of RESOE.

To satisfy the needs of RESOE, combining existing RESOE procedures with attendance procedures, must contribute to performing the following general functions:

- Establishing individual student files;
- Updating student files by obtaining and processing data related to changes in student status within a local agency;
- Providing information for evaluation (of programs, modules, or instructors) by obtaining and processing attendance for inferring student "motivation".

The last two functions depend upon data obtained directly from a classroom.

Data related to student status include, for example, student transfers from one class to another within a local agency. (Another type of data that might be obtained

with attendance data from the classroom is data on student skill mastery and module completion in an ISES[33] context.) However, changes such as program changes within a local agency, and transfers into or out of a local agency might not be indicated by attendance; such data might be obtained directly from the administrative personnel of the local agency.

Attendance data might be used to infer student "motivation" for the purpose of evaluating programs, modules (in an ISES context) or instructors. Developing reliable measures for this purpose will be difficult, but attendance data, if properly used can contribute to evaluation. For example, unusual absences, (numbers or patterns) currently are used as an indicator of personal problems in individual students. Generally low student attendance in a local agency might indicate that factors outside the control of the agency are limiting the effectiveness of the programs in that agency. Generally low student attendance in a program might indicate inadequacies in program design. Generally low attendance in a particular module might indicate a deficiency in module design or in the delivery of instruction. These are only a few obvious examples. Any attempt to use attendance data as a component in a measure of effectiveness must be based on very careful design and analysis of the measure itself.

d. Generalized System

Based on the requirements sketched above, the general nature of one possible way to combine RESOE and attendance procedures can be described. This description is intended

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[33] See Chapter III, Section B, Part 2 of this report.

only to illustrate the features implied by the requirements and specifications presented earlier.

1.) Subsystem Example

At the time of enrollment in a program (at the beginning of or during the school year), each student fills out an enrollment form equivalent to the currently used RESOE enrollment form. This form acquires all data necessary for initially creating student files for enrolled students. An identification number for each student is established at this time.

Based on the information obtained on enrollment forms, attendance-taking instruments (cards or forms) are prepared for each class. The instrument must obtain data on absences (legal and illegal) and tardiness. (Other data for file maintenance might also be obtained in the classroom, such as data on "dropouts," transfers, course changes, etc.)

In the case of BOCES, data provided by daily classroom attendance instruments must be processed each day to provide attendance data. This capability is essential because BOCES must submit daily reports to the attendance personnel of the schools they serve.

Periodic reports giving individual attendance data and summarized attendance data must be prepared. The scheduling of these reports is determined by WADA reporting requirements and local usage. RESOE will permit specifying unique reports at local user discretion and cost; however, to the extent possible, standard report formats might be designed to minimize costs associated with time expended specifying reports via a terminal.

A capability for analyzing patterns in absences can be useful to attendance personnel for detecting symptoms of personal student problems. If a student is absent to an unusual degree, appears to be regularly absent (or tardy) on a given day of the week or month, or if two or more students appear to be regularly absent together, these patterns may signify that a problem needing attention exists. (In addition, if modularized curricula are used, patterns associated with individual modules may provide information for evaluating modules or teachers to the extent that inferences can be drawn from student attendance in a module.)

Attendance cards might be used to obtain a variety of additional types of information necessary for keeping secondary level student files current. For example, as the end of the school year nears, columns might be added to the attendance card in which the teacher can indicate that a student is expected to graduate.

2.) Summary

Figure 8 depicts the process encompassing relationships among the elements discussed above. Enrollment forms are filled out at the start of the process. Enrollment data provides the basis for preparing attendance cards. (As an option, in an ISES context, skills mastery cards are also prepared.) Attendance card data leads to updated enrollment files, attendance reports and pattern analyses. (The optional skills-mastery cards provide output in the form of reports.) Combined with information derived from sources other than attendance cards, follow-up questionnaires, enrollment forms (for the subsequent year or for updating during a given school year), comprehensive student record reports can be prepared.

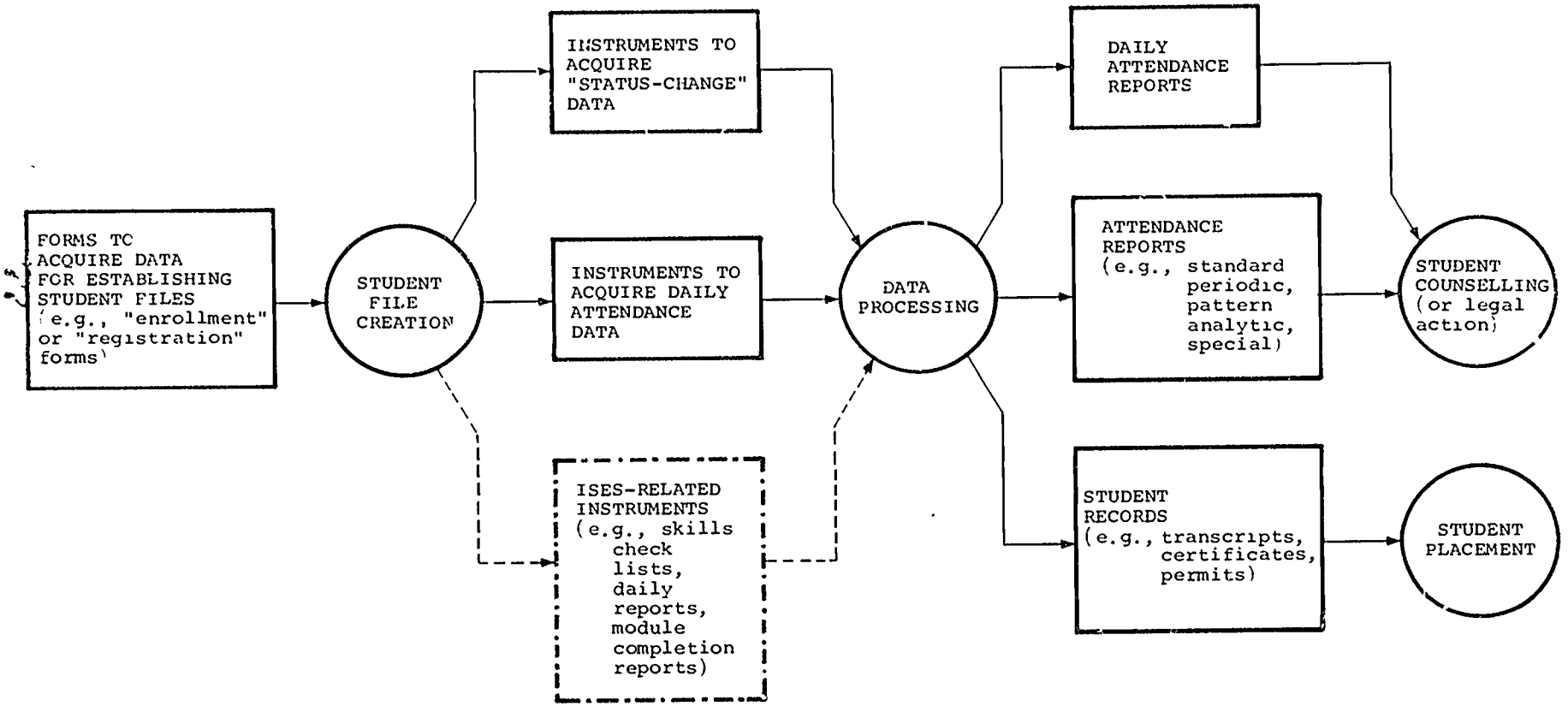

FIG. 8 ATTENDANCE-RELATED ITEMS (BOXES), PROCESSES (CIRCLES), AND FLOWS (ARROWS)

e. Development of the Attendance Subsystem

This discussion of attendance is based upon a preliminary investigation of a few existing systems and upon preliminary conclusions drawn regarding requirements. The investigation is incomplete in the sense that information has been obtained from individuals in a small number of BOCES, and from a small set of documents describing attendance requirements. However, further work should be undertaken to insure that the information obtained to date is complete, and that it adequately reflects the general case.

Subsequent to confirming that information is complete and representative, current design objectives and specifications can be detailed further if necessary.

Existing systems and procedures, including those independently developed and operated by local agencies and those purchased as proprietary packages, can then be investigated in terms of their ability to meet the objectives and in terms of the costs associated with their use. An existing system might currently meet all the requirements; an existing system might be amendable to adaptation into one meeting all the requirements at a modest cost for redesign; an extensive, complete design effort may be required.

Based on this analysis, an optimal system can be selected or designed, and implemented on a pilot basis.

A pilot study might be performed involving one or a few BOCES, and perhaps one city school system. The pilot study verifies assumptions made during design and analysis. It involves a limited commitment of resources and can provide invaluable experience for redesign and improvement prior to making a substantial investment.

4. Remote Data Entry

The use of a remote terminal for entering new or corrected data, for requesting reports, and for specifying data analyses seems to possess considerable merit. The general effect of using remote terminals is to shift responsibility and activity for entering correct data toward the local user, and therefore to distribute responsibility and activity over the population of users rather than concentrating it at a central site. The general advantage of this situation is that the local user, who can best detect errors in data, enters edited data and makes corrections efficiently. In addition, the local user, who best understands his own needs for data or analyses, can specify requirements for reports or analyses directly to the computer. The general disadvantages of this situation are that users may not have required skills for effectively interacting with the computer, and they may not have the time or resources to devote to entering large amounts of data.

In anticipation of the general need to address this topic in a systematic manner and the particular need to assess the feasibility of data entry and editing at a local site, a remote terminal was installed in a BOCES (the Charles G. May Occupational Center, in Mount Morris, New York) this fall as a "demonstration." The demonstration and some observations regarding the use of remote terminals are discussed below.

a. General Description of the Demonstration Project

The major unknowns of interest in the demonstration involved human factors such as performance operating the terminal, and the feasibility of transferring data entry, editing and error correcting responsibilities to local agency

personnel. (Detecting and correcting errors in RESOE enrollment forms has consumed considerable RRI resources during the past two years. This situation is unavoidable in a procedure requiring that central facility personnel not familiar with local circumstances edit data.) Consequently, a very versatile, sophisticated terminal was used, a Hazeltine model 2000 with a cathode ray tube (TV-screen) display, a printer, and a dual cassette recorder.

In the demonstration, the terminal was to be used to edit and enter enrollment data into computer files. This application is quite repetitive and routine, and it involves entry of a large amount of data. The Hazeltine was selected for the demonstration to provide the option of investigating more sophisticated applications if the opportunity appeared; it was not selected because it is the optimal unit for the primary application in this demonstration.

Two methods of data entry were used. In the first method, termed "on-line, interactive," the terminal was connected to the computer using conventional (voice-carrying) telephone lines throughout the entire period during which data were entered. In the second method, termed "off-line, recording," data were entered into the terminal memory, edited and then transferred onto a tape in a cassette recorder attached to the terminal. Subsequent to "filling" cassettes, the cassettes were mailed to RRI for entering data into the computer. (Alternatively, data on the tape might have been transmitted over telephone lines, in a single, relatively brief period.)

In an introductory session at the BOCES, the terminal operator was instructed on the first method, and was observed during entry of data from a few sample forms. Subsequent to this introductory session, the operator entered data

daily, and data entry was monitored at RRI. Data were entered at a rate of approximately 50 forms per hour.

After a period of several weeks using the first method, a cassette recorder was attached to the terminal, and the operator was instructed on the second method. Using this method, the rate of data entry was approximately 70 forms per hour. The rate increase resulted from having a display of a blank enrollment form on the screen of the terminal during data entry. Information for this display was prerecorded on one of the two cassettes in the recorder. The operator simply used the terminal as a typewriter, in effect, typing information on the displayed form. During typing, data were recorded in the memory of the terminal itself. While in the terminal memory, the operator examined displayed data for errors, corrected errors, and transferred data in the memory to the tape in the cassette. After completing entry of data from one form, displayed data were erased from the screen leaving the blank form displayed. Data from a subsequent enrollment form then were entered onto the displayed blank form.

b. Assessment of the Demonstration

The demonstration can be assessed on two grounds: human performance and technical considerations. In both cases, the demonstration confirmed expectations.

In general, data entered were excellent in comparison to data entered from forms at the central facility (RRI). Thus, transferring editing (error detection and correction, ambiguity detection and resolution) responsibility to local agencies appears to be effective.

1.) On-line, Interactive Method

In the first method (on-line, interactive), human performance was limited by the lack of a display of the blank form. This limit was severe in this demonstration because enrollment forms were designed to facilitate data entry by key-punching. Software could be developed to permit entry of each data field on the form into a separate line on the terminal display; such software would reduce this problem. Alternatively, a form could be designed to facilitate data entry using a remote terminal. (However, in the present case, the significance of this limitation is reflected by the increased rate of data entry from 50 forms per hour without a blank form on the screen to 70 forms per hour with a blank form on the screen.)

Two serious technical problems were associated with the on-line, interactive method; both involved the use of telephone lines.

The first problem involving the use of telephone lines is that the lines connecting the Mount Morris Center to New York City were unreliable. For example, during the first day of data entry, line noise and accidental disconnections at the exchange in Rochester made data entry impossible. The major concern is that line noise can be interpreted by the computer as a command from the terminal; an inappropriate command can seriously disrupt data entry and make considerable data (thought to be properly entered) useless. The operator is compelled to check terminal status frequently in order to detect such perturbations as promptly as possible.

The second problem related to using telephone lines is that the terminal is connected to the computer continuously during the period in which the operator is working. This leads to high telephone charges; for example, the direct

dial rate to New York City from Mount Morris is $0.42 per minute. (Thus, assuming 50 forms are entered per hour and 1500 forms are required for an agency, the charges would be $756.00.)

In addition to problems associated with using telephone lines, another technical problem exists in the case of on-line, interactive data entry. In the demonstration, a processor (a particular type of software package) called EDIT was used to create the files. EDIT is designed to facilitate writing computer programs using a remote terminal, and it is not designed for creating files. However, EDIT is probably as suitable as any available processor for creating files and entering data via a terminal. More suitable processors for creating files currently are not available because other methods (e.g., keypunching or optical scanning) are almost universally used for such functions; these methods generally are far less expensive than using a remote terminal for high volume, repetitive entry of data into files. However, a processor tailored to large volume repetitive data entry and file creation could be developed.

2.) Off-line, Recording

The second method (off-line, recording) is superior to the first in terms of human performance and technical factors.

The Hazeltine terminal's ability to display a blank form proved to be a significant asset from the perspective of human performance. From this perspective, if large volumes of data must be entered via a terminal, the off-line recording method may be the optimal method.

Once data are recorded on the cassette tape (i.e., transferred from the terminal's "memory" to the tape), error correction is difficult. However, while data are still in the terminal's memory, corrections are made quite easily, more easily than in the on-line, interactive method using the EDIT processor.

Each cassette holds a given number of records. In the case of this year's enrollment forms, each side of the tape holds 300 forms. However, the tape does not provide an indication that the end of the tape is being reached, e.g., that one more form can be accommodated. In addition, the operator must enter an "end-of-tape" record as the last entry on each side of the tape.

In the Hazeltine unit, a given record is difficult to find once it is recorded in the tape because the tape can only be rewound to its beginning.

Turning off the recorded at the end of a data entry session sometimes causes spurious signals to be entered onto the tape.

c. General Conclusions and Recommendations

Based on the observations discussed above, some general conclusions can be drawn regarding the use of remote terminals for data entry and suggestions can be made regarding alternative methods of entering large volumes of data.

As stated earlier, data entered via the terminal appear to be quite low in errors compared to data entered by conventional means. Thus a tentative general conclusion can be drawn that transferring to local agencies the responsibility for providing "clean" data is feasible. However, at present analysis of costs of entering data using remote

terminals versus costs for entering data by other means has not been performed. Such an analysis is desirable to justify the use of remote terminals for data entry. The justification is increased as the functions (for example, entering attendance, facilities or personnel data, or specifying reports) for which the terminal is used increase.

1.) Conclusions Drawn from the Demonstration

A remote terminal, particularly the Hazeltine model, is designed for interactive communications with a computer. For example, it is well suited for editing, correcting or updating files or for entering programs, specifying reports, or performing data analyses. Large-volume, repetitive data entry is not a cost-effective application for such remote terminals. In the case where large amounts of data, e.g., enrollment data from several agencies, are to be entered via a single terminal, the terminal might act as a severe "bottleneck". If time is a factor, the "bottleneck" would be a significant problem.

If a remote terminal were to be used for large-volume data entry, the off-line, recording method seems the most suitable. Technical difficulties associated with it might be overcome by modest changes in hardware and perhaps by developing software for use at the central site or the terminal itself for detecting spurious errors or keeping a tally of records entered.

2.) Alternatives and Recommendations

A cost-effective system for remote data entry should have the following characteristics:

- Hardware should involve simple technology, i.e., it should be inexpensive to purchase, easy to repair and usable by semi-skilled persons.
- Recorded data should be easily corrected. As a corrollary, individual records should be easy to recall for examination.
- "Hard copy" should be generated for local editing and "receipting" purposes.
- A rapid method should exist for entering data into the central computer files and confirming that no errors have been introduced during the entry process.

Remote data entry via a terminal that is eminently suited to flexible interactive operations (such as the Hazeltine) does not possess these traits. However, the following alternatives are worth consideration:

- Key-punch, key-tape or key-disc;
- Optical scanning (mark-sense);
- Optical character recognition.

Key-punch, key-tape and key-disc methods are inexpensive and commonly used for entering large volumes of data. To date, RESOE has relied upon key-punching, in which data are entered by key-punch operators onto computer cards; cards in turn are used to transfer data to computer tape or disc for storage processing operations. In key-tape

and key-disc, the key-punching of cards is eliminated; the operator inserts (key-punches) data directly onto tape or disc. (Some key-tape data entry was used this year in RESOE.)

Optical scanning (mark-sense) is a very inexpensive, simple, and reliable method of reading forms and entering data by machine. However, the machine only responds to simple marks; the machine cannot interpret shapes. In situations where written information, such as names or addresses, are to be entered, the optical scanning form may have to be large and entering data on the form may be tedious and subject to error.

Optical character recognition is a sophisticated, relatively expensive, but reliable, method of reading forms and entering data by machine. Optical character recognition machine recognizes symbols by their shape, but only can recognize standard symbols. Thus, handwritten information must be typewritten before insertion into the machine. However, the typing can be done on commonly used typewriters such as the IBM Selectric.[34]

In any of these methods, initial steps of data entry can be performed locally or regionally.

Data processing facilities at BOCES might perform key-punch, key-tape or key-disc operations, return forms to their source agency, and forward cards, tapes or discs to the central computer. Similarly, forms in an optical-scanning format might be "read" at a local agency, BOCES or regional data processing facility, and data then could be

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[34]Selectric is a registered trademark of the International Business Machines Corporation (IBM).

forwarded to the central computer. (Simple "readers" are quite inexpensive and could be used for attendance and test-scoring as well as large-volume entry of enrollment data.)

In many respects, optical character recognition procedures are particularly amenable to transferring "editing" functions to the local agency Clerk-typists at local agencies could type information from handwritten enrollment forms onto machine-readable forms, using a conventional typewriter. The clerk-typist would be in an ideal situation to detect and correct errors or ambiguities on handwritten information. (For example, a local clerk-typist might recognize that John Jones writes his name in such a way that it looks like Job Janes; a key-punch operator at a different site could not know this fact.) In addition, a carbon or equivalent copy of the typed form could be retained by the schools for their records. The amount of effort required in terms of time would be equal to or less than that required for remote data entry via a terminal, and a less skilled operator could be employed. Effort could be expended at local agencies rather than at a BOCES so that the "bottleneck" effect would be reduced. The immediate generation of a copy for local records could permit enrollment and registration processes to be combined at the very beginning of the school year. (This also would extend the time available for or make earlier the completion data of data processing and generation of mandated, state-wide enrollment reports.)

This discussion leads to the conclusion that further systematic analyses is required before a commitment is made to a particular mechanism for remote data entry. The uses to which remote equipment might be put must be specified. These uses determine the type of remote equipment

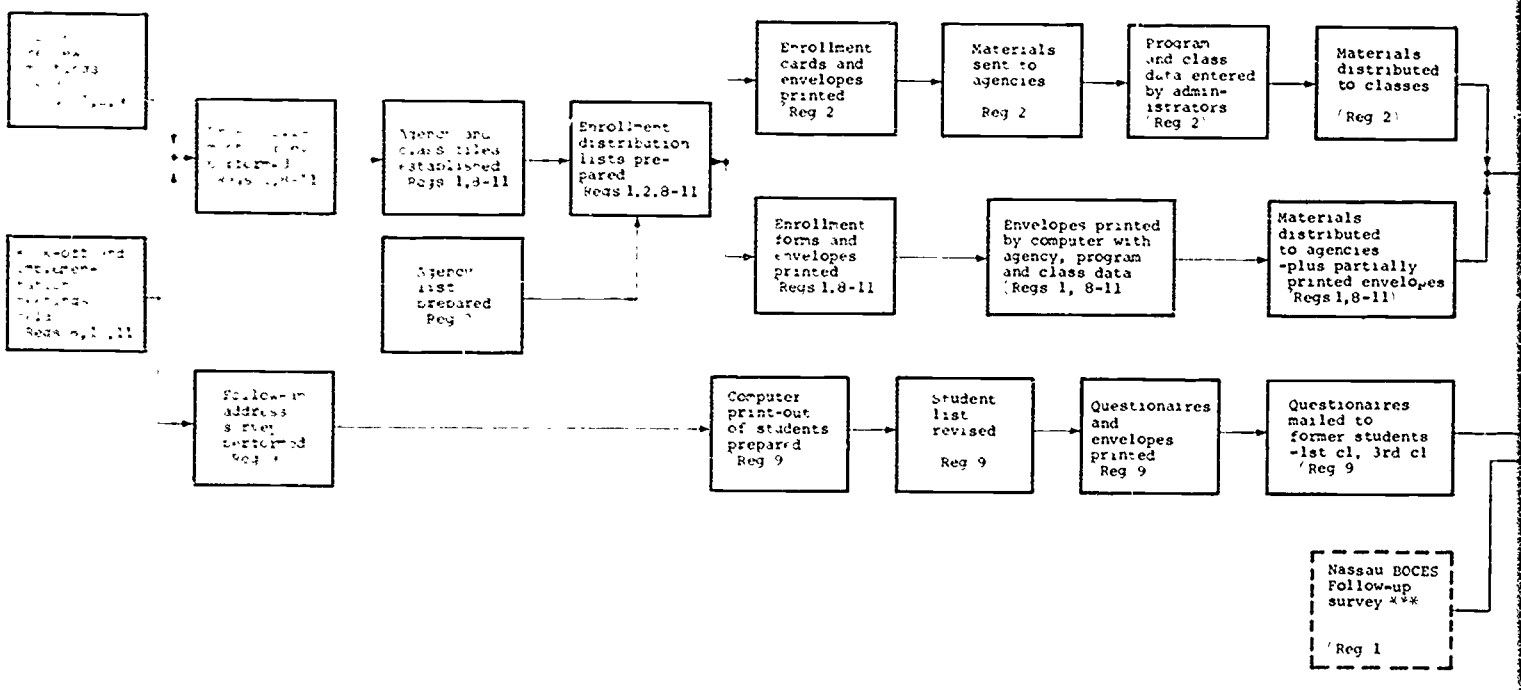
to be used and the most effective implementation scheme. For example, if the equipment is to be used for routine, repetitive entry of test scores and attendance data, as well as enrollment data, then mark-sense optical scanning would be a strong candidate. Alternatively, a hybrid procedure might be used in which, for example, optical character recognition is used for entering edited enrollment data (via a central or regional optical character reading machine), mark-sense optical scanning is used for entering attendance and test-score data (via optical scanners at each local agency), and a flexible sophisticated terminal is used for direct interaction with the computer to correct existing file or to specify analyses (via terminals at BOCES).

IV. APPENDICES

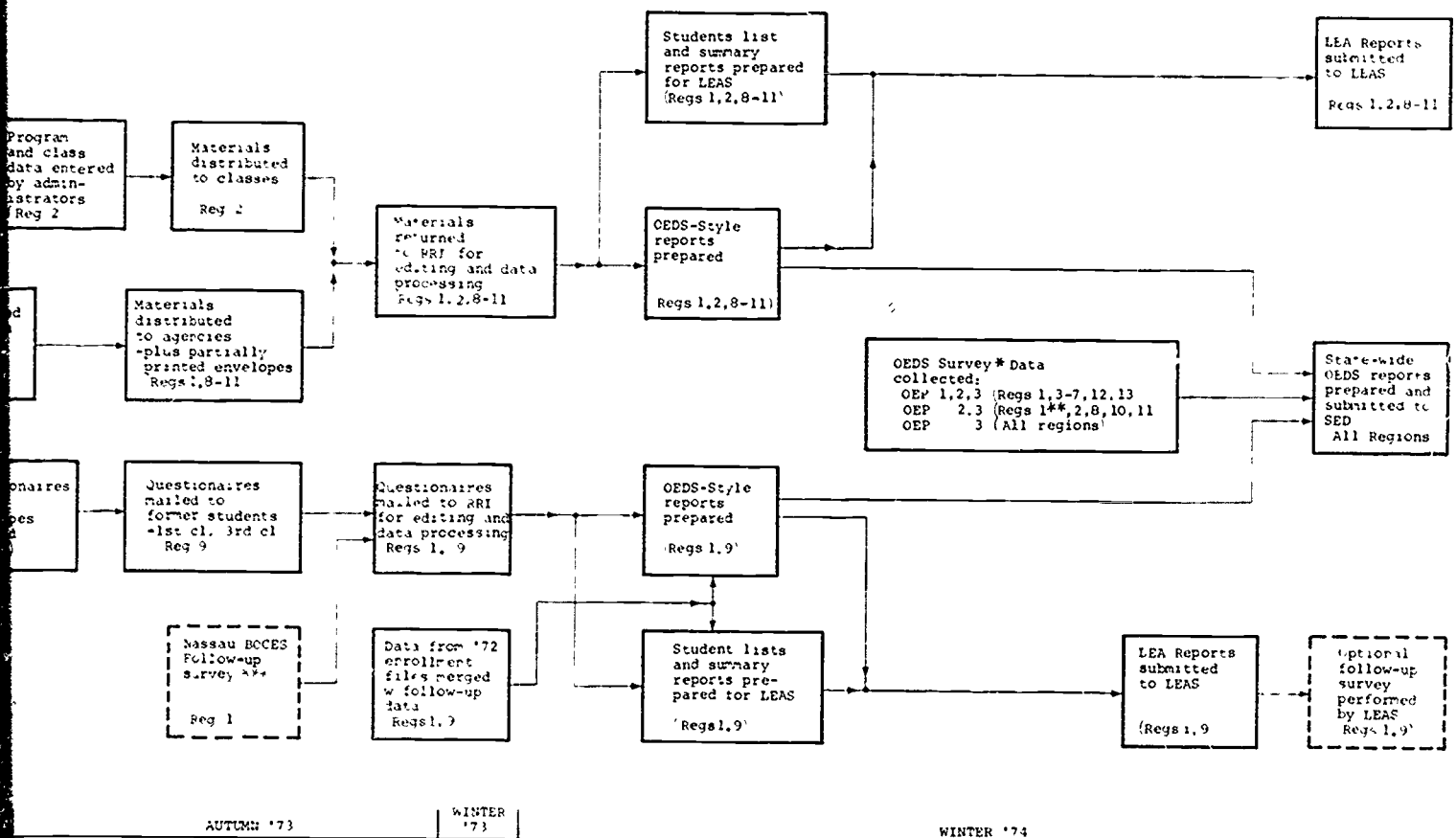
These appendices contain materials related to Stage I of RESOE. Appendix A consists of a flow-chart depicting Stage I operations undertaken this year. Appendix B provides examples of forms, questionnaires, envelopes and other items related to Stage I data collection.

A. Appendix A: RESOE Stage I Operations

The figure on the next page depicts operations undertaken this contract year disseminating and implementing Stage I processes.


Enrollment cards and envelopes printed (Reg 2
Materials sent to agencies Reg 2
Program and class data entered by administrators (Reg 2)
Materials distributed to classes (Reg 2)
Agency and class titles established Regs 1,8-11
Enrollment distribution lists prepared Regs 1,2,8-11
Enrollment forms and envelopes printed Regs 1,8-11
Envelopes printed by computer with agency, program and class data (Regs 1, 8-11
Materials distributed to agencies -plus partially printed envelopes (Regs 1,8-11)
Agency list prepared
Computer print-out of students prepared Reg 9
Student list revised Reg 9
Questionnaires and envelopes printed Reg 9
Questionnaires mailed to former students -1st cl, 3rd cl (Reg 9
Nassau BOCES Follow-up survey ***
(Reg 1
SUMMER '73
SUMMER '73
AUTUMN '73

****



* See Chap III, Sec B, Part for a discussion of the OEDS survey

** In Region 1 the BOCES utilized RESOE but school districts utilized OEDS procedures

*** In Region 1, the BOCES utilized RESOE follow-up questions on a form prepared and distributed by the BOCES

**** Time-line not to scale

B. Appendix B: Materials Used in RESOE Stage I Operations

Examples of instructions, envelopes and forms used in RESOE enrollment and follow-up operations are provided on this appendix.

First, enrollment materials are shown. Samples of materials used outside New York City are provided; these include an envelope label, instructions to teachers, a secondary enrollment form and an adult enrollment form. Samples of enrollment materials used in New York City then are provided; these include an envelope label and an enrollment form.

Second, follow-up materials are shown. A sample follow-up form containing instructions, mailing envelope, and return envelope are provided.

Third, a sample pre-enrollment form is provided.

Fourth, instructions and the form used to veryify existing information and obtain additional information to perform the follow-up survey are shown.

PACKET NUMBER: [illegible] SCHOOL CODE: 1102520

SCHOOL NAME: [illegible]

COURSE TITLE: [illegible]
(13) (32)

COURSE CODE: [illegible]
(33) (38)

PROGRAM LEVEL: |X| SECONDARY | | ADULT
(39)=1 (39)=2

STUDENT TYPE: |X| REGULAR | | COOPERATIVE | | SPECIAL ED.
(40)=1 (40)=2 (40)=3

TEACHER
LAST NAME: [illegible]
(41) (59)

FIRST NAME: [illegible] INITIAL: | |
(60) (71) (72)

INSTRUCTIONS TO TEACHERS FOR COMPLETING THE OCCUPATIONAL EDUCATION SECONDARY STUDENT ENROLLMENT FORM-1

This enrollment survey is taken annually to fulfill mandated reporting requirements for State and Federal funding of occupational education.

I. PACKAGE CONTENTS

Before distributing student enrollment forms, please see that you have the following items in addition to this instruction sheet:

1. Pre-addressed manila envelope in which enrollment forms were delivered to you; and
2. An enrollment form for each student in your class.

If you receive an incomplete package, please contact the proper school official to obtain missing items.

II. FORM DISTRIBUTION

A. Please distribute one enrollment form to each student in your class.

B. If you have any absentees, please complete a form for that person.

III. GENERAL INSTRUCTIONS

Please read these instructions before you ask students to begin.

A. Student portion of the form is divided into sections, lettered A to L, each of which should be completed by students.

B. In "lockstep" sequence, please have students complete A to L.

IV. STUDENT INSTRUCTIONS

A. Please ask students to begin filling-out the forms, A to L.

B. If students do not have, or cannot remember phone and/or Social Security numbers, please ask them to leave those boxes blank.

C. Section L is not mandatory: A student may choose not to answer.

V. FORMS COLLECTION AND COMPLETING "OFFICIAL USE ONLY" BOX

A. Please collect completed enrollment forms. Please check the forms to see that each student has at the very least filled out:

1. Name (Section A);
2. Address (Section B and C); and
3. Date of Birth and Sex (Section D).

F/290-5-00

(Instructions continued on other side)

(Continued from Page 1)

B. The "Official Use Only" box (box 12) in the upper right hand corner of the form is used for fulfilling mandated reporting requirements. Since you may not have had the student in class very long, the judgments you provide may be preliminary, but please do the best you can, using the following definitions as your guidelines:

Please Enter the Appropriate Code Number (i.e., 1, 2, 3, 4) in Box 12

1 =	Regular Student:	The student is able to perform satisfactorily in a regular course of study in this subject without special assistance.
2 =	Disadvantaged Student:	The student requires special assistance or a modified course of study in this subject because of academic, socioeconomic or cultural deprivation.
3 =	Handicapped Student:	The student requires special assistance or a modified course of study in this subject because of mental retardation, hearing difficulty, deafness, speech impairment, visual handicap, serious emotional disturbance, crippling or other health impairment.
4 =	Students Who Are Both Handicapped and Disadvantaged	

VI. RETURNING THE FORMS

A. After entering required data in "Official Use Only" box, and checking completed forms, please place all forms in the large, manila envelope in which the forms were delivered to you. Please close the envelope with the metal clasp, and return it to your school administrator.

B. In order to process these forms correctly, they must be returned in the envelope in which they were delivered to you! Please do not combine forms from different classes in the same envelope.

Thank you for your assistance in this important survey.

F/290-5-00

OCCUPATIONAL EDUCATION SECONDARY STUDENT ENROLLMENT FORM-1

No. 384101 (1–6) (7–11)

PLEASE PRINT NEATLY IN COMPLETING THIS FORM

OFFICIAL USE ONLY (12)

F/290-5-00

A. FIRST NAME (14–25) MIDDLE INITIAL (27) LAST NAME (26–47)

B. ADDRESS (STREET NAME AND NUMBER OR RFD NUMBER) (49–73)

C. TOWN OR CITY (14–29) STATE (31–35) ZIP CODE (36–40)

D. DATE OF BIRTH — MONTH (41) — DAY — 19 YEAR (42–46)

SEX (47) ☐ MALE ☐ FEMALE

HOME PHONE NUMBER, IF ANY (48 AREA CODE – 51 – 57)

SOCIAL SECURITY NUMBER, IF ANY (58 – – 66)

E. NAME OF HIGH SCHOOL OR BOCES WHERE YOU TAKE THIS COURSE.

NAME OF HIGH SCHOOL OR BOCES (14–29)

TOWN OR CITY (31–46)

F. NAME OF HIGH SCHOOL, IF DIFFERENT THAN NAME IN BOX "E".

NAME OF HIGH SCHOOL (47–63)

TOWN OR CITY (65–80)

G. HAVE YOU COMPLETED THIS FORM IN ANOTHER CLASS? (4) 1 ☐ YES 2 ☐ NO

H. IS THIS YOUR FIRST, SECOND, THIRD OR FOURTH YEAR OF STUDY IN OCCUPATIONAL EDUCATION? (15) 1 ☐ FIRST 2 ☐ SECOND 3 ☐ THIRD 4 ☐ FOURTH

I. DO YOU NOW HAVE A JOB FOR WHICH YOU GET PAID? (16) 1 ☐ YES 2 ☐ NO

J. IF YOU HAVE A JOB, HOW USEFUL IS YOUR OCCUPATIONAL TRAINING FOR YOUR JOB? (17) 1 ☐ VERY USEFUL 2 ☐ SOMETIMES USEFUL 3 ☐ NEVER USEFUL

K. PLEASE CHECK YOUR GRADE LEVEL. (18)

1 ☐ NINTH GRADE 2 ☐ TENTH GRADE 3 ☐ ELEVENTH GRADE

4 ☐ TWELTH GRADE 5 ☐ SPECIAL OR UNGRADED 6 ☐ POST-GRADUATE STUDY

L. IN WHICH GROUP OR GROUPS DO YOU PLACE YOURSELF?

19 ☐ AMERICAN INDIAN 20 ☐ BLACK 21 ☐ ORIENTAL

22 ☐ SPANISH-SPEAKING AMERICAN 23 ☐ WHITE 24 ☐ OTHER

PREPARED FOR NEW YORK STATE EDUCATION DEPARTMENT, (RESOE) ALBANY NEW YORK

A-100-E-0243 9-73 200M

F/290-5-00

99

- 91 -

INSTRUCTIONS TO TEACHERS FOR COMPLETING THE OCCUPATIONAL EDUCATION ADULT STUDENT ENROLLMENT FORM-1A

This enrollment survey is taken annually to fulfill mandated reporting requirements for State and Federal funding of occupational education.

I. PACKAGE CONTENTS

Before distributing student enrollment forms, please see that you have the following items in addition to this instruction sheet:

1. Pre-addressed manila envelope in which enrollment forms were delivered to you; and
2. An enrollment form for each student in your class.

If you receive an incomplete package, please contact the proper school official to obtain missing items.

II. FORM DISTRIBUTION

A. Please distribute <u>one</u> enrollment form to each student in your class.

B. If you have any absentees, please complete a form for that person.

III. GENERAL INSTRUCTIONS

Please read these instructions <u>before</u> you ask students to begin.

A. Student portion of the form is divided into sections, lettered <u>A to K</u>, each of which should be completed by students.

B. In "lockstep" sequence, please have students complete <u>A to K</u>.

IV. STUDENT INSTRUCTIONS

A. Please ask students to begin filling-out the forms, <u>A to K</u>.

B. If students do not have, or cannot remember phone and/or Social Security numbers, please ask them to leave those boxes blank.

C. Section <u>K</u> is not mandatory: A student may choose <u>not</u> to answer.

V. FORMS COLLECTION AND COMPLETING "OFFICIAL USE ONLY" BOX

A. Please collect completed enrollment forms. Please check the forms to see that each student has at the very least filled out:

1. Name (Sections <u>A</u> and <u>B</u>);
2. Address (Sections <u>C</u> and <u>D</u>); and
3. Date of Birth and Sex (Sections <u>F</u> and <u>G</u>).

(Instructions continued on other side)

(Continued from Page 1)

B. The "Official Use Only" box (box 32) in the lower right hand corner of the form is used for fulfilling mandated reporting requirements. Since you may not have had the student in class very long, the judgments you provide may be preliminary, but please do the best you can, using the following definitions as your guidelines:

<u>Please Enter the Appropriate Code Number (i.e., 1, 2, 3, 4) in Box 32</u>

1 =	<u>Regular Student</u>:	The student is able to perform satisfactorily in a regular course of study in this subject without special assistance.
2 =	<u>Disadvantaged Student</u>:	The student requires special assistance or a modified course of study in this subject because of academic, socioeconomic or cultural deprivation.
3 =	<u>Handicapped Student</u>:	The student requires special assistance or a modified course of study in this subject because of mental retardation, hearing difficulty, deafness, speech impairment, visual handicap, serious emotional disturbance, crippling or other health impairment.
4 =	<u>Students Who Are Both Handicapped and Disadvantaged</u>	

VI. RETURNING THE FORMS

A. After entering required data in "Official Use Only" box, and checking completed forms, please place all forms in the large, manila envelope in which the forms were delivered to you. Please close the envelope with the metal clasp, and return it to your school administrator.

B. In order to process these forms correctly, <u>they must be returned in the envelope in which they were delivered to you!</u> Please <u>do not</u> combine forms from <u>different</u> classes in the <u>same</u> envelope.

Thank you for your assistance in this important survey.

№ 539751

OCCUPATIONAL EDUCATION ADULT STUDENT ENROLLMENT FORM - 1A

PLEASE PRINT

1/12

A. FIRST NAME ☐☐☐☐☐☐☐☐☐☐☐☐ (13–24) MIDDLE INITIAL ☐ (25)

B. LAST NAME ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ (26–44)

C. STREET ADDRESS (STREET NAME AND NUMBER OR RFD NUMBER) ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ (45–69)

2/12

D. TOWN OR CITY ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ (13–28) STATE ☐☐☐☐☐ (29–33) ZIP CODE ☐☐☐☐☐ (34–38)

E. HOME PHONE NUMBER, IF ANY ☐☐☐ – ☐☐☐ – ☐☐☐☐ (39–48) SOCIAL SECURITY NUMBER, IF ANY ☐☐☐ – ☐☐ – ☐☐☐☐ (49–59)

F. DATE OF BIRTH ______ MONTH (60) ☐☐ DAY ☐☐☐☐ YEAR (67)

3/12

DATE YOU STARTED THIS COURSE ______ MONTH (13) ☐☐ DAY 19☐☐ YEAR (18)

G. SEX (19) 1☐ MALE 2☐ FEMALE

H. ARE YOU A VETERAN ? (20) 1☐ YES 2☐ NO

I. HAVE YOU COMPLETED THIS FORM IN ANOTHER CLASS ? (21) 1☐ YES 2☐ NO

J. WHY ARE YOU TAKING THIS COURSE ?

- 22 ☐ TO PREPARE FOR A NEW JOB
- 23 ☐ TO HELP ON MY CURRENT JOB
- 24 ☐ TO COMPLETE PART OF AN APPRENTICE PROGRAM
- 25 ☐ HOBBY OR OTHER REASON

K. IN WHICH GROUP OR GROUPS DO YOU PLACE YOURSELF ?

- 26 ☐ AMERICAN INDIAN
- 27 ☐ BLACK
- 28 ☐ ORIENTAL
- 29 ☐ WHITE
- 30 ☐ SPANISH SPEAKING AMERICAN
- 31 ☐ OTHER

OFFICIAL USE ONLY 32 ☐

PREPARED FOR: NEW YORK STATE EDUCATION DEPARTMENT, (RESOE), ALBANY, NEW YORK

A-100-E-0245 5-73 150M

Board of Education

Office of High Schools

OCCUPATIONAL CLASS ENROLLMENT ENVELOPE

1. School Name_____ School Code (1-3) ☐☐☐

2. Subject Class_____ Subject Room_____

3. Occupational Code (4-9) ☐☐.☐☐☐☐

4. Regular Class (10) ☐ 1 or Cooperative Education Class ☐ 2

5. Type of School or Activity (11-12)

01 ☐ Day High School	07 ☐ WEP
02 ☐ Evening High School	08 ☐ ASOSP
03 ☐ Evening Trade School	09 ☐ WIN
04 ☐ Special Education	10 ☐ MDTP
05 ☐ Continuing Education	11 ☐ Title III
06 ☐ Business Educ., Adult	

Return envelope to:

6. _____

_____

1. School _____ Today's Date _____

2. Name _____

Board of Education Office of High Schools

OCCUPATIONAL ENROLLMENT RECORD CARD

1973

3. Initials (13-15) _____ First _____ Middle _____ Last

4. Date of Birth (16-21) _____ Month _____ Day _____ Year

5. Sex: (22) Male ☐ 1 Female ☐ 2

6. Grade level of official class: (23-24) 9 10 11 12 adult (circle one)

7. The elementary or junior high school I last attended before I entered high school was _____;

Borough _____ (25); E (26) ☐ 1 N ☐ 2

8. Cooperative Ed: (27) Alternate weeks ☐ 1 part-time ☐ 2

9. Enter your Social Security Number

☐☐☐-☐☐-☐☐☐☐ (28-36)

10. Have you completed this form in another class this term? (37)

Yes ☐ 1 No ☐ 2

I	N	O	S	A	R	D	H
38	39	40	41	42	43	44	45

F/290-5-00

OCCUPATIONAL EDUCATION STUDENT FOLLOW-UP FORM-2

Dear Former Student

In an effort to find out what you have been doing since you left school, we are sending you the enclosed questionnaire. We sincerely hope that you will read the instructions carefully, and fill-out this questionnaire as completely as is possible. Be assured that all your answers will be treated confidentially.

Information you and your fellow graduates provide is needed for improving occupational education so that future students will benefit from your experience. Please enclose a separate sheet of paper if you have any comments you would like to make about your occupational training.

Please return the completed questionnaire in the enclosed postage-free envelope.

Thank you very much for your cooperation.

A. Have you completed this questionnaire before? ☐ Yes ☐ No

If your answer is Yes, please Do Not fill-out this questionnaire. Return it, unused, in the postage-free envelope provided for you. Thank you.

B. If the information printed below is incomplete or not correct, please print the missing or corrected information in Box "C"

C.

1 11 12 FIRST NAME 23 25 MIDDLE INITIAL

27 LAST NAME 45

2 11 12 ADDRESS (STREET NAME AND NUMBER OR RFD NUMBER) 36

38 TOWN OR CITY 53 55 STATE 59

61 ZIP CODE 65 66 SOCIAL SECURITY NUMBER, IF ANY 76

(OVER)

PREPARED FOR NEW YORK STATE EDUCATION DEPARTMENT (RESOE), ALBANY, NEW YORK

(OVER)

F/290-5-00

OCCUPATIONAL EDUCATION STUDENT FOLLOW-UP FORM-2

3
11

PLEASE CHECK THE APPROPRIATE BOXES BELOW ✓

D Please check your current employment status.

12 Employed FULL-TIME (30 or more hours per week)
13 Employed PART TIME (Less than 30 hours per week)
14 Unemployed and LOOKING for work
15 Unemployed and NOT LOOKING for work

E If you are unemployed, please check the reason that best applies to you.

16 Serviceman or about to enter military service
17 Continuing my education
18 Married, or about to be married
19 Too ill to work
20 Can't find work

F. If you have a job, how useful is your occupational training for your job?

1 Very useful
2 Sometimes useful
3 Never useful

21

G. If you are employed, what is your job called?

22 41

H. If you are employed, please enter employer's name and address.

EMPLOYER S NAME

STREET NAME AND NUMBER OR RFD NUMBER

TOWN OR CITY

STATE ZIP CODE

I. If you are employed, please check the wages you currently earn.

1 $1 59 or less per hour
2 $1 60 to $1 99 per hour
3 $2 00 to $2 49 per hour
4 $2 50 to $2 99 per hour
5 $3 00 to $3 99 per hour
6 $4 00 or more per hour

43

J. If you are continuing your education, please check type of education.

44 Adult Occupational Classes
45 Private Occupational School
46 On-The-Job Training
47 Apprentice Program
48 Two-Year Occupational College
49 Other Two-Year College
50 Four-Year College or University
51 Other

Please return this questionnaire promptly in the enclosed, postage-free envelope.
Thank you once again for your valuable assistance.

F/290-5 JO

Official Use Only 52

F/290-5-00

First Class
Permit No.
50324
New York, N.Y

BUSINESS REPLY MAIL
No Postage Stamps Necessary If Mailed In The United States

Postage Will Be Paid By

RIVERSIDE RESEARCH INSTITUTE
80 WEST END AVENUE
NEW YORK, N. Y. 10023

ATTENTION: B. LESSER

RIVERSIDE RESEARCH INSTITUTE
80 West End Avenue
New York, New York 10023

Forwarding and Return Postage Guaranteed

NEW YORK STATE OCCUPATIONAL EDUCATION FOLLOW-UP SURVEY

RIVERSIDE RESEARCH INSTITUTE
80 WEST END AVENUE
NEW YORK, NEW YORK 10023

OCCUPATIONAL EDUCATION
PRE-ENROLLMENT DATA LIST

BOCES or School Name ____________________

BOCES or School Address ____________________

____________________ CITY OR TOWN ____________ ZIP CODE

BOCES or School Location Code ____________________

COURSE TITLE	O.E. PROGRAM CODE	TEACHER NAME	ROOM NO.	PLEASE CHECK TYPES OF CLASSES (√) REG.	COOP.	CONT.	NEW	SECOND.	ADULT
				☐	☐	☐	☐	☐	☐
				☐	☐	☐	☐	☐	☐
				☐	☐	☐	☐	☐	☐
				☐	☐	☐	☐	☐	☐
				☐	☐	☐	☐	☐	☐
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				☐	☐	☐	☐	☐	☐
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				☐	☐	☐	☐	☐	☐
				☐	☐	☐	☐	☐	☐

A-100-E-0240• 4C 6/73

F/290-5-00

STUDENT ADDRESS FORM

PLEASE READ THE INSTRUCTIONS ON THE BACK OF THIS FORM BEFORE FILLING IT OUT.

TEACHER USE ONLY

ID #

E/290=5=00.

1. PLEASE PRINT FIRST NAME | MIDDLE INITIAL | PRINT LAST NAME | ENTER YOUR SOCIAL SECURITY NUMBER

PLEASE ENTER AN ACCURATE MAILING ADDRESS WHERE YOU CAN BE REACHED NEXT OCTOBER.

2. STREET ADDRESS

CITY OR TOWN | STATE | ZIP CODE

3. PLEASE PRINT THE NAME OF YOUR OCCUPATIONAL PROGRAM

ENTER YOUR PHONE NUMBER

AREA CODE

PLEASE CHECK THE APPROPRIATE BOXES BELOW

EDUCATION NEXT OCTOBER	EMPLOYMENT NEXT OCTOBER
1 ☐ ADULT EDUCATION COURSES	1 ☐ MILITARY SERVICE
2 ☐ PRIVATE OCCUPATIONAL SCHOOL	2 ☐ FULL-TIME JOB REQUIRING OCC. ED TRAINING
3 ☐ ON-THE-JOB TRAINING	3 ☐ FULL-TIME JOB NOT REQUIRING OCC. ED TRAINING
4 ☐ APPRENTICE PROGRAM	4 ☐ PART-TIME JOB
5 ☐ TWO-YEAR COLLEGE	5 ☐ NOT EMPLOYED
6 ☐ FOUR-YEAR COLLEGE OR UNIVERSITY	
7 ☐ NONE	

INSTRUCTIONS FOR COMPLETING THE STUDENT ADDRESS FORM

You are being asked to provide a mailing address so that a questionnaire concerning your plans and activities can be sent to you after graduation. This information will help us to plan programs for future students.

The questionnaire will be sent to you at the address you enter on this form. Therefore, please enter an address at which you are sure you can receive your mail. Make sure to include the Zip Code.

Enter as much of the information that is requested on this form as you can. If you do not know your Social Security number, or do not have a number, leave the SOCIAL SECURITY section blank. If you do not know the name of your occupational program, or are not enrolled in a full program, you should also leave the OCCUPATIONAL PROGRAM section blank. Please print neatly in filling out this form. When you have finished, return this form to your teacher.

When you receive your questionnaire next October, please be sure to fill it out and return it promptly. We are very interested in knowing what you are doing. We want your plans and opinions to be included in our important research.