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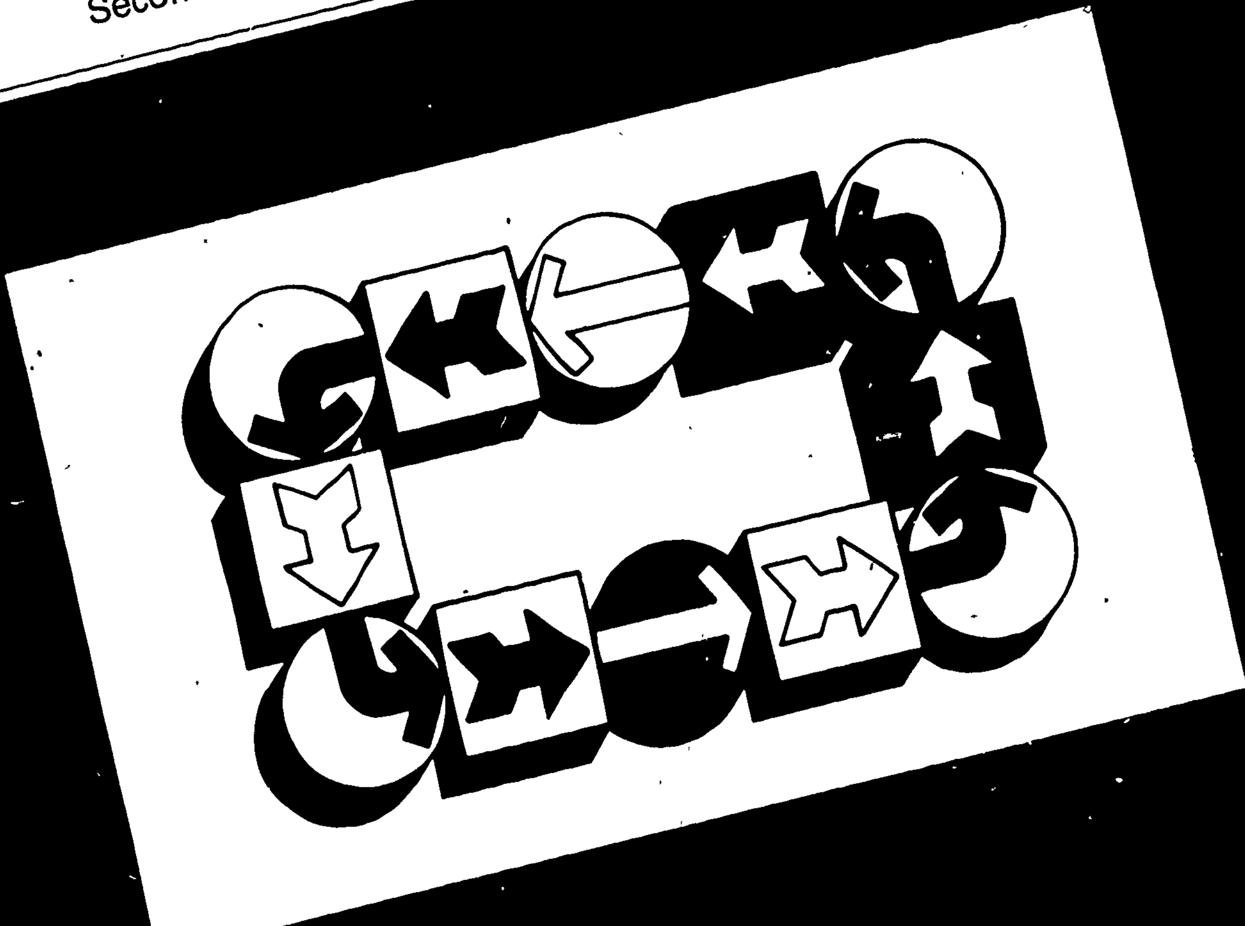
ABSTRACT

This module is one of a series of 127 performance-based teacher education (PBTE) learning packages focusing upon specific professional competencies of vocational teachers. The competencies upon which these modules are based were identified and verified through research as being important to successful vocational teaching at both the secondary and postsecondary levels of instruction. The modules are suitable for the preparation of teachers and other occupational trainers in all occupational areas. This module provides five learning experiences that integrate theory and application on the subject of conducting an occupational analysis. Each learning experience consists of an overview, an enabling objective, required and optional activities, and a self-check. A criterion-referenced assessment of the teacher's performance of the specified competency completes the module. The module covers the following topics: defining the scope of an occupational analysis; preparing an initial listing of duty and task statements by partially analyzing a selected occupation; verifying an initial listing of task and duty statements; and analyzing and reporting task inventory data. (KC)

Conduct an Occupational Analysis

Second Edition



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FOREWORD

This module is one of a series of 127 performance-based teacher education (PBTE) learning packages focusing upon specific professional competencies of vocational teachers. The competencies upon which these modules are based were identified and verified through research as being important to successful vocational teaching at both the secondary and postsecondary levels of instruction. The modules are suitable for the preparation of teachers and other occupational trainers in all occupational areas.

Each module provides learning experiences that integrate theory and application; each culminates with criterion-referenced assessment of the teacher's (instructor's, trainer's) performance of the specified competency. The materials are designed for use by teachers-in-training working individually or in groups under the direction and with the assistance of teacher educators or others acting as resource persons. Resource persons should be skilled in the teacher competencies being developed and should be thoroughly oriented to PBTE concepts and procedures before using these materials.

The design of the materials provides considerable flexibility for planning and conducting performance-based training programs for preservice and inservice teachers, as well as business-industry-labor trainers, to meet a wide variety of individual needs and interests. The materials are intended for use by universities and colleges, state departments of education, postsecondary institutions, local education agencies, and others responsible for the professional development of vocational teachers and other occupational trainers.

The PBTE curriculum packages in Categories A – J are products of a sustained research and development effort by the National Center's Program for Professional Development for Vocational Education. Many individuals, institutions, and agencies participated with the National Center and have made contributions to the systematic development, testing, revision, and refinement of these very significant training materials. Calvin J. Cotrell directed the vocational teacher competency research study upon which these modules are based and also directed the curriculum development effort from 1971 – 1972. Curtis R. Finch provided leadership for the program from 1972 – 1974. Over 40 teacher educators provided input in development of initial versions of the modules; over 2,000 teachers and 300 resource persons in 20 universities, colleges, and postsecondary institutions used the materials and provided feedback to the National Center for revisions and refinement.

Early versions of the materials were developed by the National Center in cooperation with the vocational teacher education faculties at Oregon State University and at the University of Missouri – Columbia. Preliminary testing of the materials was conducted at Oregon State University, Temple University, and the University of Missouri – Columbia.

Following preliminary testing, major revision of all materials was performed by National Center staff, with the assistance of numerous consultants and visiting scholars from throughout the country.

Advanced testing of the materials was carried out with assistance of the vocational teacher educators and students of Central Washington State College; Colorado State University; Ferris State College, Michigan; Florida State University; Holland College, P.E.I., Canada; Oklahoma State University; Rutgers University, New Jersey; State University College at Buffalo, New York; Temple University, Pennsylvania; University of Arizona; University of Michigan–Flint; University of Minnesota–Twin Cities; University of Nebraska–Lincoln; University of Northern Colorado; University of Pittsburgh, Pennsylvania; University of Tennessee; University of Vermont; and Utah State University.

The first published edition of the modules found widespread use nationwide and in many other countries of the world. User feedback from such extensive use, as well as the passage of time, called for the updating of the content, resources, and illustrations of the original materials. Furthermore, three new categories (K–M) have been added to the series, covering the areas of serving students with special/exceptional needs, improving students' basic and personal skills, and implementing competency-based education. This addition required the articulation of content among the original modules and those of the new categories.

Recognition is extended to the following individuals for their roles in the revision of the original materials: Lois G. Harrington, Catherine C. King-Fitch and Michael E. Wonacott, Program Associates, for revision of content and resources; Cheryl M. Lowry, Research Specialist, for illustration specifications; and Barbara Shea for art work. Special recognition is extended to the staff at AAVIM for their invaluable contributions to the quality of the final printed products, particularly to Donna Pritchett for module layout, design, and final art work, and to George W. Smith Jr. for supervision of the module production process.

Robert E. Taylor
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- Providing information for national planning and policy.
- Installing educational programs and products.
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- Conducting leadership development and training programs.

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The institute is a cooperative effort of universities, colleges and divisions of vocational and technical education in the United States and Canada to provide for excellence in instructional materials.

Direction is given by a representative from each of the states, provinces and territories. AAVIM also works closely with teacher organizations, government agencies and industry.

MODULE A-7

Conduct an Occupational Analysis

Second Edition

Module A-7 of Category A—Program Planning, Development, and Evaluation

PROFESSIONAL TEACHER EDUCATION MODULE SERIES

The National Center for Research in Vocational Education

The Ohio State University

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This work was developed under a contract with the Department of Education. However, the content does not necessarily reflect the position or policy of that Agency, and no official endorsement of these materials should be inferred.

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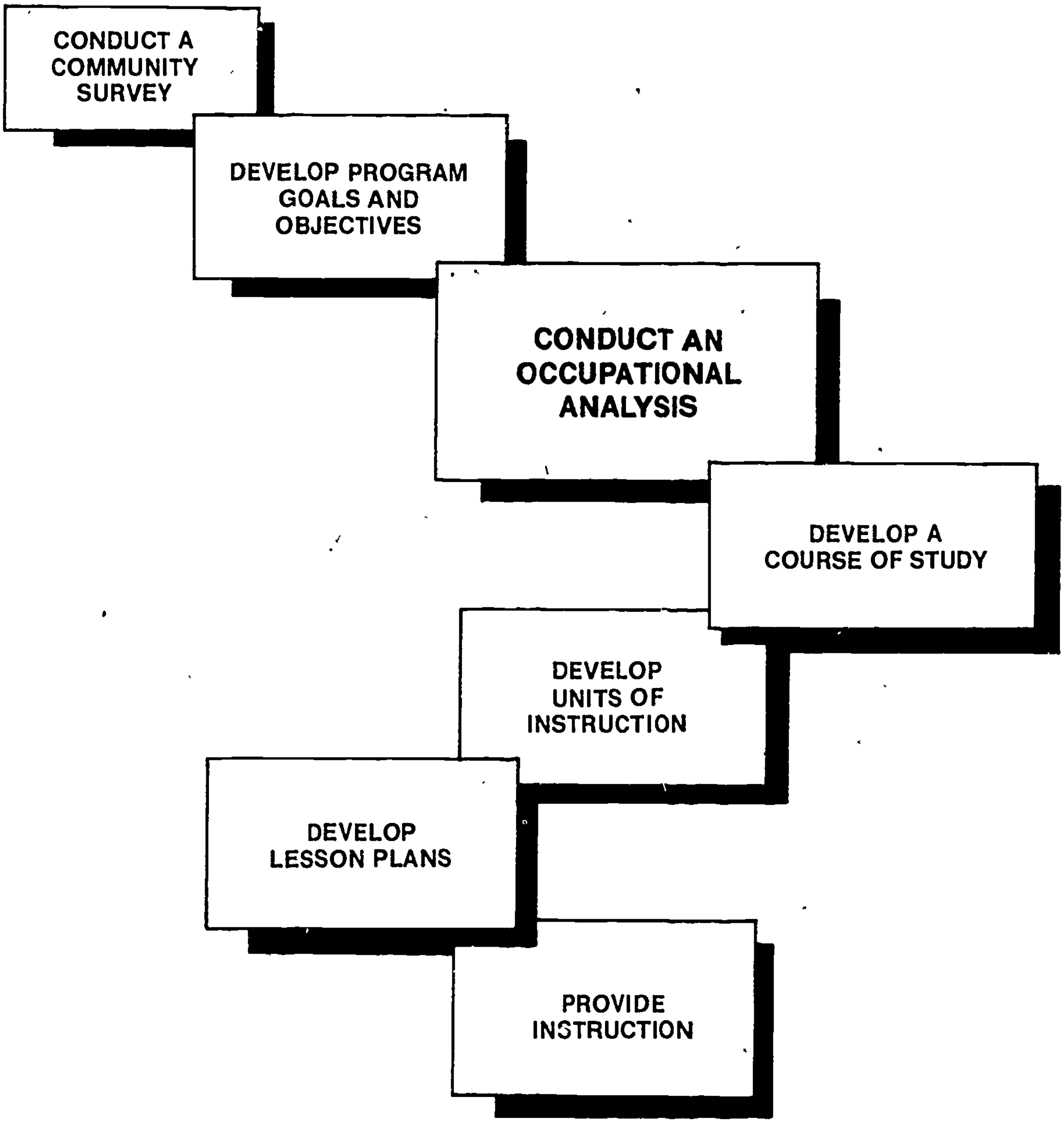


CONVENTIONAL CURRICULUM
AND INSTRUCTIONAL DEVELOPMENT PROCESS

INTRODUCTION

The rationale for vocational-technical education rests on the premise that the skills contributing to success in an occupation can be identified and used to develop relevant educational experiences. These skills, of course, must be reviewed and revised from time to time to meet changing occupational requirements.

Occupational analysis has long been used by vocational-technical educators to identify the skills that should be taught in their programs. And re-analysis can help to identify new skills that should be added to, as well as unnecessary or obsolete skills that should be eliminated from, an existing program.

It is important to identify the critical occupational competencies needed if the goal of vocational-technical education—that of successful employment in an occupation suited to the needs and interests of each individual—is to be met. Since it is possible to design a **good** educational program only when the end results being sought are clearly stated, the analysis of an occupation is an important step in the program development process.

The conventional curriculum and instructional development process is depicted in the diagram on p. 2. For additional information on occupational analysis as it relates to competency-based education (CBE) programs, you should refer to Module K–2, *Organize the Content for a CBE Program.*

Your successful completion of this module will prepare you for analyzing an occupation. In addition, you will learn how to organize the results of the analysis in order to maximize its value in developing an educational program.

ABOUT THIS MODULE

Objectives

Terminal Objective: For an actual teaching situation, conduct an occupational analysis. Your performance will be assessed by your resource person, using the Teacher Performance Assessment Form, pp. 71–72 (*Learning Experience V*).

Enabling Objectives:

1. After completing the required reading, define the scope of an occupational analysis (*Learning Experience I*).
2. After completing the required reading, prepare an initial listing of duty and task statements by partially analyzing a selected occupation (*Learning Experience II*).
3. After completing the required reading, verify an initial listing of task and duty statements (*Learning Experience III*).
4. After completing the required reading, analyze and report task inventory data (*Learning Experience IV*).

Resources

A list of the outside resources that supplement those contained within the module follows. Check with your resource person (1) to determine the availability and the location of these resources, (2) to locate additional references in your occupational specialty, and (3) to get assistance in setting up activities with peers or observations of skilled teachers, if necessary. Your resource person may also be contacted if you have any difficulty with directions, or in assessing your progress at any time.

Learning Experience I

Required

Sources (e.g., reference books, surveys, employers) through which you can gather information about a selected occupation.

Optional

Reference: Ammerman, H.L., and Pratzner, F.C. *Performance Content for Job Training. Volume I: Introduction.* RD 121. Columbus, OH: The Center for Vocational Education, The Ohio State University, 1977.

Reference: Ammerman, H.L. *Performance Content for Job Training. Volume 2: Stating the Tasks of the Job.* RD 122. Columbus, OH: The Center for Vocational Education, The Ohio State University, 1977.

A vocational teacher experienced in conducting occupational analyses whom you can interview concerning how to define the scope of an analysis.

Learning Experience II

Required

Two or *more employers or employees* whom you can interview concerning a selected occupation.

One or more references (e.g., curriculum guides, existing task inventories) that you can review.

Optional

Reference: Ammerman, H.L. *Performance Content for Job Training. Volume 2: Stating the Tasks of the Job.* RD 122. Columbus, OH: The Center for Vocational Education, The Ohio State University, 1977.

Learning Experience III

Required

An initial partial listing of task and duty statements that you can verify.

A resource person and/or peers to review an initial listing of task and duty statements for clarity and accuracy.

Five workers whom you can contact to verify an initial listing of task and duty statements.

Optional

Reference: Ammerman, H.L. *Performance Content for Job Training. Volume 3: Identifying Relevant Job Performance.* RD 123. Columbus, OH: The Center for Vocational Education, The Ohio State University, 1977.

Reference: Ammerman, H.L., and Essex, D.W. *Performance Content for Job Training. Volume 4: Deriving Performance Requirements for Training.* RD 124. Columbus, OH: The Center for Vocational Education, The Ohio State University, 1977.

Learning Experience IV

Required

Sample inventory data to use in preparing a summary report.

Learning Experience V

Required

An actual teaching situation in which you can conduct an occupational analysis.

A resource person to assess your competency in conducting an occupational analysis.

General Information

For information about the general organization of each performance-based teacher education (PBTE) module, general procedures for its use, and terminology that is common to all the modules, see About Using the National Center's PBTE Modules on the inside back cover. For more in-depth information on how to use the modules in teacher/trainer education programs, you may wish to refer to three related documents:

The *Student Guide to Using Performance-Based Teacher Education Materials* is designed to help orient preservice and inservice teachers and occupational trainers to PBTE in general and to the PBTE materials.

The *Resource Person Guide to Using Performance-Based Teacher Education Materials* can help prospective resource persons to guide and assist preservice and inservice teachers and occupational trainers in the development of professional teaching competencies through use of the PBTE modules. It also includes lists of all the module competencies, as well as a listing of supplementary resources and the addresses where they can be obtained.

The *Guide to the Implementation of Performance-Based Teacher Education* is designed to help those who will administer the PBTE program. It contains answers to implementation questions, possible solutions to problems, and alternative courses of action.

Learning Experience I

OVERVIEW

Enabling Objective	After completing the required reading, define the scope of an occupational analysis.
Activity 1	You will be reading the information sheet, The Occupational Analysis and Defining Its Scope, pp. 8–13.
Optional Activity 2	You may wish to read one or both of the following supplementary references: Ammerman and Pratzner, *Performance Content for Job Training, Volume I: Introduction;* and/or Ammerman, *Performance Content for Job Training, Volume 2: Stating the Tasks of the Job.*
Optional Activity 3	You may wish to meet with a teacher in your occupational specialty who is skilled in conducting occupational analyses to determine how the scope of the analysis was defined.
Activity 4	You will be defining the scope of an occupational analysis by preparing one or more occupational descriptions, as appropriate.
Feedback 5	You will be evaluating your competency in defining the scope of an occupational analysis, using the Scope Definition Checklist, pp. 15–16.

Activity 1

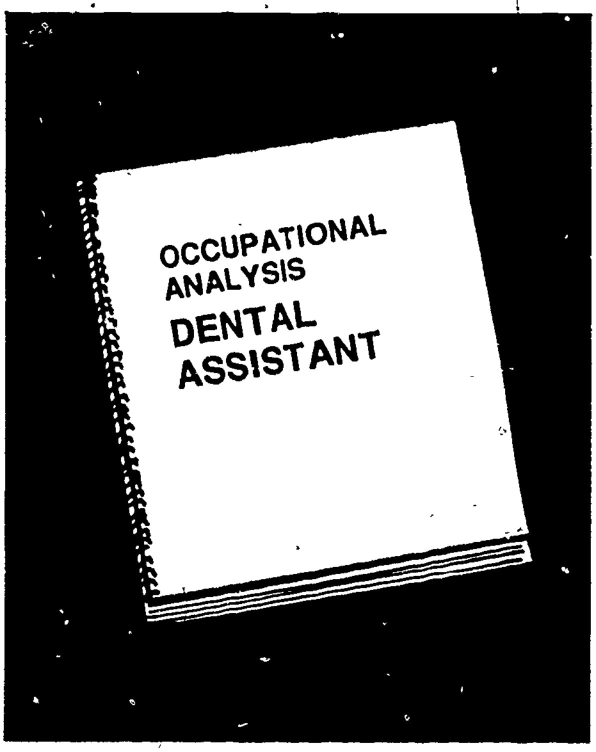
For information on the purposes of, terms commonly used in, and steps involved in analyzing an occupation, and how to define the scope of an occupational analysis, read the following information sheet.

THE OCCUPATIONAL ANALYSIS AND DEFINING ITS SCOPE

An occupational analysis defines a worker's **role,** that is, what the worker does on the job. These analyses serve an important function in determining how organizational activities are conducted and managed, products are produced and distributed, and services are provided for. Usually, the results of an occupational analysis are used for the following four related purposes.

First, this type of information is often given to a prospective worker to **explain what he/she is or will be expected to** do on the job. It helps the worker understand the requirements of the job, and the responsibilities and functions he or she will have.

Second, an analysis can serve as a **basis for organizing the job.** During such an organizational effort, decisions might be made regarding (1) the sequence in which work is to be performed or (2) which workers will perform certain tasks. These decisions are made so that the work can be performed efficiently and effectively.



Third, **educational programs can be developed** using the analysis. Once specific worker skills are identified, a sound basis exists for identifying the types of educational experiences a potential worker should be provided in order to be competent in those skills.

The fourth purpose for which analyses are often used is **evaluation.** By knowing exactly what is involved in a job or occupation, it is possible to determine whether an individual is carrying out his/her work role. An analysis also provides a basis for evaluating how well an individual in a training program is progressing.

For vocational-technical teachers, the overriding purpose of conducting an analysis of an occupation is to obtain a sound basis for **designing, revising, or updating a training program.** It also helps teachers evaluate the progress of students toward their occupational goals. By using the information secured through an analysis, teachers have a basis for decision making.

Terms in Occupational Analyses

Before discussing the steps involved in analyzing an occupation, you need an understanding of the terms associated with occupational analyses.

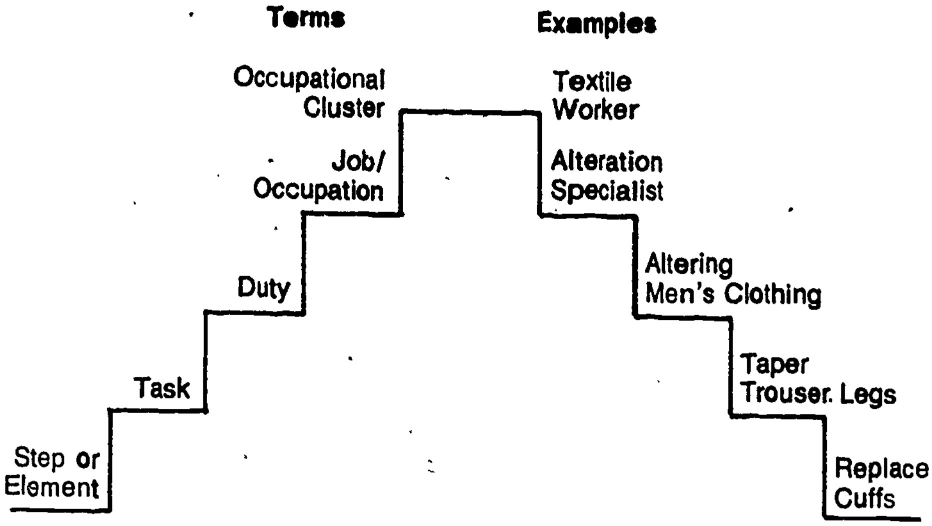
An **occupational cluster** is a group of **jobs/occupations** that are related on the basis of the type of materials and equipment worked upon, subject-matter content needed, or technical concepts involved. For example, textile workers are a group of individuals who work with cloth. They form an occupational cluster.

A **job/occupation** is a collection of **duties and tasks** constituting the total work assignment of a single group of workers performing essentially the same type of work and/or having the same job title. For example, an alteration specialist is a specific type of textile worker whose job consists of altering clothing.

A **duty** is an arbitrary **division of a job** (or of an occupational area) **into related tasks** for descriptive purposes. Duties are usually stated as general areas of responsibility, with action words ending in

SAMPLE 1

RELATIONSHIP OF OCCUPATIONAL ANALYSIS TERMS, WITH EXAMPLES



ing. For example, a specific duty of an alteration specialist may be altering men's clothing.

A task is a meaningful unit of work activity generally performed on the job by one worker within a limited period of time. A task must be logical and necessary to achieving a single objective or output. For example, when altering men's clothing, the alteration specialist may be given the specific task of tapering the legs of a pair of men's slacks.

A step or element is an action, operation, or activity that is a logical segment of a task and that, when completed, advances the work. For example, one of the most important steps involved in tapering the legs of a pair of slacks may be to replace the cuffs.

The relationship of these occupational analysis terms, along with supporting examples, is shown in sample 1. In addition to being familiar with them, you also need an understanding of the definitions of the following analysis terms:

- An **analysis** is an orderly process for determining the makeup of a whole by dividing it into its essential parts.
- An **occupational analysis/job analysis** is the systematic identification, usually for instructional purposes, of the essential duties and tasks that workers are required to perform on the job. Such an analysis may also include working conditions, technical knowledge required, and worker qualifications.
- A **task analysis** is the systematic examination of a task in order to identify the steps or elements involved in the task.

Steps in Analyzing an Occupation

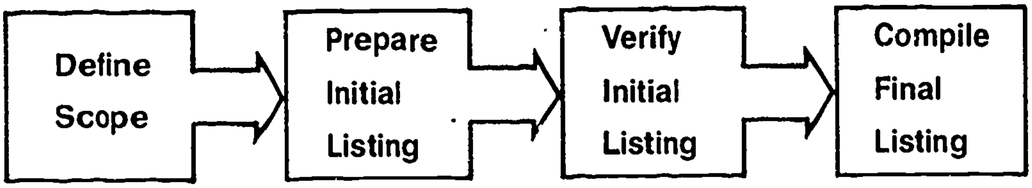
The following steps must be completed in conducting an occupational analysis:

1. **Define the scope or breadth of the analysis**—That is, determine whether it is for one specific occupation or for an occupational cluster.
2. **Prepare an initial listing of analysis components (duties and tasks)**—That is, develop a list of statements describing worker duties and tasks in each occupation involved.
3. **Verify initial listing of analysis components**—That is, confirm that the statements actually describe the work performed in the occupation(s) being considered.
4. **Compile a final listing of the analysis components**—That is, gather together statements that have been confirmed as describing the occupation(s).

Each of these steps is depicted in sample 2. The first step, that of deciding on the scope of the analysis, will be discussed in this learning experience.

SAMPLE 2

STEPS IN ANALYZING AN OCCUPATION

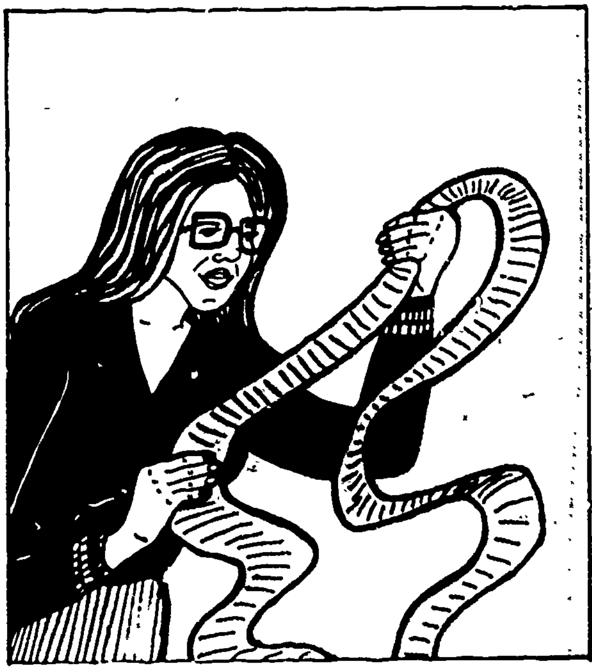


Defining the Scope of the Analysis

The first step in analyzing an occupation is to decide on the breadth or scope of the analysis. Determining this scope will affect how the analysis inventory (i.e., list of statements describing worker performance) will be constructed and administered.

If task statements are highly specific and occupations are clustered too broadly, there will be a large number of statements in the inventory, and the analysis will be cumbersome. If the task statements are too general, the volume of associated work will be reduced, but the inventory results will probably be less useful.

Because of the potential difficulties that might arise from either situation, it is recommended that analyses be designed between the two previously mentioned extremes. For example, constructing an analysis of the occupational cluster of *secretary* to use as a basis for planning a program to prepare *legal secretaries* would not be useful because it would be too general. The task statements in the inventory would not be specific enough to give students the special skills they need to become legal secretaries (e.g., *Use legal terminology*).



A program for training legal secretaries would need to be based on an analysis of the job of legal secretary. However, when preparing task statements for the specific job of legal secretary, it is important not to bog down the analysis with overly specific statements (e.g., *Pronounce legal terminology*).

An additional factor that should be considered in deciding how broad an analysis to make relates to the breadth of preparation a student needs in order to be employable. If a program is directed only toward one **specific** occupation, what happens to graduates if there are no immediate vacancies, if they are unemployed for long periods of time, or if that job becomes obsolete? If they are able to enter an occupation other than the one for which they were prepared, will they be productive, and will they be able to hold on to their positions?

As with the previous concern about the specificity of the task statements, this concern can be avoided by conducting an analysis for a cluster of related occupations—occupations that have more or less similar skill and knowledge entry-level requirements. This would make the program more comprehensive and provide individuals leaving the program with more options for becoming employed.

When updating an analysis for an existing vocational-technical program, you would normally analyze the same occupations that the program was based on. The scope of an existing program analysis might, however, be **enlarged** if the enrollment was **low** because the occupational area was too narrowly defined, or **reduced** if the enrollment was **high** and the occupational area very broadly defined.

There could be a third concern in planning the breadth of the analysis. Which occupations you choose to deal with in the analysis might depend on whether you are trying to **update** an existing program or **design** a new program.

Therefore, the three concerns you should be addressing when determining the scope of the analysis are as follows:

- What is the nature of the task statements you will be dealing with?
- Will students be employable after leaving the program?
- What is the present status of the program?

While all these concerns are important and should be considered, the employability of students leaving the program is by far the most important.

Using community survey and other inputs. Many questions that you will need to have answered before conducting the analysis can be answered by **reviewing** community survey data and **talking** with members of the community. They can also be answered by examining **employment projections** from state and federal employment offices and from local business and industry.

Some of the questions you will need to answer are as follows:

- In what occupations or occupational areas do employment opportunities exist. Will these opportunities exist two, three, four, or five years from now? If not, what other occupations or occupational areas offer more employment potential during the next five years?
- Are qualified students interested in preparing to work in the identified occupations or occupational areas?
- Are the rewards offered in these occupations or occupational areas of sufficient magnitude to hold an individual who has been prepared?
- Is a formal educational program really necessary for preparing workers for any of the occupations or occupational areas?
- Will employers hire individuals who have completed a formal program?

After answering the questions you have, it should be a relatively simple matter to define the scope of your analysis—to identify an appropriate occupation or occupational cluster for which employees should be prepared and in which there is potential student interest.

If an occupational **cluster** is to be analyzed, each of the occupations included in the cluster needs to be identified. For example, in one analysis, the automotive mechanics cluster included the following occupations: (1) mechanic, (2) mechanic's helper or apprentice, (3) service manager, (4) service writer or advisor, and (5) garage owner (usually only in the case of the independent garage).[1]

Using the data you have collected, together with input from your occupational advisory committee, you should be able to identify the occupations involved in your occupational cluster. *The Dictionary of Occupational Titles*[2] or the *Occupational Outlook Handbook*[3] may also prove valuable in identifying and describing related occupations.

1 Sidney D Borcher and Paul B. Leiter, *Automotive Mechanics Occupational Performance Survey*, Interim Report (Columbus, OH. The Center for Vocational Education, The Ohio State University, 1973), p. 3.

2. U.S Department of Labor. Bureau of Employment Security, *Dictionary of Occupational Titles* (Washington, DC: U.S. Government Printing Office, current edition).

3 U.S. Department of Labor, Bureau of Labor Statistics, *Occupational Outlook Handbook* (Washington, DC: U S. Government Printing Office, current edition)

Developing the job descriptions. Once the occupation or occupations are identified, you should further define the scope of the analysis by developing occupational or job descriptions for each occupation specified. Although such descriptions vary widely in content (see samples 3 and 4), the following information should ideally be included in each description:

- What is the occupational title?
- What is the *Dictionary of Occupational Titles* (DOT) code number, if available?
- What does the individual worker do?
- What must the individual know (general areas of knowledge only)?
- Where does the individual work, and under whose supervision?
- What are the physical requirements?
- What are some of the more common tools and equipment used on the job?
- What future occupational changes are expected?
- What related occupations exist that require more or less preparation?
- What licensing requirements exist, if any?

The preparation of these occupational descriptions will play an important role in any analysis effort because they help to define the scope of the analysis to be performed. This is especially important in communicating to others exactly what is being undertaken.

In preparing these descriptions, there are many sources of data from which you can get the necessary information. Your own personal knowledge of an occupation might result in your being a primary

SAMPLE 3

JOB DESCRIPTION

Occupational Cluster: Alteration Specialist

Occupations: Seamstress (DOT Code No. 782.884)

Alteration Tailor (DOT Code No. 785.281)

In the textile service industry, the bulk of the repair and/or alteration of clothing will be handled by two trained and skilled individuals. Their job titles are dressmaker (seamstress) and bushelman (alteration tailor). The head of the department will usually take care of any customer fitting problems. The dressmaker who does alteration work performs a wide variety of sewing operations, such as hemming coats and dresses, removing and replacing zippers, resewing seams, and performing other minor alterations.

The bushelman (alteration tailor) will, as a rule, work on the heavier fabrics and garments, such as trousers, suit coats, top coats, and rainwear. The bushelman will perform such tasks as lengthening or shortening sleeves, trouser cuffs, coat and skirt hems. He/she will also alter waistbands for trousers, slacks, and skirts. The head bushelman or dressmaker will handle garments that come under the heading of plant damage or have a major sewing problem.

Responsibilities of the head dressmaker or bushelman may also include the supervision of sewing room operations and maintenance of various records.

SOURCE Elaine Buerkel and Joseph H Rehling, *Alteration Specialist. Occupational Analysis* (Columbus, OH. The Ohio State University, Trade and Industrial Education Instructional Materials Laboratory, 1974), p 11

SAMPLE 4

JOB DESCRIPTION

Occupation: Ranch Laborer (DOT Code No. 413.887)

Participates in branding, dehorning, and castrating. Herds animals to pens and pastures. Applies prescribed medications. Digs post holes by hand, repairs fences and buildings using hand tools, pulls weeds by hand, removes trash and dirt from watering places. Mixes feed by hand. May ride horseback to assist in herding. Does not operate mobile or stationary power-driven equipment.

SOURCE Lee R Gobbo "Competencies Needed for Employment in Beef Production Enterprises (unpublished master s thesis, Colorado State University, 1975) p 142

source of such information. However, a broader range of sources should usually be used.

Workers and employers can provide you with the answers to many questions about their occupations. Members of your advisory committee may also be able to provide you with useful information. In addition, many published sources are available that describe occupations. The *Dictionary of Occupational Titles* and the *Occupational Outlook Handbook* are two of the more readily available sources.

Previously developed occupational descriptions are also often available in curriculum guides or other educational literature related to preparing an individual for employment. These often will need to be revised and updated, however. Sometimes employers can provide detailed job descriptions that they have developed for use in their own operations.

Preparing for the analysis. To prepare yourself for conducting the analysis, you should be sure you are familiar with the language and characteristics of the occupations to be studied. Information for these purposes may be obtained from the following sources:

- Books, periodicals, and other literature on technical or related subjects available in libraries
- Catalogs, organizational and flow charts, and process descriptions already prepared by business or industry
- Technical literature on industrial processes and job descriptions prepared by trade associations, trade unions, and professional societies
- Pamphlets, books, and job descriptions prepared by federal, state, and local government departments that have interests in the industry or occupational area

By planning in advance for the analysis, you will be able to talk to management, supervisors, and workers in a language common to all. This background information will also help you observe and evaluate job tasks and processes objectively, without loss of time.

Optional Activity 2

For further information about the purposes of and rationale and techniques for conducting an occupational analysis, you may wish to read one or both of the following supplementary references: Ammerman and Pratzner, *Performance Content for Job Training, Volume I: Introduction;* and/or Ammerman, *Performance Content for Job Training, Volume 2: Stating the Tasks of the Job.*

Optional Activity 3

You may wish to arrange through your resource person to meet with a teacher in your occupational specialty who is skilled in conducting occupational analyses. During this meeting, you could discuss how he/she defines the scope of an occupational analysis and obtain sample job descriptions to review.

Activity 4

Using the **occupations** in your vocational service area and the **community** in which you presently reside as a basis, define the scope of a proposed occupational analysis. This will include the following steps:

- Tentatively select an occupation to analyze
- Gather information about the occupation from the following sources (insofar as is possible in your present situation): community surveys, members of the community, employers, employment projections, and reference books
- Identify an appropriate occupation or occupational cluster based on the information gathered
- Identify as many of the occupations commonly found within the occupational cluster as possible (if a cluster is to be analyzed)
- Develop a brief but comprehensive written job description for the occupation or for at least two of the occupations in an occupational cluster

Feedback 5

After you have defined the scope of your occupational analysis, use the Scope Definition Checklist, pp. 15–16, to evaluate your work.

SCOPE DEFINITION CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL box to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name ______________________

Date ______________________

Resource Person ______________________

LEVEL OF PERFORMANCE

	N/A	No	Partial	Full
1. An occupation or occupational cluster was selected for analysis based on:				
a. the needed level of specificity of the task statements	☐	☐	☐	☐
b. the breadth of preparation needed by students in order to be employable	☐	☐	☐	☐
c. the intent of the analysis	☐	☐	☐	☐
2. For the selected occupation or occupational cluster, available data indicate that:				
a. employment opportunities will exist at the time the students complete their preparation	☐	☐	☐	☐
b. rewards of such work are sufficient to hold prepared individuals	☐	☐	☐	☐
c. a formal educational program is necessary for preparing workers	☐	☐	☐	☐
d. employers will hire individuals who have completed an educational program	☐	☐	☐	☐
3. If an occupational cluster was selected, the occupations within that cluster were identified	☐	☐	☐	☐
4. Each job description includes the following types of information:				
a. occupational title	☐	☐	☐	☐
b. *Dictionary of Occupational Titles* (DOT) code number	☐	☐	☐	☐
c. what the individual worker does	☐	☐	☐	☐
d. what the individual must know (general areas of knowledge) .	☐	☐	☐	☐
e. where the individual works, and under whose supervision ...	☐	☐	☐	☐
f. what the physical requirements are	☐	☐	☐	☐
g. what some of the more common tools and equipment used on the job are	☐	☐	☐	☐

	N/A	No	Partial	Full
h. what future occupational changes are expected	☐	☐	☐	☐
i. what related occupations exist that require more or less preparation	☐	☐	☐	☐
j. what licensing requirements exist, if any	☐	☐	☐	☐
5. In developing the job descriptions, at least the following sources of data were consulted:				
a. *Dictionary of Occupational Titles*	☐	☐	☐	☐
b. *Occupational Outlook Handbook*	☐	☐	☐	☐

Level of Performance: All items must receive FULL or N/A responses. If any item receives a NO or PARTIAL response, review the material in the information sheet, The Occupational Analysis and Defining Its Scope, pp. 8–13, revise your definition accordingly, or check with your resource person if necessary.

Learning Experience II

OVERVIEW

Enabling Objective

After completing the required reading, prepare an initial listing of duty and task statements by partially analyzing a selected occupation.

Activity 1

You will be reading the information sheet, Preparing an Initial Listing of Duty and Task Statements, pp. 18–28.

Optional Activity 2

You may wish to read the following supplementary reference: Ammerman, *Performance Content for Job Training, Volume 2: Stating the Tasks of the Job.*

Activity 3

You will be preparing an initial listing of task and duty statements for a specific occupation, using employers or employees and available references to guide you.

Feedback 4

You will be evaluating your competency in preparing an initial listing of duty and task statements, using the Initial Listing Checklist, pp. 31–32.

Activity 1

For information concerning the preparation of an initial listing of duty and task statements, read the following information sheet.

PREPARING AN INITIAL LISTING OF DUTY AND TASK STATEMENTS

After you have defined the scope of your analysis, the next step is to prepare an initial listing, or inventory, of the duties and tasks of the occupation or occupational cluster.[4] This is an initial and fairly rough list—one that you will revise and refine in the course of your analysis.

In constructing such a listing, you will need to seek input and information from employers, employees, occupational advisory committee members, members of employer and employee organizations, and relevant printed materials. Among the sources available to you are the following.

Resources in Vocational Education (RIVE). Produced by the Eric Clearinghouse on Adult, Career, and Vocational Education at The Ohio State University in Columbus, Ohio, this is a bimonthly publication that provides indexes to and summaries of a variety of instructional and research materials, including recently developed occupational analyses.

State curriculum laboratories. Many states have one or more curriculum laboratories or instructional materials centers that are supported through state department of education funding and/or through membership subscription fees. Some states, such as Ohio, have separate labs for agricultural education, distributive education, and trade and industrial education, while other states have only one lab or center serving all vocational service areas.

Many of these curriculum labs and centers have developed and published occupational analyses. The Ohio State University's Trade and Industrial Education Instructional Materials Laboratory, for example, has released analyses for over 100 occupational areas. These publications are available by job title for a nominal fee from the laboratory. Before beginning a local curriculum development effort, it is advisable to check the status of existing state or regional efforts.

Regional and national consortiums. In recent years a number of regional and national consortiums have been organized and supported by various states and/or individual institutions to fund the development of occupational analyses and/or curricular materials. Two such consortiums are as follows:

- **Vocational-Technical Education Consortium of States (V-TECS)**—V-TECS is a consortium of states joined together to conduct occupational analyses and to publish them in the form of catalogs. An occupational catalog consists of duty areas and task statements, as well as performance guides and criterion-referenced measures for each task. As of this writing there are over 140 catalogs that you may obtain (if your state is a member of V-TECS) from your state department of education. Persons in nonmember states can purchase the catalogs from V-TECS; 795 Peachtree Street, NE; Atlanta, GA 30365.
- **Interstate Distributive Education Curriculum Consortium (IDECC)**—IDECC is a consortium of states organized in 1972 to develop a competency-based learning system based on occupational analyses for 69 occupations in marketing and distribution. The consortium sponsored the development of a series of 500 learning activity packages (LAPs), containing 983 competencies and over 2,000 behavioral objectives. It is continuing to develop more materials based on occupational analyses for additional occupations. The IDECC office is located at The Ohio State University; 1564 West First Avenue; Columbus, OH 43212.

National Network for Curriculum Coordination in Vocational and Technical Education (NNCCVTE). The U.S. Department of Education supports NNCCVTE, which includes six regional curriculum coordination centers. These centers maintain libraries of curricular materials, including occupational analyses, and also have reference documents that might help you locate occupational analyses available elsewhere. Inquiries should be processed through the NNCCVTE state representative in your state department of education.

4 Much of the material in this information sheet was adapted from William H Melching and Sidney O Borcher, *Procedures for Constructing and Using Task Inventories* (Columbus, OH. The Center for Vocational Education, The Ohio State University, 1973)

Other organizations. In addition, within your own individual state, certain occupational analyses may have been developed by a particular secondary or postsecondary school, university, professional or technical association, labor organization, federal or state government bureau, trade association, business or industry, research or consulting firm, and so on.

Texts. Modern texts can also furnish you with ideas for your task list. Chapter or section headings, topic statements, and instructional content can be used to generate items for the list. You can also use the texts to double-check the completeness of lists you may already have. It should be mentioned that the acquisition of reference materials should start well in advance of the actual construction of the initial inventory. This will allow you time to both locate and secure the needed materials.

Personal contacts. Observing, interviewing, or informally conversing with selected workers on the job are effective means of establishing the initial listing. Though an initial listing can be prepared in this manner, it is probably more efficient to prepare the original listing using other techniques and then to verify the listing using the observation or interview technique.

The information gathered from sources such as these, combined with your own knowledge of the occupation, should provide you with a reasonably complete initial list.

Developing an Inventory

The following are suggested steps to follow in developing the initial listing (or inventory) of task and duty assignments:

1. Determine the duty categories.
2. Prepare task statements.
3. Organize the tasks and statements into a preliminary inventory.
4. Ask people from the occupational area to review the preliminary inventory.
5. Revise the inventory based on information received during the review.
6. Pilot test the inventory.

Duty Statements

Before assembling the task statements for the inventory, tentative duty categories must be established under which the task statements can be grouped. You will recall that a duty is an **arbitrary** division of a job (or occupational area) consisting of related tasks that are grouped for descriptive purposes.

There are generally two types of duty statements in an inventory: (1) duty statements that reflect **supervisory activities** (e.g., supervising, organizing, planning, directing, implementing, training, inspecting, and evaluating) and (2) duty statements that reflect **work performance activities** (e.g., performing, maintaining, troubleshooting, repairing, removing and replacing, adjusting, and installing).

An **object** (item acted upon) is used with these action words to further specify the duties (e.g., *Repairing Transmissions*). The object is always either data, people, or things.

Other duty headings may be suggested by headings from analyses, organizational charts, textbooks, and curriculum guides. A worker in a particular job might perform a number of related tasks that logically can be grouped together, and an appropriate duty heading can be written to cover those tasks.

If few task statements (i.e., ten or less) are found for a particular duty category, tasks under related duties might be combined (e.g., organizing and planning, directing and implementing, inspecting and evaluating). Thus, more than one action word may be used to designate a single duty category. Examples of typical duty statements for four occupations are listed in sample 5.

SAMPLE 5

DUTY STATEMENTS

I. Automotive Mechanics Task Inventory

A. Organizing and Planning Mechanics' Functions
B. Supervising Mechanics' Functions
C. Evaluating and Inspecting Mechanics
D. Training Mechanics
E. Performing Maintenance Control Functions
F. Performing Engine Overhaul Activities
G. Maintaining and Repairing Power Trains
H. Maintaining and Repairing Automatic Transmissions
I. Maintaining and Repairing Electrical Systems
J. Maintaining and Repairing Fuel Systems
K. Maintaining and Repairing Cooling Systems
L. Maintaining and Repairing Standard and Power Steering Units
M. Maintaining and Repairing Braking Systems
N. Maintaining and Repairing Front Ends
O. Maintaining and Repairing Automobile Air Conditioners
P. Maintaining and Repairing Automobile Heaters
Q. Lubricating and Maintaining Chassis

II. Paralegal Inventory

A. Assisting Clients
B. Performing Communications Functions
C. Implementing Legal Procedures
D. Performing Investigative Functions
E. Conducting Legal Research
F. Preparing Instruments and Documents
G. Assisting with Judicial and Administrative Appearances
H. Completing Client Projects
I. Coordinating Office Functions
J. Keeping Up-to-date

III. Retail Travel Agent Inventory

A. Using Reference Materials
B. Arranging Ticketed Air Travel
C. Arranging Tours
D. Arranging Cruise and Steamship Travel
E. Arranging for Hotels and Cars
F. Arranging Rail Transportation
G. Using Sales Techniques
H. Providing Insurance for the Traveler
I. Providing Related Services
J. Performing Routine Office Functions

IV. Drafting Inventory

A. Conducting Field Work and Making Preliminary Presentations
B. Preparing Final Drawings
C. Communicating with Others
D. Using Reference Materials
E. Making Mathematical Calculations
F. Preparing Written Documents
G. Checking Drawings
H. Reproducing Drawings
I. Maintaining Document Storage
J. Keeping Up-to-date

Task Statements

The number of task statements in an inventory or listing is largely dependent on the scope of the occupation or occupational cluster for which information is to be sought. Generally, you should focus on a cluster of closely related occupations. This means that the inventory will usually include several occupations, all requiring similar skills and knowledge.

The inventory also should be designed to cover all levels of a particular career or promotion ladder. However, in cases in which there is a large cluster of management positions, it may be best to develop separate inventories, one for the management positions and one for skilled workers.

It is recommended, for practical reasons, that an inventory should generally contain at least 100, but not more than 600, task statements. The ultimate determiner of the number of task statements should be the complexity of the occupation being analyzed. Complex occupations will obviously require more task statements than simpler ones. Certainly all task statements that have direct implications for instruction, regardless of the number, should be listed when the analysis is being made for curriculum development purposes.

Since you will be testing this inventory at a later date by asking workers to respond to tasks on a voluntary basis, length should also be roughly determined by the number of tasks these people can reasonably be expected to react to in a limited amount of time. Unless you can pay them, you cannot expect workers to spend over one hour of their time reviewing an inventory.

Another important issue that arises in connection with the preparation of task statements is the **level of specificity of the statements**—how specific should the task statements be? It is clear that they must be specific enough to give you the information you need in order to be able to develop effective and efficient courses of study.

However, if the task statements are too specific, they can become cumbersome, providing more detailed information about workers' performance than can be incorporated in an educational program. On the other hand, if they are too general, information about important activities may be lost, communication among analysts and curriculum designers may be reduced, and general conclusions may be reached that provide no effective guidance.

While it is possible to distinguish between the **what** and **how** aspects of work activities, it is doubtful whether a single task statement should contain both elements. Following are examples to illustrate the point:

What	How
Calculate the cost of a shipment of supplies	Use a fully automatic desk calculator
Estimate the stress exerted on a beam in a structure (building)	Use the IBM 650 computer

While statements containing both elements can provide more information than statements containing only one element, using many statements combining the two elements can easily lead to an inventory of unmanageable length. It is better, therefore, to make separate statements. In fact, many educators now feel it is best to include only statements describing the what aspects of work activities, leaving the **how** elements to be delineated during task analysis.

A similar problem exists if one focuses only on a specific example of an activity. For example, a statement such as *Calculate the profit margin on shoes* focuses on performing this activity only in relation to **shoes**. Yet, the calculation of a profit margin is the same process, whether for use with shoes, eggs, or some other item. In other words, the real activity (calculating profit margin) may be performed for a variety of purposes.

Sometimes, similar-sounding statements actually identify two completely different processes (e.g., *Check tires for proper inflation* and *Check tires for tread wear*). In this case, two separate statements would be preferred.

Developing a task inventory in which all statements are equal in specificity is desirable—but usually impossible. The level of specificity one needs in a given situation should be the deciding criterion. There is probably no one ideal level of specificity. Examples of task statements for one duty statement in a secretarial science task inventory are shown in sample 6.

SAMPLE 6

TASK STATEMENTS

Secretarial Science

DUTY G: PERFORMING BOOKKEEPING AND ACCOUNTING ACTIVITIES

1. Perform cashier/teller functions
2. Administer imprest and petty cash funds
3. Administer small purchases such as credit card charges and blanket purchase agreements
4. Age the accounts receivable
5. Approve bills of any kind
6. Approve customers' transactions such as checks and charge purchases
7. Approve monthly group insurance bills
8. Arrange for insurance policies
9. Ascertain availability of funds
10. Calculate deductions such as income tax, FICA, and insurance
11. Check bills and invoices
12. Check money orders and checks for accuracy and completeness
13. Check on supplies for reordering purposes
14. Close ledger accounts
15. Control the safekeeping of monies, bonds, and sealed bids
16. Compose business reports
17. Compute amount and percentage of markup and loss
18. Compute depreciation
19. Compute dividends
20. Compute interest charges
21. Compute payrolls for employees
22. Compute property taxes
23. Compute income taxes

SOURCE Adapted from Sidney D Borcher and John Joyner. *Secretarial Science Occupational Performance Survey*. Interim Report (Columbus, OH, The Center for Vocational Education, The Ohio State University, 1973), pp 43 and 50-55

General Guidelines for Task Statements

Several considerations should be kept in mind when constructing, reviewing, and editing task statements to be included in an inventory. Here are some of the most helpful.

Consider the purposes to be served by the task inventory. Each task statement should be written in the context of the uses to be made of the information derived from it. In general, the statement should serve one or more of the following purposes:

- The task statement should be worded so as to elicit responses that differentiate between workers in different job types within the occupational area.
- The task statement should be worded so as to elicit responses that differentiate between managers and supervisors, supervisors and foremen, and foremen and workers.

Consider the worker responding to the task statements. In considering the worker who will respond to the inventory, each task statement should conform to the following ground rules:

- The task statement must be clear so that it is easily understood by the worker.
- The task statement must be stated using terminology that is consistent with current usage in the occupational area.
- The task statement should be brief to save the reading time of the worker.
- The use of abbreviations should be avoided, if possible, since they may not be understood throughout the occupational area. Where they must be used, it is good practice to spell out the term and follow it with the abbreviation in parentheses the first time the term appears in the inventory. In later usage, the abbreviation may stand alone.
- The task statement must be ratable in terms of worker time spent on the task and/or other rating factors. This **eliminates** skill, knowledge, and responsibility items that begin with such words as *have responsibility for, know how to, understand,* or *have knowledge of.*

  Such statements found in source materials should be rewritten as two or more task statements (e.g., write *Maintain files* and *Supervise maintenance of files,* not *Have responsibility for maintaining files*).
- Vague or ambiguous words (e.g., *check, assist, coordinate, recommend,* and *assure*) should be avoided.
- Short words should be used in preference to long words or expressions (e.g., write *Fill out work orders,* not *Prepare forms for vehicle repairs to be accomplished by mechanics*).
- The qualifications a worker has—such as intelligence, aptitude, knowledge, education, skill, training, and experience—are not tasks and should not be included in the duty/task section of the inventory. Information about training, education, and work experience, however, may be obtained by including appropriate items in a separate section —background information— of the inventory.
- Receiving instruction should not be included as a task unless useful work is actually performed during the training. Thus, classroom instruction, laboratory or shop instruction, and the coaching a person receives are not tasks. On-the-job training, however, may include the performance of tasks under supervision. These tasks can be listed in the inventory (e.g., *Provide instruction,* which is a supervisory task, can be included under the duty *Training Workers*).

- Each task statement should begin with a present tense action word with the subject *I* understood (e.g., write *operate, write, clean,* **not** *operates, writes, cleans*).
- Task statements should be arranged alphabetically under each duty. This order shortens the worker's reading time and assists in recalling tasks that are not listed. For example, the worker can easily scan through a list of tasks beginning with the word *inspect* to make sure that all the inspections he/she performs are in the inventory. The alphabetical arrangement also helps the inventory developer eliminate duplicate tasks.

Consider task statement format to facilitate analysis. Each task statement must appear in a format that will make it most useful. The following guidelines should be observed:

- Task statements should be limited to not more than two lines.
- The task statements should be numbered consecutively, beginning with the number *1* under each duty heading.
- Each task statement must be specific and capable of standing alone. An item such as *Repair other types of equipment* may be meaningful to a worker if listed at the end of a series of specific tasks on operating specific types of equipment. However, when a consolidated listing is prepared from the inventory results, the tasks are not printed in the same order as on the initial inventory. Thus, the original context may be destroyed, and an item such as *Repair other types of equipment* may no longer make sense.
- Each task statement must be a complete sentence (subject understood). A straightforward verb-object construction (e.g., *Repair fuel pumps*) is recommended.

- The period at the end of the task statement is omitted.
- Do not use an action subheading followed by a series of objects. For example, statements should be constructed to read *Type and correct offset masters, Type and correct spirit masters, Type and correct stencils.* They should **not** be constructed to read *Type and correct the following: (1) offset masters, (2) spirit masters, and (3) stencils.*
- Parallel tasks should appear under appropriate duties. For each task listed as being supervised, there should almost certainly be a related task that is performed. Equipment to be inspected is also likely to be repaired or replaced.
- Use simple statements without qualifiers (e.g., write *Operate paper cutter,* **not** *Operate paper cutter to cut paper*) unless the qualifier is essential to the meaning of the statement (e.g., write *Schedule employees for on-the-job training,* not *Schedule employees*).
- If a modifier is needed for greater specificity, be sure to include all other significant tasks with comparable modifiers. For example, in an automotive mechanic inventory, *Repair transmissions* would not be specific enough. Therefore, if the statement were modified to read *Repair automatic transmissions,* then *Repair manual transmissions* should also be added.
- When qualifying a task, use *such as* followed by two or three examples. Avoid *and/or* and *etc.* (e.g., write *Type cards, such as index cards, file cards, and address-finder cards,* not *Type index cards, file cards, and/or address-finder cards, etc.*
- Avoid tasks that are obviously too specific or trivial (e.g., write *Operate fork lift truck,* not *Turn ignition key, Shift gears, Elevate fork*).
- Avoid tasks that are too general. Such tasks will not differentiate job types (e.g., write *Repair carburetors, Repair standard transmissions,* not *Repair motor vehicles*).
- In general, avoid multiple verbs in a task statement, unless several actions are invariably performed together (e.g., write *Erect and align poles,* but **not** *Inspect, tow, and repair engines or equipment*).
- As far as possible, tasks included in the inventory should be independent. Avoid overlapping task statements.

Inventory Organization

When organizing the inventory, it is important that supervisory duties such as organizing, planning, inspecting, evaluating, and training be placed last on the list. These are left until last for two reasons. Because of the ongoing nature of many supervisory activities, it is more difficult to write time-ratable supervisory items. The review can become bogged down if supervisory tasks are considered first.

By dealing with supervisory items last, the reviewer will have had some practice with easier items. In addition, the nonsupervisory tasks are regarded as the central tasks of the occupational area and, therefore, should comprise the main body of the inventory.

The DACUM Approach to Competency Identification

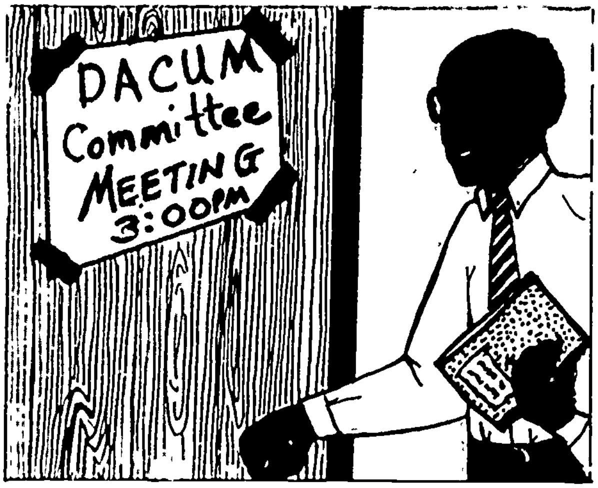
It should be mentioned at this point that other approaches to preparing an inventory of duties and tasks are gradually emerging. The DACUM technique, for example, is a relatively new approach that is now being used at many secondary and postsecondary institutions as a basis for program planning.[5]

DACUM (Developing **A** Curriculum) was created in the late 1960s by the Experimental Projects Branch, Canada Department of Regional Economic Expansion, and the General Learning Corporation of New York. It has proven to be a very effective approach for quickly deriving, at a relatively low cost, the competencies or tasks that must be performed by persons employed in a given position or occupational area.

DACUM, which utilizes small-group brainstorming techniques, is a process that results in a skill profile for a particular job or occupational area. DACUM is primarily concerned with the **what** of a curriculum, rather than the **how**. It is, in fact, an analysis of the occupation rather than a curriculum evolving from an analysis.

It is graphic in nature, defining an entire occupation on a single sheet of paper. This tends to prevent treatment of any element of the occupation in

5. Material in this section is adapted from William E. Sinnott, *The Application of DACUM in Retraining and Post-Secondary Curriculum Development* (Toronto, Ontario: Humber College of Applied Arts and Technology, Lakeshore Campus, 1974).



isolation and, conversely, tends to promote treatment of each element as part of a larger whole.

The duties (or duty areas or general areas of competence) required in the occupation are listed, and each is broken down into those individual tasks that collectively enable an individual to perform competently within that duty area. These tasks are defined quite simply and are structured independently in small blocks on the chart (see sample 7). Each can serve as an independent goal for learning achievement.

A carefully chosen group of about 10-12 experts (workers and supervisors) in the occupational area form the DACUM committee and work for two to three days to develop the DACUM chart. Committee members are recruited directly from business, industry, or the professions; they do not include vocational educators. A DACUM committee is carefully guided through each of the following steps by a **trained** DACUM coordinator:

1. Receive a general introduction and orientation.
2. Review a description of the specific job or occupational area.
3. Identify the duties.
4. Identify the specific tasks for each of the duty areas.
5. Review and refine the task statements.
6. Sequence the task statements.
7. Establish levels of competence for each task in terms of difficulty, frequency of use, and general importance.
8. Structure the competency profile chart into a final form.

Once completed, a vocational teacher, with the advice of the occupational advisory committee, can use the DACUM chart as a basis for instruction and/or the development of instructional materials.

SAMPLE 7

PARTIAL TASK LIST: CHART FORM

Drafting Skill Profile

	Duties	Tasks				
A	Conduct Field Work and Make Preliminary Presentations	A-1 Take Measurements	A-2 Determine Site Orientation	A-3 Make Site Inspections of Work Being Done	A-4 Use Surveying Techniques	A-5 Develop Working Sketches
B	Prepare Final Drawings	B-1 Determine Type and Size of Medium	B-2 Prepare Surface for Drawing (Pounce)	B-3 Determine Details to Be Shown (Isometric, Auxiliary)	B-4 Lay out Drawings	B-5 Apply Basic Principles and Practices Pertaining to Drafting Specialty
	Prepare Final Drawings (cont'd)	B-14 Make Assembly Drawings (Isometric)	B-15 Make Perspective Drawings	B-16 Make Tracings	B-17 Check Drawings for Completeness and Accuracy	
C	Communicate With Others	C-1 Consult With Peers	C-2 Consult With Clients	C-3 Consult with Craftspersons and Technicians	C-4 Communicate With Supervising Personnel	C-5 Communicate With Subcontractors and Vendors
D	Use Reference Materials	D-1 Use French's and Svenson's References	D-2 Use Architectural Graphics Standards	D-3 Use Sweet's Catalog	D-4 Follow Company Standards	D-5 Conduct Library Research
E	Make Mathematical Calculations	E-1 Convert Inches to Metrics	E-2 Convert Fractions to Decimals	E-3 Make Geometric Calculations	E-4 Make Trigonometric Calculations	E-5 Apply Basic Principles of Physics
F	Prepare Written Documents	F-1 Develop Written Instructions or Specifications	F-2 Generate Job Orders or Worksheets	F-3 Write Change Orders	F-4 Submit Requisitions for Services	F-5 Submit Requisitions for Drafting Supplies
G	Check Drawings	G-1 Check Accuracy of Dimensions and Scale	G-2 Check Coordination of Prints	G-3 Check Revisions	G-4 Check for Completeness	G-5 Check Line Quality
H	Reproduce Drawings	H-1 Select Type of Reproduction	H-2 Make Copies of Drawings	H-3 Make Copies of Blueprints	H-4 Make Reproductions of Blueprints	H-5 Make Photographic Reproductions
I	Maintain Document Storage	I-1 File Masters	I-2 File Media Materials	I-3 Retrieve Media and Masters	I-4 Maintain File of Revisions	I-5 Maintain Drawing Log (Notebook or Index File)
J	Continue Education	J-1 Participate in Inservice Education Classes and Seminars	J-2 Study Trade Publications	J-3 Participate in Trade Societies	J-4 Study Job-Related Books	J-5 Participate in Trade Shows and Exhibits

SOURCE Adapted from a DACUM analysis done by Durham Technical Institute, Durham, North Carolina.

Reviewing the Initial List

After the preliminary inventory has been constructed, a group review should be conducted using people from the occupational area. These people should refine and revise the inventory items **prior** to your asking incumbent workers to rate the items. The purpose of this review is to add missing statements, delete obviously irrelevent statements, and improve the wording of vague or lengthy statements.

Reviewers should be selected for their occupational knowledge and practical experience in all aspects of the occupational area. If several specific occupational titles are covered by the inventory, it is advisable to involve at least one worker or supervisor for each job title or a supervisor who directly supervises several job titles.

In selecting reviewers, you must be flexible. It is not possible to know at the outset which individuals will give the best and most complete information or precisely how many reviews will be required. You should conclude the review process when you judge that the preliminary form is well structured and essentially complete. From three to eight reviews are adequate for most inventories. However, as a rule and to the extent practicable, the more reviewers, the better.

Whenever possible, it is desirable to use individuals from several different businesses or industrial firms. Getting the organizational structure and work breakdown of only a single establishment can bias your results. In most cases, it is easy to find individuals who are willing to take an hour to go over the preliminary inventory.

Conducting the Review

The purposes and uses of the inventory should be explained to the group of reviewers before they begin to examine the duty and task statements. The reviewers should clearly understand how the duties and tasks should be stated and how specific they should be.

The reviewers should then be shown a list of the duty headings. These should be reviewed one by one for clarity and accuracy. If the reviewers point out duties that are missing from the list, consider adding additional ones.

After completing the review of the duty headings, the reviewers should be given a copy of the task inventory and asked to review the individual task statements. You should read each task statement aloud and ask questions about the particular task. Following are examples of the types of questions to be asked:

- Is the task statement clear? Will everyone understand what this means?
- Is this task covered by a previous task statement?
- Does this task fit better under another duty?
- Is this task performed in your business or firm?
- Is this task performed by any workers in the occupational area?
- Are there any other tasks that should be included under this duty?

You should not attempt to secure perfectly polished task statements from the reviewers. However, you should accurately record the main substance of any new statements and suggested revisions in a form that can be edited later. The reviewers should not be considered experts on how to write task statements; they should be used to review the essential **content** of the statements.

All tasks under a duty heading should be covered before going on to the next duty. When the nonsupervisory duties or tasks are changed in any important way during the review, it may be necessary to revise the supervisory sections accordingly. For example, if new nonsupervisory duties are added, parallel tasks may need to be added to cover the supervision of those duties.

Editing and Grouping Items

When the reviews are completed, all preliminary inventories that were used during the reviews should be assembled. All revisions, new task statements, and the comments of the reviewers should be copied from these onto a single inventory form.

Final decisions about whether to accept or reject the proposed changes should be made by the people who constructed the preliminary task inventory and conducted the review. Further consultation with technical reviewers may be necessary for some items, especially if conflicting revisions or suggestions have been given by the reviewers.

Most conflicts can be resolved by reference to a published source or by a telephone call to an authority in the field. Once these decisions have been made, all items (especially new or revised ones) must be checked to determine whether they are consistent in format.

In terms of organizational format, all statements falling under a duty should again be arranged alphabetically by the action word (e.g., *adapt, build, compose*). This will help the target audience—the incumbent workers—to detect missing information and reduce the time they spend completing the inventory. Future modifications to the inventory are also easier to make.

As an additional aid to the incumbent worker, the tasks within a duty may be grouped or categorized into major sections. These groupings should appear natural to the wor' er, thereby helping him/her to make judgments. Duty statements should also be grouped in the most logical sequence.

The revised listing should be reviewed by members of your occupational advisory committee and others involved in the original development of the list. Once the revised list has been accepted, it should be prepared for pilot testing.

Pilot Testing the Items

Once you have a draft form of the completed inventory, it is a good idea to try it out on another sample of workers. The goal here is to obtain some first-hand feedback from workers concerning whether they understand the statements on the revised inventory. To do this, the developer of the inventory should locate a few workers who represent the full range of incumbent workers who will eventually respond to the inventory.

The developer should meet with these workers individually. Each worker should be asked to read each statement and to comment on any statement that appears confusing to him/her. The specific reason for the confusion should be determined, and suggested revisions should be devised with the worker's help.

The worker should **not** be asked at this time to indicate whether he/she performs a given task. It is his/her **comprehension** of the statement of each task—the **clarity** of each statement—that is being pilot tested, not the adequacy of the statements in describing what the worker does.

The need for pilot testing is dependent upon the degree to which the preliminary form of the inventory has been reviewed by other persons from the occupational area. If several knowledgeable persons from the occupational area have carefully reviewed the inventory and the occupational advisory committee has also studied the instrument, pilot testing is of lesser importance. However, it is always a good idea, if time and funds permit, to try to check on the clarity of the directions and the statements.

30

Optional Activity 2

For further information on preparing an initial listing of duty and task statements, you may wish to read the following supplementary reference: Ammerman, *Performance Content for Job Training, Volume 2: Stating the Tasks of the Job.*

Activity 3

Select an occupation in your service area or another occupation—such as secretary, nurse, teacher, or automotive mechanic—with which you are already familiar. If you completed Learning Experience I, you may wish to use the same occupation or occupational cluster that you used in that experience in defining the scope of an occupational analysis. For the purposes of this practice activity, the occupation you select must be one for which you can locate and gain the cooperation of two or more employers or employees locally.

Obtain, on your own or through your resource person, one or more references (e.g., curriculum guides, existing task inventories or occupational analyses) that you can use in developing a partial duty and task inventory for the occupation you have selected. Using these references, your own knowledge of the occupation, and input from others (optional), prepare a list of duty statements for the occupation. Then, for at least **four** of those statements, develop at least **six** task statements each.

Contact, on your own or through your resource person, two or more employers or employees within the occupation. Have these persons review the partial inventory for clarity only. (Since this is a partial inventory, it is not necessary for them to suggest additional items.) Revise the inventory as required.

Feedback 4

After you have developed your preliminary inventory, use the Initial Listing Checklist, pp. 31–32, to evaluate your work.

NOTES

INITIAL LISTING CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL box to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name

Date

Resource Person

	LEVEL OF PERFORMANCE			
	N/A	No	Partial	Full
Sources of information used in preparing the initial listing included:				
1. you	☐	☐	☐	☐
2. employers (optional)	☐	☐	☐	☐
3. employees (optional)	☐	☐	☐	☐
4. previously constructed inventories and analyses	☐	☐	☐	☐
5. curriculum publications such as guides, outlines, courses of study	☐	☐	☐	☐
The duty statements:				
6. reflect both supervisory and work performance activities	☐	☐	☐	☐
7. are arranged so that supervisory statements appear last	☐	☐	☐	☐
8. are designed so that each statement contains an action word ending in *ing* and an object (e.g., *Adjusting Baler Needles*)	☐	☐	☐	☐
The task statements:				
9. differentiate between workers in different occupations and at different levels	☐	☐	☐	☐
10. use terminology that is consistent with current usage in the occupation	☐	☐	☐	☐
11. are stated clearly and briefly	☐	☐	☐	☐
12. are ratable in terms of time spent	☐	☐	☐	☐
13. are stated in accepted form and structure	☐	☐	☐	☐
14. are not too specific or too general	☐	☐	☐	☐
15. are independent of one another (i.e., do not overlap)	☐	☐	☐	☐

	N/A	No	Partial	Full
The preliminary version of the initial listing:				
16. was reviewed by two or more reviewers from the occupational area	☐	☐	☐	☐
17. was revised to incorporate the reviewers' comments, insofar as practical	☐	☐	☐	☐
18. was formatted for consistency after the review	☐	☐	☐	☐

Level of Performance: All items must receive FULL or N/A responses. If any item receives a NO or PARTIAL response, review the material in the information sheet, Preparing an Initial Listing of Duty and Task Statements, pp. 18–28, revise your inventory accordingly, or check with your resource person if necessary.

34

Learning Experience III

OVERVIEW

Enabling Objective

After completing the required reading, verify an initial listing of task and duty statements.

Activity 1

You will be reading the information sheet, Verifying an Initial Listing of Task and Duty Statements, pp. 34–50.

Optional Activity 2

You may wish to read one or more of the following supplementary references: Ammerman, *Performance Content for Job Training, Volume 3: Identifying Relevant Job Performance*; and Ammerman and Essex, *Performance Content for Job Training, Volume 4: Deriving Performance Requirements for Training.*

Activity 3

You will be verifying an initial listing of task and duty statements.

Feedback 4

You will be evaluating your competency in verifying an initial listing of task and duty statements, using the Initial Listing Verification Checklist, pp. 53–54.

Activity 1

For information concerning the verification of an initial listing of task and duty statements, including the types of information to be collected, the selection of participants, and the procedures to be used, read the following information sheet.

VERIFYING AN INITIAL LISTING OF TASK AND DUTY STATEMENTS

Verification of the initial listing of task and duty statements is an important step in the occupational analysis process.[6] It confirms that the inventory task statements actually describe the activities conducted as part of the occupation being considered.

One might ask why such verification is necessary if the development of the initial listing was done thoroughly and correctly. One might be especially curious if already-developed analyses or the employee observation technique were used.

However, the earlier review and pilot testing of the inventory simply indicate, using a very small sample of workers, that the items are relevant and clear. Verification uses a broad base of input to ensure that the listing indeed accurately describes an occupation in a specific employment area.

6 Much of this material was adapted from *Handbook for Analyzing Jobs* (Washington, DC: U.S. Department of Labor, Manpower Administration, 1972).

Determining the Information to Collect

To prepare the initial listing of task and duty statements for verification, several things must be done. First, with the aid of your occupational advisory committee, you need to determine what types of information should be collected related to the inventory.

Information about tasks. If an analysis is to be conducted purely to describe what takes place in an occupation, you need to determine only whether the various tasks are actually performed by the worker. A sample of a simple scale that would obtain that type of information is shown in sample 8.

SAMPLE 8

INVENTORY: SIMPLE RATING SCALE

OCCUPATION: Artificial Inseminator

Duty: Handling Cattle

No.	Task	Check If Performed
1	Detect heat	
2	Determine time to inseminate	
3.	Identify symptoms of reproductive diseases	
4	Maintain breeding records	
5	Move cattle	
6	Operate breeding chute	

SOURCE Adapted from Gobbo. "Competencies Needed for Employment in Beef Production Enterprises," p. 150.

SAMPLE 9

INVENTORY: MULTIPLE RATING SCALES

OCCUPATION: Feed Lot Foreman

Duty: Keeping Records

No.	Tasks	Check (✓) if performed by beginning worker	How often is the task performed?	How important is the task?	How difficult is it to learn to perform the task?
1	Keep equipment inventory				
2	Keep financial records				
3	Keep livestock inventory				
4	Keep production records				
5	Set up record-keeping system				

SOURCE: Gobbo, "Competencies Needed for Employment in Beef Production Enterprises," pp. 110-111.

However, if you are trying to plan an instructional program, this will probably not provide you with enough information to make intelligent instructional decisions. For such planning, questions such as the following might be appropriate:

- Is the task performed by beginning workers?
- How often is the task performed?
- How important is the task?
- How difficult is it to learn to perform the task?

Finding out whether the tasks involved are performed by **beginning workers** is especially important if the instructional program to be developed is to be oriented toward providing the entry-level skills required by workers. A question dealing with the **frequency of performance** can be of value in identifying frequently performed tasks that should be emphasized in an instructional program.

A rating of the **importance of a task** can also aid in making instructional decisions. Mere performance or frequency of performance may not be an accurate indicator of importance, especially in some medical or public service occupations. A rating of **how difficult it is to learn to perform a task** can be of value in allocating instructional resources.

Sample 9 illustrates an inventory in which such questions are asked. Note that for a worker to respond to these items, clear directions would be

SAMPLE 10

ANALYSIS WORKSHEET

Occupation: ____________________

Duty: ____________________

Column A	Column B				Column C								Column D	Column E
Task	Frequency of Performance				Importance								Conditions Under Which Task Will Be Performed	Criteria That Exhibit Satisfactory Application of the Task
	Number of Times Per				For Occupational Entry				For Occupational Advancement					
	Day	Week	Month	Year	E	D	U	NS	E	D	U	NS		

needed. The following is an example of the directions that might be provided with such an inventory:

Directions: Rate each task listed according to the following four factors.

In the first rating column, place a check (✓) if the task is performed by a **beginning worker.**

In the second rating column, indicate how often the task is performed, using the word or phrase from the following scale that most accurately describes the **frequency of performance.**

- Rarely
- ____ times a month
- ____ times a week
- ____ times a day
- Hourly
- Continuously

In the third rating column, indicate **how important** the task is, using a three-point scale, where 1 = very important, 2 = important, and 3 = not very important.

In the fourth rating column, indicate **how difficult it is to learn** to perform the task, using a three-point scale, where 1 = difficult, 2 = moderately difficult, and 3 = easy.

Another form that might be of use to you is shown in sample 10. Note particularly the scale used in Column C: *essential—desirable—unnecessary—not sure*. Such scales have proven to be very popular for use as part of data-gathering devices. (NOTE: Sample 10 has been much reduced in size to serve here as an example. For actual use, much more space would be needed in columns A, D, and E to allow room to write the task statements, conditions, and criteria.)

Two other useful scales are the importance scale and the agree/disagree scale. The **importance** scale includes five ratings: *of extreme importance—of considerable importance—of some importance—of limited importance—of no importance*. The **agree/disagree** scale also has five ratings: *strongly agree—agree—uncertain—disagree—strongly disagree*. Number values (1–5) can be assigned to each rating in order to make tabulation possible.

If you are interested in obtaining greater detail in the analysis, occupational analysis and task detailing sheets such as those shown in samples 11 and 12 might be used. Note that the task detailing sheet contains a listing of the steps involved in the task. Curriculum laboratories conducting full-scale occupational analyses collect even more detailed data.

(NOTE: In these samples, the explanations of the scales are provided in footnotes because these examples have been taken from reports of completed verification activities. In reality, the actual inventory would have included this information in a separate directions section).

SAMPLE 11

OCCUPATIONAL ANALYSIS

Occupation: Wastewater Treatment Plant Operator

No.	Task	Frequency of Performance[1]	Importance[2]	Learning Difficulty[3]
1	Adjust chlorination and record	3 times a day	1	1
2	Adjust recirculation to flow	Rarely	2	1
3	Check for malfunction of equipment	Continuously	2	1
4	Clean and maintain work area and equipment	Continuously	1	2
5	Prepare composite sampling for lab analysis	Hourly	1	2
6	Draw digested sludge to beds	Once a month	2	2
7	Draw raw sludge to digester	12 times a day	2	1
8	Administer first aid	Rarely	2	2
9	Maintain security regulations	Hourly	2	3
10	Operate emergency power generator	Once a week	2	2
11	Read meters—(flow)	Hourly	1	3
12	Record digester gas production and consumption (heat regulation)	3 times a day	3	3
13	Record pertinent information on daily log	Hourly	2	3
14	Sample for D.O.	9 times a day	1	2
15	Sample for H_2S	12 times a day	1	2

[1] Rarely, ___ times a month, ___ times a week, ___ times a day, hourly, continuously
[2] 1 = Very important, 2 = Important, 3 = Not very important
[3] 1 = Difficult, 2 = Moderately difficult, 3 = Easy

SOURCE: Taken from *Guidelines for Establishing and Evaluating Programs to Prepare Water and Wastewater Treatment Plant Operations*. Bulletin 79L-6 (Tallahassee, FL: State of Florida, Department of Education, May 1971)

SAMPLE 12

TASK DETAILING SHEET

Occupation: Wastewater Treatment Plant Operator

Task: Draw Digested Sludge to Beds

No.	Steps in Performing Task	Type of Performance[1]	Learning Difficulty[2]
1	Interpret lab results to determine proper time for function	2	2
2	Operate valves to start and regulate rate of flow	1	2
3	Observe consistency	2	2
4	Draw off proper amount	1	2
5	Flush lines	1	1
6	Collect sample for lab analysis	1	1
7	Record amount drawn to drying bed	2	1
8	Clean equipment	2	1

[1]1 = Manipulation, 2 = Discrimination, 3 = Problem Solving
[2]1 = Easy, 2 = Difficult, 3 = Very Difficult

SOURCE *Guidelines for Establishing and Evaluating Programs to Prepare Water and Wastewater Treatment Plant Operations.*

Background Information. In addition to the types of information indicated previously, background information should normally be collected. This section of the inventory is used to obtain information about the incumbent workers. The purposes of these items are (1) to describe the workers surveyed, (2) to answer questions of interest to users of the survey data, and (3) to help distinguish among significant occupational types of special worker groups.

Information about job location, previous work experience, sources of training, and other job-related information—apart from the specific duties and tasks performed—may be requested. Care should be exercised so that only relevant information is requested and human subjects rights and privacy rights are not violated.

The following types of background information are usually required:

- Identification information (e.g., date, name or number to identify the individual respondent, occupation or job title)
- Type of business in which the individual works
- Work experience
- Education-and-training information

Examples of background information questions that have been used are presented in sample 13.

At this point, a draft of the final inventory instrument should be prepared. This draft should include clear directions, all statements to be verified, any rating scales to be used, along with the required background information questions.

SAMPLE 13

BACKGROUND INFORMATION

Respondent Code-# ____________

Date ____________

1. Name ______________________________
(Optional)

2. What is your present job title? ______________________________

3. Check the type of business in which you work:

__ Banking-Finance
__ Construction
__ Distribution (wholesale-retail)
__ Educational Research
__ Insurance
__ Manufacturing
__ Public Utility
__ Publishing
__ Legal Service
__ Health Service
__ Transportation
__ Government (specify level)
☐ Local
☐ State
☐ Federal
__ Other ______________ (please specify)

4. How many years have you worked at your present job? ______________

5. Where did you receive your training?

__ On-the-jcb (self-learned)
__ Military school
__ Correspondence course
__ Secondary public school
__ Public vocational-technical school
__ Private business school
__ Junior or community college
__ College or university
__ Other ______________ (please specify)

A sample form that was used in one analysis effort is presented in sample 14. Note that this sample form provides space for the respondent to add statements to those already identified in the inventory. Any type of form developed should provide the opportunity for the respondent to record and rate additional statements. The completed form should be reviewed by the members of your occupational advisory committee.

Selecting Process to Be Used

Once a decision has been made about the types of information desired, you and your advisors should decide how the process will be conducted. What will the participants be asked to do? Will they be observed and/or interviewed? Will it be more practical to ask them to attend a meeting? Will a list of statements be sent to the participants through the mail?

If the participants are asked to verify the statements without being paid for their services, calling them to a meeting may be asking too much. In any case, it might be very difficult to arrange such a meeting if the participants work in different places and on different schedules. Visiting them individually to observe their work activities and/or to conduct an interview is also time-consuming and may be very expensive.

SAMPLE 14

INVENTORY INSTRUMENT

Name: ______________________________

Position: ______________________________

Business Address: ______________________________

____

Phone: ______________________________

Date: ______________________________

Department of Vocational Education
Agriculture Education Section
Colorado State University
Fort Collins, CO 80523

NATIONAL AGRICULTURAL OCCUPATION COMPETENCY PROJECT

Instructional Area: Production Agriculture

Employment Area: Beef Production

Occupation Cluster: Feed Truck Driver

Job Description: Drives a special feed hauling truck in transporting prepared feed to cattle pen feeding bunks as assigned. Unloads truck with the power driven mechanism and distributes feed in feed bunks. Performs maintenance on the truck such as lubrication, changing oil, and completes minor repairs such as replacing light bulbs, fuses, and changing tires. Keeps truck clean. Inspects the truck for proper operation and safety.

Directions: Using your occupational experience as a basis, check the degree of importance of each competency for a beginning employee wishing to enter this occupation in 1985. Additional spaces are provided to allow you to add and evaluate other essential competencies.

Duties and Competencies (Tasks)	Essential	Important	Of Some Importance	Not Important	Does Not Apply
1. Driving and Unloading Truck					
a. Distribute feed in feed bunks					
b. Drive gas or diesel truck					
c. Operate unloading mechanism					
d. Position truck for loading feed					
e.					
f.					
2. Inspecting and Maintaining Truck					
a. Check air cleaner; service when needed					
b. Check brakes; service when needed					
c. Check coolant; service when needed					
d. Check lights and other electrical devices; replace bulbs and fuses when needed					
e. Check oil; change according to schedule					
f. Check tires, change them when needed					
g. Check water level in battery; add water when needed					
h. Fill truck with fuel; service fuel filter					
i. Lubricate truck and unloading mechanism according to schedule					
j. Maintain truck in safe operating condition					
k.					
l.					
3. Record Keeping					
a. Keep records of feed hauled					
b. Keep records of pens fed					
c. Keep records of truck maintenance					
d. Keep records of truck repairs					
e. Operate scales and record weights of feed					
f.					
g.					

SOURCE Gobbo Competencies Needed for Employment in Beef Production Enterprises," pp 121-122

Mailing the task inventory would permit you to reach more participants. In addition, the participants would not be pressured by your presence, and the data could be collected with less expense. While mailing the inventory may be preferable, a thorough occupational analysis can be conducted using any of the previously mentioned methods.

Selecting Participants

The next step is to determine what group or groups of individuals will be asked to help verify the statements using the process selected. The overall purpose for identifying participants is to ask them to verify the list of statements—that is, to confirm that the statements do indeed describe actual occupational activities. In deciding whom to ask to participate in the verification process, you should consider the following:

- Participants should be selected for their job knowledge and practical experience in the occupational area of concern.
- If the analysis deals with a cluster of related jobs, you need to involve at least two incumbent workers or work supervisors for each job title. This should give a picture of the discrepancy, if any, between what is being done on the job and what is indicated by the inventory statements.
- Whenever possible, it is desirable to include participants from different businesses or industrial firms. This avoids getting the organizational structure and work breakdown of only a few establishments.
- Make sure that the participants are representative of area employers, employees, and trade or labor organizations.

How many participants need to be identified depends on many factors. For example, it depends on how they will be asked to verify the statements, how many occupational titles are included in the analysis, and how many participants you expect will be able to help. To have only 10, 15, or 20 individuals verify the statements may be too few to be representative of the people employed in the occupations you are analyzing. To have 100 or 300 might be just right.

The number of participants you choose to verify the statements also depends on the type of analysis you are planning. An analysis for an occupation to be used in a local community will probably require fewer participants than an analysis for an occupation to be used statewide. If an observation and/or interview is to be used in soliciting data, fewer participants would be required than if a mailed instrument is used.

Select the number of persons that you can reasonably expect to participate in the analysis. Select the number you will be able to work with, considering possible limitations such as time, money, and staff. And select the number that can provide the type of valid and reliable data you need.

Once the number of participants has been identified, one or more of the procedures shown in sample 15 or some other procedure may be used for selecting and locating the required participants. Although it is included as one alternative in the sample, the **least desirable** approach is to go directly to the employees **without** the approval and cooperation of their employers. It is often advantageous to have the support of a well-known employee or employer organization in conducting the analysis.

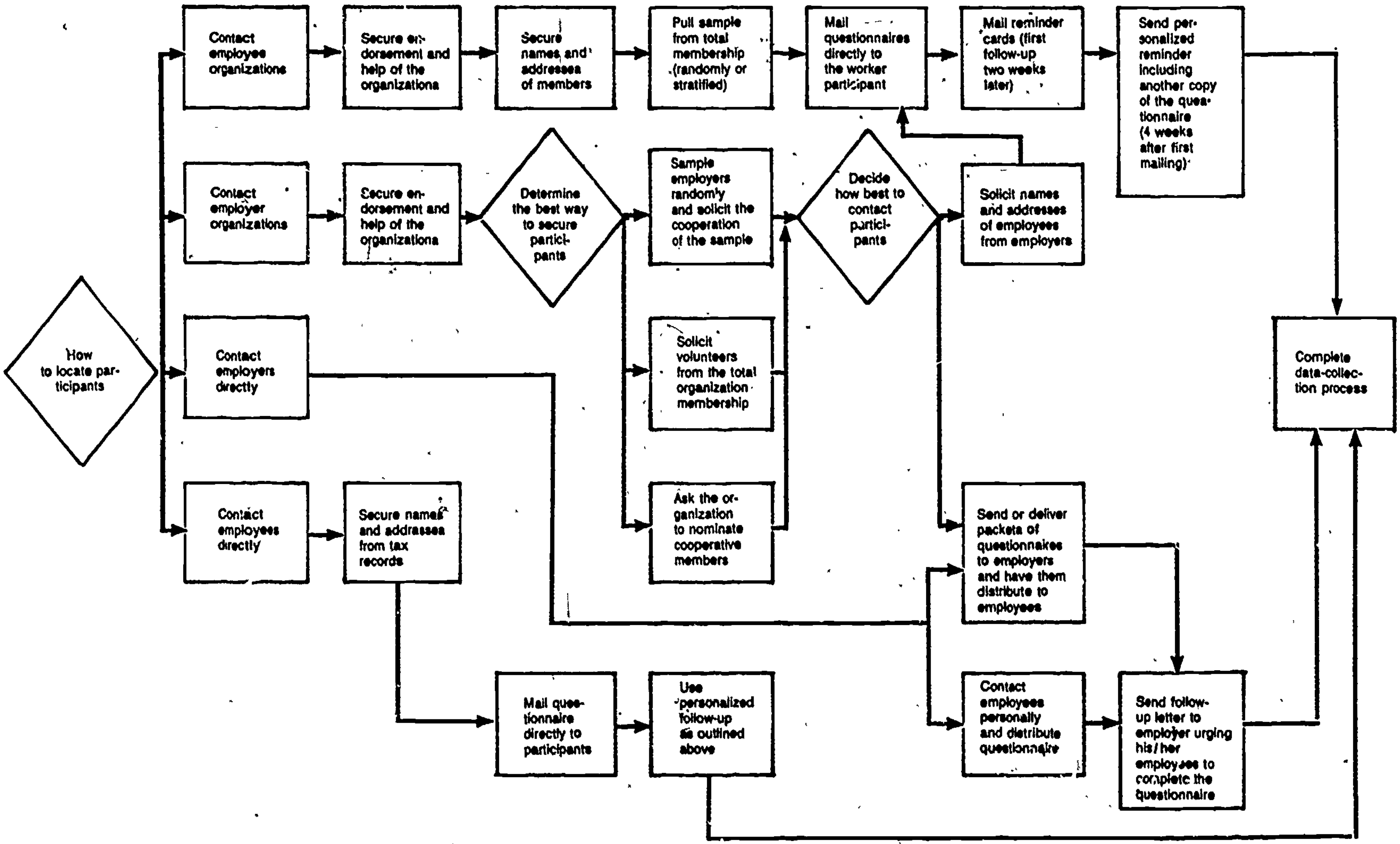
If your first contact is with a labor or trade organization (e.g., local chapter of the United Auto Workers or the National Secretaries Association) or an employers association (e.g., automobile dealers association or beef cattle farmers association), start by explaining the purpose of the project. Then, request that they identify skilled, competent individuals in their membership or employ, whom they would recommend to serve as participants. Secure a letter of endorsement from such organizations, if possible. Such endorsements can help open the door to the individual employers or employees.

At this point, sufficient copies of the instruments to be used should be prepared. Be sure to prepare a sufficient number of extra copies for follow-up and other uses.

44

SAMPLE 15

SELECTION AND LOCATION OF PARTICIPANTS FOR VERIFICATION PROCESS



43

Mailing the Inventory

When prospective participants are contacted by letter to participate in a survey in which mailed inventories (questionnaires) are used, be sure to include the following information in a cover letter:

- Purposes of the analysis
- Sponsor of the study
- Reason they were selected to serve as participants
- What they are requested to do
- A date when the list of statements should be returned to you

In addition, include the following:

- A letter of endorsement from their employer or organization
- The list of statements to be verified
- A self-addressed, stamped return envelope

Make sure that the directions on how to verify the statements are clearly stated and understood. Sample instructions for an inventory to be completed solely by the respondent are shown in sample 16.

To encourage the return of the completed inventories, you should send a reminder to all nonrespondents about two weeks after your first letter was mailed (see sample 17). Four weeks after the initial contact, a personal letter and a second copy of the inventory should be sent to all nonrespondents (see sample 18).

If these mailings do not secure the desired responses, consider calling or visiting the nonrespondents. Efforts should be made to secure as many completed inventories as possible, with your ideal goal being a return of 100 percent.

SAMPLE 16

INVENTORY INSTRUCTIONS

Instructions for Self-Administration of This Inventory

In completing the inventory, you are to respond in terms of your present regular job. Disregard any task that is not part of your regular assignment, no matter how often you did it in the past. Additional tasks that you do for a few days while someone is away are not to be reported. In recalling tasks, go back far enough in time to get a true picture of your job. If your work changes from one season to another, you may have to go back a full year. If there was a permanent change in your duty assignment during the past year, go back to the time just after this change. You probably will need to go back not less than three months or more than a year.

Do the following steps in order:

1. Fill in the **Background Information** section. Be sure you provide all information asked for.
2. Beginning with Duty A, read each task statement under every duty. As you read, place a check mark (✓) in the column beside each task you perform as part of your job.
3. When you finish reacting to all task statements in a duty, add (write in) any other tasks you perform that are not listed. If some tasks do not fit under any duty, write them in on the blank page at the end. Be very thorough about adding tasks.
4. When you have finished reacting to all duties, turn back to Duty A again. Now make a **time spent** rating for each task you have checked or added. The 5-point rating scale you are to use is at the top of each page. *Time spent* means the total time you spend on each task you are rating. Be sure to rate every task you checked or wrote in.

SAMPLE 17

FOLLOW-UP LETTER I

REDLANDS AREA VOCATIONAL SCHOOL
GREENVILLE, KANSAS

Mrs. Carol Reid
Wedgewood Beauty Shop
152 Larkin Avenue
Greenville, Kansas

Dear Mrs. Reid:

Some two weeks ago, a questionnaire was mailed to you asking you to help us with an occupational analysis inventory by identifying tasks performed in your occupation. As of yet, we have not received your response.

We believe this analysis to be of considerable importance, not only to the success of the cosmetology program at Redlands, but also to the needs of the community. Would you please take a few minutes during the next two or three days to respond to the questionnaire and return it to me. Your response will be most appreciated.

If, by chance, you no longer have the questionnaire, please drop a card to us and we will be happy to send you one.

Sincerely,

Samuel Marcus, Instructor
Department of Cosmetology

48

SAMPLE 18

FOLLOW-UP LETTER II

REDLAND AREA VOCATIONAL SCHOOL

GREENVILLE, KANSAS

Mrs. Carol Reid
Wedgewood Beauty Shop
152 Larkin Avenue
Greenville, Kansas

Dear Mrs. Reid:

The occupational analysis conducted by the Cosmetology Department at Redlands Area Vocational School is almost completed. Obviously, however, it is important that the data we gather from the analysis are accurate and complete. For this reason, we are anxious to receive completed questionnaires from every member of our sample.

We have not received your completed questionnaire. Therefore, I am enclosing a duplicate of the questionnaire that was sent to you a few weeks ago.

The purpose of this study is to find out what tasks you need to perform and how often. This information will then be made available to persons who do training for the various jobs. Your answers will not be evaluated or reported in any way. They will be tabulated as a group, and in no way will names be associated with responses.

Your cooperation in filling out the questionnaire will be greatly appreciated. Thank you for your assistance.

Sincerely,

Samuel Marcus, Instructor
Department of Cosmetology

Conducting an Observation-Interview

If the observation and/or interview technique is to be used, the initial contact with participants might be by telephone, personal visit, or letter. Regardless of the method of contact, participants should be provided with the following types of information.

- Purposes of the analysis
- Reason they were selected to serve as participants
- What they are requested to do
- Endorsement by any organization of the project
- Details on when, where, and how the verification activity is to be conducted

Specific instructions for the analysts (interviewers/observers) must also be provided. A sample set of instructions for analysts is shown in sample 19. When several analysts are involved, they should participate in a training session conducted prior to the actual data-collection activities to ensure that the data collected reflect identical considerations.

Obtaining information by observation-interview involves analyzing jobs by observing workers, supervisors, and others who have information pertinent to the job. It is the most desirable method for analysis purposes because it (1) involves firsthand observation by the analyst, (2) enables the analyst to evaluate the interview data and to sift essential from nonessential facts, and (3) permits the worker to demonstrate various tasks of the occupation rather than describing the occupation orally or in writing.

The observation-interview also has several limitations that you should note. It runs into higher costs than other methods and usually involves much more time. It is less likely to be representative of the occupation because fewer numbers of workers participate. And it may produce less standard data because of the greater possibility of recording and observation errors. It also requires the respondent to **recall** tasks performed rather than simply **recognizing** tasks on a list. It takes many observations-interviews to obtain data equivalent to a mailed inventory in terms of completeness, representativeness, and accuracy.

In many instances, it is impossible to use the observation-interview method. It may not be possible to observe the worker performing tasks because of security reasons, reluctance on the part of management to allow the analyst to observe the manufacturing process, or the complex and protracted nature of the work. For example, an analyst might find it a bit difficult to observe and interview a photographic darkroom worker and a skin diver as they go about their tasks.

In other instances, it may be impossible to interview the worker while observing the work because of the surrounding noise or the employer's request not to disturb the worker by asking questions. A large number of jobs, such as those in professional and technical areas, do not lend themselves to the observation method because they do not involve a set sequence of activities and, therefore, cannot be observed as an entire unit.

If it is possible to use the observation-interview method, it can be used in two ways. The analyst can **observe the worker** on the job performing a complete work cycle **before asking any questions**. During the observation, the analyst can take notes of all the job activities, including those he or she does not fully understand. A previously prepared form can make note-taking easier. When the analyst is satisfied that as much information as possible has been accumulated from observation, he or she can talk with the worker, supervisor, or both to supplement his/her notes.

Or, the analyst can **observe** and **interview simultaneously**. While watching, the analyst can talk with the worker about what is being done and ask questions about what he or she is observing and about the conditions under which the job is being performed. Here, too, the analyst should take notes so that all data pertinent to the job and its environment are documented.

The interview process should be a conversational interaction between individuals. Communication is a two-way process. Therefore, the analyst must be more than a recorder; he or she must contribute to the conversation. The amount and objectivity of information received depends upon how much the analyst contributes to the situation. That contribution should involve understanding and adjusting to the worker and the job.

A good background preparation will enable the analyst to obtain facts quickly, accurately, and comprehensively. He or she must be able to establish friendly relations on short notice, obtain all the pertinent information, and yet be sufficiently detached to be objective and free of bias.

When adequate time and funds are available, the interview may be the most effective and most dependable method of securing data. The extent to which you are able to make use of this method depends on the ability of your analysts to make use of conversation to encourage the formation of judgments, analyze the essential points of the interview, and report the data accurately. Sample 20 presents some interviewing suggestions.

Taking notes. Analysts must develop a certain skill in combining note-taking with the conversational aspect of the interview. They must be able to write intelligible notes while engaged in conversation.

Often, when a worker is being interviewed, he/she will stop talking while notes are being made. Analysts will need to make it clear whether they wish the conversation to be continued or not in these circumstances.

Analysts may sometimes use a portable cassette recorder to record the interview. This should be used only to supplement note-taking; it should not be depended upon as the sole record of the conversation. However, some workers object to having others record what they say. The analysts must decide how much a particular interview may be affected by this attitude and modify their practices accordingly.

Following are some suggestions for effective note-taking:

- Notes should be complete, legible, and contain the data necessary for the preparation of the analysis inventory.
- Notes should be organized logically, according to tasks and the categories of information required for a complete analysis.
- Notes should include only facts about the occupation, with emphasis on the work performed.

On completion of an analysis study, a letter of appreciation should be directed to the management for all courtesies and cooperation given. Then the data secured as a result of the study must be compiled and analyzed, and the inventory must be put into a more usable form.

SAMPLE 19

INTERVIEWER'S GUIDE

I. **Scheduling the interview by telephone:**

This is ____________ from the College of Agriculture at Cornell University. I'm in the area interviewing different kinds of ornamental horticulture businesses for our horticulture occupational analysis study. You were suggested by Cooperative Extension Agent ____________ (name of agent) as a person to contact to request an interview in the areas of ____________, ____________ (business areas) ____________. Our study has the endorsement of Cooperative Extension and ____________ ____________ (horticulture trade organization if applicable).

If possible, I would like to schedule about ______ hour interview with you sometime on ____________ (date and time).

(Assuming a Positive Response)

Is ____________ (address of business from agent) the correct address?

Do you have any suggestions as far as parking is concerned?

Thank you, Mr./Ms. ____________, I will be looking forward to seeing you on ____________ (date, time, and location of interview).

NOTE: We may want to consider asking the Extension Office in the area to serve as a clearinghouse in case an emergency comes up and the interviewee needs to contact us by phone.

II. **During the interview:**

1. Verify the business name, address, and telephone number (recorded prior to the interview).
2. Record full name of each person interviewed.
3. Record each interviewee's title using commonly accepted title such as manager, supervisor, assistant manager, etc.
4. Record the highest and lowest number of full-time, part-time and seasonal workers employed during the specified year. Full-time constitutes 35 or more hours per week. Part-time is less than 35 hours.
5. Record the total number of new employees hired during the specified year. These may have been hired to fill vacated and/or new positions.
6. Record whether there is any product specialization in the business area (e.g., roses in the greenhouse production area).
7. Define and explain the meaning of the task to the respondent:

   Task: A task is a logically related set of actions required for the completion of a job objective. A group of acts or activities that generally occur close together and have common purposes, it forms a logical and necessary part of the performance of a duty.
8. Explain job conditions and performance level for tasks. (See key for conditions and performance levels).
9. Show and explain instrument to respondents:
   a. Tasks performed and indicated by a check in the performance column.
   b. The key is used wth job conditions and performance level.
   c. Job conditions presented are indicated by drawing a slash through one or more letters that represent the response indicated on the key.
   d. Performance level
      1. Quantitative—Write in the number of units per hour, draw a slash through the one letter representing the correct response.
      2. Qualitative—Draw a slash through the one letter representing the correct response.
10. Explain the division of the ornamental horticulture industry into nine business areas and into functions within business areas (refer to list of business areas and functions).
11. Explain that performance of tasks should be judged in terms of the task being performed by some person **within** the business areas being interviewed.
12. Explain that the interpretation of task statements should be in terms of the function under which they are listed.
13. Request that any performed tasks not listed be written in and rated as to job conditions and performance level in the spaces provided at the end of each function. If more than two tasks need to be added, ask respondents to use the reverse side of the sheet and so indicate on the bottom of the second page.
14. Assist the interviewee in completing the rating of job conditions and performance level for several tasks until it is apparent he or she understands and is correctly recording responses.

SOURCE: Arthur L. Berkey, William E. Drake, and James W. Legacy, *A Model for Task Analysis in Agribusiness* (Ithaca, NY: Cornell University, New York State College of Agriculture and Life Sciences, Department of Education, Division of Agricultural Education, 1972) pp. 152-154

SAMPLE 20

INTERVIEWING SUGGESTIONS

Opening the Interview

- Put the worker at ease by learning his/her name in advance, introducing yourself, and discussing general and pleasant topics long enough to establish rapport.
- Make the purpose of the interview clear by explaining why the interview was scheduled, what is expected to be accomplished, and how the worker's cooperation will help in the production of a valuable occupational analysis. Assure the person that the interview is not concerned with time study or wages.
- Encourage the worker to talk by always being courteous and showing a sincere interest in what is said.

Steering the Interview

- Help the worker to think and talk according to the logical sequence of the tasks performed. If tasks are not performed in a regular order, ask the worker to describe the tasks in a sequential manner by taking the most important activity first, the second most important next, and so forth. Ask the worker to describe the infrequent tasks of his/her job, ones that are not part of his/her regular activities, such as the occasional setup of a machine, occasional repairs, or infrequent reports.
- Allow the worker sufficient time to answer each question and to formulate an answer. Ask only one question at a time.
- Phrase questions carefully, so that the answers will be more than yes or no.
- Leading questions should be avoided.
- Secure specific and complete information pertaining to the questions required for a complete analysis of an occupation.
- Conduct the interview in plain, easily understood language.
- Consider the relationship of the occupation under analysis to other occupations in the department.
- Control the interview with respect to the economic use of time and adherence to subject matter. For example, when the interviewee strays from the subject, a good technique for bringing him/her back to the point is to summarize the data collected up to that point.
- The interview should be conducted patiently and with consideration for any nervousness or lack of ease on the part of the worker.

Closing the Interview

- Summarize the information obtained from the worker, indicating the major duties performed.
- Close the interview on a friendly note.

Miscellaneous Do's and Don'ts for Interviews

- Do not take issue with the worker's statements.
- Do not show any partiality to grievances or conflicts concerning the employer-employee relations.
- Do not show any interest in the wage classification of the job.
- Show politeness and courtesy throughout the interview.
- Do not "talk down" to the worker.
- Do not permit yourself to be influenced by your personal likes and dislikes.
- Be impersonal. Do not be critical or attempt to suggest any changes or improvements in organization or methods of work.
- Talk to workers only after receiving the permission of the supervisor.

Optional Activity 2

For further information on verifying an initial listing of task and duty statements, you may wish to read one or both of the following supplementary references: Ammerman, *Performance Content for Job Training, Volume 3: Identifying Relevant Job Performance*; and/or Ammerman and Essex, *Performance Content for Job Training, Volume 4: Deriving Performance Requirements for Training.*

Activity 3

Conduct a **limited-scale** verification of an initial listing of task and duty statements. If you completed Learning Experience II, you may use the partial initial listing you developed at that time. If not, you may use a partial listing supplied by your resource person or obtained from some other source (e.g., an occupational analysis available through the library, state department of education, or curriculum laboratory).

Decide on the questions you want to ask about each statement, and prepare a suitable instrument, with directions that will obtain the type of responses desired. Ask your resource person and/or peers who have completed or are completing this module to review this instrument for clarity and accuracy.

Arrange through your resource person to verify the partial listing by mailing the instrument to five workers in the occupation or by interviewing five workers using the instrument.

Feedback 4

After you have verified an initial listing of task and duty statements, use the Initial Listing Verification Checklist, pp. 53–54, to evaluate your work.

NOTES

INITIAL LISTING VERIFICATION CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL box to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name ______________________

Date ______________________

Resource Person ______________________

LEVEL OF PERFORMANCE

	N/A	No	Partial	Full
1. The types of information to be collected were determined, including:				
a. task and duty information	☐	☐	☐	☐
b. background information on respondents	☐	☐	☐	☐
2. A draft of the final inventory instrument was prepared and reviewed by a resource person and/or peers	☐	☐	☐	☐
3. Participants were selected considering:				
a. their job knowledge and practical experience in the occupational area	☐	☐	☐	☐
b. representation of different businesses or companies	☐	☐	☐	☐
c. representation of employers, employees, and trade or labor organizations	☐	☐	☐	☐
4. When participants were contacted regarding the analysis, they were told:				
a. the purpose(s) of the analysis	☐	☐	☐	☐
b. why they were selected as participants	☐	☐	☐	☐
c. what they were requested to do	☐	☐	☐	☐
d. details on when, where, and how the verification activity was to be conducted	☐	☐	☐	☐
5. If the observation-interview approach was used:				
a. specific instructions were prepared for use by observers or interviewers	☐	☐	☐	☐
b. previously prepared forms were used to facilitate the gathering of data	☐	☐	☐	☐
c. observations and interviews were conducted so as to limit interference with the work being performed by the individual	☐	☐	☐	☐

56

	N/A	No	Partial	Full
d. sufficient time was allowed for observations or interviews	☐	☐	☐	☐
e. interviews were closed on a friendly note	☐	☐	☐	☐
f. adequate notes were taken to be of value	☐	☐	☐	☐
6. If a mail questionnaire was used:				
a. previously prepared forms were used to facilitate the gathering of data	☐	☐	☐	☐
b. a listing with specific instructions was provided	☐	☐	☐	☐

Level of Performance: All items must receive FULL or N/A responses. If any item receives a NO or PARTIAL response, review the material in the information sheet, Verifying an Initial Listing of Task and Duty Statements, pp. 34–50, take steps to revise your initial listing accordingly, or check with your resource person if necessary.

57

Learning Experience IV

OVERVIEW

Enabling Objective

After completing the required reading, analyze and report task inventory data.

Activity 1

You will be reading the information sheet, Analyzing and Reporting Task Inventory Data, pp. 56–64.

Activity 2

You will be analyzing the data obtained from a limited-scale task inventory investigation and reporting the data.

Feedback 3

You will be evaluating your competency in analyzing and reporting task inventory data, using the Task Inventory Data Analysis Checklist, p. 67.

Activity 1

The verification process provides you with a wealth of raw data, which can be very difficult to interpret and work with in that form. Thus, it is important to analyze the data and summarize them in an easily comprehensible form. For information concerning the procedures for analyzing and reporting task inventory data, read the following information sheet.

ANALYZING AND REPORTING TASK INVENTORY DATA

Once the task inventory data have been collected, they must be analyzed. The first step in this process is to check the inventory forms for completeness as they are returned by the participants, observers, or interviewers. Those that were not properly completed should be discarded and not considered further.

To complete the data analysis, the data should first be tabulated. This can be accomplished by developing one or more frequency counts for each statement verified. For hand tabulating, this might be done using a blank form similar to the one used during the data-collection process or a specially prepared form. Sample tabulation forms are shown in samples 21 and 22. Sometimes data processing equipment can be used for tabulating the data if a large amount of data is to be processed.

SAMPLE 21

DATA TABULATED USING DATA-COLLECTION FORM

Occupation: Feed Lot Hand

Directions: Using your occupational experience as a basis, check the degree of importance of each competency for a beginning employee wishing to enter this occupation in 1985. Additional spaces are provided to allow you to add and evaluate other essential competencies.

Duties and Competencies (Tasks)	**Essential**	**Important**	**Of Some Importance**	**Not Important**	**Does Not Apply**
1. Tending cattle	卌	卌 |||	||		
a. Bed cattle shelters, pens, and trucks	卌				卌					
b. Castrate cattle					卌		卌				
c. Dehorn cattle	||	卌		卌					
d. Mark cattle by using paint and chalk and by using ear tags and ear notches		卌							卌		
e. Brand cattle								卌 卌			
f. Control movement of cattle between the various pens	卌				卌						
g. Fit and show market cattle	||	卌	卌	||	||
h. Apply medicants by using syringe		||||||	||||	卌		|||
i. Apply medicants in feed and water	||||	|||	卌					

SOURCE Adapted from Gobbo, "Competencies Needed for Employment in Beef Production Enterprises," p. 116.

SAMPLE 22

TABULATION FORM FOR TASKS PERFORMED BY RESPONDENTS

Occupation: Drycleaner

Duty: Spotting Operations

Tasks		Code Numbers of Respondents															
No.	**Statement**	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	
1	Separate garments with spots and stains	✓	✓		✓												
2	Apply reagents to spots and stains before garments are cleaned	✓	✓	✓													
3	Sprinkle chemical solvents over stains and pat area with brush or sponge until stain is removed	✓	✓	✓	✓												
4	Spray steam, water, or air over spot to flush out chemicals and dry garments	✓	✓	✓	✓												
5	Apply chemicals to neutralize effect of solvents	✓	✓	✓	✓												

NOTE: Checks indicate that the task is performed by the beginning worker.

If additional statements were added by one or more respondents during the verification process, the number of individuals who added any one particular statement is likely to be very low. Probably the best way of handling these statements is to include them in a separate section of the summary tabulation form, as shown in sample 23. If resources permit, the added statements should be submitted to the participants for detailed consideration.

When the frequency counts have been completed, the data should be put into a form that makes them easier to interpret. One way of doing this is to show the frequency of occurrence of the different items by using a table, a bar or line graph, or a frequency curve.

Another way to make the data more meaningful is to convert them into percentages or averages. Data might be presented as percentages for each statement, numbers and percentages of responses for each statement, or mean (average) responses. Examples of these are presented in sample 24.

SAMPLE 23

TABULATION SUMMARY FORM

JOB TITLE: SALES MANAGER
JOB NUMBER: 35
SPECIFIC JOB DUTIES

Interviewees* indicated that the following tasks were performed (1) regularly, (2) occasionally, or (3) never.

Transient (over 100 rooms)				Transient (under 100 rooms)	CRITICAL TASKS
S	E	S	E	E	
1	1	1	1	1	1. Solicit income-producing business of all types for the hotel or motel
1	2	1	1	1	2. Direct promotional correspondence with travel bureaus and organizations
1	1	1	1	1	3. Obtain information on contemplated conventions and social functions
1	1	1	1	1	4. Contact convention sponsors for their patronage
1	2	1	1	1	5. Attend meetings of such groups as Rotary Club and chamber of commerce for developing promotional plans for attracting more people into the city or area
1	1	1	1	1	6. Contact executives of national or statewide business enterprises to obtain their business
1	3	1	1	1	7. Contact local groups to promote facilities for local dances, banquets, or luncheons
1	1	1	1	1	8. Furnish newspapers with interesting stories or events about the hotel to obtain free publicity
1	1	1	1	1	9. Initiate and promote events that contribute to the popularity and income of the hotel or motel
1	1	1	1	2	10. Travel outside the city to promote the hotel or motel facilities and services

TASKS ADDED BY INTERVIEWEES:

1. Participate in professional associations to keep informed of changes in the industry, new techniques and approaches
2. Establish sales policies and procedures with the general manager
3. Train new personnel in the department
4. Advise the manager pertaining to sales
5. Help form plans to promote the hotel's facilities
6. Participate actively in local civic and social clubs and groups

* *S* indicates the supervisor of the employee whose job was selected for study
E indicates the employee in the job selected for study

SOURCE Adapted from Lucy C Crawford, *A Competency Pattern Approach To Curriculum Construction in Distributive Education* (Blacksburg, VA Virginia Polytechnic Institute, College of Arts and Sciences, Department of Education, 1967), p. 1001.

SAMPLE 24

DATA AS PERCENTAGES AND NUMBERS

Item 1 Task Statements	Number Performing N = 30*	Percentage Performing
1. Detect heat	30	100.0
2. Determine time to inseminate	22	70.3
3. Identify symptoms of reproductive diseases	10	33.3
4. Maintain breeding records	8	26.7
5. Move cattle	25	80.3
6. Operate breeding chute	28	90.3

Item 2	Importance										
Task Statement No.	Of Extreme Importance (4)		Of Considerable Importance (3)		Of Some Importance (2)		Of Limited Importance (1)		Of No Importance (0)		AVERAGE
	No.	%	No.	%	No.	%	No.	%	No.	%	
1	4	13	2	7	16	53	0	0	8	27	1.8

*The *N* is the number of respondents; in this case, 30 persons responded to the inventory.

To arrive at an average or mean for the responses, a value must be assigned to each scale category. Note in item 2 of sample 24 that *of extreme importance* was assigned the value of 4; *of considerable importance*, 2; *of limited importance*, 1; and *of no importance*, 0.

The assigned value for a specific category is first multiplied by the number of individuals who responded in that category. Next, the totals for the columns—five in this case—are then added together. The sum resulting from this operation is then divided by the total number of respondents in order to obtain the average.

To obtain the average indicated in item 2, the following was computed:

Number		Value		Totals
4	×	4	=	16
2	×	3	=	6
16	×	2	=	32
0	×	1	=	0
8	×	0	=	0
30				54

The total obtained, 54, was then divided by the total respondents, 30. As a result of this division, the average of 1.8 was obtained.

There are many other ways in which data may be analyzed and presented.[7] For example, measures of central tendency such as the following might be used:

- **Mean**—This is the mathematical **average**, which can be obtained as described above.
- **Median**—This is the **midpoint** in the distribution of values or cases, or the point in a distribution with an equal number of cases on each side of it.
- **Mode**—The mode is that **value** in a distribution that has the **largest frequency**, or occurs most frequently.

Making the Data Summary

At this point, a summary of task statements and responses should be compiled. The summary should be prepared with the purpose of the analysis in mind. For example, if the intent was to describe the total occupation, the summary should be rather detailed.

If, however, the intent was to establish a basis for developing an educational program to prepare individuals to **enter** an occupation, then the summary should not provide as detailed a listing of occupational activities. Rather, it should identify only those activities that an individual must be able to perform to enter the occupation.

The data collected as the result of the analysis procedures can then be interpreted, and the statements to be included in the final task list can be identified. If a detailed list is to be developed, all statements identified as being relevant should be included. If a limited listing is to be prepared, you should include only those statements identified as (1) relevant to beginning employees or (2) actually performed by 50 percent or more (or some other arbitrary percentage) of the respondents. Additional limitations could be imposed by selecting some minimum average scale value (e.g., 1.50 on the importance scale) to use in identifying the statements to be included.

In making decisions concerning which statements should be included in the summary, caution must always be exercised in interpreting the data. Examine the table in sample 25. Let us assume that the analyst elected to place emphasis on the frequency of the performance in identifying the statements to be included and selected a minimum average value of 2.50. Would you include task 2, *Edit letters dictated by employer*? Note that only eight respondents performed this task. If the 2.50 minimum average value is the only criterion, then it probably should be included.

However, more realistic criteria might include both a minimum average value of 2.50 **and** a minimum of 50 percent of the respondents indicating that they perform the activity described. In that case, task 2 would not be included. As much of the data collected as possible should be included in the summary. However, you should always be careful to explain and interpret any unusual situations that may be identified.

Once the criteria for selecting the statements have been determined, a format for presenting them must be identified. The format must be conducive to presenting the type of information that is desired. Sample formats that can be used are shown in samples 26 and 27.

Remember, the tasks and duties in this summary listing should conform to the suggested standards (see pp. 19–24). In addition, statements may be added or deleted on the basis of the information collected. Duty statements might be altered or consolidated. Task statements may be listed in alphabetical order under the duty statement or be ranked on the basis of selected data collected during the analysis procedures.

If the analysis deals with an occupational cluster, it is important to summarize the data for **each** occupation included in the cluster. Once a summary of task statements has been prepared for each of the individual occupations, a consolidated summary of task statements can be prepared. This can probably best be achieved by using a form similar to that shown in sample 28. Once such a form is completed, with the activities important to the various occupations identified, it is a relatively simple matter to prepare a summary of task statements for the cluster.

Prior to preparing the final summary, however, the completed consolidation summary form should be reviewed to determine if, indeed, the occupations are similar enough in the activities required to warrant being so clustered. If it is determined that an occupation does not fit, then that occupation should be eliminated from the cluster. This is particularly important if it is anticipated that the final summary-of-analysis components will be used in developing an instructional program to prepare individuals for working in occupations considered to be part of the cluster.

7 To gain skill in analyzing data, you may wish to refer to Module A-3, *Report the Findings of a Community Survey*

Presenting the Findings

After tabulating, analyzing, and interpreting the data, the findings should be presented so as to be of maximum value to the user. It is usually important that the findings be reported in such a manner that they will be usable by persons other than the analyst.

The report should reflect not only the summary of identified task and duty statements, but how and why the list was developed. A report designed to be used by vocational-technical educators should contain information related to the following topics:

- Need for vocational-technical programs related to the occupation, in terms of employment outlook and need for prepared individuals to enter the occupation
- Job descriptions
- Summary of the task and duty statements, along with relevant findings
- Procedures used in developing the inventory, including the guidelines followed in making pertinent decisions about which statements were included

Tables, charts, and graphs should be used in conjunction with the narrative to graphically illustrate the findings for the reader.

After the analysis has been completed, you are ready to proceed with the development of an instructional program. Using the summary report, particularly the summary of task statements, you can formulate relevant objectives and begin the development of instructional materials.

SAMPLE 25

ANALYSIS

Duty: Performing Stenographic Activities

N = 30

Tasks	Number Performing	Frequency of Performance: not at all (1)	seldom (2)	quite often (3)	often (4)	very often (5)	Average Frequency of Performance
1. Compose correspondence	15		10	5			2.33
2. Edit letters dictated by employer	8		3	4	1		2.75
3. Operate dictaphone	25		10	12	3		2.72
4. Operate dictating machine	25		8	7	10		3.08
5. Operate shorthand machine	27		5	7	15		3.37
6. Transcribe (type) from dictaphone	25		10	12	3		2.72
7. Type minutes or reports of meetings	30			10	20		3.06

SAMPLE 26

SUMMARY FORM I

TASKS PERFORMED BY ALTERATION SPECIALISTS ARRANGED IN CLUSTERS

Duties and Task Clusters (arranged in descending order of mean frequency scores)	**Performance Rate of Tasks***
A. Analyzing Fitting Problems	
Fit garment on customer, examining location and slope of shoulder lines	A
Fit garment on customer, examining location of grain lines	B
Fit garment on customer, examining design of garments	B
Maintain grain line in cutting	B
Fit garment on customer, examining position of darts in bodice and at elbow	B
Offer suggestions, when requested, for desirable alterations	B
Fit garment on customer, examining position of waistline	B
Fit garment on customer, examining length of bodice and sleeve	B
Fit garment on customer, examining ease at bust	C
Fit garment on customer, examining measurement of waistline	C
Mark or pin garment indicating desired alterations	C
B. Offering Alterations	
Alter shoulder length or slope	A
Alter length of coat, skirt, dress, slacks	A
Alter waist measurement	A
Sew rips and seams	A
Rip stitching without injuring fabric	A
Alter length of sleeves in coat, suit, dress	A
Change style of suit	B
Perform various hem types	B
Taper shirts	B
Cuff trousers	B

*An *A* indicates a task that is performed several times a week; *B* a task that is performed several times a month; *C* a task that is performed several times a year; *D* a task that is performed less than once a year; and — a task that is never done.

SOURCE *Identification of Tasks in Home Economics Related Occupations Clothing, Apparel, and Textile Services* (Des Moines, IA Department of Public Instruction, 1974), p 26

SAMPLE 27

SUMMARY FORM II

MEAN FREQUENCY FOR FABRIC SPECIALIST

RANK*	ITEM NUMBER	TASK	MEAN FREQUENCY
1	2	Select appropriate notions according to fabric content	3.94
2	1	Aid customer in selection of fabric content for end use	3.93
3	35	Give customer information about care procedures for fabrics	3.89
4	4	Aid customer in selection of interfacings for each fabric content	3.87
5	34	Aid customer in selecting a fabric suitable for a particular pattern	3.74
6	33	Aid customer in selecting a pattern appropriate for a particular fabric	3.64
7	47	Perform housekeeping duties such as dusting and sweeping	3.51
8	3	Aid customer in pattern selection for his/her build	3.49
9	32	Restock shelves	3.48
10	27	Perform routine office work such as answering the telephone, taking messages, and filing	3.40
11	31	Perform routine cleaning of tables and shelves	3.38
12	36	Lay patterns on fabrics to see if pattern will fit a specified amount of fabric	3.36
13	22	Order patterns	3.34
14	11	Stock shelves with notions	3.31
15	26	Handle customer complaints	3.14

*Descending Order
Scale—0 to 4

SOURCE *Identification of Tasks in Home Economics Related Occupations Clothing, Apparel, and Textile Services*, p 84

SAMPLE 28

CONSOLIATED SUMMARY FORM—CLUSTER ACTIVITY LISTING

Cluster: Automobile Mechanics

Activities (Duty/Tasks)	Occupations (1) Mechanic	(2) Mechanic's Helper	(3) Service Manager	(4) Service Writer or Advisor	(5) Garage Owner	(6)	(7)	(8)	(9)	(10)
G. Maintaining and Repairing Power Trains										
1. Adjust external shift linkage on manual transmissions										
2. Adjust mechanical type clutch										
3. Analyze and repair electrical control circuit and components for overdrive units										
4. Balance drive shaft (in-car)										
5. Inspect shifting										
6. Inspect drive shaft										
7.										
8.										
9.										

SOURCE Duty tasks and occupations adapted from Borcher and Leiter, *Automotive Mechanics Occupational Performance Survey*, p 44

Activity 2

Prepare a task inventory summary report. If you completed Learning Experience III, you may use the data you collected in that experience. If you did not collect data for verifying the task statements in an occupational analysis in Learning Experience III, you should ask your resource person for sample inventory data that you can use for this purpose. Or you may wish to work with a peer who has collected such data and is also ready to prepare a summary.

Feedback 3

After you have prepared a task inventory summary report, use the Task Inventory Data Analysis Checklist, p. 67, to evaluate your work.

NOTES

TASK INVENTORY DATA ANALYSIS CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL box to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name

Date

Resource Person

	LEVEL OF PERFORMANCE			
	N/A	No	Partial	Full
1. Data from usable forms were tabulated using appropriate procedures	☐	☐	☐	☐
2. Tabulated data were presented in forms to make them easily interpreted (e.g., percentages, measures of central tendency)	☐	☐	☐	☐
3. Realistic criteria were established and used for selecting task and duty statements to be included in the final summary	☐	☐	☐	☐
4. A final summary report was prepared in which the following topics were discussed:				
a. need for vocational-technical programs related to this occupation in terms of the employment outlook and the need for prepared individuals to enter the occupation	☐	☐	☐	☐
b. job description	☐	☐	☐	☐
c. summary of task and duty statements, along with relevant findings	☐	☐	☐	☐
d. procedures used in developing the inventory, including the guidelines followed in making pertinent decisions about which statements were included	☐	☐	☐	☐

Level of Performance: All items must receive FULL or N/A responses. If any item receives a NO or PARTIAL response, review the material in the information sheet, Analyzing and Reporting Task Inventory Data, pp. 56-64, revise your data summary accordingly, or check with your resource person if necessary.

NOTES

Learning Experience V

FINAL EXPERIENCE

Terminal Objective

For an **actual teaching situation,*** conduct an occupational analysis.

Activity 1

At a time when your program planning, development, and/or evaluation calls for the identification of the skills needed for success in an occupation or occupational cluster, conduct an occupational analysis. This will include—

- defining the scope of your analysis
- preparing an initial listing of duty and task statements for the occupation
- verifying the initial listing of duty and task statements
- analyzing and reporting the task inventory data

NOTE: As you complete each of the above activities, document your actions (in writing, on tape, through a log) for assessment purposes.

Feedback 2

Arrange in advance to have your resource person review your documentation and observe at least one instance in which you are working with others to verify the duty and task statements.

Your total competency will be assessed by your resource person, using the Teacher Performance Assessment Form, pp. 71–72.

Based upon the criteria specified in this assessment instrument, your resource person will determine whether you are competent in conducting an occupational analysis.

* For a definition of "actual teaching situation," see the inside back cover.

NOTES

TEACHER PERFORMANCE ASSESSMENT FORM

Conduct an Occupational Analysis (A-7)

Name

Date

Resource Person

Directions: Indicate the level of the teacher's accomplishment by placing an X in the appropriate box under the LEVEL OF PERFORMANCE heading. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

LEVEL OF PERFORMANCE

	N/A	None	Poor	Fair	Good	Excellent
In defining the scope of the analysis, the teacher:						
1. considered community, student, and resource factors in selecting an occupation or occupational cluster	☐	☐	☐	☐	☐	☐
2. prepared a complete job description for each occupation involved	☐	☐	☐	☐	☐	☐
3. consulted standard authoritative sources of data in developing the job descriptions	☐	☐	☐	☐	☐	☐
In developing the initial listing of duty and task statements, the teacher:						
4. consulted several appropriate sources of information	☐	☐	☐	☐	☐	☐
5. included enough duty and task statements to adequately describe the occupation	☐	☐	☐	☐	☐	☐
6. included both supervisory and work performance activities in the duty statements	☐	☐	☐	☐	☐	☐
Task statements in the initial inventory:						
7. differentiated between workers at different occupations and levels	☐	☐	☐	☐	☐	☐
8. were stated briefly and clearly	☐	☐	☐	☐	☐	☐
9. used the terminology of the occupation	☐	☐	☐	☐	☐	☐
10. were ratable in terms of time spent and other factors	☐	☐	☐	☐	☐	☐
11. did not include nontask items	☐	☐	☐	☐	☐	☐
12. were written in accepted format	☐	☐	☐	☐	☐	☐
The initial task statement listing:						
13. was reviewed by workers and/or supervisors of workers from the occupational area	☐	☐	☐	☐	☐	☐
14. was revised following the review, if necessary	☐	☐	☐	☐	☐	☐

	N/A	None	Poor	Fair	Good	Excellent
The revised version of the initial listing:						
15. was reviewed by workers from the occupation to indicate their comprehension of each statement and their understanding of the directions	☐	☐	☐	☐	☐	☐
16. allowed for appropriate information on the workers' backgrounds and personal records to be recorded	☐	☐	☐	☐	☐	☐
Participants in the verification process were selected in relation to:						
17. their knowledge and experience in the occupational area	☐	☐	☐	☐	☐	☐
18. their representation of the appropriate occupational groups	☐	☐	☐	☐	☐	☐
19. available resources for the project	☐	☐	☐	☐	☐	☐
In verifying the statements, the teacher:						
20. developed detailed procedures to be used	☐	☐	☐	☐	☐	☐
21. gave interviewers special training if an observation or interview procedure was selected	☐	☐	☐	☐	☐	☐
22. prepared sufficient numbers of copies of the final inventory for participants and follow-up	☐	☐	☐	☐	☐	☐
23. gave potential participants adequate information on the purposes and requirements of the verification process	☐	☐	☐	☐	☐	☐
24. prepared forms to be used to gather data during the observation or interview	☐	☐	☐	☐	☐	☐
In analyzing the data, the teacher:						
25. tabulated data using appropriate procedures	☐	☐	☐	☐	☐	☐
26. summarized data in a manner designed to make them easy to interpret	☐	☐	☐	☐	☐	☐
27. used realistic criteria for selecting task statements to be included in the final listing	☐	☐	☐	☐	☐	☐
A final analysis report was prepared, including the following sections:						
28. need for the vocational-technical program of concern	☐	☐	☐	☐	☐	☐
29. job descriptions	☐	☐	☐	☐	☐	☐
30. inventory of analysis components	☐	☐	☐	☐	☐	☐
31. related data and findings	☐	☐	☐	☐	☐	☐
32. procedures and criteria used in developing the inventory	☐	☐	☐	☐	☐	☐

Level of Performance: All items must receive N/A, GOOD, or EXCELLENT responses. If any item receives a NONE, POOR, or FAIR response, the teacher and resource person should meet to determine what additional activities the teacher needs to complete in order to reach competency in the weak area(s).

ABOUT USING THE NATIONAL CENTER'S PBTE MODULES

Organization

Each module is designed to help you gain competency in a particular skill area considered important to teaching success. A module is made up of a series of learning experiences, some providing background information, some providing practice experiences, and others combining these two functions. Completing these experiences should enable you to achieve the **terminal** objective in the final learning experience. The final experience in each module always requires you to demonstrate the skill in an actual teaching situation when you are an intern, a student teacher, an inservice teacher, or occupational trainer.

Procedures

Modules are designed to allow you to individualize your teacher education program. You need to take only those modules covering skills that you do not already possess. Similarly, you need not complete any learning experience within a module if you already have the skill needed to complete it. Therefore, before taking any module, you should carefully review (1) the introduction, (2) the objectives listed on p. 4, (3) the overviews preceding each learning experience, and (4) the final experience. After comparing your present needs and competencies with the information you have read in these sections, you should be ready to make one of the following decisions:

- That you do not have the competencies indicated and should complete the entire module
- That you are competent in one or more of the enabling objectives leading to the final learning experience and, thus, can omit those learning experiences
- That you are already competent in this area and are ready to complete the final learning experience in order to "test out"
- That the module is inappropriate to your needs at this time

When you are ready to complete the final learning experience and have access to an actual teaching situation, make the necessary arrangements with your resource person. If you do not complete the final experience successfully, meet with your resource person and arrange to (1) repeat the experience or (2) complete (or review) previous sections of the module or other related activities suggested by your resource person before attempting to repeat the final experience.

Options for recycling are also available in each of the learning experiences preceding the final experience. Any time you do not meet the minimum level of performance required to meet an objective, you and your resource person may meet to select activities to help you reach competency. This could involve (1) completing parts of the module previously skipped, (2) repeating activities, (3) reading supplementary resources or completing additional activities suggested by the resource person, (4) designing your own learning experience, or (5) completing some other activity suggested by you or your resource person.

Terminology

Actual Teaching Situation: A situation in which you are actually working with and responsible for teaching secondary or postsecondary vocational students or other occupational trainees. An intern, a student teacher, an inservice teacher, or other occupational trainer would be functioning in an actual teaching situation. If you do **not** have access to an actual teaching situation when you are taking the module, you can complete the module **up to** the final learning experience. You would then complete the final learning experience later (i.e., when you have access to an actual teaching situation).

Alternate Activity or Feedback: An item that may **substitute** for required items that, due to special circumstances, you are unable to complete.

Occupational Specialty: A specific area of preparation within a vocational service area (e.g., the service area Trade and Industrial Education includes occupational specialties such as automobile mechanics, welding, and electricity.

Optional Activity or Feedback: An item that is not required but that is designed to **supplement** and enrich the required items in a learning experience.

Resource Person: The person in charge of your educational program (e.g., the professor, instructor, administrator, instructional supervisor, cooperating/supervising/classroom teacher, or training supervisor who is guiding you in completing this module).

Student: The person who is receiving occupational instruction in a secondary, postsecondary, or other training program.

Vocational Service Area: A major vocational field: agricultural education, business and office education, marketing and distributive education, health occupations education, home economics education, industrial arts education, technical education, or trade and industrial education.

You or the Teacher/Instructor: The person who is completing the module.

Levels of Performance for Final Assessment

N/A: The criterion was not met because it was not applicable to the situation.

None: No attempt was made to meet the criterion, although it was relevant.

Poor: The teacher is unable to perform this skill or has only **very limited ability** to perform it.

Fair: The teacher is unable to perform this skill in an acceptable manner but has **some ability** to perform it.

Good: The teacher is able to perform this skill in an **effective** manner.

Excellent: The teacher is able to perform this skill in a very **effective** manner.

Titles of the National Center's Performance-Based Teacher Education Modules

Category A: Program Planning, Development, and Evaluation

A-1 Prepare for a Community Survey
A-2 Conduct a Community Survey
A-3 Report the Findings of a Community Survey
A-4 Organize an Occupational Advisory Committee
A-5 Maintain an Occupational Advisory Committee
A-6 Develop Program Goals and Objectives
A-7 Conduct an Occupational Analysis
A-8 Develop a Course of Study
A-9 Develop Long-Range Program Plans
A-10 Conduct a Student Follow-Up Study
A-11 Evaluate Your Vocational Program

Category B: Instructional Planning

B-1 Determine Needs and Interests of Students
B-2 Develop Student Performance Objectives
B-3 Develop a Unit of Instruction
B-4 Develop a Lesson Plan
B-5 Select Student Instructional Materials
B-6 Prepare Teacher-Made Instructional Materials

Category C: Instructional Execution

C-1 Direct Field Trips
C-2 Conduct Group Discussions, Panel Discussions, and Symposiums
C-3 Employ Brainstorming, Buzz Group, and Question Box Techniques
C-4 Direct Students in Instructing Other Students
C-5 Employ Simulation Techniques
C-6 Guide Student Study
C-7 Direct Student Laboratory Experience
C-8 Direct Students in Applying Problem-Solving Techniques
C-9 Employ the Project Method
C-10 Introduce a Lesson
C-11 Summarize a Lesson
C-12 Employ Oral Questioning Techniques
C-13 Employ Reinforcement Techniques
C-14 Provide Instruction for Slower and More Capable Learners
C-15 Present an Illustrated Talk
C-16 Demonstrate a Manipulative Skill
C-17 Demonstrate a Concept or Principle
C-18 Individualize Instruction
C-19 Employ the Team Teaching Approach
C-20 Use Subject Matter Experts to Present Information
C-21 Prepare Bulletin Boards and Exhibits
C-22 Present Information with Models, Real Objects, and Flannel Boards
C-23 Present Information with Overhead and Opaque Materials
C-24 Present Information with Filmstrips and Slides
C-25 Present Information with Films
C-26 Present Information with Audio Recordings
C-27 Present Information with Televised and Videotaped Materials
C-28 Employ Programmed Instruction
C-29 Present Information with the Chalkboard and Flip Chart
C-30 Provide for Students Learning Styles

Category D: Instructional Evaluation

D-1 Establish Student Performance Criteria
D-2 Assess Student Performance Knowledge
D-3 Assess Student Performance Attitudes
D-4 Assess Student Performance Skills
D-5 Determine Student Grades
D-6 Evaluate Your Instructional Effectiveness

Category E: Instructional Management

E-1 Project Instructional Resource Needs
E-2 Manage Your Budgeting and Reporting Responsibilities
E-3 Arrange for Improvement of Your Vocational Facilities
E-4 Maintain a Filing System
E-5 Provide for Student Safety
E-6 Provide for the First Aid Needs of Students
E-7 Assist Students in Developing Self-Discipline
E-8 Organize the Vocational Laboratory
E-9 Manage the Vocational Laboratory
E-10 Combat Problems of Student Chemical Use

Category F: Guidance

F-1 Gather Student Data Using Formal Data-Collection Techniques
F-2 Gather Student Data Through Personal Contacts
F-3 Use Conferences to Help Meet Student Needs
F-4 Provide Information on Educational and Career Opportunities
F-5 Assist Students in Applying for Employment or Further Education

Category G: School-Community Relations

G-1 Develop a School-Community Relations Plan for Your Vocational Program
G-2 Give Presentations to Promote Your Vocational Program
G-3 Develop Brochures to Promote Your Vocational Program
G-4 Prepare Displays to Promote Your Vocational Program
G-5 Prepare News Releases and Articles Concerning Your Vocational Program
G-6 Arrange for Television and Radio Presentations Concerning Your Vocational Program
G-7 Conduct an Open House
G-8 Work with Members of the Community
G-9 Work with State and Local Educators
G-10 Obtain Feedback about Your Vocational Program

Category H: Vocational Student Organization

H-1 Develop a Personal Philosophy Concerning Vocational Student Organizations
H-2 Establish a Vocational Student Organization
H-3 Prepare Vocational Student Organization Members for Leadership Roles
H-4 Assist Vocational Student Organization Members in Developing and Financing a Yearly Program of Activities
H-5 Supervise Activities of the Vocational Student Organization
H-6 Guide Participation in Vocational Student Organization Contests

Category I: Professional Role and Development

I-1 Keep Up to Date Professionally
I-2 Serve Your Teaching Profession
I-3 Develop an Active Personal Philosophy of Education
I-4 Serve the School and Community
I-5 Obtain a Suitable Teaching Position
I-6 Provide Laboratory Experiences for Prospective Teachers
I-7 Plan the Student Teaching Experience
I-8 Supervise Student Teachers

Category J: Coordination of Cooperative Education

J-1 Establish Guidelines for Your Cooperative Vocational Program
J-2 Manage the Attendance, Transfers, and Terminations of Co-Op Students
J-3 Enroll Students in Your Co-Op Program
J-4 Secure Training Stations for Your Co-Op Program
J-5 Place Co-Op Students on the Job
J-6 Develop the Training Ability of On-the-Job Instructors
J-7 Coordinate On-the-Job Instruction
J-8 Evaluate Co-Op Students' On-the-Job Performance
J-9 Prepare for Students' Related Instruction
J-10 Supervise an Employer-Employee Appreciation Event

Category K: Implementing Competency-Based Education (CBE)

K-1 Prepare Yourself for CBE
K-2 Organize the Content for a CBE Program
K-3 Organize Your Class and Lab to Install CBE
K-4 Provide Instructional Materials for CBE
K-5 Manage the Daily Routines of Your CBE Program
K-6 Guide Your Students Through the CBE Program

Category L: Serving Students with Special/Exceptional Needs

L-1 Prepare Yourself to Serve Exceptional Students
L-2 Identify and Diagnose Exceptional Students
L-3 Plan Instruction for Exceptional Students
L-4 Provide Appropriate Instructional Materials for Exceptional Students
L-5 Modify the Learning Environment for Exceptional Students
L-6 Promote Peer Acceptance of Exceptional Students
L-7 Use Instructional Techniques to Meet the Needs of Exceptional Students
L-8 Improve Your Communication Skills
L-9 Assess the Progress of Exceptional Students
L-10 Counsel Exceptional Students with Personal-Social Problems
L-11 Assist Exceptional Students in Developing Career Planning Skills
L-12 Prepare Exceptional Students for Employability
L-13 Promote Your Vocational Program with Exceptional Students

Category M: Assisting Students in Improving Their Basic Skills

M-1 Assist Students in Achieving Basic Reading Skills
M-2 Assist Students in Developing Technical Reading Skills
M-3 Assist Students in Improving Their Writing Skills
M-4 Assist Students in Improving Their Oral Communication Skills
M-5 Assist Students in Improving Their Math Skills
M-6 Assist Students in Improving Their Survival Skills

RELATED PUBLICATIONS

Student Guide to Using Performance-Based Teacher Education Materials
Resource Person Guide to Using Performance-Based Teacher Education Materials
Guide to the Implementation of Performance-Based Teacher Education
Performance-Based Teacher Education: The State of the Art, General Education and Vocational Education

For information regarding availability and prices of these materials contact—AAVIM, American Association for Vocational Instructional Materials, 120 Driftmier Engineering Center, University of Georgia, Athens, Georgia 30602, (404) 542-2586

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