Conducting a Task Analysis. Self-Paced Instructional Module. Module Number VIII-A.

Mississippi Research and Curriculum Unit for Vocational and Technical Education, State College;
Mississippi State Dept. of Education, Jackson. Div. of Vocational and Technical Education.

Office of Education (DHEW), Washington, D.C.

Dec 76

G007500439

25p.; For related documents see CE 011 375-407

Coordinator of Industry Services, Research and Curriculum Unit for Vocational-Technical Education, College of Education, Mississippi State, Mississippi 39762. ($50.00 for the set of 33)

MP-$0.83 HC-$1.67 Plus Postage.

Adult Vocational Education; Guidelines; *Industrial Education; Industry; Job Analysis; *Leadership Training; Learning Modules; *Program Development; Services; *Task Analysis

ABSTRACT

One of 33 self-paced instructional modules for training industry services leaders to provide guidance in the performance of manpower services by public agencies to new or expanding private industries, this module contains three sequential learning activities on conducting a task analysis (review of the actual job content in the industry) as a basis for planning an effective and efficient training program. The first learning activity is designed to provide the learner with the needed background information on task analysis (components and procedures). The second activity gives opportunity to apply the information in a practice situation, and the final checkout activity allows the learner to conduct a task analysis in a real work situation, such as when employed or when serving as an intern learner. Feedback devices (learner self-test and performance checklist) are included for use by the learner and instructor/supervisor to assess progress. Case study information, task information worksheet, example task information, and examples of task statements are appended for guidance in performing the learning activities. (This module is the first of seven on the preparation of training materials.) (JT).
CONDUCTING A TASK ANALYSIS

SELF-PACED INSTRUCTIONAL MODULE
This publication was prepared pursuant to a grant with the Office of Education, U.S. Department of Health, Education and Welfare. Contractors undertaking such projects under government sponsorship are encouraged to express freely their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official Office of Education position or policy.

Grant Number: G007500439

December, 1976

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INSTRUCTIONAL PROCEDURE

This module contains two sequential learning activities and a final check-out activity. A brief overview precedes each learning activity and the final check-out activity. Each learning activity and the final check-out activity provide learning experiences to help you accomplish the objectives. Feedback devices (learner self-test, worksheet, and performance checklist) are provided to help you determine when each objective has been accomplished.

The first learning activity is designed to provide you with the needed background information. The second learning activity is designed to give you an opportunity to apply that information in a practice situation. The Check-Out Activity is the final learning activity. It is designed to allow you to conduct a task analysis in a real work situation, such as when you are employed or when you are serving as an intern learner. The Performance Checklist (Appendix A) is used by the learner and the instructor/supervisor to assess progress. The checklist is applicable for both practice performance and performance in the real work situation.

After reading the Objectives and the Introduction on page 3, you should be able to determine how much of this module you will need to complete before the Check-Out Activity.

* If you already have the necessary background information required for conducting a task analysis, you may not need to complete Learning Activity I, p. 4.

* If you already have had practice in conducting a task analysis, you may not need to complete Learning Activity II, p. 15.

* Instead, with the approval of your instructor or supervisor, you may choose to proceed directly to the Check-Out Activity, p. 36, and conduct a task analysis for an industry when you have access to a real work situation.

Your instructor or supervisor may be contacted if you have any difficulty with directions, or in assessing your progress at any time.
An effort has been made to make this module as self-contained as possible. The information contained in the module should be sufficient to develop "entry-level" knowledge and skills. However, much more has been written on this topic. The advanced learner may wish to attain higher levels of knowledge and skills.

A list of resources which supplement those contained within the module follows. Check with your instructor or supervisor (1) to determine the availability and the location of these resources, and (2) to get assistance in setting up additional learning activities.

There are no prerequisites for completing this module. However, it may be used in conjunction with module number VIII-B, Developing Performance Objectives.

Learning Activity I


Learning Activity II

* Skilled workers in subject area

Check-Out Activity

* Industry manufacturing engineers, quality control specialists, supervisors, set-up persons, machine operators, and assemblers
OBJECTIVES

I. After completing the required reading, take the learner self-test to demonstrate you have attained the knowledge of conducting a task analysis. You should complete all items correctly. (Learning Activity I)

II. After analyzing the performance instructions, complete all the designated experiences in conducting a task analysis in a practice situation. Your work must conform to the worksheet and checklist provided. (Learning Activity II)

III. In an actual work situation, conduct a task analysis for an industry. Satisfactory performance will be realized when all items on the performance checklist (Appendix A) are rated “yes.” (Check-Out Activity)

CONDUCTING A TASK ANALYSIS

INTRODUCTION

After an industry service need has been identified, it will be necessary to become thoroughly familiar with the production procedures of the client company. This is essential when prospective employees are to be trained to perform specific duties and tasks of the industry. A task analysis is the process of reviewing the actual job content in industry as a basis for planning an effective and efficient training program. From the task analysis, curriculum materials are developed to be used in the training program.

In this module, you will learn the components of task analyses and the steps which should be applied to conduct task analyses.
LEARNING ACTIVITY I: INFORMATION

You should study the information presented in the following section. You may wish to read more on the subject from the references listed in the section on Supplementary Teaching/Learning Aids. After reading these materials, you will demonstrate knowledge of conducting a task analysis by completing the Learner Self-Test, p. 11. You will be evaluating your knowledge by comparing your self-test answers with the Answers to Self-Test, p. 13.

I. TERMS UNIQUE TO MODULE
   A. Curriculum materials. Training manuals, instructor guides, videotapes, slides, and other materials used to teach tasks.
   B. Duty. One of the distinct major activity groups involved in work performed, comprising related tasks.
   C. Instructional block. Synonymous with "duty."
   D. Knowledge. The principles and basic information required for successful task performance.
   E. Learning activities. Specific activities or pursuits carried out in the classroom to teach the knowledge, skills, and responsibilities required by the industry. The activities should be directly related to the task information obtained during the task analysis.
   F. Sequence. Succession or continuity of activities.
   G. Task analysis. The process of identifying the job content in industry, including task lists, procedures for performing tasks, information related to task, quality control standards and equipment, tools, and supplies needed for task performance.

II. KINDS OF ANALYSES
   A. Job description. A general statement indicating the duties, responsibilities, working conditions, and training requirements for a particular job. It does not give detailed information about specific tasks and task information required in a job. Generally, a job description should contain:
      1. A general statement about the job
2. Degree of education or training needed to perform the job
3. Manual skills needed
4. Mental skills needed
5. Physical fitness required for job
6. Type tools and machines used in job
7. Health and safety factors involved in job
8. Working conditions

B. Task listing. A listing of activities performed by workers and supervisors. The list may be compiled from job descriptions, production sheets, worker interviews, and observations of work in progress.

C. Task specifications. Statements showing the specific items and requirements needed to complete a task or product. It includes such items as the:
1. Conditions under which the task is performed, e.g., in a standing position
2. Equipment, tools, and supplies used
3. Standards of performance
4. Procedures for performing the task
5. Knowledge required for successful completion of the task
6. Safety and responsibility factors associated with task performance

D. Organizational chart. A chart showing the relationship of personnel or services in an organization.

E. Flow chart. A chart showing the manufacturing processes of a product from one station to another or from department to department. This chart tells the trainee where a particular job fits into the organization of the company.

F. Time-and-motion study. In time studies, workers are observed and timed while performing their job. Data collected from the study are used to determine the standard time used for production of products. Motion studies involve observing workers to determine the quickest, most efficient way to perform tasks.

G. Job classification. A technique used to establish base rates for classifying all jobs in an industry. Jobs may be classified (1) by occupations, and (2) by grades within an occupation.
III. FACTORS TO REMEMBER WHEN IDENTIFYING TASKS

A. Tasks occur frequently with uniformity of content.
B. A teaching unit can be built around a task. Do not list tasks for which no training is required.
C. Tasks are separate, distinct units of work.
D. When tasks are combined, they render a service or result in a product.
E. Tasks involve depicting, shaping, forming, assembling, inspecting, testing, and servicing.
F. A task is comprised of two or more steps of procedure. In addition to direct procedures involved in performing a task, supplemental and/or auxiliary tasks may be performed in order to realize the full completion of the task.
G. Express task statements in simple, but relevant terms.

IV. TASK INFORMATION CATEGORIES

A. Procedural information needed to successfully complete a task
B. Technical information the trainee must know in order to perform a task
C. Equipment, tools, and supplies required for task performance
D. Guidance information relating to securing, holding, and making progress in a job

V. EXAMPLES OF TASKS AND TASK INFORMATION

In order to minimize time, it is best to use one instrument to collect task information. Although information can be recorded on tape, the information must be transposed on paper. An example instrument (form) is shown in Appendix B which can be used to collect task information.

The purpose of a task analysis is to identify all required job information needed for developing a training program, including the content for training manuals. It is best to collect too much information, rather than too little. Analyzing tasks to obtain detailed task information requires persistent questioning and observing of task performance. It is difficult, if not impossible, to obtain useful task information without first clearly specifying the actual task to be performed. The example information shown in Appendix C represents the precise information needed for completing a single task analysis. Examples of task statements are given in Appendix D.
The first place to start in making task lists is the industry production sheets. Often much information concerning tasks can be obtained from these sheets. However, care must be taken to see that the information represents the latest techniques being implemented in the plant by the manufacturing engineering department.

Related task information is an important part of a task analysis. It includes basic knowledge required before attempting to perform a task. The assumption should not be made that the trainee will bring previously learned knowledge or skills into the training program. Obtain as much information as possible while analyzing each task.

VI. CATEGORIZING RELATED TASKS INTO INSTRUCTIONAL BLOCKS/DUTIES
(groups of tasks)

A. The instructional block should contain several related tasks that comprise a significant portion of the job.

B. The tasks within each block should follow a logical sequence from simple to complex.

C. Each task in the instructional block should contain common elements, e.g., (1) equipment, (2) tools, and (3) supplies.

D. Each succeeding task should depend upon the former task for satisfactory completion. Order the tasks within each instruction block from simple to complex, and/or by the order performed on the job.

VII. SEQUENCING INSTRUCTIONAL BLOCKS

The logic for sequencing instruction blocks (groups of tasks) may be similar in some respects to sequencing tasks, e.g., by order of difficulty and by order performed on the job. However, other logic must be used, such as the availability of equipment, and the feasibility for skill development during pre-employment training. The sequence of blocks must be based upon the schedule of production start-up in the new department or plant, since the learning activity sequence should dovetail the manpower needs of the industry.

VIII. SEQUENCING LEARNING ACTIVITIES

A. Sequencing basic knowledge and skills. It is best to teach basic knowledge, skills, and responsibilities in the context of actual production tasks. However, in some situations
it is not possible for training to be conducted for actual tasks. Basic or prerequisite skills which may be applied to one or more actual tasks can usually be taught separately from actual tasks, provided a relationship is shown between the two. The basic skills and related knowledge can easily be sequenced similar to the outline of a lesson plan.

A decision must be made by the curriculum specialist and/or the instructor whether to develop group-paced learning activities or to compile individualized, learner-paced instructional units for each skill. The latter method provides many advantages over group-paced instruction, particularly when industry needs small numbers of employees in job categories or blocks. Numerous learner-paced materials are now available for many of the basic skills required by new and expanding industries.

B. Sequencing production-type tasks. Production-oriented tasks should be sequenced in the “assembly-line” pattern followed on the job. Learning activities for the basic knowledge and skills required should be taught immediately before attempting to perform each task. The instruction will likely require one-on-one focus until the trainee/worker has mastered task performance.

IX. CONVERTING TASK ANALYSIS INTO LEARNING ACTIVITIES

Each task contained in the task analysis should be carefully reviewed for position and/or location in the total duty process, e.g., whether it is the first, fifth, or seventh task to be performed in accomplishing the duty. The task analysis will indicate the machine(s) on which the task is performed, along with the motor skills performed by the worker to accomplish the task. The task analysis will also denote the tools and supplies used to perform the task. Additionally, a description of the knowledge and concepts associated with the task will be presented in the task analysis. This information is the basis for converting task analysis into learning activities.

The learning activities should closely parallel or duplicate the action required on the job. In situations where heavy equipment, tools, and supplies are not readily available, learning activities might focus on basic skill requirements which
can be applied to the performance of one or several comprehensive tasks. For example, basic learning activities may include blueprint reading, part identification, small tool use, and quality control features. The basic skills, as well as the necessary learning activities, can be identified through a study of the task analysis, particularly the procedural steps and related information.

In situations where industry-type equipment, tools, and supplies are readily available, the learning activities should more completely duplicate the tasks performed on the job. The learning activities will include the basic skill and knowledge requirements, as well as the manufacture of a product or component parts. Examples of product-oriented tasks are the assembly of handles for portable electric power tools, and the machining of aluminum casting parts for portable electric power tools.

*Continue this learning activity by taking the Learner Self-Test which follows.*
LEARNER SELF-TEST

This is a checkpoint knowledge test needed before proceeding to the task of conducting a task analysis in a practice situation. Follow the instructions given with each item. Check your answers with the Answers to Self-Test which follow. If you fail to complete all items correctly, you may wish to review parts of the module information.

1. Match the left column with the right column by drawing connecting lines.

   a. Task analysis
   b. Task list
   c. Task information
   d. Basic knowledge
   e. Task statements

   1. Procedural information and technical information
   2. Precedes attempts to perform tasks
   3. Clear, precise descriptions of job activities
   4. Activities performed by workers and supervisors
   5. Process of identifying job content

2. A/an ____________________________ is a general statement identifying the duties, responsibilities, and working conditions of a particular job.

3. A chart showing the relationship between company personnel or services is a/an ____________________________

4. A/an ____________________________ identifies the tasks and the amount of time required to complete a task.

5. A technique used to categorize all occupations in industry is called ____________________________

6. A statement showing the specific items and requirements needed to complete a task or product is called a/an ____________________________

7. Organizing tasks according to the order they are performed on the job is called ____________________________
ANSWERS TO SELF-TEST

1.
   a.  5.
   b.  4.
   c.  1.
   d.  2.
   e.  3.

2.  Job description
3.  Organizational chart
4.  Time-and-motion study
5.  Job classification
6.  Task specification
7.  Sequencing

*Proceed to the next learning activity for practice in conducting a task analysis.*
LEARNING ACTIVITY II: PRACTICE PERFORMANCE

You will be required to practice conducting a task analysis. Several subactivities must be performed before the analysis is completed. You must read the example task information presented in the module. Then you must list the tasks you have performed in a job. Finally, you must examine one task in detail and identify all content associated with the task. You will be evaluating your performance in conducting a task analysis using the Performance Checklist from Appendix A.

I. Study carefully the example task information found in Appendices C and D. This information will serve as a guide as you practice performing a task analysis.

II. Think about a skilled job you were engaged in during the last year. The job need not have been performed for pay. It should be a job in which several tasks were performed.

III. Determine the major duties performed during the job. Remember, a duty is a category or block of work for classifying a group of tasks.

IV. List the tasks which were performed in each duty.

V. Order (sequence) the duties and tasks according to the way they were performed on the job.

VI. Select a task from the list you would like to analyze in detail. Using the task worksheet from Appendix B, and the example task information in Appendix C, identify as much information about the task as you can recall.

VII. Use the Performance Checklist from Appendix A to check your competency in performing a task analysis in the practice situation. Satisfactory performance is realized when all items on the checklist are rated “yes.”

Completion of this learning activity should have qualified you to conduct a task analysis in a real work situation. Proceed to the Check-Out Activity.
CHECK-OUT ACTIVITY: PERFORMANCE IN REAL WORK SITUATION

The activity which follows is intended to be conducted in an actual work situation. It may be performed without completing the two learning activities, if you already have the knowledge and skills to do so.

You will be given an assignment to conduct a task analysis for an industry in your community. In order to complete the assignment, you must perform the following activities: determine the jobs for which training will be provided; identify task information which is already available from the client company; identify persons who can provide task information; observe and/or interview workers, supervisors, and engineers for task information; verify all task information collected with company representatives; and organize task information into usable form. Your performance will be judged by your instructor or supervisor using a checklist. All items on the Performance Checklist (Appendix A) must be rated "yes."

*After completing the Check-Out Activity, you may select another module for study. Your instructor or supervisor may be contacted if you have any difficulty in selecting a module.
## APPENDIX A

### PERFORMANCE CHECKLIST

Conducting a task analysis.

**INSTRUCTIONS:** If the performance is satisfactory, write YES in the space provided. If the performance is unsatisfactory, write NO in the space. Each item must be rated “yes” for satisfactory task performance.

1. Tasks were organized by duties. 

2. The task statements were separate, distinct units of work. 

3. The tasks would result in a product or service. 

4. Each task has at least two steps of procedure. 

5. Task information is directly related to the task statement. 

6. The conditions under which the tasks were performed were specified. 

7. The tools, materials, and supplies provided the worker were specified. 

8. The quality control standards were clearly specified.
**TASK INFORMATION**

**WORKSHEET**

<table>
<thead>
<tr>
<th>TASK:</th>
<th>NOTES:</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Tools and/or Equipment</td>
<td>Test below in a sequential order steps that describe the performance of the task. Describe below a situation(s) in which the performance of this task is most likely to occur.</td>
</tr>
<tr>
<td>* Materials and/or Supplies</td>
<td>If a task is generally performed in more than one way, use a separate sheet to describe each additional method(s).</td>
</tr>
</tbody>
</table>

**IMPORTANT:**

List below those things that you would look for in order to judge the completed task as having been satisfactorily performed.

Note: If insufficient space exists to complete task steps, continue on the back of this worksheet.
APPENDIX C

EXAMPLE TASK INFORMATION

PROJECT: Steel Machining of Portable Electric Tools
Task: Finish-turn a shaft

TOOLS AND EQUIPMENT REQUIRED
1. Seago lathe
2. 5/8" collet
3. Straight template
4. 1-inch micrometer

MATERIALS AND SUPPLIES REQUIRED
1. 9/16" diameter steel stock, 6" in length
2. Carbide insert cutting tools

SITUATION IN WHICH TASK IS PERFORMED
This is the first of a series of tasks (operations) performed on the shaft. The task is repeated on 500 parts. The machine operator must complete 150 parts per hour.

QUALITY CONTROL INFORMATION
The part must be turned to .513/.516 diameter. Check every 25th part with a 1-inch micrometer. Watch the finish of the cut. When the finish becomes rough, replace the carbide insert cutting tool. Following the insert change, the diameter of the first part turned should be checked.

OTHER RELATED INFORMATION
The turning task is performed on the short bearing end of the shaft.

STEPS OF PROCEDURE
1. Call set-up person if machine is not prepared for operation.
2. Place drive-dog on part.
3. Load part between centers.
4. Start rpm and depress feed lever.
5. Turn automatic feed. CAUTION: Keep hands free of live center when it moves into part.
6. Observe completion of turning task.
7. Stop feed and rpm.
8. Remove part from machine, and remove drive-dog from part.
9. Place part in parts basket. CAUTION: Do not throw parts in basket. This will nick the finish on the shafts.

NOTE: Time can be saved if photographs and other graphic arts materials are produced or collected while tasks are analyzed.
APPENDIX D

EXAMPLES OF TASK STATEMENTS

NOTE: In actual industry jobs, some of the tasks below may be combined into one task which is performed in one sequence on a machine.

MACHINING STEEL PARTS
1. Broach a shaft.
2. Straighten a shaft.
3. Drill and counterbore a plate.
4. Turn a shaft.
5. Harden a shaft by induction process.
7. Mill a keyseat on a spindle.
8. Hobb a gear.
10. Deburr a bearing.
11. Belt-sand a plate.

MACHINING ALUMINUM CASTINGS
1. Belt-sand a motor housing.
2. Straddle-face a motor housing.
3. Bore and face a motor housing.
4. Drill and tap holes in a motor housing.
5. Deburr tapped holes in a motor housing.
6. Ream holes in a motor housing.
7. Chamfer holes in a motor housing.
8. Counterbore holes in a motor housing.

ASSEMBLING ARMATURES
1. Assemble armature stacks.
2. Insulate armature slots.
3. Wind an armature core.
4. Separate coil lead wires.
5. Slot a commutator.
6. Press a commutator on a shaft.
7. Connect leads to commutator.
8. Surge-test an armature.

ASSEMBLING PORTABLE ELECTRIC POWER TOOLS

1. Press a bearing to a wobble plate.
2. Assemble a bearing retainer to a bearing plate.
3. Press wobble plate to wobble shaft.
4. Assemble bearings in gear case.
5. Assemble reciprocating mechanism to gear case.
6. Assemble brushholder to motor housing.
7. Assemble tool handle.
8. Connect electrical leads to switch.
9. Test tool for proper operation.
LIST OF INDUSTRY SERVICES LEADERSHIP DEVELOPMENT MODULES

I. Orientation to Industry Services
   A. Introduction to Industry Services
   B. Industry Services Leadership Development Program: Guide for Using the Self-Paced Instructional Modules

II. Establishing Contacts and Relationships
   A. Speaking to Industrial and Community Groups
   B. Writing Articles for News Media
   C. Identifying Functions of Agencies Involved in Industry Services
   D. Developing a Brochure for Industry Services

III. Obtaining Agreements
   A. Developing Training Agreements
   B. Developing a Lead-time Schedule
   C. Interpreting Legislation Related to Industry Services

IV. Identifying Training Needs
   A. Collecting Framework Production and Training Information
   B. Selecting Types of Training Programs
   C. Preparing a Budget for an Industry Services Project

V. Acquiring Resources
   A. Selecting Instructors for Industry Services
   B. Securing a Training Site
   C. Securing Training Equipment, Tools, and Supplies

VI. Training Instructors for Industry Services

VII. Preparing for Training
   A. Adapting the Training Site to Training Needs
   B. Evaluating Safety Conditions at Training Sites
   C. Announcing the Opening of a Training Program

VIII. Preparing Training Materials
   A. Conducting a Task Analysis
   B. Developing Performance Objectives
   C. Determining Types of Instructional Methods and Media
   D. Developing Performance Tests
   E. Developing Training Manuals
   F. Preparing Videotapes for an Industry Services Program
   G. Setting Up Learning Centers for Industry Services Programs

IX. Selecting Candidates
   A. Developing a Plan for Testing and Counseling Applicants for a Training Program

X. Monitoring Training Programs
   A. Assisting in Providing Pre-Employment and In-Plant Training
   B. Developing a Procedure for Keeping Participating Agencies Informed About Training Program Activities
   C. Monitoring Training Programs for Progress and Expenditures

XI. Closing Training Programs
   A. Closing a Training Program

XII. Placing Program Participants
   A. Developing a Plan for Placing Graduates of a Pre-Employment Training Program

XIII. Evaluating Industry Services Programs
   A. Evaluating Industry Services Programs

Direct Inquiries To: Research and Curriculum Unit for Vocational-
                     Technical Education, College of Education,
                     Mississippi State University, Drawer DX,
                     Mississippi State, MS 38762
                     (601) 325-2510