Needs and Task Analysis

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Lesson Administration Page

Module: Needs and Task Analysis

Scope: This module introduces the student to the analysis of training requirements. The student will learn the purpose of the needs analysis, the proper methods in determining training needs, and the process for task analysis and critical task identification when the needs analysis demands training.

Instruction Objectives:

Terminal Learning Objective: At the conclusion of this module, the student will be able to articulate a needs analysis, conduct a task analysis, and define the critical tasks that must be incorporated into a viable training program.

Enabling Learning Objective 1: Identify and describe the requirement for a needs and training task analysis

Enabling Learning Objective 2: Identify and describe the meaning and purpose of the task analysis, including task selection, criteria, and procedures for conducting task selection

Enabling Learning Objective 3: Demonstrate the ability to complete the task analysis worksheet

Practical Exercises: Conduct a needs and task analysis for a performance objective

References:

- Dick, W., & Carey, L. *The Systematic Design of Instruction*. 1996. New York, NY: Harper Collins College Publishers.
- Gredler, M. E. *Learning and Instruction: Theory into Practice*. 1997. Upper Saddle River: Prentice-Hall.
- Gustafson, K. L. *Survey of Instructional Development Models*. 1991. Syracuse, NY: Information Resource Publications, Syracuse University.
- Leshin, C. B., Pollack, J., & Reigeluth, C. M. *Instructional Design: Strategies and Tactics for Improving Learning and Performance*. 1992. Englewood Cliffs, N.J.: Educational Technology Publications.

- Mayer, R. E. "Designing Instruction For Constructivist Learning." In C. M. Reigeluth (Ed.), *Instructional Design Theories and Models. Vol. II: A New Paradigm of Instructional Theory*, 1999. Mahwah, NJ: Lawrence Erlbaum Associates.

- Petraglia, J. *Reality by design: Rhetoric, Technology and the Creation of Authentic Learning Environments.* 1998. Mahwah, NJ: Lawrence Erlbaum Associates.

- Christopher, Paula. "Needs Analysis: The Who, What, When and Where of Training." <http://www.gsu.edu/~mstswh/courses/it7000/papers/needs.htm>.

Duration: 3.0 Hours (1 hour seminar and 2 hour PE)

Method of Instruction: Facilitated seminar in classroom environment with practical exercises completed in small groups.

Instructor Ratio: 1:40 and 1:8

Required Reading Assignments: *Needs and Task Analysis* module

Evaluation Strategy: End of course 30-question written examination and oral presentations

Special Instructions: At the beginning of the class, the instructor will provide each student with an *Instructor Training Certification Task, Hazard, and Learning Objective Analysis Guidebook*; this book will be used for the practical exercise at the end of the module. Have students return books to instructors when the class ends.

Needs and Training Task Analysis

The Needs Analysis

A needs analysis is the study undertaken to find out the root of a problem and how to resolve it. A needs analysis must find out not only the needs involved in a training program, but why those needs exist. In other words, the question why something won't or doesn't work is just as crucial as what students do or do not know. The analysis then becomes the basis for recommendations for training and for supporting tactics.

There are two main methods used to discover training needs. The first method takes the proactive approach. This is when an instructor goes into the system or process and searches for problems or potential problems. The goal is to make the system more efficient and to prevent future problems from occurring.

The second method used to discover a training need is when a request comes to the training department for help in resolving a problem. A training need exists when personnel lack the skills, knowledge, or attitudes (SKA) to perform an assigned task satisfactorily.

Training is needed when an individual *does not* know how to meet the required performance standards for an accountable task.

When looking for training needs, or when problems arise, there are several instruments that may be used to locate the actual symptoms. Some of these needs assessment instruments are:

- Literature research—Analyzing all budget documents, quality control documents, goal statements, evaluation reports, scheduling and staffing reports, or other documents for existing problems
- Interviews—Talking to supervisors, managers, subject matter experts (SME), and employees
- Observations—Watching the job or task being performed
- Surveys—Sending out written questionnaires
- Group discussions—Leading a group discussion composed of employees and supervisors of the employees

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Some questions that might be asked to determine training needs are:

- What are the employees doing that they should not be doing?
- What specific things should employees do, but do not?
- What is the ideal way to perform this job properly?
- What prevents performance of a prescribed task according to standards?
- Are job aids available and if so, are they accurate? Are they being used?
- Are the standards reasonable? If not, why?
- What desirable changes could be made for better performance?
- On what subjects do workers need to be trained?
- What new technology would boost performance most?
- What new technology could be invented to help with work? Why?

Regardless of which methods are chosen and what questions are asked, the data gathered must accurately reflect the specific tasks now being performed. The information gathered would be used as the basis to select the tasks that need to be trained.

The system overview document, job list document, and any documents obtained from the training needs analysis form the basic requirements for the initial analysis. They ensure a basic understanding of the system, who is in the system, and what are believed to be shortcomings within the system.

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Task Analysis

Task analysis for instructional design is a process of analyzing and articulating the kind of learning students are expected to know how to perform. Following the determination that an instructional need exists (needs assessment), task analysis is used to analyze that need for the purpose of developing the instruction.

The general task analysis functions include:

- *Inventory tasks*—Identify or generate a list of the relevant tasks that should be considered for instructional development.
- *Select tasks for analysis*—Select certain feasible and appropriate tasks for training, since it is impossible to train every person on every task to a level of proficiency that might be required for the job.
- *Describe or decompose tasks*—Identify and describe the components of the tasks, goals, or objectives identified in the inventory.
- *Sequence task components*—List task component in an understandable chronological order.
- *Classify learning outcomes*—Classify performance and knowledge states required of students by the kind of learning outcome required.

Considerations for Selecting Task Analysis Methods

- What kind of instruction is expected to be designed?
- What task analysis function is needed to be performed (inventorying, selecting, describing, sequencing, or classifying)?
- What is the scope of the task (single or complex performance involving many tasks)?
- In what context will instruction be delivered?

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- What experience or training do the designers have in conducting task analysis?
- How much time and what resources are available in any instructional design context to support different forms of task analysis, since they vary in complexity?
- What resources are available?

Considerations for Selecting Tasks for Analysis

- What are the most important tasks to be learned?
- Which are the most essential to the goals of the organization?
- Which learning outcomes will provide the most benefit to the students?

Description of Task Selection Criteria

- *Criticality*—How important is the performance of the task to the goals/mission of the organization, or how critical is the risk of failure to adequately perform the task in its application context?
- *Universality/frequency*—How widely and commonly is the task performed in its application context?
- *Standardization*—Is the task similarly performed in all application contexts within the organization?
- *Feasibility*—Is support available for the task to be learned? Will support be available for the application context?
- *Difficulty*—How difficult is it to learn to perform the task?

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Conducting Task Selection

- *Specify a referent situation*—State the situations in which this task may be used.

- *Complete the task inventory*—List each task or skill to be included on the worksheet.

- *Assess Criticality*—Consider the severity of impact of unlearned skills on the goals and productivity of the organization, ability to operate normally, safety of personnel, safety of clients, and impact on the environment. (Rate 0-40: 0 = unnecessary, 40 = invaluable, absolutely critical)

- *Assess Universality*—Consider the number of contexts where task is performed, percent of similar positions requiring performance of task, and percent of employees who perform the job. (Rate 0-10: 0 = never performed by anyone, 10 = performed by everyone)

- *Assess Standardization*—Consider the consequences of the task not being standardized to the goals of organization, ability to operate, safety of personnel, safety of clients, and impact on environment. (Rate 0-10: 0 = idiosyncratic, 10 = standardized methods)

- *Assess Feasibility*—Consider the adequacy of instructional support available, whether the task will be used in its application context, whether the task will be supported within the application context, the attitude of students in learning the skill or task, and the necessity of follow-up training. Rate 0-10: 0 = not able to be learned, 10 = learning and performance supported and feasible)

- *Assess Difficulty*—Consider the amount of time student need to learn task, degree of danger, likelihood of retention, probability that the task can be learned, and the characteristics of students (aptitude, prerequisite skills, maturity, motivation, etc.). (Rate 0-30: 0 = easy, 30 = extremely difficult to learn)

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Factors to consider when selecting tasks to be trained are:

- Is the training mandated by the Occupational Safety and Health Act?
- Could a job performance aid or self study packet be used in place of formal training?
- Can people who are previously trained be hired?
- Is training needed to ensure students' behavior does not compromise the company's legal position, i.e., Equal Employment Opportunity, labor relations laws, or state laws?
- What will happen if this task is not trained?
- What will be the benefits if this task is trained?
- If training is not provided, how will the employee learn?
- How will this training help to achieve goals?

Questions to be asked when performing a task analysis are:

- How difficult or complex is the task?
- What behaviors are used in the performance of the job?
- How frequently is the task performed?
- How critical is the task to the performance of the job?
- To what degree is the task performed individually, or is part of a set of collective tasks?
- If a subset of a set of collective tasks, what is the relationship between the various tasks?
- What is the consequence if the task is performed incorrectly or is not performed at all?

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- To what extent can the task be trained on the job?
- What level of task proficiency is expected following training?
- How critical is the task?
- What information is needed to perform the task? What is the source of information?
- What are the performance requirements?
- Does execution of the task require coordination between other personnel or with other tasks?
- Are the demands (perceptual, cognitive, psychomotor, or physical) imposed by the task excessive?
- How often is the task performed during a specified timeframe (i.e., daily, weekly, monthly, or yearly)?
- How much time is needed to perform this task?
- What prerequisite skills, knowledge, and abilities are required to perform the task?
- What are the current criteria for acceptable performance?
- What are the desired criteria for acceptable performance?
- What behaviors distinguish good performers from poor performers?

NOTE: Total the scores for the five criteria on the worksheet for each task and reconcile any prior differences between raters.

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Task Selection Worksheet

Task Selection Criteria WorkSheet	Criticality (40)	Universality Frequency (10)	Standardization (10)	Feasibility (10)	Difficulty (30)	Total	Notes	Priority

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Steps to performing a task analysis include:

1.) *Describe the GOAL*—The GOAL is the state of a system that the human wishes to achieve or the desired state of the system. 2.) *List the tasks* that are required to accomplish the goal. The GOAL may be comprised of multiple TASKS and SUBTASKS. TASKS are a structured set of activities required in which actions are undertaken in some sequence to obtain the GOAL. 3.) *Divide tasks into subtasks*—Shorter sequences that serve an intermediate sub-goal along the way to achieving the overall goal of the task. SUBTASKS are simpler actions required to complete a TASK. 4.) *Decide at what level of detail the task needs to be analyzed*—This process of hierarchic subdivision can be taken to a succession of levels, thus modeling the task to a degree of detail that matches the analysis we wish to perform. Levels of detail include task, subtask, keystroke, etc. The level of detail is decided by determining what purpose this analysis serves.	1.) *Identify potential user tasks to meet system goals* 2.) *Organize tasks into alternative scenarios or use cases* (Minimum 2-3). 3.) *Specify all human-machine interactions for interface design* 4.) *Identify the objects and interaction styles associated with each task scenario* 5.) *Assess the adequacy of current objects to meet task demands* 6.) *Recommend additional objects (or features) to improve system performance* *Task scenarios*—A scenario includes the general activities of the user and the system components. *Stopping Rule*—The task should be at the abstraction level at which typical users can read and understand their part in a human-machine interaction activity. *How*—Briefly describe the task context (What is the overall task goal? What are the assumptions about the user and the system?). Describe the human-machine interaction (like a script).	1.) *Task Step*—Describe the task step, the goal the needs to be accomplished. 2.) *Stimuli that initiate the step*—Indicate all stimuli associated with accomplishing the task step. 3.) *Decisions to be made*—Indicate the decisions required to accomplish the task step. 4.) *Actions to be made*—List any actions required to accomplish the task step. 5.) *Information required*—List all information required to accomplish the task step. 6.) *Feedback required*—List all feedback required to accomplish the task step and to know the task step has been accomplished. 7.) *Sources of error or stress*—List all possible sources of error or stress associated with this task step.

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Practical Exercise

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Needs and Task Analysis

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Under the guidance of an instructor, each student will develop a task analysis using an *Instructor Training Course Task, Hazard, and Learning Objective Analysis Guidebook* issued to him or her at the beginning of the class.

Practical Exercise:

1. Select an analysis method and conduct a task analysis.

2. Using the factors to be considered on page NTA-8, and the questions on page NTA-8 & 9, conduct a job/training task analysis for the item of technology/procedure in your *Instructor Training Course Task, Hazard, and Learning Objectives Guidebook.*

3. Complete your task analysis in the task analysis worksheet on page NTA-16; ruled paper may be used for additional space.

4. At the conclusion of the PE time period, you will instruct your group on the analysis method you have chosen. Identify the tasks and subtasks, and explain their importance.

TASK ANALYSIS WORKSHEET

Task:

Supporting Task and Subtask Analysis	Subtask Sequence Number
Supporting Task:	
Subtask:	
Subtask:	
Supporting Task:	
Subtask:	
Subtask:	
Supporting Task:	
Subtask:	
Subtask:	