Chapter 4

Task Analysis

Jody is the head nurse in a hospital maternity ward at a large teaching hospital. She oversees the nurses she manages, ensuring they are following the most current procedures for patient care. She provides ongoing training to her nurses to help them stay current. There have been several recent incidents where nurses have not followed proper procedures for admitting new patients. Jody has explored the problem and determined that a group of new hires are responsible for many of the occurrences. These nurses lack some knowledge and skill and thus need to be trained on the proper procedures.

Ben teaches an advanced qualitative research course for doctoral students in a college of education at a large university. A major goal of Ben's course is for students to be able to determine which qualitative approach to take when given various research scenarios. Ben is not happy with the lack of depth in which his students are able to defend the choices. He wonders if the instruction he has provided his students is missing key information.

Both Jody and Ben have identified a problem that needs to be solved. Although the problems are different, each problem stems from a lack of skill and knowledge on the part of those Jody and Ben teach. A task analysis needs to be completed by both to determine the instructional content that will help the students most.

Guiding Questions

- What is task analysis?
- What important information is gathered as a result of conducting a task analysis?
- What do experts in instructional design recommend about conducting a task analysis?
- What is the final outcome of a task analysis?
- How can an instructional designer evaluate the effectiveness of a task analysis?

Key Terms

content analysis (page 69)
learning task analysis (page 69)
subject matter analysis (page 69)
subject matter expert (SME) (page 69)
task analysis (page 68)

Chapter Overview

It is common practice to conduct a *task analysis* after a needs analysis that has determined if instruction should occur, who is requesting the instruction, and in what environment this instruction needs to take place. Task analysis is a critical component in the instructional design process because it provides important information about the content and/or tasks that will form the basis for the instruction being developed. According to many instructional design experts (Jonassen, Hannum, & Tessmer, 1989; Morrison, Ross, Kalman, & Kemp, 2012), task analysis is often considered to be the most important part of the instructional design process.

This chapter describes various methods for gathering information about the content and/or activities that need to be included in the instruction. Various task analysis approaches taken by instructional design experts will be introduced and explained. This chapter also suggests how an instructional designer can evaluate the effectiveness of a task analysis.

What is Task Analysis?

Careful consideration must be taken to ensure that there is a clear understanding of what learners are to know or are able to accomplish by participating in instruction. Coming to this understanding requires the identification of the type of content that will make up the instruction and in what sequence this content should be provided. The systematic process used by instructional designers to accomplish this is typically called task analysis. It is important to note that instructional designers sometimes refer to task analysis as *content analysis, subject matter analysis*, or *learning task analysis*. According to Morrison et al. (2012), these terms can be confusing because they can refer to different activities based on the context in which they are being used. In an instructional design context, what is important to remember is that despite their different names, each refers to the task analysis process, and the goal remains the same: to gather information about the content and/or tasks that need to be part of the instruction being developed.

Morrison, Ross, and Kemp (2006b, p. 78) write that a task analysis solves three problems for an instructional designer.

1. It defines the content required to solve the performance problem or alleviate a performance need. This step is crucial because most designers work with unfamiliar content.
2. Because the process forces the *subject matter expert* to work through each individual step, subtle steps are more easily identified.
3. During this process, the designer has the opportunity to view the content from the learner's perspective. Using this perspective, the designer can often gain insight into appropriate teaching strategies.

Jonassen, Tessmer, and Hannum (1999, p. 3) provide a slightly expanded view of what instructional designers are trying to determine when a task analysis is carried out. They write that a task analysis helps determine the following.

1. The goals and objectives of learning.

2. The operational components of jobs, skills, learning goals, or objectives—that is, to describe what task performers do, how they perform a task or apply a skill, and how they think before, during, and after learning.
3. What knowledge states (declarative, structural, and procedural knowledge) characterize a job or task,
4. Which tasks, skills, or goals should be taught—that is, how to select learning outcomes that are appropriate for instructional development.
5. Which tasks are most important—which have priority for a commitment of training resources.
6. The sequence in which tasks are performed and should be learned and taught.
7. How to select or design instructional activities, strategies, and techniques to foster learning.
8. How to select appropriate media and learning environments.
9. How to construct performance assessments and evaluation.

Gagne, Wagner, Golas, and Keller (2004) state that task analysis includes various procedures that are conducted by an instructional designer to obtain information that is needed to plan instruction. Two such approaches are information-processing analysis and learning-task analysis. These types of analyses focus on lesson or course target objectives (Gagne et al., 2004).

Jody knows that she needs to conduct a task analysis to determine the various elements of the procedures her nurses need to complete. She must determine if the current training is leaving out certain steps or if the new hires are simply not retaining what they are being taught.

Ben has determined that he needs to break down the process of choosing and defending a qualitative research approach. This will help him determine if he is leaving out important information for his students. He needs to look at the content and the skills that experts use in choosing a qualitative research approach.

Popular Approaches to Task Analysis

Numerous approaches to task analysis exist that have been developed by instructional design scholars and practitioners. The approaches vary based on the context surrounding the instruction that needs to be developed. Most approaches have similar elements, although their procedures may be slightly different. They all share the same goal: determining the type of content and/or skills that need to be included in the instruction. The various approaches to task analysis are important to understand as you develop your own understanding of how this process is accomplished.

- According to Jonassen et al. (1989), task analysis is a "process of analyzing and articulating the kind of learning that you expect the learners to know how to perform" (p. 3). They assert that the task analysis process consists of five discrete functions: a) inventorying tasks; b) describing tasks; c) selecting tasks; d) sequencing tasks and task components; and e) analyzing tasks and content level. These functions consist of the following activities.
    - **Inventorying tasks**: identifying tasks that need to be developed for instruction.
    - **Describing tasks**: the process of elaborating the tasks identified in the inventory.
    - **Selecting tasks**: prioritizing tasks and choosing those that are more feasible and appropriate if there is an large quantity of tasks.
    - **Sequencing tasks and task components**: defining the sequence in which instruction should occur to successfully facilitate learning.
    - **Analyzing tasks and content level**: describing the type of cognitive behavior, physical performance, or affective response required by the tasks.

Morrison et al. (2012) state that the content required for instruction is influenced by the goals derived during a needs analysis and the information gathered during the learner analysis. The needs analysis provides instructional designers with a focus and the overall breadth of the instruction that needs to be developed. The learner analysis provides an understanding of the learner's knowledge and background related to the content. The combination of the needs and learner analyses provides a starting point for the instructional designer to determine the scope and sequence of the content to be included in instruction. The result of a task analysis is used to provide input for developing instructional objectives.

Three different techniques for analyzing content and tasks are provided by Morrison et al. (2012): topic analysis, procedural analysis, and the critical incident method. Topic analysis is designed to help analyze cognitive or declarative knowledge. A topic analysis provides two types of information: 1) the content that will make up the

instruction and 2) the structure of the content components. The content components can be facts, concepts, principles and rules, procedures, interpersonal skills, or attitudes. Conducting a topic analysis is much like creating an outline, where you start with the major topic and work your way down to subordinate information that is associated with the major topic.

Procedural analysis is utilized to analyze tasks by identifying the steps that are required to complete them. In conducting a procedural analysis, the instructional designer typically walks through the steps with an SME. This is preferably done in the environment (or as close as possible to the actual environment) where the task will be performed. The result of a procedural analysis is typically a flowchart that identifies the different substeps that need to take place for the learner to accomplish the task.

The major element of a critical incident method is an interview. The interview allows the instructional designer to gather important information about the conditions in which an individual successfully and unsuccessfully accomplished a task. This method was developed during World War II by Flanagan (1954) to help determine why military pilots were not learning how to fly correctly. Pilots were interviewed to determine the conditions that were present when successful and unsuccessful missions were performed. The pilots were asked three types of questions.

1. What were the conditions before, during, and after the incident?
    a. Where did the incident occur?
    b. When did it occur?
    c. Who was involved?
    d. What equipment was used, and what was its condition?
2. What did you do?
    a. What did you do physically (e.g., grabbed the rudder)?
    b. What did you say and to whom?
    c. What were you thinking?
3. How did this incident help you reach or prevent you from reaching your goal? (Flanagan, 1954, as cited in Morrison et al., 2012, p. 87)

The interview process in the critical incident method allows the instructional designer to identify knowledge and skills that an individual (the SME) uses to accomplish a task. The information identified during the interview can be combined with a topic and/or procedural analysis to gather additional information about the content or tasks that are to be part of the instruction (Morrison et al., 2012).

Dick, Carey, and Carey (2011) write that the process of identifying the skills and knowledge that should be included in instruction is a complex process. They call this process instructional analysis. “Instructional analysis is a set of procedures that, when applied to an instructional goal, results in the identification of the relevant steps for performing a goal and the subordinate skills required for a student to achieve the goal” (p. 38). They separate this process into two parts. The first part involves the instructional designer determining the major components of the instructional goal through goal analysis. The second part involves how each step of the instructional goal can be further analyzed to identify subordinate skills learners must have to meet the instructional goal.

The instructional analysis process can begin once the instructional goal has been identified. Dick et al. (2011) write that the instructional designer should start the instructional analysis process by asking, “What exactly would learners be doing if they were demonstrating that they already could perform the goal?” (p. 37). This question keeps the focus on what learners should be able to accomplish by participating in instruction rather than just on the content of the instruction. This focus is called a goal analysis procedure. The result of a goal analysis includes two items: 1) the classification of the kind of learning that will occur and 2) a visual representation (e.g., a flowchart) that displays the specific steps (and substeps) a learner should take when performing an instructional goal. There are a variety of goal analysis procedures an instructional designer can use.

The second part of the instructional analysis process is referred to as the subordinate skills analysis. The purpose of this analysis is to identify the appropriate set of subordinate skills that a learner will need to perform a specific step that helps the learner meet an instructional goal. Several techniques for conducting a subordinate skills analysis have been identified by Dick, Carey, and Carey; the hierarchical approach and cluster analysis are two examples. A specific technique is selected for use by an instructional designer based on the type of knowledge that is needed to meet the instructional goal.

Smith and Ragan (2004) refer to task analysis as "analysis of the learning task." They state: "The process of task analysis transforms goal statements into a form that can be used to guide subsequent design. Designers expend a great deal of effort in obtaining as clear a description and as thorough an analysis as possible of the learning task" (p. 63). They list five steps that are performed during the learning task analysis.

1. Write a learning goal.
2. Determine the types of learning of the goal.
3. Conduct an information-processing analysis of the goal.
4. Conduct a prerequisite analysis and determine the type of learning of the prerequisites.
5. Write learning objectives for the learning goal and each of the prerequisites.

The result of a learning task analysis is a listing of the goals that describe what learners should know or be able to accomplish at the end of instruction. Included in the list are the prerequisite skills and knowledge learners will need to achieve these goals.

A key element of this approach is the information-processing analysis of the goal (step 3). This allows the instructional designer to determine the content that is needed for the instruction. Smith and Ragan state that when instructional designers conduct an information-processing analysis, they are attempting to identify the mental and/or physical steps an individual goes through to complete the learning task. They state that although the information-processing analysis is not the only approach to examining and dissecting the task, "it seems to be the easiest, most straightforward approach to take" (2004, p. 69).

Professionals in Practice

We work closely with "new product introduction" engineers to ensure that the technical content on slides and in student lab guides is accurate. However, because access to SMEs is sometimes limited, we are increasingly finding it necessary to become SMEs in the subjects for which we develop content. Additionally, it is mandated that instructional designers teach a public class for each course developed at least once per quarter in order to experience the course flow and to develop a first-hand understanding of what works and what does not work. The days of throwing a finished course over the fence to an instructor and never touching it again are long gone.

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Task Analysis Procedures

The different approaches described in the previous section share the common goal of gathering information about the content and/or tasks that will make up the instruction that needs to be developed. Each approach has its own specific set of techniques that help to accomplish this goal. It is beyond the scope of this book to describe the techniques of each approach in detail; you will most likely be able to study these approaches and their techniques in depth during more advanced instructional design courses you will take, specifically those on task analysis (however, if you are too anxious to wait until then, you can start with some of the recommended reading listed at the end of this chapter).

Professionals in Practice

When I was the director of distance education, I managed a team who developed online courses with faculty from different disciplines who served as subject-matter experts. The typical context my team worked in was one in which a faculty member had taught a course face-to-face numerous times and for various reasons needed to transition the course into an online or hybrid format. Because the course had been previously taught, the content had been developed and approved by university committees. Formal task analyses were typically not conducted. The instructional designer working with the faculty member did, however, conduct a modified task analysis by looking at the content with the faculty member to get a thorough understanding of the content involved in the course. The result was an outline of the content and skills that students needed to be successful in the course that aligned with the course goals and objectives.

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Involving a Subject Matter Expert

An additional element that all the approaches emphasize is the need for a subject matter expert (referred to as an SME; pronounced *SMEE or S-M-E*) to be part of the task analysis process. The job of the SME is to help the instructional designer gather the necessary information about the content and/or tasks that will be used to develop the instruction. In some instances, the instructional designer may work as the subject matter expert because of his or her expertise in the content. In most task analysis procedures, instructional designers work with a subject matter expert. An SME is an individual who is an expert in the content area that will make up the instruction being developed. Subject matter experts play a critical role in the task analysis process by providing insights into what makes up the content and how it should be sequenced.

Task Analysis Documents

With all task analysis procedures, the result is a document created by the instructional designer that depicts the content and/or tasks. This document can take on several forms. The two most common are outlines of the content or flowcharts that depict the different tasks and subtasks that the learner will need to accomplish (see Figures 4.1 and 4.2).

Teaching a Dog to Touch his Nose on the End of A Stick

This skill leads to many different tricks such as closing an open door.

Please keep in mind that this example is provided to illustrate a relatively simple task that most of us can identify with. In providing this example, we are not intending to minimize the role of an instructional designer to that of someone who solely creates training that deals with dogs. We recognize that the majority of tasks that you will analyze will not be as simplistic and follow such a strictly behavioristic approach. As an instructional designer, you will be involved in analyzing many complex behaviors, such as a doctor performing a cardiac catherization. We would have loved to provide an example of this procedure; however, we are not experts in this field, and we did not want you to blame us if the procedure failed as a result of you following our task analysis. We feel rather safe in knowing that if you follow our example below you might actually come back to us thanking us for helping teach your dog a new trick.

1. **Obtain the necessary supplies**
    a. Training clicker.
    b. Dog treats.
    c. Yard stick.
    d. Plastic lid from a yogurt container (or a similar-sized round and flat object).
    e. Adhesive to attach lid to the end of the yard stick.

2. **Get ready to train your dog**
    a. Break treats into small pieces.
    b. Place treats in your pocket or in a place they are easily accessible.
    c. Get your clicker and place in your dominate hand.
    d. Find a comfortable area where you and your dog will not be distracted.

3. **Train your dog to respond to the clicker**
    a. Have your dog in front of you.
    b. Click the clicker one time.
    c. Immediately give your dog a treat.
    d. Repeat this step several times until your dog recognizes that he will receive a treat each time the he hears the clicker.
        i. An attentive dog is an indication that the dog recognized that a click will be followed by a treat.
    e. Stop the activity for at least 15 minutes.
    f. Repeat steps a through c.

4. **Train your dog to "touch"**
    a. After you feel your dog now recognizes that he will receive a treat each time he hears a click, a new step can be added.
        i. Typically you will not attempt this step until a least one day has gone by.
    b. Make sure you have plenty of small pieces of dog treats.
    c. Have your clicker.
    d. Have your dog in front of you.

Figure 4.1 Result of a Task Analysis: Outline Format

e. Touch the palm of your hand to your dog's nose and at the same time click the clicker and say "touch".
f. Immediately give your dog a treat.
g. Repeat this process several times.
h. Touch the palm of your hand to your dog's nose and say "touch" at the same time.
    i. Do not use the clicker.
i. Immediately give your dog a treat.
j. Repeat this process several times.
k. Move back at least one foot from your dog.
l. Hold out your hand to the side with your palm open.
    i. Your hand should be at the level of your dog's height.
m. Say "touch".
    i. Your dog should move and touch his nose to your palm.
        1. Immediately give your dog a treat and praise.
        2. If your dog does not touch his nose to your palm, you may need to move your hand closer to his nose and attempt the process again or go back to step e if moving your palm closer to his nose does not work.
    ii. Repeat steps l and m several times.

5. Train your dog to touch round lid on the end of a yard stick

a. Attach the round lid to the end of a yard stick.
b. Make sure you have plenty of small pieces of dog treats.
c. Have your clicker.
d. Have your dog in front of you.
e. Hold out the yard stick with the lid on the end of it.
f. Touch the lid to your dog's nose and say "touch" at the same time.
g. Immediately give your dog a treat.
h. Repeat this process several times.
i. Move back at least a foot from your dog.
j. Hold out the stick with the lid on the end.
k. Say "touch".
    i. Your dog should move and touch the lid with his nose
    ii. If your dog does not do this, you will need to repeat steps e through h.
l. Immediately give your dog a treat and praise.
m. Repeat this process several times.
n. Move back several feet and either hold out your palm or the yard stick and give the command "touch".
    i. Immediately give a treat and praise when the dog touches your palm or the stick.
    ii. Eventually move the target higher and lower to challenge the dog.v

Figure 4.1 (Continued)

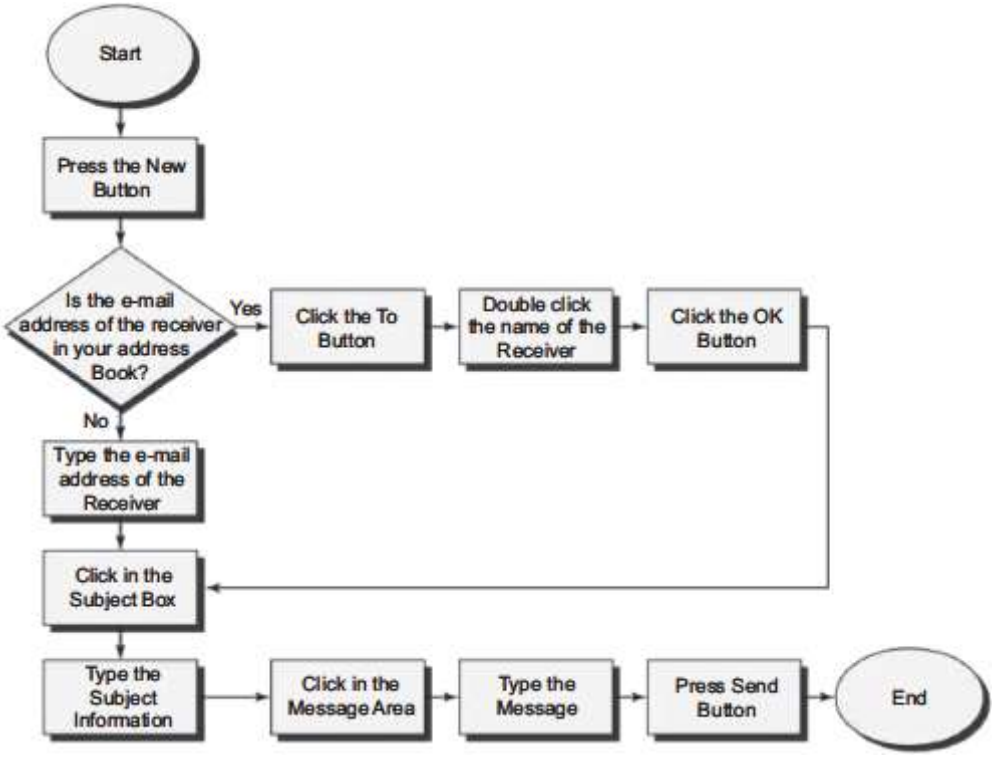

Figure 4.2 A Flowchart Depicting the Process of Sending a Message Using a Typical Email System
Source: Author

Influencing Factors

The task analysis approach that an instructional designer will use depends on the context that surrounds the instruction that needs to be developed. A major influencing factor in the approach that is selected is the goal of the instruction. The goals of the instruction will relate to the type of content and/or task that will make up the instruction. For example, if the goal of instruction is for learners to know how to change a flat tire, the task analysis approach that should be used will be one that is best suited for analyzing procedural tasks. An important thing to remember regarding task analysis is that no single approach works for every situation. Successful instructional designers can select the appropriate approach based on the context and the instruction that needs to be developed and then modify the approach to meet their needs.

Evaluating the Success of a Task Analysis

How do you know that you have conducted a successful task analysis? How do you know that you correctly analyzed the content and/or tasks that will be part of the instruction that needs to be developed? Probably one of the most effective methods for determining the success of your task analysis during the design and development of instruction is to ask a subject matter expert who was not part of the task analysis to look over what you created and evaluate it for accuracy and thoroughness. This formative evaluation activity will provide a valuable perspective that you can use to compare to the data you gathered during your task analysis.

Another method to evaluate the effectiveness of your task analysis is to compare it to the other available information that has been gathered during the instructional design process, such as the needs analysis and learner analysis. Do the results of the task analysis match what is known about the goal of the instruction being developed? Have you gathered the necessary information about the content and/or tasks that will help learners meet the instructional goal? Additionally, what is known about the learners? Have the correct prerequisite content and/or skills that need to be included in instruction been correctly identified? Taking a step back from the task analysis results and comparing them to other information you have available will allow you to evaluate—to some degree—the initial effectiveness of your task analysis.

Finally, an obvious summative evaluation activity that can be conducted once the instruction has been implemented is to look at the success of the instruction. Were the learners able to accomplish the instructional goal?

If the learners were successful, more than likely your task analysis was effectively conducted.

Task Analysis and the Instructional Design Process

A task analysis is vital in helping an instructional designer to identify the task or tasks that guide the instruction being developed. A task analysis should help you answer the following questions, regardless of the approach taken.

1. What is the task that individuals need to be able to accomplish or perform?
2. What are the key components of this task (that is, the skills and knowledge an individual needs to successfully complete or perform the task)?
3. What is the sequence in which a task is accomplished or performed and should be learned and taught?
4. How can you determine whether an individual is able to complete the task?

Jody followed the procedural analysis approach. With this approach, she analyzed the task of admitting new patients by identifying the various steps required to successfully complete the task. In conducting the procedural analysis, Jody went through the steps with a veteran nurse and a hospital admissions expert. Once they had listed the steps, the group performed the process with a real patient being admitted on the maternity ward. This helped Jody identify if there were any missing steps. The result of the procedural analysis was a flowchart that identified the different substeps that needed to take place for a nurse to successfully admit a new patient. The flowchart was compared to the information used in the current training. Jody determined that the current training left out important steps and that new training needed to be developed.

Ben's task analysis focused on the content he was teaching. He created an inventory (a list) of the steps he taught his students to go through—along with the content associated with the steps. Ben took this inventory and shared it with several colleagues who are experts in qualitative research design to determine if he was leaving something out. His colleagues agreed that the inventory was thorough and that Ben was including the proper content and skills in his instruction. Ben was happy and puzzled with the results—happy because his colleagues helped him determine he was not leaving anything out but puzzled because his students were not doing well. This led Ben to suspect that the organization, presentation, and management of his instruction may be causing the problem.

Summary

Task analysis is often considered to be the most critical component of instructional design. For effective instruction to be developed, instructional designers need to be able to determine the content and/or the tasks that will make up the instruction. A properly conducted task analysis will help an instructional designer to accomplish this. Numerous task analysis procedures exist that can be used by instructional designers depending on the context that surrounds the instruction that needs to be developed. Popular approaches to task analysis include those outlined by Jonassen, Hannum, and Tessmer; Morrison, Ross, Kalman, and Kemp; Dick, Carey, and Carey; and Smith and Ragan. Most task analysis procedures include the use of a subject matter expert (SME), who assists the instructional designer by providing guidance on the scope and sequence of the content and tasks that need to be included in the instruction (which in most cases are based on the needs analysis and learner analysis). The result of a task analysis is a scope and sequence of the content and/or tasks that will make up the instruction. Typically, this will take the form of an outline or a graphical representation, such as a flowchart. Evaluating the effectiveness of a task analysis is often done during the design and development of the instruction by having an SME not involved in the initial task analysis critique the results of the task analysis or by comparing the results to other information gathered during instructional design (e.g., needs analysis or learner analysis). Once the results have been evaluated and modified (if necessary), they are used to develop specific learning goals and objectives that learners will be expected to meet during instruction.

Chapter Comprehension Questions

1. The task analysis is often considered by instructional design experts to be the most important part of the instructional design process.

    a. True.
    b. False.

2. Instructional designers may refer to a task analysis as a _____ analysis, _____ analysis, or _____ analysis.
3. The primary purpose of a task analysis is to _____ about the content and/or _____ that need to be part of the instruction being developed.
4. The job of the _____ is to help the instructional designer gather the necessary information about the content and/or tasks that will be used to develop the instruction.

    a. Content specialist.
    b. Project manager.
    c. Subject matter expert.
    d. Subject matter professional.

5. Despite the different approaches to task analysis, each approach uses the same techniques for gathering information about the content and/or tasks that will make up the instruction to be developed.

    a. True.
    b. False.

6. Two forms a task analysis document can take are a _____ or an _____.
7. A summative approach to determine if a task analysis was effectively completed is to determine how _____ the learners were in meeting the _____ once the instruction has been completed.

Connecting Process to Practice Activities

1. A variety of approaches to task analysis were outlined in the chapter. What key elements for conducting a task analysis do these approaches have in common? How do these approaches differ?
2. Examine the approaches taken by Ben and Jody. Do you believe each took the appropriate task analysis approach? Explain why you believe the approach each took is appropriate or what you might do differently if you were in their positions.
3. Consider Ben's approach. Does his approach follow one that was discussed in the chapter? Explain your answer.
4. Describe an instructional design scenario where you believe a task analysis would be difficult to carry out?
5. Select a common activity that you regularly do. Conduct a task analysis on this activity.
6. You have been hired by a client to work on an instructional design project. The client is an international phone company. The client has indicated that over 100 operators need to be trained on how to provide customers who call a toll-free number with information about the company's different products and services. The operators need to be trained on how to access this information through the company's electronic knowledge base and provide this information to the customers in a timely and accurate manner.
7. How might a high school teacher go about conducting a task analysis when preparing instruction on the causes of World War II that will be delivered in his or her Advanced Placement History class?
8. Think about a routine task that you do on a daily basis. Conduct a task analysis on this task. Share the task analysis with a peer to determine if he or she can determine what task you have analyzed.
9. You have been hired by the general manager of a manufacturing company to document the process of creating a metal part that is used in outboard boat motors. The metal part is created using a specialized machine that only two employees know how to use. There is no documented process on how to use the machine to create this part. The two employees are retiring soon, and they are reticent to train new employees on the use of the machine and how to create the part. The location where the parts are manufactured is noisy. How would you go about conducting a task analysis to document the process in order to develop training for new employees on how to use the machine to create the part?
10. How would you go about a task analysis given the following scenario? Describe what steps you would take in conducting the needs analysis. Bobby is a seven-year-old student starting second grade. He has been diagnosed with autism. Bobby is integrated into a general education classroom for the entire school day. He does receive support from a special education teacher to address the goals and objectives outline on his individualized education plan (IEP). The special education teacher knows that Bobby struggles with picking up the classroom routines. How would a task analysis conducted on the classroom routines help Bobby? How would you go about conducting a task analysis on the classroom routines? Describe what you would do in the task analysis.

Recommended Reading

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