Chapter 4

Hierarchical Sequencing: How to Do It

This chapter provides guidance on how to design, and conduct analyses for, hierarchical sequences. Chapters 5-8 provide similar guidance for the other four major sequencing strategies: procedural, simplifying conditions, conceptual elaboration, and theoretical elaboration. I strongly recommend you have a firm understanding of the theory of hierarchical sequencing from Chapter 3 before you begin this chapter.

As discussed in Chapter 3, to design a hierarchical sequence, you need to identify skills that are prerequisites (simpler component parts) of other skills. Then you design a sequence that teaches the prerequisite skills first. So the most difficult part of the design process is analyzing skills for their prerequisites. The hierarchical task analysis process is therefore described first, followed by the hierarchical sequence design process.

Hierarchical Task Analysis Process

How to Do It

According to Robert Gagné, you conduct a hierarchical task analysis by asking the question, "What does a learner need to be able to do so that, when given only instructions, he can do X?" In addition to that rule of thumb, you may find the following guidance helpful. In the next section, two examples of this guidance process are provided, followed by examples of the resulting analyses. You may want to refer to these as you read through this guidance.

1. Prepare. Prepare for analysis.

1.1 Establish rapport with a **SME** (subject-matter expert).

- It is desirable to have a SME who also has experience teaching the content of interest to the target student population, so you can easily identify the skills that the learners should already know.
- Working with a good SME is crucial to the success of this sequence design effort, so make sure the SME takes you

and the work with you seriously. Problems in this area have sabotaged many design efforts in the past.

1.2 Identify the characteristics of the **task** in general.

- The purpose here is for you to gain a general understanding of the task. This can be done by such methods as observing an expert perform the task, interviewing an expert, or studying a task description.

1.3 Identify the characteristics of the **learners** in general.

- This includes primarily the age level, general ability, experience and interests, and general prior knowledge.

1.4 Identify the delivery **constraints** for the instruction in general.

- This includes any constraints on how often and how long the students can meet, how much "homework" time can be expected, what resources can be available, and so forth.

2. Select a skill. Select a skill that the learner needs or wants to learn, and describe it as a *single action* (mental and/or physical), using an active verb. Then decide whether or not the learner will be able to understand how to do the action, as described, assuming she or he already knows all the concepts (terms/nouns) involved. If so, you do not need to do a rule analysis, and you should proceed to Step 4 to see if a concept analysis is needed. Otherwise, proceed to Step 3 to conduct a rule analysis.

- The skill will usually be one identified by your needs analysis. For more about needs analysis, see Kaufman and English (1979), Kaufman, Rojas and Mayer (1993), and Rossett (1987).
- The skill will often be a complete task.
- The skill will usually be a rule or a higher-order rule, as defined by Gagné.

  A **rule** is often a procedure (set of steps). It could also be a principle (cause-effect relationship or guideline/ rule-of-thumb). Examples: How to add 2-digit numbers, the temperature-evaporation principle (an increase in surface temperature causes an increase in evaporation), and a guideline for rating an advance placement essay on a scale of 1 to 5.

  A **higher-order rule** is a rule that combines several lower-order rules. Examples: How to perform long division for 2-digit divisors, the causal model shown in Figure 3.5, and an interrelated set of guidelines for rating an advance placement essay on a scale of 1 to 5.

- If the skill is a concept, you can skip to Step 3.

  A **concept** involves a concept-classification skill, which is a matter of being able to classify an object, event, or idea

as belonging to a category. Examples: Divisor, evaporation, supporting evidence.

3. Conduct a rule analysis. If the skill is a rule or higher-order rule, break it down into its simpler component rules (subskills) until you reach entry-level rules (ones for which the learners could already perform the actions). To do this:

3.1 Identify a complete set of rules (subskills) that comprise the target rule or higher-order rule, and describe each such rule (subskill) as a *single action* (mental and/or physical), complete with an active verb. I recommend you sketch out a learning hierarchy such as the one in Figure 3.3 while you are interviewing your SME.

- In the case of a procedural rule, the subrules will be the steps for performing the skill. However, even if a step is performed more than once, it is listed only once in a hierarchical analysis. Remember, it is subskills you are listing (in any order), not substeps (in order of performance).
- In the case of a heuristic rule, the subrules will be principles or guidelines, which typically only have concepts as subskills.
- Keep in mind the hierarchical paradox: simpler is more complex — that each individual rule becomes simpler the further down you go in your analysis, even though each level down is a more complex description of the overall skill being analyzed.
- A complete set of rules (subskills) includes all the rules necessary for performing the target rule. The complete set could be described with as few as two subskills, or it could be described with literally hundreds of subskills. If you find yourself thinking in terms of more than about seven subskills, you should try to collapse several of them into a more complex rule that is still a subskill of the target rule. Later you can break it down further (see Step 2.2). This helps you to always keep the larger picture in mind and avoid overlooking some subskills.

3.2 For each rule (subskill), decide whether or not the learner will be able to understand how to do the action, as described, assuming she or he knows all the concepts involved. If yes, you have reached "entry level" of description of that rule (subskill) for your target learners, and your rule analysis is complete for that subskill. If no, continue to analyze the subskill by repeating Step 3 for it.

- The surest way to find this out is to test a representative sample of your target population of learners, but it is also the most expensive and time-consuming.
- A good alternative is to get an instructor who is experienced in teaching this skill to learners from the target population,

and ask his or her opinion. It is advisable to get opinions from several such instructors, for their opinions may differ. Keep in mind that this approach, while quicker and less expensive, is also less reliable.

4. Select concepts. For the lowest level of each rule identified in Step 3, identify the concepts that each includes. Then decide whether or not the learner will be able to correctly classify examples of each concept. If yes, your analysis is complete. Otherwise, proceed to Step 5 to break the concept into simpler component concepts or discriminations.

- The concept will usually be mentioned in a complete description of the rule (developed as a part of your rule analysis). Typically, it is a **tool** that is used in performing the action (mental or physical), an **object** on which the action is performed, or an **product** (result) of the action.
- The concept will usually be a defined concept, though it could be a concrete concept or even a discrimination. Discriminations cannot be further broken down.

5. Conduct a concept analysis. Break the concept down into simpler component concepts or discriminations until you reach entry-level concepts or discriminations. At that point your hierarchical task analysis is complete.

- Often a concept is defined as a special case of its superordinate concept (e.g., "A sonnet is a poem which ...."). In such cases, the superordinate concept will be one of the simpler component concepts.
- If the concept has a criterial definition (see p. 3.17), its critical characteristics are prerequistes.
- If the concept has a functional definition (see p. 3.17), its functions are prerequisites.
- Concrete concepts and discriminations don't have definitions.
- For the vast majority of skills that you will teach in training or education contexts, the learners will already have mastered the prerequisite concrete concepts and discriminations.
- For purposes of doing your concept analysis, don't worry much about whether a skill should be called a discrimination or a concrete concept or a defined concept. Just try to break it into simpler parts if it is not at entry level.

Job Aid for Hierarchical Sequencing

1. **Prepare**
   - 1.1 Establish rapport with SME.
   - 1.2 Identify characteristics of task in general.
   - 1.3 Identify characteristics of learners in general.
   - 1.4 Identify delivery constraints of task in general.

2. **Select a skill.**

3. **Conduct a rule analysis of the skill,** to entry level.
   - 3.1 Break the rule (skill) down into a complete set of subrules.
   - 3.2 Continue to break down those subrules to entry level.

4. **Select concepts for each entry-level rule.**

5. **Conduct a concept analysis of each concept,** to entry level.

Process Example 1: Mathematics

By Dan Kennedy

Here is an example of the process for conducting a hierarchical task analysis for the skill of **solving multiple-step equations in one variable**, using the guidance provided in the previous section. The result of the hierarchical analysis is shown after this.

1. Prepare

For the design of this sequence of instruction, I served as both the designer and the SME. With 15 years experience teaching middle-level mathematics, I had confidence in my ability to perform the role of SME. I felt I could adequately make judgements on such things as characteristics of the task and entry-level skills of the learners. However, for the sake of credibilty and to guard against any ideosyncracies that I may have had, I solicited input from other math teachers.

One of the national standards (NCTM 1989) for middle level mathematics is equation solving. The task of solving an equation is characterized by various levels of skills (rules) and sub-skills, which range from very simple to quite complex. So equation solving, with its prerequisite skills and sub-skills, lends itself well to hierarchical task analysis.

The target learners were 7th, 8th, and 9th graders ranging from 12 to 16 years in age. I assumed that all students had at least mastered the operation rules (including order of operations) through rational numbers.

Equation-solving instruction had traditionally been organized in 45-minute blocks, five times a week, with practice exercises assigned frequently. While some schools had moved to longer time blocks, the great majority of math educators were still limited to short class periods.

2. Select a skill

For this project, there was only one skill of interest (whereas in most projects there are many skills). My "single-action" description of the skill is: "Solve multiple-step equations in one variable." Entering learners have no idea how to do this skill given only this general-level description, so I knew a rule analysis would be needed. This is a higher-order rule because it usually combines several lower order rules, depending on the complexity of the equation.

3. Conduct a rule analysis

3.1 I began by asking myself what was a complete set of subskills that would cover all types of equations. It seemed to me that the subskills varied according to the type of equation you were solving. Therefore, I identified four major subskills (Q, W, X, and V in the diagram under "Product Example 1" below.

3.2 Again, I knew that entering learners would have no idea how to do any of these four skills given only a single-action description of each, so I continued to further analyze each sub-skill until I felt I reached entry level (see the learning hierarchy below).

4. Select concepts

Performing some of the skills in the hierarchy requires being able to identify concepts that students have already mastered, such as negative numbers. Performing other skills in the hierarchy, though, involves mastery of concepts not taught previously. In the task analysis I isolated each skill (shown in sharp rectangles). If there was a new property or concept that needed to be mastered for that skill in the hierarchy, I enclosed it in a rounded rectangle.

For example, when teaching the skill of isolating "x" in the equation

$$\frac{2}{3}x = -16$$

(box G in the hierarchy), the act of performing that skill has as a prerequisite the *concept-classification skill* of identifying the coefficient.

Other similar relationships between new skills and new concepts are shown graphically throughout the hierarchical diagram (see Figure 4.1).

5. Conduct a concept analysis

All of the concepts identified in Step 4 were already at entry-level for the target learners, so this step was not needed.

Product Example 1: Mathematics

By Dan Kennedy

Figure 4.1 shows the final result of conducting the hierarchical task analysis process for solving multiple-step equations in one variable.

Note that when we view this skill as being comprised of the four subskills (or rules), Q, W, X, and V, those four subskills all share the same sub-subskills! It is the way those sub-subskills are combined that makes the four subskills distinct.

Note that P is not broken down any further, even though it is relatively high up in the hierarchy. Thus, even though the levels in general denote different levels of complexity, with the skill at the top being the most complex, two skills on the same level can in fact differ greatly in their complexity.

Note that F is a prerequisite to J, K, and L, whereas G is a prerequisite only to L. Also, note that A is a prerequisite to C, D, F, G, and H.

Also, please note the following:

- Each skill is stated as a single action with an action verb.
- The results of the concept analysis are in rounded boxes to help show their fundamentally different nature.

Place Figure 4.1 (the Hierarchy) on this page.

Process Example 2: Psychology

By Charoula Angeli

Here is an example of the process for conducting a hierarchical task analysis for the skill of diagnosing mental disorders, using the guidance provided in the previous section. The result of the hierarchical analysis is shown after this.

1. Prepare

I met with my subject-matter expert on a Monday morning. We spent a few minutes in the beginning to get to know each other. She told me that she had been a psychologist for over a decade, and also a visiting professor at Indiana University every Spring semester. I told her about my studies and my interests.

I asked then what task she had in mind to discuss. She told me that one of the tasks every student had to learn in a counseling psychology program, was the process that psychologists engage in to diagnose mental disorders. I asked her about the characteristics of the task in general, and she said that it was really a procedure that students learned during their first year in graduate school. The learners, she said, were motivated to learn the material because they recognized the importance of mastering the skill. She said that the instructional strategies she used to teach the skill were mostly lectures and role modeling.

2. Select a skill

We then proceeded to analyze the skill that learners needed to learn. I asked her to describe the skill as one single mental action. She said, "Diagnose a mental disorder," and I wrote this down in a box on the top of a large piece of paper. Since I recognized this skill as a higher-order rule, we then proceeded to conduct a rule analysis.

3. Conduct a rule analysis

I asked the subject-matter expert to identify the major rules or mental activities that she performs when she diagnoses a mental disorder. She identified four sub-skills: (1) Question the patient, (2) Distinguish depression from anxiety, (3) Rule out psychosis, and (4) Assess mental history. I wrote each of these rules in separate boxes under the previous box (see Figure 4.2 on the next page). Then I asked her if there were any other rules she ever uses to diagnose a mental disorder, and she said no.

Then I took each of these four rules and went through the same process. I asked her to identify the major rules that she performs when she does each, and she gave similar answers. For example, for "(2) Distinguish depression from anxiety," she identified (a) Specify symptoms, and (b) Reach a conclusion (see Figure 4.2).

We continued this process for subrules and sub-subrules until we reached rules that she thought her new students would be able to handle. Then we proceeded to select concepts for analysis.

4. Select a concept

I picked each rule (one at a time) on the lowest level of the hierarchy-in-progress and asked the SME to identify all the concepts that it included. Then I asked her which ones her new students had not all previously mastered. For example, for the rule "specify symptoms" identified in Step 3 above, she identified the following concepts: (1) Date of onset, (2) Prior occurrence, (3) Frequency, (4) Duration, (5) Intensity, and (6) Severity. I then asked her whether any of these concepts might have simpler component concepts that the students hadn't yet mastered. She said that learners could learn these concepts easily without her teaching any simpler component concepts first.

5. Conduct a concept analysis

As all of the concepts identified in Step 4 were already at entry level for the target learners, this step was not needed.

Product Example 2: Psychology

By Charoula Angeli

Here is the final result of conducting the hierarchical task analysis process for diagnosing mental disorders.

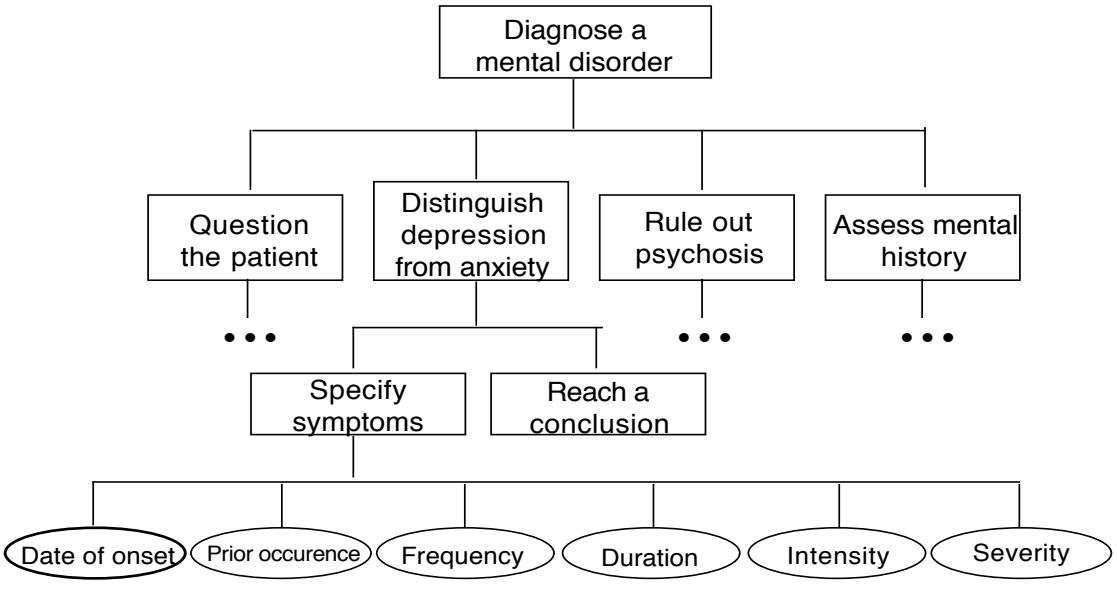

Figure 4.2 A learning hierarchy in which the lower skills must be learned before the higher skill can be learned. (The entire hierarchy is not shown.)

Hierarchical Sequence Design Process

How to Do It

According to Robert Gagné, you design a hierarchical sequence by teaching skills that are lower in a hierarchy before teaching skills that are directly above them. But that makes it seem a lot simpler than it really is. In addition to that rule of thumb, you may find the following guidance helpful. The numbering of steps is a continuation from the analysis process. In the next section, an example of this guidance process is provided, followed by an example of the resulting sequence. You may want to refer to these as you read through this guidance.

6. Select the size of a learning episode. Decide how big your groupings of content should be. We shall call each such grouping a "learning episode" in a course.

- Analyze the delivery constraints of the specific instructional situation, if any. For example, you may be forced to use 45-minute time blocks for class sessions, with two hours of homework expected for each hour of class time. However, with enough effort, you may be able to use other options, in which case the standard practice is not a constraint, and you can make your decision based on more important considerations.
- Be sure to keep in mind both in-class and out-of-class time.
- Too big is bad. In considering the optimal size of your groupings of content, consider how long your learners can be actively engaged without a break. This will depend to some extent on such factors as the age of the learners, the difficulty/abstractness of the content, the motivational value of the instruction, and additional factors.
- Too small is bad. Also consider how long the learners should be allowed to work in order to not interrupt their concentration and engagement.

7. Select an approach. Decide what approach you want to use to group the skills in each learning episode.

- You could group them so as to take a **spiral** approach to hierarchical sequencing by teaching all the skills on the bottom level of the hierarchy, then teaching all the skills on the next level up, and so forth.
- You could group them so as to take a **topical** approach by moving as far up a "leg" of the hierarchy as quickly as possible for one learning episode, and then moving on to other "legs" in other

episodes, always trying to get as high up as you can as soon as you can.

- Of course, other options are also possible.

8. Group and sequence the episodes. Using your decisions from Steps 1 and 2, group the skills in your learning hierarchy into learning episodes, and arrange those episodes in a hierarchical sequence.

- Keep in mind that the hierarchical sequence requires that no skill is taught before all its subordinate skills (learning prerequisites) have been taught.

9. Design a within-episode sequence. Design a within-episode sequence for each learning episode. This entails arranging all the skills within an episode into a hierarchical sequence.

- Your hierarchical sequence should be consistent with the approach you selected in Step 2.

This completes the hierarchical sequence design process. An example of this process is described next.

Job Aid for Hierarchical Sequence Design

6. Select the size of a learning episode.
- Analyze the delivery constraints.
- Keep in mind both in-class and out-of-class time.
- Too big is bad.
- Too small is bad.

7. Select an approach.
- Spiral, topical, or other.

8. Group and sequence the episodes.
- Based on size and approach
- Teach no skill before all its subordinate skills.

9. Design a within-episode sequence.
- Again, teach no skill before all its subordinate skills.

Process Example 1: Mathematics

By Dan Kennedy

The following is an example of the process for designing a hierarchical sequence on solving multiple-step equations in one variable, using the guidance provided in the previous section.

6. Select the size of a Learning Episode

Middle-school mathematics instruction is almost always designed for and presented in 45 minute time blocks. This is the standard for current public education, but should not necessarily be considered a constraint. According to the SME (me), the following are factors that support both the feasability and desireability of this "short" class period:

- Before moving from one skill to the next, drill and practice are necessary to internalize and automatize the skill. This creates a need to break the task down into "bite-sized" pieces.
- While there are exceptions, the attention span for adolescents can easily be quenched within 45 minutes, particularly when learning to solve equations.
- The size of the content groupings (skills in the hierarchy) is small enough to easily fit the typical school schedule.

7. Select an approach

The skills in this hierarchy are usually taught using a topical approach, going up one leg and then the next, trying to get as high as possible before it is necessary to move over to another leg. Said differently, a skill is introduced as soon as its sub-skills (or correlate skills) are mastered. I have found this more holistic approach to be more motivating for students, so I selected it for this sequence.

8. Group and sequence the episodes

I used the selection of 45-minute episodes and topical sequencing as criteria for selecting the skills for each episode and sequencing those episodes. The resulting sequence outline (or blueprint) is shown in Figure 4.3 0n the next page.

9. Design a within-episode sequence

Each 45-minute episode will follow a routine where prerequisite or correlate skills are reviewed and informally assessed first. This phase in the daily sequence generally lasts 15 minutes. When I feel these skills are mastered, the next skill in the hierarchy is introduced, which takes approximately 15 minutes. This leaves the remainder of the class period for guided and independent practice on that specific skill.

Each of the 45 learning episodes will follow a similar sequence. The instructor should make appropriate adaptations, however. Built into this sequence is a daily emphasis on review. That segment of each lesson reflects a different type of strategy, but it affects the sequence. As new skills are learned, previously

learned skills are reviewed and strengthened as they become components of higher order skills.

Product Example 1: Mathematics

By Dan Kennedy

Here is the final result of designing a hierarchical sequence for solving multiple-step equations in one variable.

Learning Episode	Skills	
1	A, C	Identify "variable," Use addition to isolate "x"
2	D, I	Convert –a to +(-a), Solve x+a+b and x-a=b
3	B, F	Identify "coefficient," Use multiplication to isolate "x"
4	K	Solve x/a=b
5	G, H, L	(If "a" is a fraction) Use multiplication to isolate "x," (If "a" is a nonfraction) Use division to isolate "x," Solve ax=b
6	E, J, N	Express –x/a as x/-a, Solve -x/a=b, Solve 1-step equations
7	Test on N	
8	O, S	Reverse order the operations to isolate "x," Solve ax+b=c
9	M, Q	Express (-x) as (-1x), Solve –x+b=c
10	P, T	Identify "like terms," Use addition to combine ax+bx
11	R, U	Use multiplication to simplify a(x+b), Solve a(x+b)=c
12	V	Solve ax+c=bx
13	W	Solve ax+d=bx+c
14	X, Y	Solve ax+bx=c, Solve multiple step equations in 1 variable
15	Test on Y	

Figure 4.3 A sequence outline for a skill in mathematics.

Note that many other sequences could be designed without violating the principles of hierarchical sequencing. For example, M and Q could be taught in the first learning episode, as could P and T, or E and J, or A, B, and F. There is a great deal of latitude for alternative sequences within the hierarchical approach.

Process Example 2: Psychology

By Charoula Angeli

The following is an example of the process for designing a hierarchical sequence for the skill of diagnosing mental disorders, using the guidance provided earlier.

6. Select the size of a Learning Episode

According to my subject-matter expert (SME), instruction in 75-minute time blocks twice a week is good for teaching the skill. Specifically, she identified five different instructional episodes as shown in Figure 4.4 (next page). She emphasized that 75 minutes give enough time not only for the teacher to teach a skill, but also for the learners to practice the skill. These decisions were based on her belief that role modeling and teaching with cases are appropriate instructional strategies to use.

7. Select an approach

The skills in the hierarchy, according to my SME, are best taught using a topical approach—that is moving one leg at a time in the hierarchy, trying to get as high as possible before branching onto another leg. She found that this approach enabled the learners to learn sub-skills without loosing the big picture of things.

8. Group and sequence the episodes

The order of the instructional episodes is depicted in Figure 4.4.

9. Design a within-episode sequence

Each instructional episode begins with a review of what was covered during the last instructional session. This activity usually takes about ten minutes. Then, my SME introduces the agenda for the day and teaches for about 30 minutes. She makes sure that enough time is given to the students to practice the skill. This usually takes place during the last 35 minutes of class time.

Design Product Example 2: Psychology

By Charoula Angeli

Here is the final result of designing a hierarchical sequence for the skill of diagnosing mental disorders. Note that the sequence only includes the portion of the hierarchy of skills that is shown in Figure 4.2. The remaining skills would be sequenced in the same manner.

Learning Episode	Skills
1	Concepts: Date of onset, prior occurrence, frequency, duration, intensity, severity Rule: Specify symptoms
2	Convert –a to +(-a), Solve x+a+b and x-a=b
3	Identify "coefficient," Use multiplication to isolate "x"
4	Solve x/a=b
5	(If "a" is a fraction) Use multiplication to isolate "x," (If "a" is a nonfraction) Use division to isolate "x," Solve ax=b
6	Express –x/a as x/-a, Solve -x/a=b, Solve 1-step equations
7	
8	Reverse order the operations to isolate "x," Solve ax+b=c
9	Express (-x) as (-1x), Solve –x+b=c

2 Specify how these (individually or in combination) might constitute symptoms for a disorder. Identify threshold values for each one of the concepts as indicators for a mental disorder.

3 Introduce the concept of anxiety. Specify its major symptoms and their respective thresholds signifying it.

4 Introduce the concept of depression. Specify its major symptoms and their respective thresholds signifying it.

5 Based on units 3 and 4 develop rules that distinguish between depression and anxiety.

Product Example 2: Psychology

By Charoula Angeli

Practice Exercises

If you are using this book in a course and you want to use a problem-based learning approach to learning these skills and understandings, you should begin by selecting a problem and scenario that fit the criteria outlined below, and use the relevant prior material in this book on an as-needed basis.

I recommend you choose your own scenario and problem for this exercise, for then it will be more personally relevant and authentic. But if you do so, it is important that the scenario and problem meet certain criteria, or they will not afford you the opportunity to learn to do a hierarchical analysis and sequence design. Here are the criteria.

The Problem

- The skill should be relatively simple. Picking a more complex skill will just make your project take longer, without enhancing your learning much. To keep it simple, think in terms of a task that will take no longer than 15 minutes to perform, and no longer than a couple of hours to learn. It may be a mental skill, a physical skill, or a combination of the two. It may be a higher-order rule or a rule, but make it more complex than just a concept. It may be a procedural rule or a heuristic rule. In fact, it would be more useful to do a project with a simple rule of each kind than to do a project with a complex rule of just one kind.
- The problem should only entail designing the sequence at this point, unless you are using this book in conjunction with other resources that can help you to design additional aspects of the instruction.

The Scenario

- Work on a team of 2 (or at the most 3) people to perform this project. You will learn more by sharing ideas and perspectives with each other. You will also further build your teaming skills, which are extremely important for instructional designers. I have found that the more people beyond two on a team, the less both active involvement and learning will take place for at least one of the teammates.
- Try to find a real client for whom to do the project, in a school (k-12 or higher education), corporate (profit or nonprofit), or informal setting. If you can't find a real client, then arrange for a classmate or friend to be your client in a role-play type situation. Your client should serve as your subject-matter expert.

A Sample Problem and Scenario

The university in which you are studying wants to develop some training for all its resident advisors (RAs) on providing some basic psychological counseling to undergraduates in their dorms. You and a classmate have volunteered to select and sequence the content for a workshop on detecting and dealing with depression. One of the people working for the university on this project is an RA who is a graduate student in psychology. She has agreed to be your SME. She told you that you only need to teach the RAs to deal with relatively mild cases of depression, because they will be instructed to refer more severe cases to the campus counseling services.

Other options: a skill from music, from football, from sales or marketing, from project management, from elementary math or composition, from operating a piece of equipment.

What's Next?

Given this chapter's skill-building focus on how to design, and conduct analyses for, hierarchical sequences, Chapters 5-8 provide similar guidance for the other four major sequencing strategies: procedural, simplifying conditions, conceptual elaboration, and theoretical elaboration. Be sure you have a good understanding of a sequence from Chapter 3 before you go to its corresponding skill-focused chapter.

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