Chapter 6

Simplifying Conditions Method:

How to Do It

This chapter provides guidance on how to design, and conduct analyses for, instructional sequences based on the Simplifying Conditions Method (SCM). Chapters 4 and 5 provided similar guidance for hierarchical and procedural sequencing, and Chapters 7 and 8 do so for the other two major sequencing strategies: conceptual elaboration, and theoretical elaboration. I strongly recommend you have a firm understanding of the theory of SCM sequencing from Chapter 3 before you begin this chapter.

As discussed in Chapter 3, to design an SCM sequence, you need to identify versions of a complex task that are simpler than other versions. Then you design a sequence that teaches the simplest versions first. However, the SCM development process is designed to facilitate rapid prototyping by allowing sequence design to occur while the analysis is continuing. The SCM task analysis process is therefore intermingled with the SCM sequence design process. This was not the case for the hierarchical and procedural sequences.

SCM Development Process

How to Do It

You conduct an SCM task analysis by asking the question, "What is the simplest version of the task that an expert has ever performed?" and "What is the next simplest version?" and so forth. As each version is identified, its place in the sequence is simultaneously determined. In addition to this rule of thumb, you may find the following guidance helpful. In the next section, three examples of this guidance process are provided, followed by examples of the resulting analyses and sequence outlines. You may want to refer to these as you read through this guidance.

Phase I. Prepare for Analysis and Design

1. Prepare. Lay the groundwork for your analysis and design. This is the same as for the hierarchical and procedural sequences.

>   1.1   Establish rapport with a SME.

>   1.2   Identify the characteristics of the task in general.

>   1.3   Identify the characteristics of the learners in general.

>   1.4   Identify the delivery constraints of the task in general.

Phase II. Identify the First Learning Episode

2. Identify the simplest version. Help the SME to identify the simplest version of the task that is fairly representative of the task as a whole, and to describe the conditions that distinguish that version from all other versions.

>   • You may want to use some other criteria in addition to simple and representative, such as common (how frequently performed the version of the task is) and safe (how much risk there is to the learner and/or the equipment).

>   • Ask the SME to recall the simplest case she or he has ever seen. The simplest version will be a class of similar cases. Then check to see how representative it is of the task as a whole.

>   • It may be helpful to start by identifying some of the **major** versions of the task and the conditions that distinguish when one version is appropriate versus another.

>   • Thinking of different conditions helps to identify versions, and thinking of different versions helps to identify conditions. Hence, it is wise to do both simultaneously (or alternately).

>   • There is no single right version to choose. It is usually a matter of trade-offs. The very simplest version of the task is usually not very representative of the task as a whole.   The more representative the simple version can be, the better, for it provides a more useful schema to which learners can relate subsequent versions.

3. Analyze the organizing content. Analyze the organizing content for this version of the task. How you do this will vary depending on the nature of the task: procedural, heuristic, or a combination of the two (see page 3.10). (This is done now rather than later because it is important for determining whether this version of the task will be too large or too small for a single learning episode.)

>   • For primarily ***procedural*** tasks, perform a procedural task analysis to identify *substeps* at the entry level of description (see p. 5.2), and draw a *flowchart* for this version of the task.

>   • For primarily ***heuristic*** tasks, use the following process   (See example in Figure 6.1 below.):

>>   1.   Identify a *descriptive model* for any and all objects involved

in performing the task.

2. Identify the *goals* for this version of the task under its conditions

3. Identify all the important *considerations* for attaining each goal. Considerations are the major categories of causal factors that influence performance of the task. If there are a lot of causal factors for a consideration, it is useful to identify subconsiderations for it.

4. Identify all the important *causal factors* for each consideration (or subconsideration).

5. Analyze each causal factor to identify all *guidelines* (prescriptive principles) that an expert uses to account for this consideration. (See examples below.)

6. Identify any *decision rules* an expert uses to combine the guidelines into a performance model.

7. Identify *explanations* as to why each of the guidelines works, and combine the explanations into explanatory models. (See example below.)

- For **combination** tasks, do both: identify substeps at entry level in a flowchart, and identify guidelines and decision rules in a performance model and explanations in explanatory models for each step that is heuristic in nature.

4. Analyze the supporting content. Analyze supporting content for this version of the task. (This is also important to do now so that you can determine whether this version of the task will be too large or too small for a single learning episode.)

4.1 Identify information, understandings, skills (concept classi-fication, procedure using, principle using, and higher-order thinking skills), and affective qualities (e.g., attitudes) that are directly relevant to this version of the task and have not yet been acquired by the target learners.

4.2 Analyze those understandings, skills, higher-order thinking skills, and affective qualities down to entry level. The procedural and hierarchical task analysis approaches work well for skills and higher-order skills, and the hierarchical approach can be fairly easily extended to identifying prerequisite understandings. But I can't offer much guidance for analyzing affective qualities.

At this point, you have identified all the content that needs to be taught in the learning episode for this version of the task.

5. Adjust episode size. Make sure the amount of learning required for this version of the task fits the **size** of the learning episodes for your course.

5.1 Decide how big your episodes should be

guidance).

5.2   Compare the size of the episode to the target size.

5.3   Adjust the size of the learning episode, if necessary.

- If its length is greater than the target, reduce the size of the epitome, preferably by adding another simplifying condition. It is possible to create simplifying conditions that don't exist in the real world to accomplish this if necessary, but there are obvious negatives in doing so. However, it is often possible to compensate for those negatives. Alternatively, some supporting content could be removed from the epitome episode, but don't remove any prerequisites for the organizing content.

- If its length is much smaller than the target, increase the size of the epitome, preferably by removing a simplifying condition.

6. Design the within-episode sequence. If you intend to use a problem-based learning approach with very little guidance, you may require the learner to figure out what learning resources he or she needs when. On the other hand, if you have decided to provide much guidance to the learner, sequence the content selected for this learning episode (called the "epitome" because it epitomizes the task). Either way, you may want to consider some of the following guidelines as you either make suggestions to the learner or as you decide on a within-episode sequence for the learner.

- Teach content in the order in which it is used (e.g., a procedural sequence).

- Teach *prerequisites* just prior to the content for which they are prerequisite.

- Teach *understanding* (principles, causal models, or process models) prior to a related procedure.

- Teach *coordinate concepts* together.

At this point, if you are using a rapid-prototyping approach to ISD, you are ready to **design and develop** the instruction for this episode (the epitome). Otherwise you can continue to Phase III to design the scope and sequence for your remaining episodes.

Phase III. Identify the Next Learning Episode

7. Identify the next simplest version. Help the SME to identify the next simplest version of the task that is fairly representative of the task as a whole.

7.1 Identify and rank-order all the simplifying conditions that distinguish the simplest version of the task from all the more complex versions.

- Each simplifying condition eliminates some skills and

knowledge from what an expert needs, to be able to perform the task. Different conditions correspond to different sets of skills and knowledge that vary in complexity. This allows the simplifying conditions to be ranked according to how much additional complexity each requires for performance of the task.

- The rank ordering of the simplifying conditions corresponds to an ordering of the versions of the task from simple to complex.

- The rank-ordering of the simplifying conditions should be done using the same criteria you used in Step 2: how simple and representative the resulting version of the task is, and any other criteria you choose, such as how common it is and how safe it is.

- Don't expect to be able to identify all of the simplifying conditions right away. As you proceed with the analysis, you will find additional conditions to add, no matter how thorough you try to be from the beginning.

- These simplifying conditions are referred to as the "primary simplifying conditions" because they are identified first. Secondary simplifying conditions are discussed next.

- It is usually helpful to identify the full variety of versions of the task appropriate for this course.

7.2 Identify the next simplest and most representative version of the task (the **next elaboration**).

- This will be the next rank-ordered simplifying condition.

- If removing a primary simplifying condition (PSC) requires that more new content than can be taught in one episode, then identify *secondary simplifying conditions* (SSCs) that can be included to reduce the complexity of the new version of the task that results when the PSC is removed.

- If SSCs (secondary simplifying conditions) are added, rank order them.

- Note that episodes defined by removing a PSC (called "primary elaborations") must be taught after the simplest episode (called the "epitome" because it epitomizes the task), for they all elaborate on it. However, those episodes *could* be taught in any order in relation to each other, even though it is usually better to teach the simpler elaborations first. On the other hand, the episodes defined by removing SSCs (called "secondary elaborations") cannot be taught until after the related primary elaboration is taught, for they all elaborate on it. If you want to design a learner-controlled sequence, you can design the primary elaborations so that they can be selected in any order.

However, sometimes this can result in a fair amount of redundancy, if skills learned in one elaboration are also required in another. Of course, computer-based instruction can be designed to eliminate any such redundancy.

7.3 If SSCs are added, rank-order them (see Step 7.1).

8. Analyze the organizing content. See Step 3.

9. Analyze the supporting content. See Step 4.

10. Adjust the size. See Step 5.

11. Design the within-episode sequence. See Step 6.

12. Identify remaining versions. Repeat Phase III (except for Step 7.1) for each remaining simplifying condition—primary, secondary, tertiary, etc.—until instructional time runs out or you have reached the level of expertise desired.

Process	Task: Determine the media for a course
1. Identify the **goals** of the task (or subtask)	• the media will help the learner to master the objective, • the media will be cost effective, • the media fall within the constraints for the course development and implementation.
2. Identify the **considerations** for attaining each goal. (If there are lots of causal factors for a consid-eration, then it is helpful to also identify **subcategories** of considerations	For the third goal above: • budget, • skills of personnel available to teach the course, • availability of equipment for the course.
3. Identify specific **causal factors** for each consideration (or subcat-egory).	For the third consideration above: • numbers of equipment, • scheduling of equipment, • alternative uses of equipment, • features (capabilities) of equipment.
4. Analyze each causal factor to identify all **guidelines** an expert uses to perform this version of the task, that involve the causal factor.	For all the above factors: • If an insufficient number of the equipment is available for the projected number of students, do not select that delivery system. • If the equipment is not available at all the necessary times, do not select that delivery system. • If the equipment is available and would otherwise go unutilized, there is a stronger need for you to select that delivery system. • If the capabilities of the equipment do not meet the instructional needs, do not select that delivery system. Note: these examples are illustrative, not exhaustive, and there may be more than one guideline for a causal factor.
5. Identify any **decision rules** an expert uses to combine the guide-lines into a performance model.	For you to do.
6. Identify specific **explanations** as to why each of the guidelines works, and combine the explanations into explanatory models.	For you to do.
7. Identify a **descriptive model** for any objects involved in performing the task.	There are no objects that one uses to select media for a course.

Figure 6.1 Top-down approach to heuristic task analysis

Job Aid for the Simplifying Conditions Method

Phase I - Prepare.
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.

Phase II - Identify the first learning episode.
2. Identify the simplest version of the task.
   - Identify major versions and conditions that distinguish them.
   - Ask SME to recall simplest case; verify representativeness.
   - Consider other criteria.

3. Analyze the organizing content.
   - If procedural, perform procedural task analysis.
   - If heuristic, identify goals, considerations, causal factors, guidelines, decision rules, and explanations.
   - If combination, do both.

4. Analyze the supporting content.
   - 4.1   Identify requisite information, understandings, skills, & affective qualities.
   - 4.2   Analyze those understandings, skills, & affective qualities to entry level.

5. Adjust episode size.
   - 5.1   Determine target size.
   - 5.2   Compare this episode to target size.
   - 5.3   Adjust episode size, if necessary.

6. Design the within-episode sequence.
   - Teach content in order in which it is used.
   - Teach prerequisites prior to related content.
   - Teach understanding prior to related procedure.
   - Teach coordinate concepts together.

Phase III - Identify the next learning episode.
7. Identify the next simplest version.
   - 7.1   Identify and rank-order all simplifying conditions.
   - 7.2   Identify the next simplest, most representative version of task.
   - 7.3   Rank-order any SCCs.

8. Analyze the organizing content. (Same as Step 3.)

9. Analyze the supporting content. (Same as Step 4.)

10. Adjust the size. (Same as Step 5.)

11. Design the within-episode sequence. (Same as Step 6.)

12. Repeat Steps 7.3 through 11 to identify all remaining versions.

Example 1: Sales skills in business

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The following example illustrates the process of working with an SME to create instruction using the Simplifying Conditions Method.

The SME in this illustration is Mike, a manufacturer's representative who sells industrial packaging equipment and supplies. Like many manufacturer's representatives, Mike has tremendous autonomy in how he sells the products he represents.

Mike is the leading sales producer for the small manufacturer's representative company for which he works, and he was asked to develop a program to share his skills with the other reps. The intent of this program was to increase individual sales (and commissions), company sales, and sales margins.

Phase I — Prepare

Step 1.   Prepare

Mike was very receptive to working on this project, since he viewed me as someone who was available to help him with a task he felt ill prepared to complete. I took about 5 minutes to explain what the SCM was, and how he and I would work together to capture his wisdom. He agreed to let me audiotape the interviews, a technique I recommend.

I explained to Mike that his job was to tell me stories about selling packaging equipment and supplies, and that my job was to organize his stories into a systematic program of instruction. He seemed relieved when I told him this, and seemed happy to have an audience for his stories. This is common with exemplary performers, regardless of the field of expertise.

Mike spent a lot of time explaining the typical personality profile of manufacturer's representatives, and the ego needs they have. He also stressed the fact that sales training must fit into time chunks of two hours or less, since commissioned sales people are reluctant to devote time to activities that do not directly generate sales.

At several times during the preparation phase, I reassured Mike that our process was flexible and iterative, and that we were both free to suggest changes to details or procedures at any time. This seemed to reduce his anxiety about the interview process.

I asked Mike to describe in very general terms the process he follows for making a sale. I recorded these on paper, then asked him to verify the steps and their order. We kept this general listing of the steps on a sheet between us throughout the interview. Mike's initial list of steps in the sales process included nine steps. He added one more step as our interview progressed. The final list of steps Mike identified was:

General Process for Making a Sale

1. Identify the customer: who buys shipping equipment and supplies?
2. Qualify the customer: who needs to approve shipping purchases?
3. Explain that your goal is to help the customer do their job better, and obtain permission for a facility tour.
4. Take facility tour and provide spontaneous feedback about facility.
5. Provide written feedback to the customer.
6. Review your recommendation with the customer.
7. Engage the customer in dialogue about the recommendation.
8. Ask the customer to confirm the value of the recommendation.
9. Ask the customer to commit to the recommendation; "close" the sale.
10. Review the paperwork with the customer.

Phase II - Identify the First Learning Episode.

Step 2.   Identify the simplest version of the task

- **Identify major versions and conditions that distinguish them.**

I asked Mike, the SME, what distinguished simple sales from more complex sales. He identified the most obvious conditions that distinguished various versions. I listed these on a separate sheet of paper, and jotted notes about simple versions and complex versions. It is important for both the instructional designer and the SME to remember that this is a preliminary description of conditions and versions. Mike's initial conditions were:

Initial Simplifying Conditions

How you identify and qualify the customer.
How the organization makes purchasing decisions.
How easily you gain access to the facility.
Physical constraints around the shipping area in the facility.

Note that this list grew as we worked through several versions. I prefer for this to happen, since capturing the wisdom of the SME is the main focus of our interview. If the SME spends too much time analyzing conditions up front, he or she frequently filters out important details so that their stories are consistent with their description of conditions. I prefer to re-arrange or eliminate details myself after the interview is complete.

- **Consider other criteria.**

I checked this with Mike, and he was confident that simplicity and representativeness were the most appropriate criteria for organizing the instruction.

- **Ask SME to recall the simplest case; verify representativeness.**

We found ourselves combining this part of Step 2 with Step 3 (Analyze Organizing Content). Mike and I spent about 45 minutes on the simplest case. As he told the story, he recalled the steps by name (which is Step 3) and described why each step was a simple case. Without prompting, he said with genuine pride that this first example "was as good as it gets," meaning that it was an easy and lucrative sale. I took notes on a split page, recording the process, or story, on the left side and recording decision criteria, rules, and support materials on the right. Here is a condensed version of his story:

Story

The interpreter for an Asian businessman arranged a meeting between his boss (the Asian) and Mike. One of Mike's good American customers had recommended they contact Mike. They met at a new, not-yet-finished manufacturing plant. They developed instant rapport through the interpreter about the company's signature color. The businessman reviewed blueprints with Mike and the men toured the future shipping department which had been "marked in" with paint on the floor. The plans were state-of-the-art and were copied from an earlier plant that Mike knew worked well.

The businessman had sole responsibility and authority to make the buying decision, but needed to work with another person, his interpreter. Two days later the men met again to review a detailed written proposal for equipment and consumable. After an intense 4-hour meeting, the Asian businessman signed the order, contingent on painting the equipment his signature color; cost was not an issue; the businessman wired cash payment within 4 days.

Although Mike provided a lot of unnecessary background information, I encouraged him to tell *his* story as *he* felt it needed to be told. This accomplished several things. First, it facilitated the on-going rapport between us. Second, it let him explain contextual factors once up front, getting them out of the way and streamlining the subsequent interview.   Third, it let him vent frustrations up front, getting them out of the way early in the interview.

Step 3.   Analyze the organizing content.

- **If procedural, perform procedural task analysis.**
- **If heuristic, identify goals, considerations, causal factors, guidelines, decision rules, and explanations.**
- **If combination, do both.**

As Mike told his story, it became obvious that this was a combination task. Without looking at the list of steps we had previously defined (see box on the top of page 6.10), he followed the process exactly. He expressed his belief that all 10 steps were necessary and that following the steps in order was an important part of his success. This was my clue that the 10-step process of selling (the "what" of the task) was indeed procedural at that level of description.
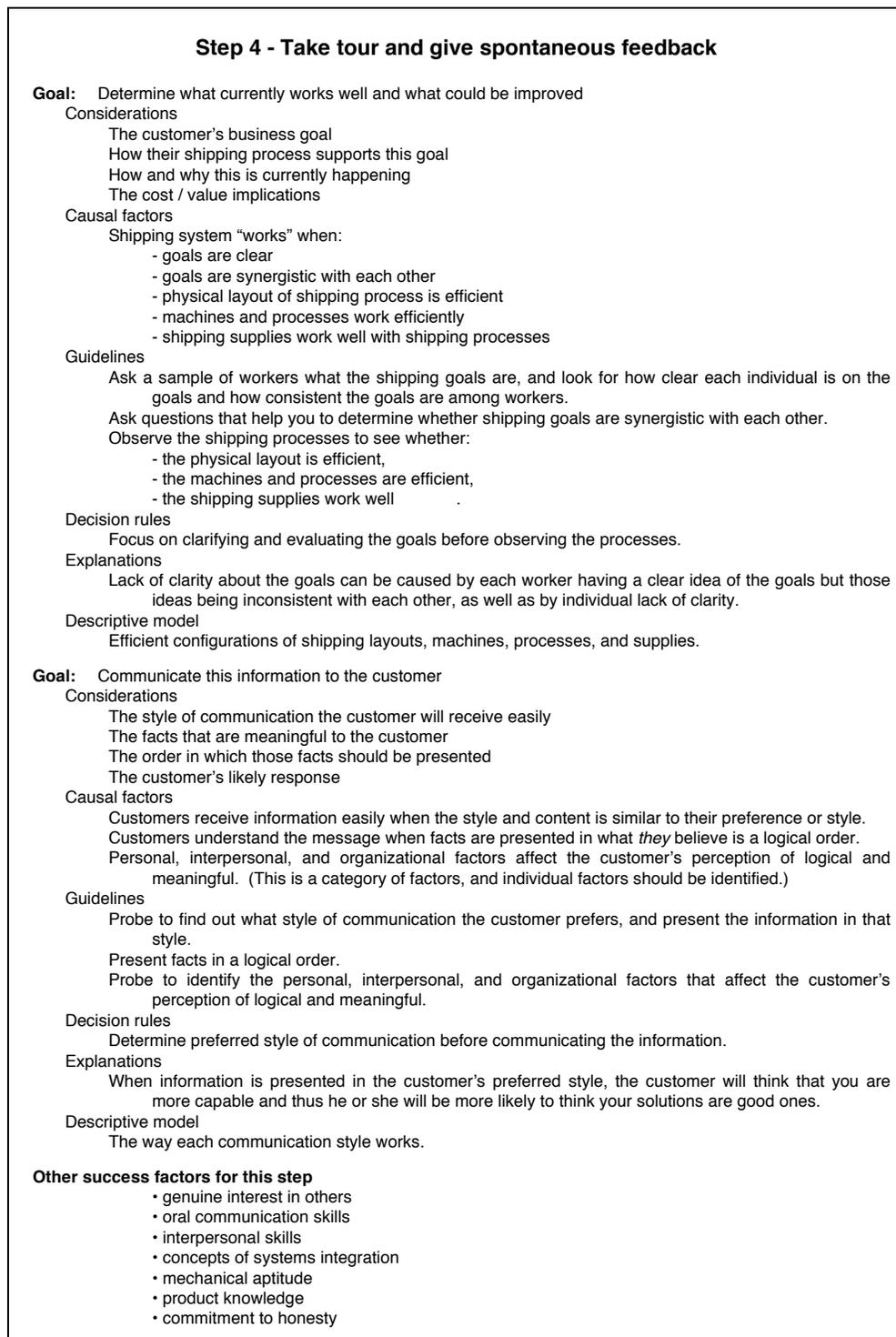
It became apparent, however, that some of the steps were heuristic. The

clue to this was Mike's answer, "I just know," when I asked him how he accomplished each step. When I asked "how he knew," he described his reason for the step (goal), the variables he felt he needed to understand (considerations and/or causal factors), and his rules of thumb for deciding on a course or action (guidelines and/or decisions rules). Therefore, the analysis of organizing content had to switch to identifying heuristics.

Figure 6.2 shows the major heuristics identified for each step of the sales process. For the sake of brevity, only the goal is listed for each heuristic, but each was fully analyzed using the process described in Step 3 and illustrated in Figure 6.1. Figure 6.3 provides a sample of the heuristic task analysis process for one of the steps in Figure 6.2.

Steps and Sub-steps	Heuristics
1. Identify customer	- Determine who is responsible for purchasing shipping supplies
2. Qualify customer	- Determine who has authority over purchase decisions
3. Explain goal; get approval for a tour	
4. Take tour and give spontaneous feedback	- Determine what currently works well and what could be improved - Communicate this information to customer (include what, why, and cost / value)
5. Give written feedback 5.1 Develop options	- Determine all options that meet need - Determine best option
5.2 Write the report	- Determine appropriate content - Organize content - Produce document
5.3 Deliver to customer	- Determine most appropriate delivery method
6. Review recommendation with customer 6.1 prepare for meeting	- Determine participants (presenters and customers) - Determine presentation format and materials - Rehearse
6.2 schedule meeting	- Coordinate schedules - Secure appropriate location
6.3 conduct meeting	- Present the facts of recommendation
7. Engage customer in dialogue about recommendation	- Determine customer's true reaction to recommendation
8. Ask customer to confirm value of recommendation	
9. Ask customer to commit to the recommendation	
10. Review paperwork 10.1 determine necessary paperwork	- Determine terms of sale (customer's and company's requirements) - Gather copies of all pertinent paperwork
10.2 complete necessary paperwork	- Work with customer to complete paperwork - Revise recommendation, if necessary
10.3 review paperwork with Customer	

Figure 6.2 Heuristics for the steps of the task.

Step 4 - Take tour and give spontaneous feedback

Goal: Determine what currently works well and what could be improved
  Considerations
    The customer's business goal
    How their shipping process supports this goal
    How and why this is currently happening
    The cost / value implications
  Causal factors
    Shipping system "works" when:
      - goals are clear
      - goals are synergistic with each other
      - physical layout of shipping process is efficient
      - machines and processes work efficiently
      - shipping supplies work well with shipping processes
  Guidelines
    Ask a sample of workers what the shipping goals are, and look for how clear each individual is on the
      goals and how consistent the goals are among workers.
    Ask questions that help you to determine whether shipping goals are synergistic with each other.
    Observe the shipping processes to see whether:
      - the physical layout is efficient,
      - the machines and processes are efficient,
      - the shipping supplies work well   .
  Decision rules
    Focus on clarifying and evaluating the goals before observing the processes.
  Explanations
    Lack of clarity about the goals can be caused by each worker having a clear idea of the goals but those
      ideas being inconsistent with each other, as well as by individual lack of clarity.
  Descriptive model
    Efficient configurations of shipping layouts, machines, processes, and supplies.

Goal: Communicate this information to the customer
  Considerations
    The style of communication the customer will receive easily
    The facts that are meaningful to the customer
    The order in which those facts should be presented
    The customer's likely response
  Causal factors
    Customers receive information easily when the style and content is similar to their preference or style.
    Customers understand the message when facts are presented in what *they* believe is a logical order.
    Personal, interpersonal, and organizational factors affect the customer's perception of logical and
      meaningful. (This is a category of factors, and individual factors should be identified.)
  Guidelines
    Probe to find out what style of communication the customer prefers, and present the information in that
      style.
    Present facts in a logical order.
    Probe to identify the personal, interpersonal, and organizational factors that affect the customer's
      perception of logical and meaningful.
  Decision rules
    Determine preferred style of communication before communicating the information.
  Explanations
    When information is presented in the customer's preferred style, the customer will think that you are
      more capable and thus he or she will be more likely to think your solutions are good ones.
  Descriptive model
    The way each communication style works.

Other success factors for this step
      • genuine interest in others
      • oral communication skills
      • interpersonal skills
      • concepts of systems integration
      • mechanical aptitude
      • product knowledge
      • commitment to honesty

Figure 6.3 Heuristic task analysis for one step of the task.

(Due to space limitations, this is not the entire result of the analysis.)

Step 4.   Analyze the supporting content

4.1 Identify requisite information, understandings, skills, and affective qualities.

The supporting information, understanding, skills, and attitudes for Mike's sales process were:

Information	**Skills**	**Attitudes**
• technical terms	• mechanical aptitude	• personal integrity
	• reading blueprints	• commitment to honesty
Understandings	• interpersonal skills	• genuine interest in others
• technical concepts	• basic oral and written	• inquisitive nature
• concepts of systems	communication	• willingness to take risks
integration	• how to use computer	
• product knowledge	• how to complete proposal form	
• order entry cycles		
• payment options		

The prerequisite skills, abilities, and characteristics of the learners are complex and sophisticated. Mike said that the selection process for hiring sales people ensured that all sales people demonstrated many of the necessary qualities. Mike's company uses an informal process to determine the level of technical skill for each new sales person. Technical training is provided primarily by the company's suppliers, a local university, and internal support staff. Mike was confident that each person who attended the sales training sessions would have the requisite information, understandings, skills, and attitudes.

4.2   Analyze those understandings, skills, and affective qualities to entry level.

I used the hierarchical approach with Mike to do this.

Step 5.   Adjust episode size.

5.1   Determine target size.

Our target time was two hours or less; see Phase I.

5.2   Compare this episode to target size.

Mike had dropped enough hints about the learners that I had already made a preliminary decision to use case studies as a primary instructional technique. As the instruction took shape, this proved to be a wise choice.

Mike expressed his confidence that 2 hours was sufficient time to cover a case study, given the organization of the instruction and content. We eventually created three levels of instruction, Novice, Expert, and Master, and planned about 7 case studies for each level. This totaled 21 2-hour sessions. Mike believed that this plan would be well received by both sales managers and sales people.

5.3 Adjust episode size, if necessary.

Adjustment was not needed in this situation.

If adjustments are necessary, I find that this is a relatively easy mechanical step that I prefer to do after the interview with the SME. I made a conscious decision in this situation to focus slightly more of our interview time gathering details, rather than developing individual learning episodes. This is a trade-off. In my experience, however, it is far easier to "fit" content to the episode size after-the-fact than it is to recreate real-life details of a work context. Mike had agreed to review a draft of the episodes, so I was confident of the opportunity to revise my episodes, if necessary.

Step 6. Design the within-episode sequence.

- **Teach content in the order in which it is used.**
- **Teach prerequisites prior to related content.**
- **Teach understanding prior to related procedure.**
- **Teach coordinate concepts together.**

The general structure of all the episodes is:

10 min.	Facilitator reviews 10-step process of selling
30 min.	Learners analyze a story, identifying all 10 steps
	- facilitator highlights supporting content
60 min.	Learners practice the 10 steps in specific sales scenarios
	- facilitator guides instruction of supporting content
20 min.	Learners summarize main concepts and key learnings

In the case study for the first episode, the 10 steps are taught in order of performance. Mike, the SME, insists that the secret is in following all 10 steps in order, and that the details (supporting content) will take care of themselves through explanations and discussion of the steps. Therefore, the supporting content is taught simultaneously with the step to which it is related.

Detailed blueprints for specific episodes are included at the end of the chapter.

Phase III - Identify the next learning episode.

Step 7. Identify the next simplest version.

7.1 Identify and rank-order all simplifying conditions.

We reviewed our preliminary framework for versions of the task (the simplifying conditions), and Mike still believed that it was adequate. It wasn't until after we worked on the third episode that Mike realized that our initial set of simplifying conditions was far too limited. In my opinion, this flexibility is part of the beauty

of the SCM. In this specific situation, the new, larger framework (see Figure 6.3) did not affect the first three elaborations. Even if it had, however, the information from the first three elaborations would not have been lost; it would simply have needed to be modified to incorporate other criteria.

Figure 6.4 shows the larger framework of simplifying conditions that evolved from the initial four conditions identified in Step 2. The shaded boxes pertain to the first story Mike told (see page 3.11); this later became the basis for episode 3.

	A. How you identify and qualify the customer	B. How the organization makes purchasing decisions	C. Ease of gaining access	D. Physical constraints of shipping area in plant	E. Terms of Sale
1 **Simple**	Existing good customer	One person (customer) has full authority	Single location; customer on-site	No physical constraints	No difficulties
2	Referral from existing good customer	Customer has responsibility but not authority; must get approval from boss	Single location, customer off-site	Solution requires restructuring work processes	Customer requires in-house credit terms
3 **Inter-mediate**	General inquiry from agent of the customer	Two or more people required to make decisions; agreement about goals and purchase criteria	Multiple locations; central purchasing and distribution	Solution requires moving existing equipment	Customer requires long-term financing
4	Cold call; buying from competitor	Two or more people required to make decisions; no agreement about goals and purchase criteria	Central purchasing with multiple-location delivery	Solution requires moving equipment and restructuring work processes	Customer resists payment terms
5 **Complex**	Cold call; loyal to competitor	Two or more people required to make decisions; open conflict about goals and purchase criteria	Decentralized purchasing with required vendor (may meet severe resistance)	Solution requires architectural (major) changes	Customer requires non-traditional terms

Figure 6.4 Simplifying conditions within five major categories

As you can see, what we initially thought were four simplifying conditions eventually became five categories of conditions, each with a range of complexity. Thus, we formed the sequence by specifying a gradation of complexity within each of the five categories. A fancier way to say this is that there were five condition variables, each of which had five parameters or levels rather than the more common two levels each.

Remember that Mike said simplicity and representativeness were appropriate considerations for managing the instructional conditions. He said that the experience of a salesperson frequently determined what was considered simple and representative. This discussion led us to define the three levels of instruction named earlier (Novice, Expert, and Master).

Although we didn't force an unnatural structure, Mike thought conditions A and B were most appropriate to teach at the Novice level, condition C was most appropriate to teach at the Expert level, and conditions D and E were most appropriate to teach at the Master level. The pattern of relaxing conditions moves, loosely, from the upper left-hand corner to the lower right-hand corner of Figure 6.4. It was Mike's actual understanding of the world of sales that determined the sequence (rank ordering of simplifying conditions) rather than an arbitrary or "forced" fit with a theoretical model. We also discussed the probability that Novice instruction would be a classroom activity, Expert instruction would be an on-the-job activity, and Master instruction would be a self-paced activity under the guidance of a mentor.

Figure 6.5 shows the rank ordering of the various gradations of simplifying conditions by salesperson experience and across the five

Level	Sequence (Episodes)	Conditions				
Novice	1	A1	B1	C1	D1	E1
	2	A2	B1	C1	D1	E1
	3	A2	B2	C2	D1	E1
	4	A2	B2	C2	D1	E1
	5	A3	B2	C1	D1	E1
	6	A3	B3	C2	D1	E2
	7	A4	B3	C1	D1	E2
Expert	8	A1	B1	C2	D1	E1
	9	A2	B1	C3	D2	E1
	10	A3	B2	C3	D2	E2
	11	A4	B2	C4	D2	E2
	12	A4	B3	C4	D3	E2
	13	A5	B3	C5	D3	E3
	14	A5	B4	C5	D3	E3
Master	15	A3	B3	C2	D1	E1
	16	A3	B2	C2	D2	E3
	17	A4	B3	C3	D3	E5
	18	A4	B4	C3	D4	E4
	19	A5	B4	C4	D4	E2
	20	A5	B5	C5	D5	E2
	21	A5	B5	C5	D5	E5

Figure 6.5 Sequence of simplifying conditions

categories. The pairs of letters and numbers (e.g., A1 or C4) correspond to individual cells in Figure 6.4. Clearly other arrangements are possible, and some may be just as beneficial to the learner as the sequence we designed. There is a lot of room for flexibility with the SCM.

I completed the first iteration of this sequence on my own after my initial interview with Mike. During our review meeting, Mike made some minor modifications, and together we agreed on the final sequence as reflected in Figure 6.5.

We double-checked the representativeness of our sequence by counting the difficulty of each "cell" for each level of instruction. Our count supported our intent:

- 86% of the content of Novice episodes was at a complexity of 1 or 2
- 74% of the content of Expert episodes was at a complexity of 2 or 3
- 54% of the content of Master episodes was at a complexity of 4 or 5, with another 23% at a complexity of 3.

We checked our sequencing plan a second way, as well. I selected several sequences at random, then asked Mike to recall a story from his experience that matched each specific set of conditions. He did this easily, and said that he felt certain that other experienced salespeople could do the same. Mike felt that this standard sequence provided a unique solution to a common dilemma in sales training: the tension between the need for standard instruction and the desire of sales trainers to tell their "war stories." With this sequencing plan, the trainers could tell whatever story they wanted, as long as it met certain pre-defined and consistent criteria.

7.2   Identify the next simplest, most representative version of the task.

During the initial interview, Mike had a vivid story that he felt typified the next simplest version of the sales process. When he told his story, we did not have a clear view of the final arrangement of conditions, as depicted above. It was through the process of discussing his stories that both he and I came to understand the relationships of various pieces of the instruction.

7.3   Rank-order any SSCs.

SSCs are necessary only when relaxing a PSC makes the task so much more complex that the new skills and knowledge can't be taught in a single episode. In our search for such complex conditions, Mike identified the following:

Secondary Simplifying Conditions

Condition A: Current customer has low packaging needs.
                        Sales rep and customer do not have an easy rapport.
Condition B: Person with purchasing authority is not respected in their
                        company.
                        Purchasing decisions are based on emotions not facts.
Condition C: Off-site location requires out-of-town travel.
                        Off-site location has poor relations with home office.

Secondary Simplifying Conditions (Cont.)

Condition D: The customer is inordinately resistant to change.
              Options for change are severely limited, for example, by building codes or cultural norms.

Condition E: Customer is a bad credit risk.
              Customer is unable to get financing.
              Customer has legal commitment to other vendor.

As we began to discuss the rank ordering of these conditions for our instruction, Mike became hesitant. He said that although these factors do differentiate simple from complex, they were rare situations that were all beyond the scope of this course. He felt that all the PSCs, when relaxed as indicated in Figure 6.5, could be handled in a single episode, so we had no SSCs.

Step 8.   Analyze the organizing content.

The organizing content for the second episode was identified using the same process as for the first episode (Step 3).

Step 9.   Analyze the supporting content.

This was done the same way as for the first episode (Step 4). The supporting content proved to be primarily various applications of judgment criteria and prerequisite skills.

Step 10.   Adjust the size.

Only minor adjustments were needed.

Step 11.   Design the within-episode sequence.

This was done the same way as for the first episode (Step 6).

Step 12.   Repeat Steps 7.3 through 11 to identify all remaining versions.

A series of charts like the following helps me review and revise the scope and sequence of the episodes. It can be used to record much of what is in previous boxes in this example. The major information lacking is the within-episode sequence, which requires separate charts.

Episode 1 (Epitome)		Time: 2 hours
Simplifying Conditions	**Steps and Heuristics**	**Supporting Content**

A1. Existing good customer
B1. One person has full authority
C1. One location, customer on-site
D1. No physical constraints
E1. Cash sale
 	
a. Product is reasonably-priced consumable
b. Sales rep gives written presentation on spot
c. Sales rep has brochures
d. Customer accepts on the spot and closes sale
	3. Explain goal and get tour approval
	  • Critique current operations
	4. Take tour and give spontaneous feedback
	  • Find things to praise
	  • Find things to improve
	5. Give written feedback
	  5.1 Develop options that will meet specific customer needs
	    • Determine all options to meet needs
	    • Determine best option
	    • Determine most acceptable option to customer
	  5.2 Write proposal on the spot
	    • Determine appropriate content
	    • Organize content
	    • Produce document
	  5.3 Deliver to customer
	    • Determine most appropriate delivery method
	6. Review recommendation
	  6.1 Prepare for meeting w/ customer
	    • Determine participants
	    • Determine presentation format and materials
	    • Rehearse
	  6.2 Schedule meeting
	    • Coordinate schedules
	    • Secure appropriate location
	  6.3 Conduct meeting
	    • Present the recommendation
	7. Talk about recommendation
	  • Determine customer's true reaction to recommendation
	8. Confirm value of recommendation
	9. Commit to recommendation
	10. Review paperwork
	  10.1 Determine needed paperwork
	    • Determine terms of sale
	    • Gather copies of paperwork
	  10.2 Complete needed paperwork
	    • Work with customer to complete paperwork
	  10.3 Review paperwork with customer
	    • Revise recommendation if necessary
		Basics of systems integration
		Product knowledge
		Communication skills
		
		Genuine interest in others
		How to use database
		
		How to complete proposal form
		
		Communication skills
		Interpersonal skills
		
		Confirmation questions
		Basic closing questions
		
		Payment options
		Order-entry cycles

Episode 2		Time: 2 hours
Simplifying Conditions	**Steps and Heuristics**	**Supporting Content**

Replace A1 with:
A2. Referral from existing good customer
	Add new steps:
	1. Identify customer
	  • Determine who is responsible
	2. Qualify customer
	  • Determine who has authority
	
	  (Repeat all other steps with slightly more complex conditions.)
		Concepts related to customer identification
		Concepts related to qualifying the customer

Episode 3 (based on Mike's story, page 6.11)		Time: 2 hours
Simplifying Conditions	**Steps and Heuristics**	**Supporting Content**
Replace B1 with: B2. Customer has responsibility but not authority; must get approval from boss **Replace C1 with:** C2. Single location, customer off-site a. off-site location is within driving distance	Repeat all steps with slightly more complex conditions, calling for these additional skills: Techniques for partnering with customer Techniques for gaining access to boss Techniques for managing 3-way interaction Arranging logistics for off-site visit	

Episode 4		Time: 2 hours
Simplifying Conditions	**Steps and Heuristics**	**Supporting Content**
(PSCs are identical to episode 3; only change is SSC) a. off-site location requires air travel and overnight accommodations	Repeat all steps with slightly more complex conditions, calling for additional procedures and heuristics for: Air/overnight travel planning	Company travel policy

Episode 5		Time: 2 hours
Simplifying Conditions	**Steps and Heuristics**	**Supporting Content**
Replace A2 with: A3. General inquiry from agent of the customer a. legitimate customer who intends to purchase	Repeat all steps with slightly more complex conditions s, calling for additional procedures and heuristics for: Applying communications and interpersonal skills to establish relationship with stranger Techniques for identifying customer Applying communications and interpersonal skills to uncover agent's motives Techniques to gain access to facility for tour in low-trust situation	

Education Example of the SCM

By Bruce Peterson

The following example illustrates the process of working with an SME to design an instructional sequence using the Simplifying Conditions Method. I worked with a SME to design a beginning English conversation course for incoming non-native university students. We pick up the process with Phase II.

Phase II. Identify the first learning episode

Step 2. Identify the simplest version of the task.

Designer: What are some major versions of the task— that is, major types of conversations? Bear in mind that we are looking for authentic types of conversations—ones that a native speaker would have.

SME: For students preparing for an academic setting, there are:
- meetings with different types of advisors
- meetings with professors
- conversations with other students

Of course, students also have conversations related to other parts of their lives, such as encounters at the store.

Designer: Of the above conversations, what might be the simplest version that is still fairly representative of conversations that native speakers have?

SME: I think scheduling meetings is a version that is relatively simple, yet includes some basic aspects of language, occurs in many situations, and is an important skill for students. Another possibility is small talk that students engage in before classes start. This is a great opportunity for students to practice their English, but they often have troubles in initiating such conversations.

Designer: Great. Let's discuss scheduling meetings. What are some of the factors that might make this easier than other kinds of conversations?

SME: In the beginning stages students frequently learn pat phrases along with some grammar. Some grammatical factors that might be present in the dialogues, but maybe not explicitly addressed, are:
- person and number—you would need only 1st and 2nd person singular
- tense—depending on the dialogue, you might need only the simple present and some future tense
- adverbs and prepositional phrases of time and place—beginning students use these instead of complicated sentence structures
- active voice only
- pronouns—you could probably get by with I, you, it and me

- nouns—both singular and plural would probably not add any serious complexity
- word order—simple declarative and interrogative sentences, maybe negatives, but I don't think you would need imperatives

Some vocabulary includes:
- basic words only, as needed for the purposes of the conversations students engage in
- phrases related to the conversation task

Some pragmatic factors include:
- conversational clues or signals that give important information about the direction of the conversation, such as "What can I do for you?", which indicates a request for a conversation topic in a conversation between a professor and a student
- relative status of the participants of the conversation—students are often intimidated by the status of the professor

Designer: Do you think that some small talk before a class might be a somewhat simpler task for the students than scheduling a meeting with a professor, which, as you pointed out, can be intimidating for students?

SME: Yes, I think so. Americans are fantastic at small talk. We do it all the time. Pre-class small talk would provide good material for a first module, because it is representative of longer conversations and in fact often leads to them. Furthermore, there are a number of ways students can learn to initiate such interactions, such as asking a student for a clarification of a point from a previous lecture. Grammatically, it could be equally simple, but pragmatically, it should be less complicated because:
- the students have basically the same social status
- the students are already in a position to initiate a conversation by sitting next to each other

(To be continued.)

On the right is the resulting sequencing blueprint for this course. The course is seven weeks long, with about five hours per week between class and homework time.

The sequence of the organizing content is based on the actual dialogues chosen for the episodes. When to relax simplifying conditions was decided on the basis of the lexical, grammatical and pragmatic content of the dialogues. Preferably, the dialogues would be authentic and appropriate to the students enrolled in the course. Thus, the following sequence is but one of many possible variations. **[Bruce, I'm not sure what you are trying to say here.]**

[This page should point out important aspects of the blueprints on the right.]

Episode 1 (Epitome)		Time: 5 hours
Simplifying Conditions	**Organizing Content**	**Supporting Content**
Dialogue • only small talk • only two persons • no telephone conversations Vocabulary • as needed for dialogue and class-room discussion Grammar • no complex, compound sentences • no relative clauses • no complement clauses • only prepositions, adverbs of time and place found in dialogue • no 3rd person verb forms • no passive voice • no negative verb forms • no imperative verb forms • no *do*, *wh*, tag questions • no short-form answers Pragmatics • one opener and close • no status difference • one pragmatic signal—questions as greetings	Dialogue • sample small talk dialogue Vocabulary • pronunciation • meaning Grammar • pronouns *I*, *you*, *it*, and *me* • 1st person singular, 2nd person verb forms • present tense of *be*, statement and question form • *be* + adjective • *be* + noun phrase Pragmatics • opener • signal—questions as greetings • close • dialogue structure—combining opener, questions, answers, and close to form dialogue	

Episode 2		Time: 5 hours
Simplifying Conditions	**Organizing Content**	**Supporting Content**
Add: Vocabulary • as needed for dialogue and classroom discussion Grammar • present simple tense • negative verb form • short-form answers (affirmative and negative) • *what*, *who* and *where* questions and answers Pragmatics • various openers and closes • two pragmatic signals: • permission to ask a question • informal pre-close	Dialogue • various small talk dialogues Vocabulary • pronunciation • meaning Grammar • present simple tense • negative verb form for *be* (present) and present simple • short-form answers • *what*, *who* and *where* questions and answers Pragmatics • openers • closes • signal—*May I...?* (no grammar instruction on modals) • signal—signaling the close (informal)	

Contiinued

[This page should point out important aspects of the blueprints on the right.]

Episode 3		**Time: 5 hours**
Simplifying Conditions	**Organizing Content**	**Supporting Content**
Add: Dialogue • clarification, scheduling after class with professor • telephone conversations Vocabulary • as needed for dialogue and classroom discussion Grammar • future reference (*going to*) • count, noncount nouns • articles Pragmatics • status difference • four pragmatic signals: • showing respect • permission to ask question with status difference • willing to answer now • not willing to answer	Dialogue • sample dialogues—after class, asking the professor for a clarification or scheduling a meeting • use the telephone Vocabulary • pronunciation • meaning Grammar • future reference (*going to*) • count, noncount nouns • articles Pragmatics • showing respect • permission to ask question with status difference • willing to answer now • not willing to answer	

Episode 4		**Time: 5 hours**
Simplifying Conditions	**Organizing Content**	**Supporting Content**
Add: Dialogue • institutional meetings Vocabulary • as needed for dialogue and classroom discussion Grammar • past tense of *be* • modals *can*, *will*, and *would* • tag questions Pragmatics • two pragmatic signals • topic starting question (e.g., *May I help you?*) • formal pre-close (e.g., *Is there anything else?*)	Dialogue • sample dialogues—institutional meetings (administrative assistant, academic adviser, housing office, health clinic) Vocabulary • pronunciation • meaning Grammar • past tense of *be* • modals *can*, *will*, and *would* • tag questions Pragmatics • topic starting question • formal pre-close Summary and review, episodes 1-4	

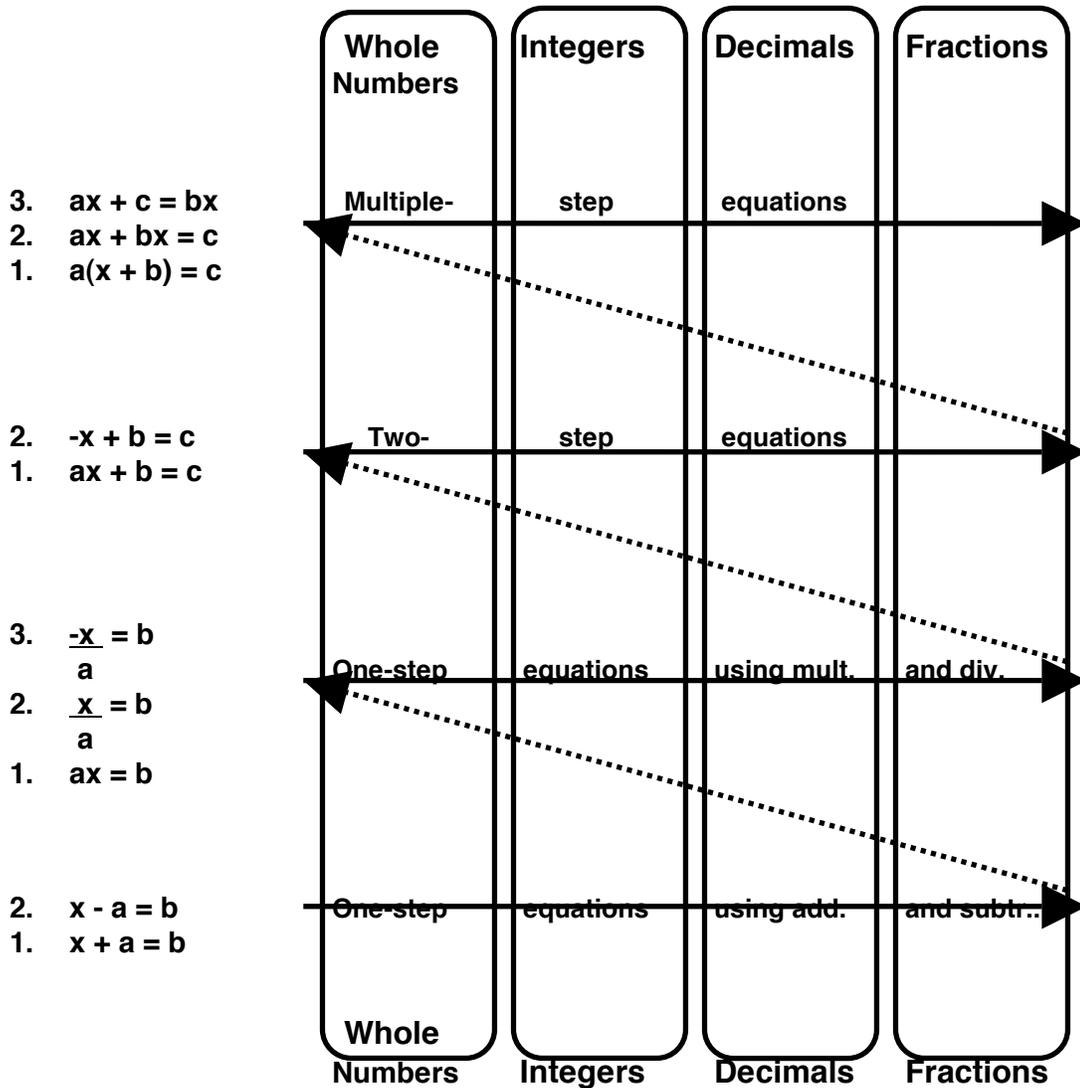**[This page should point out important aspects of the blueprints on the right.]**

Episode 5		Time: 5 hours
Simplifying Conditions	**Organizing Content**	**Supporting Content**
Add: Dialogue • conversations with students Vocabulary • as needed for dialogue and classroom discussion Grammar • third person singular and all plural verb forms • simple past tense • possessive forms • complement clauses as object of verb	Dialogue • sample dialogues—conversations with students outside of class Vocabulary • pronunciation • meaning Grammar • third person singular and all plural verb forms • simple past tense • possessive forms • complement clauses as object of verb	

Episode 6		Time: 5 hours
Simplifying Conditions	**Organizing Content**	**Supporting Content**
Add: Dialogue • meetings with professors Vocabulary • as needed for dialogue and classroom discussion Grammar • irregular past simple • present perfect • frequency adverbs Pragmatics • pragmatic signals—status difference • signal to chat • signal to start topic • signal to end meeting • first-name basis	Dialogue • sample dialogues—meeting with a professor (clarification, advice, excuses, incompletes) Vocabulary • pronunciation • meaning Grammar • irregular past simple • present perfect • frequency adverbs Pragmatics • signal to chat • signal to start topic • signal to end meeting • first-name basis	
	Summary and review of episodes 1-6 • types of dialogues • vocabulary • grammar • pragmatics	

Example 3: Mathematics

By Dan Kennedy

This example uses a task that was used in an example in both Chapters 4 and 5: **solving multiple-step equations in one variable**. But it only shows the results of the process, and only in very general terms.

	Whole Numbers	Integers	Decimals	Fractions
3. $ax + c = bx$ 2. $ax + bx = c$ 1. $a(x + b) = c$	Multiple-	step	equations	
2. $-x + b = c$ 1. $ax + b = c$	Two-	step	equations	
3. $\dfrac{-x}{a} = b$ 2. $\dfrac{x}{a} = b$ 1. $ax = b$	One-step	equations	using mult.	and div.
2. $x - a = b$ 1. $x + a = b$	One-step	equations	using add.	and subtr.
	Whole Numbers	Integers	Decimals	Fractions

The diagram above illustrates how equation solving can be taught, based on simplifying conditions, by using very basic one-step equations for the beginners and then building toward more complex multiple-step equations. Unlike the

procedural sequence where learners <u>start</u> with complex equations and don't fully solve an equation until later in the instructional sequence, the Simplifying Conditions method has the learner isolating the variable and completely solving equations immediately, albeit much simpler equations.

The diagram above also gives the instructor two ways of elaborating on the task. Generally, middle level students are more confident with whole number operations, so the instruction can be designed to begin in that domain and then expand across domains into integers, decimals, and fractions. Or the instruction may stay in the whole number domain. Students who have a low aptitude for math have had success with solving equations as long as the sequence scaled straight up instead of spiraling across and back. So the SCM can yield different sequences based on whomever the target audience is.

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 an SCM analysis and sequence design. Here are the criteria.

The Problem

- The task should be relatively simple. Picking a more complex task will just make your project take longer, without enhancing your learning much. You should pick a task that requires 10 to 40 hours to teach. It may be a procedural task, a heuristic task, or a combination of the two. In fact, it would be more useful to do a project with a relatively simple procedural task and another with a relatively simple heuristic task than to do a project with a complex task of either 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.

- 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

***

What's Next?

Given this general understanding of the hierarchical, procedural, and elaboration theory sequencing strategies, the next three chapters provide detailed guidance on how to design each of these three types of sequences. Examples and practice exercises are also provided.

<div align="center">END</div>

1. Form a **team** of two people.

2. Use the procedure on pp. 18-19 to design an **SCM sequence** on your LG procedural task. Use the example on p. 23 as a format for your sequence blueprint. Be sure to indicate:

- what skills (steps) should be **grouped** into each episode (with episodes of approximately equal length),
- how the episodes should be **sequenced**,
- what the **simplifying conditions** are for the epitome and which ones are removed for each elaboration,

- for *one* of your episodes, what the **organizing content** (steps and/or principles) should be (once it is broken down to entry level),
- what **supporting content** should be taught in that one episode, and
- how all the content should be **sequenced** within that one episode (see p. 26).

  For that one learning episode, you may give a sample of the content, rather than an exhaustive listing.

 Our assistants will review your work and give you feedback.

1. Form a **team** of two people.

2. Use the procedure on pp. 18-19 to design an **SCM sequence** on your LG heuristic task. Use the table below as a format for your sequence blueprint. Be sure to indicate:

- what goals, considerations, and causal factors should be **grouped** into each episode (with episodes of approximately equal length),
- how the episodes should be **sequenced**,
- what the **simplifying conditions** are for the epitome and which ones are removed for each elaboration,

- for *one* of your episodes, what the guidelines, decision rules, an explanations should be for each causal factor,
- what **supporting content** should be taught in that one episode, and
- how all the content should be **sequenced** within that one episode (see p. 26).

For that one episode, you may just give a sample of the content.

Our assistants will review your work and give you feedback.

Mod.	Simplifying Cond's	Organizing Content (Models)	Hours

1	....	Goal 1
		    Consideration 1
		        Causal factor 1
		        Causal factor 2
		            ....
		    Consideration 2
		        ....
		Goal 2
		    ....
			7

2	....	Goal 4	