Corporate Reality Theory

T. Mullen

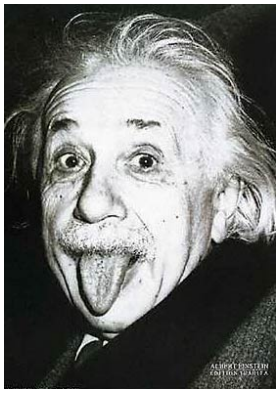
R626 - Instructor Dr. Charles Reigeluth
Instructional Systems Design Master's Program
Indiana University

August 2003

Background and Credits

This instructional design theory stems from a realization that much of corporate America does not take the time to accomplish really good instructional design. Much has been written about the best methods for training but few ideas actually get implemented because there simply isn't time. In addition, with the advent of computer learning systems, knowledge management systems, and Teleconferencing, I am amazed at the giant step-back that is taking place as everything from new product development to management skills are being delivered via a "talking head" or "talking screen" or "talking 'expert'", with little emphasis placed on the time-consuming task of quality instructional design and practice. Additionally, I have been appalled by the wasted resources, time and again, of the re-designing and re-developing of instruction and training that is very similar across contexts and domains. For the student, this typically means that tasks are seen as disjointed and non-relational instead of cohesive and connected, in the overall complexity of tasks. Finally, as a corporate trainer of a sales organization for over 15 years, I have been reminded over and over of how much money it costs to train employees in terms of wasted revenue. For this reason, when asked to develop my own ideas on my own personal design theory, I felt compelled to write about the challenges facing corporations today and to offer guidelines from my personal experience about how to juggle the quality and quantity of training and still make sure that learners receive quality, holistic, learner-focused instruction that can be both efficient and effective, instead of another "talking head".

The methods and procedures described here are my own but were based loosely on a compilation of numerous theories and experiences. It would be impossible for me to list and credit every source that has influenced my design theory through the years, but you will note similar components by reading about the theories proposed by Robert Gagne, B.F. Skinner, Jerome S. Bruner, Lev Semenovich Vygotsky, and David P. Ausubel in Marcy P. Driscoll's *Psychology of Learning for Instruction* (2000). This theory has also, more recently, been influenced by the works of Jeroen J.G. van Morriënboer (1997), Charles M. Reigeluth (1999), and M. David. Merrill, (1999). Additionally, I would be remiss if I did not acknowledge the contributions of my mentor and friend, Cindy Burrows, whose patience and dedication in sharing her own instructional design philosophies has greatly influenced my personal instructional design theory. Finally, I need to mention that some of the principles on which my instructional theory is based come from Albert Einstein:



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http://www.postershop.com/Anonymous/Anonymous-Albert-Einstein-2301926.html

"Imagination is more important than knowledge"

"Everything should be made as simple as possible, but not simpler."

"Anyone who has never made a mistake has never tried anything new."

"We can't solve problems by using the same kind of thinking we used when we created them"

"The only thing that interferes with my learning is my education."

"The important thing is not to stop questioning."

-Albert Einstein-

Introduction

"In these matters the only certainty is that nothing is certain".
Pliny the Elder (23 AD - 79 AD)

Changing Paradigm

Pliney the Elder was correct. Everything changes. We are confronted with changing needs, changing goals, changing paradigms, changing structures, changing lifestyles, changing values, changing everything. If there is one constant in this world, change has to be it. It would fall to reason, then, that changes have occurred in instructional design and implementation. It is true that focused changes have occurred in the emphasis of instructional theories over time from an emphasis on changing behaviors to changing thinking to allowing the student to create their own knowledge. Indeed, in my own personal experiences I have seen a shift from an instructional mentality of "Tell them, Show them, Have them Do it " to "Have them Do it, Have them think about it, Have them Show what they learned". The problem is, of course, that people don't know what they don't know and so, to be presented with a problem, and given a task to "do it", there is no time, not to mention way too much information out there, to "figure it out". I believe that people learn by doing but I also believe that in most organizations, much valuable learning takes place *after* the instructional event, when the learner applies, creates, invents and imagines new ways to interact with new skills and knowledge. I therefore see learning as an opportunity for a student to "learn how", "learn why", "be guided through best known practices", and "given tools to enable them to really do it - perhaps better". I also believe that experts, who have more time and attention to devote to certain matters than the rest of us, have a responsibility to "share the wealth". Only in this manner can we grow the social knowledge on our planet. For this reason, you will see in this theory a heavy reliance on authenticity, sharing, doing, and tools. It is my belief that if we can introduce students to the way an "expert" typically does something, make it meaningful and relevant to their lives, then they can grow from there to something bigger and better.

Purpose:

The primary purpose of this theory is twofold: 1) Provide trainers and instructional designers with guidelines and alternative methods that will assist learners with the transfer of existing skills, enhance understanding of new complex cognitive skills, and assist with the application of new processes, mindsets and attitudes required for changing job requirements. This entails guidance on Instructional Scope, Sequencing and Methods. 2) It is also a goal of this theory to provide reusable learning objects to support flexible and adaptive instructional events to meet varying learner needs (Schwartz, Xiaodon, Brophy, and Bransford (1999), Merrill (1999)). If developed and implemented correctly these objects could facilitate better cognitive structures by allowing learners to see how some components of their jobs relate to other components.

Values:

Some of the values upon which this theory is based include:

- Instructional Designers/Developers/Instructors should:
  - Make instruction mimic reality
  - Look at the big picture when designing instruction.
  - Make instruction that is reusable by students in other contexts/domains/proficiency level trainings when possible
  - Utilize authentic resources when possible to increase motivation and learner retention.

- Vary instructional methods within single units of instruction when possible. Provide hands-on experience whenever possible.
- Tap into community knowledge whenever possible.
- Encourage Competition and collaboration simultaneously.

- Learners should:
  - Be encouraged to share ideas across domains.
  - Be given opportunities and time to think.
  - Have some control and responsibility for how and what they learn.
  - Be aware of where they are going before they start.
- Learning should be challenging and fun.

Application:

This theory should be used in any instructional environment when existing skills and/or processes are in some way similar to those required for new and complex applications or processes; with adult learners; who may lack confidence; when some type of interaction among the learners is possible. These methods are applicable in both Face-to-Face (F2F) and Distance Learning Environments. These methods have not been tested in situations where physical safety is a concern.

This Instructional Design Theory is divided into two parts: Part I deals with the scope and sequencing strategies and tactics that help determine the scope (what to teach including the amount and type of content) and sequence (what order to present the new content in for the most efficient and effective instruction). This part is historically applicable to Instructional Designers and/or Developers but should be utilized by instructors attempting to apply flexible and adaptive methods during implementation of the instruction. Part II describes the sequence and methods for the implementation of the instruction more aimed at providing guidance to the instructional developer/instructor during the instructional event. While these methods are separated in this document, the inter-relationship is quite significant, since the majority of the content and sequence decisions made in Part I are implemented in Part II. Additionally, the lines between instructional design/development and delivery strategies become "blurred" in flexible and adaptive instruction, since understanding how content should be sequenced and how much content to offer at any given time is a prerequisite for determining what instructional method to "deliver" to the student on demand (and is therefore becoming more relevant to the actual instructor or developer).

Instructional Methods

"To do great important tasks, two things are necessary, a plan and not enough time". - Unknown attribution

Part I: Select and Sequence Content

In order to create effective and efficient instruction, it is necessary to analyze the tasks and knowledge to be learned (and is best to analyze the task and knowledge skills that the learner already has that relate to it.) An in-depth discussion of how to accomplish instructional analysis is prolifically published by others and is beyond the scope of this document (see Suggested Readings at the end of this document). Some of the significant components of task analysis are required, however, in order to effectively determine scope (what to teach) and sequence (what order to teach it). For this reason, some components of task and learner analysis are discussed as it relates to this theory of instruction. This theory assumes that a needs analysis has been conducted and that a learning need and its goal have already been determined.

One important decision that can have a significant impact on learning success and is under the control of the instructor or instructional designer is the scope and sequence of the content. It is one of the primary concerns that I have with instructional design based on constructivist thinking. Students don't know what

they don't know. It is difficult for novice learners to learn complex cognitive skills efficiently (albeit, perhaps, they could learn more effectively) by starting from scratch and developing their own questions to be answered about a particular topic, task, or skill. Complex cognitive skills, additionally, are difficult by their nature. For these reasons, I propose the following process for determining scope and sequence decisions for complex cognitive skills more efficiently and effectively.

Determine Contents and Sequence of Primary End Task Components

As mentioned above, proper needs analysis should be conducted to determine the instructional goal (What is the training supposed to accomplish?). Once the instructional goal and gap is determined, e.g. Increase sales of a product, respond to emergency situations faster, diagnose problems with equipment more accurately, etc., then it is more *efficient* to let the instructional designer analyze the End Task behaviors and skills required to reach that goal. This analysis will help the instructional designer determine the scope and sequence of the instruction by revealing what the end performance task should "look" like for: a Novice, a Proficient performer, and a Master or expert. This information will help determine the content and tools that will be needed for performance of the task. Additionally, by looking at the "big picture" of the tasks in light of the whole learner and the entire organization, the instructional designer will help determine the sequence of the instruction by revealing where this new information fits into the context of performance within the entire infrastructure (and might also aid in the discovery of additional resources that could be utilized in the training).

Questions that might be asked to determine the end performance include:

- In what context is the desired End Skill/Task performed?
- How do these skills/knowledge relate to what the target learners currently do/used to do?
    - What are the similarities between Component Skills?
    - What are the differences between Component Skills?
    - What other skills/tasks might be applicable if they were modified, or done in a different order?
- How do these skills/knowledge relate to other members of the organization?
    - Are there other members who currently perform similar skills?
    - Are there other members who currently possess/train/deal with this type of knowledge?
    - Are there other resources within the organization that deal with similar task components?
- How does a Novice (without training) perform the skill?
- How does a Proficient performer (can do the skill with some type of help) perform the skill?
- How does an Expert perform this skill?

This can be accomplished most *effectively* by conducting a full-blown task analysis (usually over a period of months) or *efficiently* by conducting interviews and observations over a period of days or weeks. The more time one has to devote to the process, the better the results will be. (I have actually performed such an evaluation in a matter of hours through phone interviews of master and novice performers by simply asking them what they do regularly and how they do it.) This particular point is highly situational and should be commensurate with the difficulty level of the skills and tasks involved. The process that is recommended to determine scope and sequence in this learning theory is listed below:

1. Simplify Task to General Procedures with Knowledge Variables and Tools
2. Look for holistic task similarities and resources outside of *this context*
3. Detail Performance and Assign to Proficiency Level Matrix
4. Categorize and/or Group Tasks
5. Determine mandatory and optional elements of this training event based on above
6. Determine what elements should be Pre/During/Post Training events (if applicable)

Each of these steps is discussed in more detail below.

1. Simplify Task to General Procedure with Knowledge Variables and Tools

The purpose of this step is to turn the overall complex skill into a simplified procedure by putting it into the context in which an expert generally performs it. This is the "template" *General Procedure* that is used in most instances of performing the task. For example, if you were evaluating the task of building a house, the template General Procedure might consist of:

1. Lay the Foundation
2. Build the Walls
3. Build the Roof

Next, consider the parts and kinds of each General Procedure. The parts and kinds of each general procedure component make up the *Knowledge Variables* associated with that particular General Procedure. A knowledge variable is anything that "goes into" or "makes up" a General Procedure step (including concepts, principles, and/or other procedures). For instance, in the house example, a knowledge variable for "Lay the Foundation" might consist of such parts as: "Build a Basement" and/or "Lay a Footer". Additional knowledge variables might consist of other things the student would need to know to "Lay a Foundation" such as "Read Blueprints", or "Get Building Permit". The amount of detail would depend on the specific learning goal, the desired End Performance, and the Tools that are/can be provided to the learner to perform the task. For example, if the learner were a job foreman, he/she would need to understand more about all the components of the task but perhaps at a more general level of knowledge than individual workers. If, on the other hand, the learner is the excavator digging the hole, he/she would need to know more about excavating than the foreman (most likely) and might need to know the same amount of general knowledge for the overall task as the foreman, depending on the goal, end performance, and tools. For instance, if I want someone to build a basement after someone else has already dug the hole, then the knowledge variables might contain a procedure that includes:

Table 1: Sample Knowledge Variable

Knowledge Variables for Basement	Tools
1. Pour Footer inside the hole	Cement Mixer
2. Lay Basement Walls on the Footer.	Mortar, Cement Block
3. Add gravel to the Basement Floor.	Dump Truck
4. Pour cement on the Gravel.	Cement Truck with Chute

The primary questions that are asked during this process are:

- What are the procedures that make up this step?
- What are the knowledge variables needed to perform those procedures?
- What other knowledge variables might be necessary?
- What tools are/can be made available to accomplish the task?

Note: It could be that knowledge about the tools themselves becomes knowledge variables for using the tools (as when an employee needs to learn how to drive a forklift to get the cement block over to the hole before he/she can lay the block).

In this manner, a layout of the task's General Procedures are "broken down" into components called knowledge variables and tools for accomplishing the General Procedure. The "breaking down" of components generally ends when the instructional designer has reached the level of detail that is already known by the target learner group. For example, if the target learner group already knows how to lay footers, then the task of laying footers would not have to be broken into component parts. Additionally, it is important to note any similarities and differences between procedures, knowledge variables and tools because these can be used to activate prior knowledge and for additional practice later in the instruction. A

sample section of what the General Procedure (containing simplified Knowledge Variables and Tools) might look like is shown below:

General Task	Knowledge Variables	Tools
2. Lay the Foundation	For a Basement	
	1. Pour Footer inside the hole	Cement Mixer
	2. Lay Basement Walls on the Footer.	Mortar, Cement Block
	3. Add gravel to the Basement Floor.	Dump Truck
	4. Pour cement on the Gravel.	Cement Truck with Chute
3. Build the Roof…		

Obviously this is an oversimplified version of the General Procedures, Knowledge Variables, and Tools that "Build a House" would consist of. However, the end result of this process is a structural framework of the task in the context in which it is generally performed. This framework and its components are the basis of the scope (what to teach) and sequence (the order in which to teach it).

Note: It is important, however, to have the oversimplified version, because it will be utilized later in the implementation of the instruction. It is also useful to have this information in the form of a table, flowchart, outline, or other graphical representation because it can be used in the instruction to show the learner where the individual tasks he/she is learning fits into the "big picture" of the overall learning goal.

2. Look for holistic task similarities and resources outside of *this context*

This step is not usually quite as complex but might require some "digging". The purpose of this step is to discover any similar tasks or task components that might exist *outside of this context*. This might include similar procedures, principles, concepts, knowledge, skills, tasks, tools, or problem solving tasks (such as building barns instead of houses, driving a forklift inside a warehouse, or even planning projects before implementing them). Some of these tasks may already be mastered by the target learners in a separate context. The results of this step helps to determine the scope of the project (and perhaps the sequence depending on the particular task) by allowing the instructor to see other areas outside of this context where similar skills exist and allows the instructor to determine the depth of detail that might be beneficial in this context, as well as future instructional events. By way of an example, let us suppose that we are designing instruction for the operation of a forklift. We discover that one knowledge variable for operating a forklift is "Balancing the Load". When we look outside this context, we find that "Balancing the Load" is also a skill required for the task of "Operating a Dump Truck" (a task that will also be needed by our target learners in the future or is currently used by them now in another context). If we are taking a holistic look at the tasks and learners, we might decide to include more detail on this particular task in an effort to use this detail in further training or find meaningful ways to make comparisons between the skills. It would also carry the subsequent benefit of making a particular piece of instruction ready and available to the learner that could be utilized in both contexts by the learner when and where he/she needed it– now for this topic, subsequently, if remedial instruction is necessary and/or desired; and as an activation point for instructional events. (This type of analysis can assist the designer, developer and/or instructor in ensuring that information is "chunked" or "grouped" in such a manner that allows the learner subsequent access to the instruction in different contexts. This also allows other learners – those learning the task of operating a dump truck, in this instance - to benefit from this particular instructional event sooner than they would have if they had to wait for this particular piece of instruction to be designed for them.

An added benefit of taking this step for the student and instructional department is that oftentimes, in the process of "asking around", other instructional resources and tools are uncovered. For instance, the

instructional designer might find "balance loading" software or job aids that are currently being utilized by the dump truck operators that could also be adapted (or used as is) by the forklift operators.

3. Detail Performance and Assign to Proficiency Level Matrix

This step is paramount in determining scope and sequence for flexible and adaptive instruction and is highly instrumental in determining what tools and resources to provide to the students for the most efficient and effective instruction. The purpose of this step is to determine what different levels of proficiency might look like. During this step, the instructional designer (with the assistance of SME's or stakeholders) assigns some type of criteria for each significant task component detailing the behavior, knowledge and/or tools that one would expect a novice, proficient performer, or master of the skill to display or utilize.

The instructional designer can use any measurement they (or the organization or the SME or the learners) deem appropriate for the skill level. After the skills are laid out on the Proficiency Matrix, the instructional scope, sequence and tools can be determined based on the desired level of performance, prior to the training (novice), during /after the training (proficient), and at some point after the training (master) (unless mastery is a requirement of the exit level behavior for the training event) for each task. The general guideline that usually works best is to think of the novice as entry level behaviors, proficiency as the level that can be performed with appropriate tools, and mastery as the level where the task can be accomplished without the aid of tools in new and different ways easily. Although this is laid out in a matrix for organizational purposes, in reality these levels operate on a continuum. It is therefore possible to aim at a level of proficiency that falls somewhere between novice and proficient or proficient and master. The matrix can be used by the instructional designer, developer or instructor to "adapt" and vary instruction by providing content aimed at various levels, allowing the learners to choose their level or be assigned different paths through the instructional event, and/or provide (or have learners create) various tools (job aids, checklists, reading materials) to shorten or enhance instructional component tasks. For example, if we were creating an instructional event for building a roof, we might assign the following proficiency levels:

End Task	Novice	Proficient	Master
4. Determine Roof Pitch	Knows what roof pitch means.	With a calculator and a list of angles for specific pitches, can determine the correct angle and board sizes needed to construct it.	Can analyze the structure and recommend the best pitch for different geographic locations without assistance.
5. Selecting Roofing Materials	Knows the names of different materials used for roofs.	Can effectively use a "Roofing Materials Chart" to select and recommend the appropriate materials for the house style and geographic location.	Knows the various types of roofing materials that are used in most geographic locations and understands the situational and structural benefits of the various alternatives of materials. Can effectively verbalize this understanding to others.

Depending on the situation, then, we might decide to 1) create tools to be used to reach proficiency more efficiently, 2) determine that mastery level is a goal that is required for a certain task by the end of the instructional event, 3) create training for all three levels of proficiency and allow students to select, create, or "test into" a recommended instructional path. These choices would need to be made on a situational basis depending on the content, context, and learners, but will play a pivotal role in determining the scope or "chunking" of the instruction and the sequence in which that instructional content component is offered.

4. Categorize and/or Group Tasks (if applicable)

In this step, the instructional designer categorizes and/or groups instructional task components according to their types based on decisions and discoveries made in the above steps. The primary purpose of this step is to identify the *types* of tasks so that the best instructional methods can be applied to the task in the correct order. The method recommended for this process is a selection of scope and sequencing strategies that incorporates aspects of Charles Reigeluth's *Elaboration Theory in Instructional Design Theories and*

Models: A New Paradigm of Instructional Theory, Vol. II (1999) and Jeroen J.G. van Merrienboer's Four-Component Instructional Design Model in *Training Complex Cognitive Skills*: *A Four-Component Instructional Design Model for Technical Training* (1997).

Skills can be categorized as either automatic (recurrent) or controlled (non-recurrent) (van Merrienboer, 1997). Additionally, each of those types of skills can be further classified into Template or Knowledge Skills and those can be again, further classified as Reusable Skills or Context Only Skills (see Figure 1 below and the descriptions that follow in Table 2).

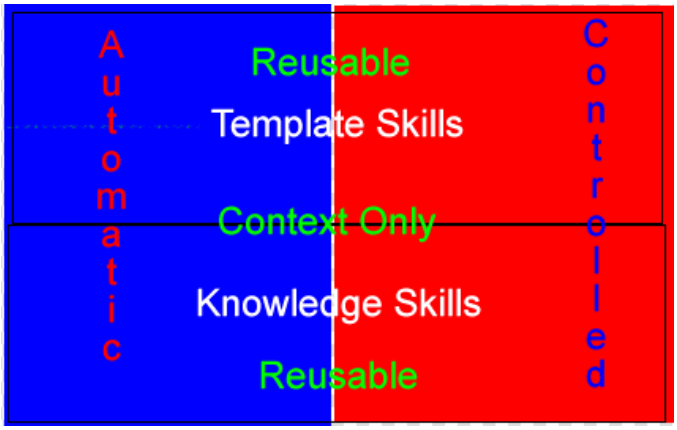

Figure 1: Image of groups of skills

Table 2: Definitions of Skill Group Terms

Type of Skill	Examples:
Automatic (Recurrent) Skill: One that must be performed fast without conscious thought (automatically)	Talking, Walking, Chewing, Typing, and other skills that are performed regularly
Controlled Skill: Performed with some sort of conscious effort (always starts controlled but can become automatic with use)	Any newly learned skill
Template Skill or Process: Normally procedural and normally has component variables that can be applied to it.	Building a House, The Selling Process
Knowledge Skill: Skill Variables that are input into the template and can usually be inter-changed with other knowledge skills.	Types of Roofing Materials, Different Products to sell
Reusable: Skills that can be used in other contexts	Problem Solving Skills, Most of the Template Skills
Context Only: Skills that are only relevant in this context	Varies by context, usually context specific knowledge skills such as context specific terms, and/or concepts or procedures. An example might include specific operating instructions for a specific piece of equipment.

While a thorough explanation of these theories is beyond the scope of this document (Merrienboer and Reigeluth wrote entire books on the subject!), a brief overview of the theory is useful for an understanding of its application in this theory. The implication for instruction is that different types of skills are attained through different types of cognitive processes. The successful formations of cognitive structures are

enhanced by certain instructional methods, including the scope and sequencing of the instructional components. The table below provides a summary of the cognitive processes and instructional methods believed to be most effective for certain types of skills (van Merrienboer, 1997). This table can be used as a general guide for making scope and sequencing decisions based on Type of skill and instructional implications.

Table 3: Summary of Merrienboer's Skill Types with Instructional Implications

Type of Skill	Primary Cognitive Process	Instructional Implications
Automatic (Recurrent) Skills: Consistent Performance over problem situations Usually procedures and specific rule learning	Compilation: embedding of domain specific rules or productions.	Sequencing: ▪ Chunked into "skill clusters" ▪ Segmentation, simplification and partitioning (for whole task) Presented ▪ Whole Task Performance. ▪ Rules and Procedures ▪ Learn by doing only ▪ Provide Knowledge (rules, procedures, prerequisite knowledge) Just in Time (JIT) as needed in the example Practice ▪ Part Task Performance ▪ Provide Examples that are divergent for all variants of procedure or for all rules from simple to complex ▪ Fading of JIT information as proficiency increases Feedback ▪ Immediate Feedback on quality of performance
Knowledge used in Automatic Skills (Prerequisite Knowledge) Usually Facts, Concepts, Plans and Principles	Restrictive Encoding: Connecting information to procedures or rules that go with it.	
Controlled (Non-Recurrent) Skills: Variable Performance over situations (Usually conceptual models, goal-plan hierarchies, causal model and mental models)	Induction: Mindful abstraction (and/or discrimination) from the situation at hand.	Sequencing ▪ Chunked into "skill clusters" ▪ Segmentation, simplification and partitioning Presented ▪ Whole Task Performance ▪ Ensure information is sufficiently "chunked" to avoid cognitive overload. ▪ Cases, Problems or worked out examples ▪ Discuss or generate activities that promote abstraction from the concrete case or problem to more general cases or problems. Practice: ▪ Whole Task Performance ▪ Knowledge is presented PRIOR to practice and within context of existing knowledge. ▪ Scaffolding ▪ Varied Practice Examples Feedback ▪ Delayed and highly informative feedback should be given on the quality of performance.
Knowledge supportive to the performance of Controlled Skills (systematic problem approaches, heuristics, supportive knowledge)	Elaboration: Connect new information to existing knowledge	

van Merrienboer (1997) gives guidance on scope and sequencing of instruction by describing (in great detail) the types of skills and knowledge and how they should be instructionally delivered. He

recommends that a combination of both part-whole task practice and whole-task practice be accomplished for automatic skills. He gives guidance for scope, how to sequence supportive and prerequisite knowledge in the performance of the task practice and the timing of feedback during practice. He also embraces Reigeluth's Conceptual Elaboration Sequence which recommends starting the instruction by sequencing through the simplest version of the whole task and then sequencing through the content again and again in a spiral sequence adding degrees of detail on each pass through the whole task to a more complex version of the whole task (Reigeluth, 1999). While this philosophy flies in the face of the standard "break it down" and teach each individual topic, one at a time, in a hierarchical sequence; I agree with the authors that the standard method "decontextualizes" (my word) the content and removes it from the conceptual framework of the whole task and thus makes it less meaningful and effective in light of the desired whole task and end performance of the that task. The primary benefit of this whole-task method is that it mimics the way people tend to store new information in a broad to narrow framework and so then facilitates schema acquisition. I agree with this "newer" method of whole task performance and spiral sequencing of content and urge the reader to examine further details on these methods (Reigeluth, (1999) and van Merrienboer, (1997)).

5. Determine mandatory and optional elements of this training event based on above.

Looking at the whole task in light of the above criteria, the instructional designer is now prepared to make final decisions about what skills should be mandatory to training, what skills could/should be optional components for different levels or types of skills and the best sequencing strategy for presenting the instruction to the learner based on the given criteria. Reviewing the task components, now grouped as Novice/Proficient/Master and labeled as Automatic/Controlled, Template, Knowledge Variables, and Tools, the instructional designer must determine (in light of the end goal and time allotted) which skills *must* be taught to meet the end performance goals. He/she must also consider optional tools, sequencing strategies, and or proficiency level goals for this instructional event based on those factors. This is one of the more challenging tasks in this process because it requires looking through all of the information gathered thus far in light of the whole task and attempting to establish a sort of "rating system" for measuring the importance and necessity of each task component. Simultaneously the designer is attempting to "budget" time, resources and skills by determining if some skills/knowledge/tasks could be accomplished by providing tools (cheat sheets, software, equipment) that enables the task to be simplified.

Finally, tasks are being evaluated for elements that can be implemented at a higher level by offering them as optional components for those students who are ready to be challenged. In light of this theory's emphasis on reusable learning objects (Merrill, 1999), learner customized components of instruction, organizational context, and the use of tools; it is highly recommended that scope and sequencing decisions take these elements into consideration. While it may cause more work on the part of the instructional designer to create instruction that is appealing to multiple "levels" of proficiency and to "chunk" information into components that are conducive to "reuse" in other contexts, the long term benefits for efficient and effective instruction cannot be understated.

6. Determine what elements should be Pre/During/Post Training Events (if applicable).

A final step in the scope and sequence process involves designing instruction that is more time and resource efficient for the instruction, organization, and/or student. This step is dependent upon some type of access to the students before, during and after training. The basic purpose of this step is to look at the instructional components and determine if any of these components are conducive and/or beneficial in pre/post instructional environment. Some instructional elements such as a survey to determine proficiency level, a tutorial for a useful tool, or a knowledge "activation" strategy for existing knowledge, might be beneficial prior to the scheduled "learning event" (classroom or web instruction). Other instructional components might be beneficial after the training such as assessment of transfer skills and coaching opportunities, mentoring "apprenticeship" practices, peer reviews with feedback, etc. Regardless of accessibility to the

students after training, a minimum of a ***plan*** for follow-up practice and/or assessment with feedback opportunities should be included in any training scope/sequence strategy. Since complex cognitive skills are initially learned and subsequently strengthened by further performance (van Merrienboer, 1999), a plan for ultimately reaching mastery performance should be part of the instructional strategy instead of "throwing the students out there" and assuming that no further guidance is necessary. I believe that Pre and Post instructional strategies are highly effective and just as highly under-utilized.

Note: While this theory lays out my own personal theory on sequence and scope (with exceptions of other author's ideas included as noted) in relation to the presentation of new content, the processes listed here were, before now, primarily tacit and automatic. While I have attempted to assimilate and elaborate my thinking on these matters, I am barely at a level of understanding that I would classify as "proficient". More time, reflection, and study are needed in this area to develop these ideas more fully.

Part II: Guidance for Implementation

Part II covers the sequence and methods for the instructional event. This section is loosely adapted from Gagne's Nine Events of Instruction (Driscoll, 2000). This section is designed to give the instructional designer, developer and/or instructor guidelines for implementation of effective and efficient instruction. It is divided into the following sections and gives guidance to the basic structure and sequence of the overall instructional event. It is made up of the following primary methods and is most effective if followed in order presented here:

- Provide a "Look" at Mastery Performance
- Activate Existing Knowledge
- Introduce New Knowledge Skills in Context
- Encourage Discussion, Exploring, and Thinking
- Facilitate Transfer
- Assess Performance and Retention

This section takes into consideration the constant "juggle" instructors deal with between time, resources, and effective instruction. For this reason, various choices of methods are provided and classified as: Efficient, Effective, and Appealing. In this context:

- *Efficient* usually means that it takes the least amount of time or resources (but is generally costly in terms of effectiveness).
- *Effective* could be considered the "middle option" in that it is more "expensive" generally in terms of time and/or resources but provides sound strategies for the overall methods.
- *Appealing*, on the other hand, is generally the most authentic and meaningful (and sometimes simply more "fun") option in terms student motivation and relevance.

It is not the intent of this theory to suggest that only one option has to be chosen in each circumstance. Indeed, if time allows, and/or the content is highly significant in terms of skill type (see Step 4 in Part I) then, perhaps, more than one method can be applied. Additionally, for flexible and adaptive instruction this theory would recommend that, where possible, all methods be offered to students so that they may choose which method they would prefer.

These methods further assume that content, scope and sequencing methods have been used for the selection of what to teach and what order to teach it in (see Part I). References are made throughout to Part I where specifically relevant but it is assumed that content and sequencing decisions based on Part I have already been determined.

Note: In the following description of methods:

- Optional choices of methods are bulleted
  1. Sequences are numbered.

1. Provide "Look" at Mastery Performance of Skill

You can't get there if you don't know where you are going. This is the basic premise for providing a "look" at the end performance that students, themselves, will be able to perform when they have completed the instruction. By providing the students with an image of what the end performance is supposed to look like in a simplified context (that makes the performance look easy) the students will be able to judge for themselves that the performance level desired is, in fact, a goal that can be accomplished. This will increase the likelihood that student confidences will increase. Additionally, knowing where they are going and seeing a good performance should motivate the student to attend to the instruction so they, too, can reach the desired state of performance. By seeing the whole task in context, an image of the task can be created to which more complex capabilities can be added (Reigeluth, 1999). If the whole task is so large and so complex that showing the whole task will confuse or de-motivate the student, consider breaking the task into separate modules and going through this step at the beginning of each module.

The following instructional options are recommended for the successful implementation of this goal:

Option 1: Present Objectives (Most Efficient)

Condition: Use when time is limited and/or end performance is easily "envisioned" through textual description.

- Verbally describe what the learners will be able to do when they have completed training.
- Have students silently read the objectives in a printed format.
- Ask students to read and/or paraphrase the printed/verbal objectives.

Option 2: Elicit Objectives (Most Effective)

*Condition: Use when resources (time/money) are available, adaptive flexibility or interaction is desired, there is a **high** level of similarity between current performance level and end performance level.*

- Controlled Demonstration

1. Provide multimedia/movie/audio/text of end performance.

   Providing an interactive, recorded, or printed version of the demonstration is highly recommended because the instructor can control the outcome of the student's "first look" at the end performance and ensure that the student sees what the instructor wants them to see. The choice of media, in an ideal situation, would depend on which media offered the best representation of the end performance. For example, if the end performance task were highly visual, a movie or multi-media presentation would be recommended. If listening skills are important, perhaps recorded text should be used. Keep in mind that multi-media may be best for demonstrations of technical equipment because you can not only demonstrate the interactions with the equipment but can actually "go inside" the equipment and show the effects of the interaction with the equipment (which you could never actually do in reality.)

2. Ask students what new skills they believe they would need to perform the observed end task. This step can be accomplished as an individual project, group project, or open class discussion. For flexible instruction, allow students to choose between individual projects and group projects.

Table 4: Group Guidelines

Group Guidelines	
Individual Project	▪ Can use to allow independent learners to work the way they prefer. ▪ Can offer as an option to allow for learner preference. ▪ Large Class Discussion afterwards is mandatory for sharing of ideas and arriving at group consensus.
Small Group Project	▪ Small groups generally work best when they consist of of 3 to 6 students (Nelson, 1999). ▪ Can allow students to choose their own groups based on instructor criteria (for variety) and a sense of involvement (Nelson, 1999).
Large Group Project	▪ Useful for competitive collaboration. ▪ Can split class into larger groups of 10
Open Class Discussion	▪ Useful if time is short ▪ Use if class consensus is required ▪ Use when sharing across domains is desired
Mixed Groups	▪ Useful for competitive collaboration. ▪ Can be done in any mixture but here is an example: • Let individuals answer the questions on their own – Reward person with the most right answers. • Form them into small groups; have them share ideas – Reward person with the most right answers. • Form them into Large groups and let the large groups share ideas – Reward group with the most right answers

3. Arrive at Group Consensus: Guide large class discussion to ensure that all necessary differences in skills (objectives of training) are identified and to identify any existing skills that were "overlooked".

Web Adaptation for Group work: Use Discussion Forums and/or scheduled chats and/or conference calls for team assignments and allow enough time for interaction to occur.

Note: This step serves the purpose of both giving the students a look at prior performance as well as activating existing knowledge by having students begin thinking about the skills and tasks that they currently perform. Depending on the content and the depth of the discussions in this section, *Step 2: Activate Existing Knowledge* (below) may become unnecessary.

Options 3: Demonstration (Most Appealing)

Condition: Use when resources are available, interaction is desired, and/or there is not necessarily a high level of similarity between current performance level and end performance level of skills.

1. Have students participate (lurk) or watch actual performances of end skill behavior by an expert.
   - The advantages of this method are authenticity and the ability to question the expert.
   - The unknown factor of this method is that things could go wrong and the desired performance might not be achieved.
   - The use of this method as effective is dependent upon contextual situation.
2. Conduct Group Discussion of what worked and what didn't. (See Table 4 above)
   - Give the groups specific questions to answers.

- Is more useful if the context is such that a distinction between examples and non-examples of correct performance is desired and can be easily ascertained through demonstration without prior training.

3. Lead Discussion of relevant skills needed to reach the best levels of performance.
   - Group consensus needs to be reached.

Note: This step serves the purpose of both giving the students a look at prior performance as well as activating existing knowledge by having students begin thinking about the skills and tasks that they currently perform. Depending on the content and the depth of the discussions in this section, *Step 2: Activate Existing Knowledge* (below) may become unnecessary.

2. Activate Existing Knowledge

This step is necessary for activation of memory of existing knowledge, skills and/or tasks. Having students focus on their current workflows and then comparing those workflow tasks to the performance of the new skills facilitate schema building. This comparison should have been done as part of the scope and sequencing strategies in Step 2 of Part I.

Option 1: Provide Exercise (Most Efficient)

If instructional event time is very limited, this step can be conducted in the form of a PreWork Exercise. If this format is chosen, feedback on the PreWork should be given as soon as possible and a review of the PreWork Exercise should be given during the instructional event just prior to the introduction of new knowledge to facilitate schema acquisition.

Condition: Use when interaction time is somewhat limited and learners are accessible prior to training event.

1. Provide written/oral/graphical review of known knowledge/skills/workflows.
   Graphical representations can be very effective at activating prior knowledge if the correct representation is provided that allows the student to make valid connections between the current skills and the skills to be learned according to Gagne (Driscoll, 2000). Flowcharts, outlines and/or advanced organizers showing the students exactly where the skills they are currently doing already exist inside the infrastructure of the new task are usually best for this according to Jerome Bruner (Driscoll, 2000). A sample of a chart depicting the similarities between making a renewal call (existing skill) and making a sales call to 1) get to the end user, and 2) try to sell a new product (new skills) is located at Attachment 1.

2. Present Questions/Problems/Project Assignments related to existing skills.
   - Whatever method, the questions for the exercise should be focused on existing skills or comparison of existing skills with new skills.
   - If you did not activate prior knowledge in Step 1 (by implementing steps 2 or 3), you may want to include a problem solving or project based assignment here to stimulate competitive cooperation.
   - Individual Study: You may want to use this opportunity for flexible instruction by allowing members to choose the option
   - Groups: For instructions on setting up teams, see Table 4 in Step 1 for Group Guidelines.

3. Provide Feedback to reach Group Consensus
   - Immediate and positive feedback should be offered by the instructor and used to guide, correct, and motivate.
   - Negative feedback should be avoided so that participation does not suffer.

Option 2: Open Group Discussion (Most Effective)

Condition: Use when time allows and the importance of group consensus on skills or procedures is paramount.

1. Elicit Responses from Group
   - Questions should focus on transfer skills
   - Play "Devil's Advocate" by asking questions inconsistent with reality (Example: "So, everyone always agrees to renew the product when you call, right?")
   - Show a movie of incorrect procedures for known skills and ask learners what they think.

2. Guide discussion to focus:
   - Focus questions toward targeted similar skills
   - Ask for clarification
   - Ask for consensus
   - Ask leading questions

3. Provide Verbal Feedback
   - Elicit feedback from other learners through questioning
   - Provide direct feedback from instructor

Option 3: Play Game or Direct Activity (Most Appealing)

Condition: Use when time allows, learner motivation is low; and/ or competitive collaboration is desirable.

- Play Any Q&A style game that meets the following criteria:
  - Questions should focus on targeted similar skills
  - Games should be played in teams with both individual and team successes rewarded (Example: "Family Feud" style format).
  - A mixture of easy and more difficult questions should be asked to aid in both competitiveness and a feeling of accomplishment.
  - Questions should be authentic and relevant

- Direct Any Problem-based Group Activity that meets the following criteria:
  - Designed to elicit responses about targeted similar skills
  - Both Individual and Group successes are rewarded
  - Problem is authentic and relevant

3. Introduce New Knowledge/Skills

This is where the scope and sequencing methods listed in Part I are applied. The steps listed there will determine the scope and sequence of the content presented here. Spiral sequencing (from simple-to complex) should be utilized to introduce new skills in accordance with the type of skill that is being presented: Automatic, Controlled, Prerequisite Knowledge, and/or Supportive Knowledge. A table of the instructional implications for each type of skill as it relates to Introducing New Knowledge is contained in the table below (van Merrienboer, 1997):

Table 5: Summary from Merrienboer's 4-Component Instructional Design Model (1997)

Type of Skill	Primary Cognitive Process	Instructional Implications
Automatic (Recurrent) Skills: Requires Consistent Performance over Problems Usually procedures and specific rule learning	Compilation: embedding of domain specific rules or productions.	Presented ▪ Whole Task Performance. ▪ Rules and Procedures ▪ Learn by doing only ▪ Provide Knowledge (rules, procedures, prerequisite knowledge) Just in Time (JIT) as needed in the example Feedback ▪ Immediate Feedback on quality of performance
Knowledge used in Automatic Skills (Prerequisite Knowledge) Usually Facts, Concepts, Plans and Principles	Restrictive Encoding: Connecting information to procedures or rules that go with it.	
Controlled (Non-Recurrent) Skills: Requires Variable Performance over situations (Usually conceptual models, goal-plan hierarchies, causal model and mental models)	Induction: Mindful abstraction (and/or discrimination) from the situation at hand.	Presented ▪ Whole Task Performance ▪ Ensure information is sufficiently "chunked" to avoid cognitive overload. ▪ Cases, Problems or worked out examples ▪ Discuss or generate activities that promote abstraction from the concrete case or problem to more general cases or problems. Feedback ▪ Delayed and highly informative feedback should be given on the quality of performance.
Knowledge supportive to the performance of Controlled Skills (systematic problem approaches, heuristics, supportive knowledge)	Elaboration: Connect new information to existing knowledge	

New knowledge should be slightly above current level of knowledge on similar tasks, (Vygotsky, 1999), be sequenced from simple-to-complex and support mechanisms should be gradually withdrawn as new skills are acquired (Reigeluth, 1999 and van Merrienboer, 1997). To aid in cognitive schema formation, the new skills should be introduced in its whole task context of end performance (so the student knows where it fits into the end performance at all times).

Both mandatory and optional elements should be provided based on proficiency level at beginning of instruction (for instance, glossaries can be provided for novices, expanded or more challenging versions of an activity can be provided for proficient performers). Methods should be varied (if possible) to provide "something for everyone". In the interest of holistic training, brief allusions of applicable relevance to other domains/contexts should be offered if they do not interfere with the current context.

Option 1: Direct Presentation with Cognitive Reinforcement Activity (Most Efficient)

When I began writing this theory, I originally allowed "Direct Presentation" to stand on its own as an instructional method (shame on me!) This very over-utilized method of "instruction" in and of itself is not really an instructional method. To borrow a term from the author's of a book whose title I enjoy quoting, "Telling Ain't Training" (by Harold D. Stolovitch & Erica J. (2002). This method, while efficient in terms of time and resources, is not very effective for complex cognitive skills (and specifically for recurrent or automatic skills) (van Merrienboer, 1997). This can be used successfully as an introduction to a particular skill or procedure and if used sparingly, to initially present ill defined concepts, procedures, facts and components of complex cognitive skills that cannot otherwise easily be "discovered". It should *never* be used as a replacement for true instructional methods but only as a supportive tool in conjunction with some other cognitive activity.

Condition: Use when time is limited, and/or to introduce totally new concepts or skills that are not easily "discovered" in conjunction with other activities.

1. Direct Presentation
   - Deliver lecture
   - Provide Reading Assignment
   - Not to be used alone as an "instructional method".
2. Provide Cognitive Reinforcement Activity for type of task/skill/knowledge being introduced in accordance with the Table 5 below or Option 2 of this section.

Note: In case it becomes necessary to introduce some component skill outside of the context of a complex cognitive skill, the table below represents the more general skills/knowledge and an overview of Instructional Strategies for each:

Table 6: Cognitive Reinforcement Activities

Cognitive Reinforcement Activities (General) adapted from Reigeluth class notes (2003).	
For Concepts	1. Present Prototypical Example 2. Make a generality available in order specify critical characteristics 3. Present Examples with non-examples 4. Provide Practice 5. Provide immediate Feedback
Procedures	1.Present Generality 2.Present examples simultaneously with the Procedure 3.Provide practice 4.Provide immediate feedback
Understanding	1. Presentation 2. Activate meaningful context 3. Relate new knowledge to it 4. Describe new knowledge 5. Provide enrichment: compare/contrast, analysis, instantiation, analogy, inference, function, roles 6. Provide Practice 7. Provide Feedback

Option 2: Provide Problem-Solving Individual/Group Activity (Most Effective)

Conditions: Use when resources are available, content is conducive to self-discovery, and/or available solutions are ill defined. Works best when learners have mixed levels of expertise in the domain.

Criteria: Problem to be solved should allow enough guidance and resources that skill and/or knowledge can be "discovered" without frustration. Problem should encourage "discovery" of most widely used and more general solutions.

1. Provide realistic problem-based scenario or case based on type of skill from Table 5 above.
   - The skill should be simple and contain learner support.
   - Knowledge should be introduced JIT (for Recurrent Tasks) or Introduced before the problem (for Controlled skills) (van Merrienboer, 1997)
2. Offer choice of media for solving problems utilizing realistic context (actual hands on solutions, theoretically solving the problem, using computer based simulations software, etc.)
3. Allow students to choose between group and individual activities for learner control.
   - For Teams: Assign problems that encourage sharing (mixed levels of expertise for the problem). Provide opportunity and guidance for team members to arrive at consensus of solution.
   - For Individuals: Assign problems that encourage individual exploration on computer or in provided articles.
4. Conduct Class Activity:
   - Have groups and Individuals share problem solving strategies and solutions
   - Lead guided discussion for acceptable solutions.
   - Lead guided discussion for assessment criteria of "good" solutions
   - Provide "rewards" for categories of accomplishment for both teams and individuals (like best individual idea, best team idea, most creative, most shared ideas, etc.)
5. Provide Feedback in accordance with type of skill from Table 5 above.

Option 3: "You Pick" Individual/Group Project (Most Appealing)

Criteria: Students should be allowed to choose between various applicable and context appropriate projects. This method works best in conjunction with one of the other options such as Direct Presentation above. All group projects should support learning of the skill being learned. Findings should be reported and shared with entire class after various activities are complete.

Condition: Use when resources are available and content is well defined. The listing below can and should be manipulated and/or expanded to include other creative projects for learning the skill at hand.

- Have students compare and contrast examples and non-examples of concepts, rules, or procedures.
- Ask students to watch a video of a process and identify the important steps in a process.
- Have students perform simplified to more complex versions of a complex task either individually or in groups.
- Provide resources and ask students to develop training for learning the new skills
- Have students interview various SME's and report findings back to group.
- Allow individuals and/or groups to create their own method of learning a particular task and establish requirements and guidelines with instructor.

4. Encourage Discussion, Exploring and Thinking

This section is designed to facilitate cognitive processing through the discussion and sharing of ideas about the skills they are learning. This step also provides time for the students to process the new information. The discussions should be guided toward relevant examples, analogies, thoughts and experiences related to the new information that was just learned. Activities should focus on shared community knowledge in order to share the wealth.

Option 1: Ask Questions to stimulate thinking (Most Efficient)

Condition: Use when time (or resources) is limited. Works best when learner experience in the content domain varies.

1. Elicit Responses from Group using open-ended questions
   - Play "Devil's Advocate" by asking provocative questions related to the materials.
   - Show a movie of incorrect procedures for new skills and ask learners what they think.
   - Ask direct questions to class or individuals in a review style format.

2. Guide discussion to focus
   - Ask for clarification
   - Ask for consensus
   - Ask leading questions

3. Provide Verbal Feedbacks
   - Elicit feedback from other learners through questioning
   - Provide direct feedback from instructor

Option 2: Present authentic and realistic problems to be solved. (Most Effective)

Conditions: Use when resources are available, exploration is a primary goal, content is conducive to self-discovery, available solutions are ill defined, and/or there are a multitude of "correct" solutions. Works best when learners have mixed levels of expertise in the domain.

Criteria: Problem to be solved should require application of newly learned skills (above) with similar level of complexity. Problem should encourage "exploration" of concepts and alternative solutions (if applicable).

1. Provide realistic problem-based scenario that requires discussion and decision-making to solve.
2. Offer choice of media for solving problems utilizing realistic context (actual hands on solutions, theoretically solving the problem, using computer based simulations software, etc.)
3. Select mixed groups with varied levels of expertise and/or experience with aspects of the contents.
   - Provide example, case or scenario similar to the one used in the last section.
4. Class Discussion:
   - Have groups share problem solving strategies and solutions used.
   - Lead guided discussion about acceptable solutions.
   - Ask them to discuss examples they've encountered in other contexts or situations that reminded them of this and discuss the differences and similarities.
   - Provide "rewards" for categories of accomplishment for both teams and individuals (like best individual idea, best team idea, most creative, most shared ideas, etc.)

Option 3: Discovery Group Exercise (Most Appealing)

Condition: This works best ONLY if relevant resources are available and there is no risk of damage to relationships.

Criteria: Must be very carefully planned and executed.

1. Split into carefully selected teams (with mixed expertise on each team if possible)
2. Provide outline, framework, or criteria of skill, procedure or methods in the new content area.
3. Allow learners to read relevant case studies, study examples, or read articles pertaining to content or context domain to discover relevant additional information.
4. Use this information to create relevant interview questions based on the newly learned skill.
5. Ask learners to conduct interviews with relevant parties (usually customers but can be vendors, content or skill SME's, editors, authors, stakeholders, etc.)
6. Report findings and experience back to entire class

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6. Facilitate Transfer

This section, unfortunately, is often subject to the "we ran out of time" syndrome in scheduled training events. The effectiveness of instruction for complex cognitive skills, when this happens, can be catastrophic since the acquisition of these skills is dependent upon "doing " them. Appropriate plans should be made *in advance* for this persistent syndrome to ensure that proper practice opportunities are provided (even if a back up web site has to be developed to provide practice at a distance after the instructional event where this syndrome might occur.) This section consists of practice *and* feedback.

General Guidelines (applies to all Optional Methods below)

The General Procedure established during scope and sequencing should be practiced using authentic Knowledge Variables (examples, scenarios, and cases) because practice of the whole task performance is important for the acquisition of all complex cognitive skills. The purpose is to provide varied knowledge variables (examples, scenarios, and cases) within the context of the General Procedure while withdrawing support tools as proficiency increases. Problem formats used in this step are difficult to recommend because they are so content specific but as a general rule, the goal is to prevent cognitive overload and redirect attention by decreasing extraneous cognitive load while simultaneously increasing learning relevant cognitive load (Merrienboer (1997). The following problem formats and general guidelines can be used to accomplish this (Merrienboer (1997):

- If the case type is relatively easy and there is not a risk of cognitive overload, it is best to use *conventional problems* where the student is confronted with some givens and a goal and asked to find the solution to reach the goal.
- Have students study *worked-out examples* that contain the givens, goal and solution (and can include annotations of features they are illustrating). Solution process steps can also be added to make it "model" the strategy of an expert.
- Completion Problems that provide a partial solution to the problem can decrease cognitive load.
- Goal-free problems that give a scenario and then ask for "all possible" factors that could have caused the scenario are usually very effective for non-recurrent tasks and can reduce cognitive load.
- Reverse Problems present both a solution and a given goal and the learners have to trace the implications of different given situations. This format reduces extraneous cognitive load but can't be used for recurrent skills because it can't be applied to the whole task.

- Imitation Problems reduce extraneous cognitive load with the presentation of conventional problems in explicit combination with worked-out examples for similar analogous problems. The student must identify the analogy between the worked-out example and the conventional problem and then use the worked out example to map the new solution. Very effective and very difficult to create.
- Performance constraints, process worksheets, and/or cognitive tools can be offered which forces or encourages the learner to work through the steps as an expert would to solve the problem if applying heuristics or problem solving is part of what needs to be learned.

Because cognitive load naturally decreases with practice, it is recommended that support be gradually withdrawn and/or more sophisticated problem formats be offered as practice progresses. Additionally, problem formats and problem level complexities can be given proficiency levels and assigned to students based on their individual proficiency levels. This would allow training to be flexible and adaptive.

Part Task Practice might also need to be conducted for selected recurrent skills that require automaticity by the end of training, and/or if the rule defining procedure is fuzzy (Merrienboer, 1997). The purpose of this type of practice is to increase speed and efficiency of applying a given rule based procedure or algorithm to a goal or situation (Merrienboer, 1997). In most instances, then, conventional practice item or problem is given and the learner must apply the rule based procedure or algorithm to "work through" the problem. Divergent variants from simple to complex should be used (Merrienboer, 1997). While learning the recurrent task, information was presented JIT. As proficiency increases, this information can be withdrawn as it becomes cognitively "connected" to the procedure or rule based task. A summary of the Instructional Practice Implications and feedback are listed below for reference.

Table 7: Summary of the Practice and Feedback Implications by Types of Task (Merrienboer, 1997)

<table>
<tr><th>Type of Skill</th><th>Primary Cognitive Process</th><th>Instructional Implications</th></tr>
<tr><td>Automatic (Recurrent) Skills: Consistent Performance over problem situations
Usually procedures and specific rule learning</td><td>Compilation: embedding of domain specific rules or productions.</td><td rowspan="2">Part Task Practice
▪ Part Task Performance
▪ Provide Examples that are divergent for all variants of procedure or for all rules from simple to complex
▪ Fading of JIT information as proficiency increases
Feedback
▪ Immediate Feedback on quality of performance</td></tr>
<tr><td>Knowledge used in Automatic Skills
(Prerequisite Knowledge)
Usually Facts, Concepts, Plans and Principles</td><td>Restrictive Encoding: Connecting information to procedures or rules that go with it.</td></tr>
<tr><td>Controlled (Non-Recurrent) Skills: Variable Performance over situations
(Usually conceptual models, goal-plan hierarchies, causal model and mental models)</td><td>Induction: Mindful abstraction (and/or discrimination) from the situation at hand.</td><td rowspan="2">Practice:
▪ Whole Task Performance
▪ Knowledge is presented PRIOR to practice and within context of existing knowledge.
▪ Scaffolding
▪ Varied Practice Examples
Feedback
▪ Delayed and highly informative feedback should be given on the quality of performance.</td></tr>
<tr><td>Knowledge supportive to the performance of Controlled Skills (systematic problem approaches, heuristics, supportive knowledge)</td><td>Elaboration: Connect new information to existing knowledge</td></tr>
</table>

Option 1: Provide Tools for Authentic Practice (Most Efficient)

Condition: Use above criteria for all practice. Use of this method by itself should only be done when content and/or resources prevent simulation or actual hands-on practice during training event and ***no other alternative is available****. Should be used when mimicking of expert performance is desired. Best if used in conjunction with simulation or actual hands on practice.*

- Provide Practice Tools in accordance with above criteria and Plan for Post Training Follow up
  - Provide Practice Guidelines
  - Provide Procedure checklists
  - Provide Feedback Guidelines (see Step 7 Below)
    - For Self Assessment if context allows
    - For Peer Assessment if context allows
    - For Manager/Instructor/SME/Mentor Assessment if context allows
- Provide corrective feedback using Assessment Sheets (see Step 7 Below)
  - Recurrent: Immediate Feedback on quality of performance
  - Controlled: Delayed and highly information feedback

.

Option 2: Provide Authentic Simulations or Role Plays (Most Effective)

Simulations:

Condition: Use when content and resources allow for authentic simulation in accordance with above criteria.

- Provide Simulation of contextual and authentic environments
- Provide Practice at actually performing the desired end skills in a safe environment
- Provide correct and appropriate tools when applicable
- Provide opportunity for feedback

Role Plays

Conditions: Use when content is ill defined, there is more than one "correct" solution, and/or the desired end performance involves communication.

Criteria: Role-plays should mimic the required end performance as closely as possible. Tasks should mimic reality. They should progress from simple to more complex (recurrent) or support systems should be withdrawn and cognitive load increased as proficiency increases.)

- Provide sample scenario
- Assign Relevant Roles (example: sales rep, customer, and observer)
- Provide appropriate and authentic context and dialog guidelines
- Provide Assessment Tool for Observer Feedback (see Attachment 2 for example)
- Provide opportunity for feedback and sharing of ideas

Option 3: Actual Performance of Task in Context (Most Appealing)

Condition: This works best ONLY if relevant resources are available and there is no risk of serious damage (to relationships, life, or equipment) and/or prior practice opportunities have been performed in a safe environment.

Criteria: Must be very carefully planned and executed because this is not actually "practice" but is really actual performance of task in the real environment.

1. Provide Actual Practice Opportunities
    - Perform task in real context (with real clients, actual equipment, etc.)
    - Provide Mentor/SME Support (Mentor or SME participates as "back up")
    - Establish "apprenticeship" environments
    - Withdraw support when it is safe to do so.
2. Provide opportunity and tools for Feedback (see Attachment 2 for Example)

7. Assess Performance and Retention

General Method Condition: Assessment should follow a safe-to-real environment whenever possible. ***All three assessments*** *should be utilized if possible, at planned intervals.*

Assessment 1: In-Training Peer/Instructor/SME Evaluation (Most Efficient)

Conditions: Use when content is ill defined, there is more than one "correct" solution, and/or the desired end performance involves communication.

Criteria: Performance should mimic the required end performance as closely as possible. Tasks should mimic reality.

- Provide scenario, case, or problem
- Assign Relevant Roles if applicable (example: sales rep, customer, and observer)
- Provide appropriate and authentic context and dialog guidelines
- Provide Assessment Tool (See Attachment 2)
- Provide opportunity for feedback and sharing of ideas

Assessment 2: After Training Evaluation (Most Effective (when used in conjunction with Assessment 1)

Condition: Use when transfer of skills is important to job or organization success.

- Provide Assessment Tool for the observation of student performance doing the actual task at assigned intervals in accordance with the context. Suggested Time Intervals are listed for each assessment below. All Assessments should be completed.
    1. Peer Assessment: Suggested 1 week after training
    2. Manager Assessment: Suggested 1 month after training
    3. Instructor Assessment: Suggested 2 months after training

- Constructive verbal feedback should be delivered immediately following performance
- Written feedback should be given within 24 hours with positive feedback and suggestions for improvement

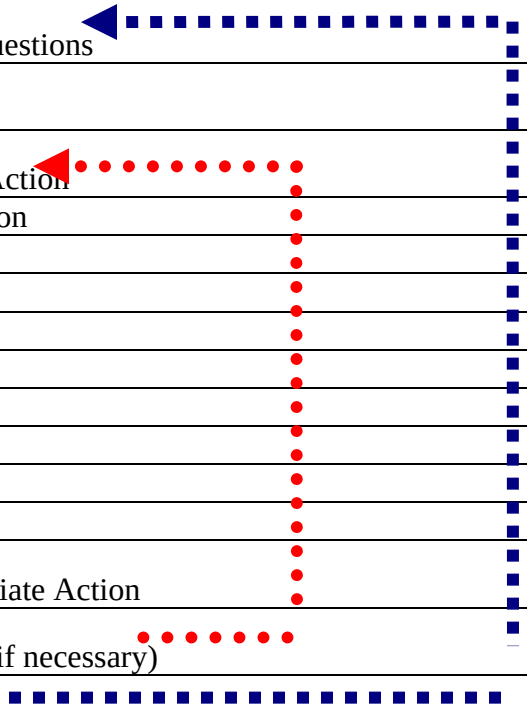
Attachment 1

Introduction

What is Sales? Selling is simply influencing someone's decision. Everyone sells. Some people fear sales because they have the wrong image of what it is. When you speak with a customer and ask them to talk to you, ask them to renew a product, or ask them to send you a check, you are selling. You are influencing their decision to stop whatever they were doing when you called and take an action that you recommend. The process resembles the checklist below:

SSA Target Product Sales Process Checklist

- Check Renewal List
- Check OMS Darwin
- Recall Plan
- Place Call
- Ask Goal Focused Questions
- Deal with Response
- Decide Appropriate Action
  - Renew Subscription
  - Collect Money
  - Ask for User
  - Qualify Lead
  - Stimulate Interest
  - Step Up
  - Step Over
  - Step Down
  - Add Product
- Recommend Appropriate Action
- Deal with Response (if necessary)
- Confirm Agreement
- Accomplish Correct Administration



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The only difference between what you've been doing and what you will do is that AFTER the renewal, you will repeat the process to accomplish OTHER goals such as asking for a user, adding a product, stepping

over a product, etc. Practicing and learning how to do this quickly will assist you in reaching your goal of 8-12 Phone Calls per hour and $XXX a week in New Business Leads and Sales. That is what this training is all about.

Attachment 2: Observer Evaluation Checklist

1. Opening the Call	
• Was Planning Apparent?	☐ Yes ☐ No
• Did he/she establish Rapport?	☐ Yes ☐ No
• Did he/she introduce themselves?	☐ Yes ☐ No
• Did he/she state the purpose and benefit of the call?	☐ Yes ☐ No
• Did he/she get permission to proceed?	☐ Yes ☐ No
2. Goal Focused Questioning	
• Did he/she ask a question focused on the benefit of the action/product?	☐ Yes ☐ No
• Was he/she pushy?	☐ Yes ☐ No
• Did he/she assume the customer knew the benefit?	☐ Yes ☐ No
• Did he/she use professional courtesy.	☐ Yes ☐ No
3. Listening for the Response	
• Did the SSA listen to the customer?	☐ Yes ☐ No
• What response did the customer make?	
• What Response Type was it?	☐ Need ☐ Question ☐ Objection ☐ Agreement
4. Clarify the Response	
• Did the SSA make an effort to clarify the response?	☐ Yes ☐ No
• Did the SSA summarize the response?	☐ Yes ☐ No
• Did the SSA ask for agreement on the understanding of the response?	☐ Yes ☐ No
5. Deal with the Response	
• Did the SSA ask more questions to for a Needs Response Type	☐ Yes ☐ No ☐ N/A
• Did the SSA either answer or clarify a Question Response Type	☐ Yes ☐ No ☐ N/A
• Did the SSA use the Feel, Felt, Found method for dealing with an Objection Response Type?	☐ Yes ☐ No ☐ N/A
• Did the SSA respond appropriately to Agreement.	☐ Yes ☐ No ☐ N/A
• Did the SSA get permission to proceed with the call?	☐ Yes ☐ No ☐ N/A
6. Deciding the Appropriate Product/Action	
• Did the SSA choose the appropriate action/product based on the needs expressed?	☐ Yes ☐ No
7. Recommend the Product/Action	
• Did the SSA sound enthusiastic?	☐ Yes ☐ No
• Did the SSA sound confident?	☐ Yes ☐ No
• Did you trust what the SSA was saying?	☐ Yes ☐ No
• Did the SSA talk about features/benefits of the product/action?	☐ Yes ☐ No
• Did the SSA concentrate on features and benefits which met the identified needs?	☐ Yes ☐ No
• Did the SSA Summarize the benefits to the customer?	☐ Yes ☐ No
• Did the SSA Ask for Action?	☐ Yes ☐ No
8. Administration	
• What was the end result of this sales conversation:	☐ Identifying and Reporting Leads ☐ Stimulating an Interest ☐ Follow-up ☐ Closing a Sale

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