

Using Instructional Design to Improve Student Learning

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Introduction

In this presentation, we demonstrate how one way of categorizing knowledge and skills can help in determining the best strategies for teaching.

Categorizations of knowledge and skills have different purposes. Robert Gagné's classification, which we use here, organizes types of learning according to the mental processes involved in performing them.² The best practices for teaching knowledge or skills in a particular category are similar, whether the knowledge being taught is torts, contracts, or electrical engineering.

For law teachers, the practical advantage of this classification is that it allows us to identify successful learning techniques from other subjects and adapt them to law teaching, rather than starting from scratch and developing and testing our own techniques. A second advantage of classifying types of learning is that it encourages us to break the complex skills that we are trying to teach into their constituent parts and identify the prerequisite knowledge

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Michael Hunter Schwartz, a colleague at Western State University, was a co-presenter of this material at the ALWD conference. Due to circumstances beyond his control, he was not able to participate fully in writing this essay, and he insisted on my taking credit as sole author. However, it is my pleasure to acknowledge Mike's contributions, both to this presentation and to better teaching in law school generally. He is the author of *Teaching Law by Design: How Learning Theory and Instructional Design Can Inform and Reform Law Teaching*, 38 San. Diego L. Rev. 347 (2001), which addresses the reform of law school instruction. Laura Rovner graciously reviewed a draft.

It is also my pleasure to acknowledge the helpful comments made at our presentation at the conference of the Association of Legal Writing Directors and during the editorial process.

2. Robert M. Gagné, *The Conditions of Learning* (4th ed., Holt, Rinehart & Winston 1985). An additional important taxonomy is that of Benjamin Bloom and his co-workers. See Benjamin S. Bloom et al., *Taxonomy of Educational Objectives* (David McKay 1956). A further description of the two taxonomies and the relative advantages of each is contained *infra* Appendix A—*Bloom's and Gagné's Educational Taxonomies*.

and skills for these parts, so that we teach systematically the prerequisites for high-level skills.

The rest of this article will proceed through Gagné's classification, providing definitions and examples of each type of knowledge, the appropriate learning conditions for each, and some specific advice for law school teachers. We then provide a sample use of Gagné's classifications to break an over-all learning goal into sub-parts and provide some thoughts on teaching the sub-parts.

In this paper, we will attempt to model good teaching techniques. As part of this, we will limit the number and content of footnotes, which will contain only brief statements of sources. For the curious, we have placed longer explanations in the appendices.

Some Basics on Types of Knowledge

Gagné divides the learning relevant to law teachers into four categories:

- verbal information, also called declarative knowledge;
- intellectual skills;
- cognitive strategies; and
- attitudes.

Verbal information, also called declarative knowledge, consists of definitions. An example is, "Oranges are citrus fruits." "Oranges" are linked to "citrus fruits" through this definition. A person could learn the definition without being able to recognize an orange.

The category of intellectual skills is itself divided into concepts, principles, procedures, and domain-specific problem solving. Concepts are the real-world entities lying behind simple definitions. For example, if an orange is defined as a citrus fruit, knowing the concept of a citrus fruit would allow people to classify oranges with other citrus fruits, and away from non-citrus fruits.

Cognitive strategies, also sometimes called learning strategies, are skills that help us learn. Knowing to put material in a table is an example of a cognitive strategy.

Finally, attitudes are propensities to behave in certain ways. For example, being inclined to re-read material that one has not learned is an attitude.

Table 1 on page 269 provides an overview of Gagné's classification. Those familiar with Bloom's taxonomy but not Gagné's may want to turn to Appendix A. Those familiar with neither Bloom nor Gagné should defer looking at Table 1 until after reading the rest of this material.

In reading this material, remember that categorizing types of learning is not an end in itself, but a means to the best teaching methods. Some types of learning seem to fall in a gap between two types of learning. For example, procedures are defined as a set of unambiguous steps. The question of

whether something is sufficiently unambiguous to be defined as a procedure can often reasonably be debated—at least, lawyers tend to think so! When there is doubt about exactly how to classify a learning goal, a good approach is to consider elements from both the types of knowledge into which the goal can be characterized.

TABLE 1—A COMPARISON OF TYPES OF LEARNING

| | |
|---------------------------------|--|
| Declarative knowledge | <i>Knowing that something is so.</i> For example, “Oranges are citrus fruits.” One can recite this definition without being able to recognize an orange or a citrus fruit. Similarly, “Battery is an act making intentional and harmful or offensive contact with the person of another.” A person can recite this without being able to recognize a battery or a harmful or offensive contact. |
| Concepts | <i>Being able to classify something.</i> For example, being able to put oranges into a pile of citrus fruit. The ability to classify something is usually dependent on learning the definition of the category, but requires in addition moving beyond the words to the underlying idea. Similarly, being able to classify conduct as a battery or to classify battery as an intentional tort. |
| Principles | <i>Being able to relate two or more concepts.</i> For example, being able to give oranges as a treatment for scurvy. That would involve recognizing two concepts (oranges and scurvy) and knowing the underlying principle relating them (oranges alleviate scurvy). Similarly, being able to award damages as a remedy for battery. That involves relating the concepts of battery and damages and knowing the underlying principle relating them. |
| Procedures | <i>Being able to follow a set of unambiguous steps to accomplish a goal.</i> For example, being able to grade oranges according to the rules set out by the USDA. Similarly, being able to assess whether an appeal has been timely filed in a federal court. |
| Domain-specific problem solving | <i>Being able to apply other forms of knowledge to solve ill-defined problems in an area of knowledge.</i> For example, being able to determine the appropriate steps to deal with threatened frost in an orange grove, which requires integrating weather forecasts, the availability of smudge pots, sprinklers and labor, and the costs. Similarly, evaluating a legal case and deciding which theories to emphasize in court. |
| Attitudes | <i>A propensity to act in a certain way.</i> For example, wanting to grow good oranges or wanting to turn in assignments on time. |
| Cognitive Strategies | <i>Knowing learning and thinking strategies and being able to use them.</i> For example, knowing how to outline or diagram course material, such as by creating a comparison chart like this one. |

Verbal Information

Verbal information consists of definitions and descriptions. It is also often referred to as “declarative knowledge.” Knowledge of verbal information requires being able to recite, paraphrase, or recognize the information.

The following are examples of verbal information:

- The definition of “fruit,” e.g., that “fruit is the edible part of a plant containing its seed and envelope.”
- The definition of liquidated damages, e.g., “A sum specified in the contract to be paid if a party breaches.”

A person can recite either of these definitions without being able to recognize examples of fruit or liquidated damages.

Verbal information can be tested through a learner’s ability to recall the information when asked or to recognize verbal information. For example, when asked for the definition of fruit, the learner could say, “A fruit is the edible part of a plant containing its seed and envelope.” In law it will usually be important for learners to be able to recall information, rather than just recognize it.

Verbal information may be known verbatim or through paraphrase. In law, actual definitions are usually best known verbatim. However, paraphrases are important as a check on students’ knowledge.

Teachers sometimes underestimate the importance of verbal information. Skills and verbal information are both important. Verbal information is an essential starting point for the exercise of many skills. If students are never exposed to sufficiently rich and complicated verbal information, their practice of skills will not equip them for dealing with real-world situations. Moreover, the verbal information must be known securely enough so that relevant information is recalled spontaneously and without effort.

The need for teaching verbal information is especially great for students starting in a particular subject area, because they may lack the skills necessary to infer specific items of verbal information from more general principles. For example, a teacher will be able quickly and reliably to conclude from most fact patterns whether a battery has occurred. Students require substantial skills training to be able to reach that conclusion with the same speed and sureness. In the case of extremely complex verbal information, they may never acquire the facility that professors have. Until they acquire that ability, expressly supplying the verbal information is necessary.

Techniques for teaching verbal information are the same as those used to make any information memorable. The same techniques you would use in writing the facts section of a brief can be used to make information memorable to students. Structure information by using story telling, chronology, or cause-effect relationships.

Non-verbal approaches can also be helpful. Use tables to provide a visual relationship in comparing things item-by-item. (Our tables are examples of this.) Also, use graphics to depict the relationships among ideas. (The section on procedures provides flowcharts as an example of this.)

Use rehearsal, preferably involving thinking aloud, because the more that people process information through thinking, the better they learn it. Use mnemonics, but only where natural associations are unavailable. (Interestingly, we see very little use of mnemonics among our students until it comes time to study for the bar, and then the mnemonics are often ill chosen.)

Concepts

Concepts are classifications or categories. Applying a concept requires being able to recognize what fits into a category and generate examples. To continue our examples,

- Being able to divide fruits and vegetables into separate piles would indicate knowledge of the concept of fruit.
- Likewise, recognizing as liquidated damages a contract clause specifying that \$100 a day be paid for delayed performance would indicate knowledge of the concept of liquidated damages.

In teaching concepts, it is important to ask for the definition of the concept before using examples. Having the definition of a concept in mind will make it easier to apply the concept, although that may not be a necessity, strictly speaking. (Examples for which it is not a necessity are easier to come by outside of law. For example, one can distinguish between compositions by Bach and Vivaldi without being able to explain why one can make the distinction. Because law is so verbal, most distinctions have an explicit definition associated with them. Justice Stewart is responsible for a famous exception, saying of obscenity, “I know it when I see it,” even while conceding that he might never succeed in defining it.³ However, he was a Supreme Court Justice. Those of us appearing on the other side of the bench are likely to be asked for definitions, rather than being allowed to proceed by providing examples.)

When using examples, start with a “best example”—examples in which the application of the definition is obvious. Only then proceed to more difficult cases. For example, to teach the contact element of battery, start with a punch, and then use harder examples, like tugging on someone’s cane (contact that is not obviously with the person), poisoning someone’s food

3. *Jacobellis v. Ohio*, 378 U.S. 184, 197 (1964).

(indirect contact), or blowing smoke in someone's face (not obviously contact at all).

Once having provided initial best examples and some less obvious examples, provide paired examples and non-examples. Paired examples and non-examples are similar in unimportant respects but different in the critical respect. Here is a paired example and non-example for battery:

- **Battery:** "Calvin throws a snowball at Susie's back and hits her."
- **A non-example of battery:** "Calvin throws a snowball at Susie's back but misses."

Matching similar examples and non-examples together allows students to isolate the attribute that is crucial to the classification, here, the contact with another person's body.

The following is a non-example of a paired example and non-example:

- **Battery:** "Calvin throws a snowball at Susie's back and hits her."
- **A non-example of battery that is not paired with the original example:** "Calvin throws a snowball at Susie's face but misses."

The reason the latter pairing is not a paired example and non-example is that the second item differs from the first in two respects: it lacks the contact that the first one has, and it probably has an element of apprehension that the first one is lacking. The professor may be trying too much by simultaneously providing paired examples and non-examples of both assault and battery.

The first set, by contrast, is fairly simple, and so may avoid confusing students. Providing examples and non-examples that are more complex than this is asking for trouble. Especially with first-year students, if one wants to use such complex examples (perhaps because they are drawn from real cases), one should draw the attention of the students to the multiple respects in which the example and the non-example differ.

Principles

A principle is a rule relating two or more concepts. Applying a principle requires recognizing the concepts involved and applying the rule relating them.

Here are examples of principles:

- Eating fruits promotes health.
- Liquidated damages will be awarded if they are a reasonable estimate of the actual or anticipated damages.

Good “best examples” of principles come from the natural sciences, because natural science principles tend to be immutable and not to have exceptions. For example, the rules for liquidated damages have changed over time, and Boyle’s law—for example—is a much better approximation of reality than many simple descriptions of judicial behavior.

The best practices for teaching principles resemble the best practices for teaching concepts. Thus, you should begin by teaching the underlying material (concepts and the declarative knowledge defining the concepts) and the declarative knowledge describing the principle.

There are some exceptions to the resemblance between teaching principles and teaching concepts. First, with principles, consider using a discovery approach in which you provide examples of a principle’s application and ask students to infer the principle. Mike Schwartz has an excellent set of materials using a discovery method to teach students the difference between binding and persuasive precedent. The materials provide examples and non-examples of binding authority and have students work in groups to identify the principle.

Second, identify and address common errors, but only after providing correct examples of the principle’s application. In contracts, the rule is that a statement must contain a present manifestation of intent to agree to be an offer or acceptance. However, students tend to think that stating all the relevant terms necessarily manifests an intent to agree. Expressly correcting this mistake will improve students’ learning.

Finally, close the lesson by stating the principle and describing its future relevance. That may be because of its application in a procedure, the next subject we cover.

Procedures

A procedure is a set of unambiguous steps to accomplish a goal. Knowledge of a procedure requires:

1. being able to state the steps of the procedure;
2. recognizing the concepts involved in the steps of the procedure; and
3. following the steps of the procedure in the proper sequence.

Procedures resemble principles and are often based on principles. For example, the principle that subject-matter jurisdiction is a pre-requisite for any judicial determination leads to the procedure for analyzing the jurisdiction of the court that begins with subject-matter jurisdiction and only then turns to personal jurisdiction.

Procedures often include decision steps that determine what step is taken next. Here is a procedure for grading oranges:

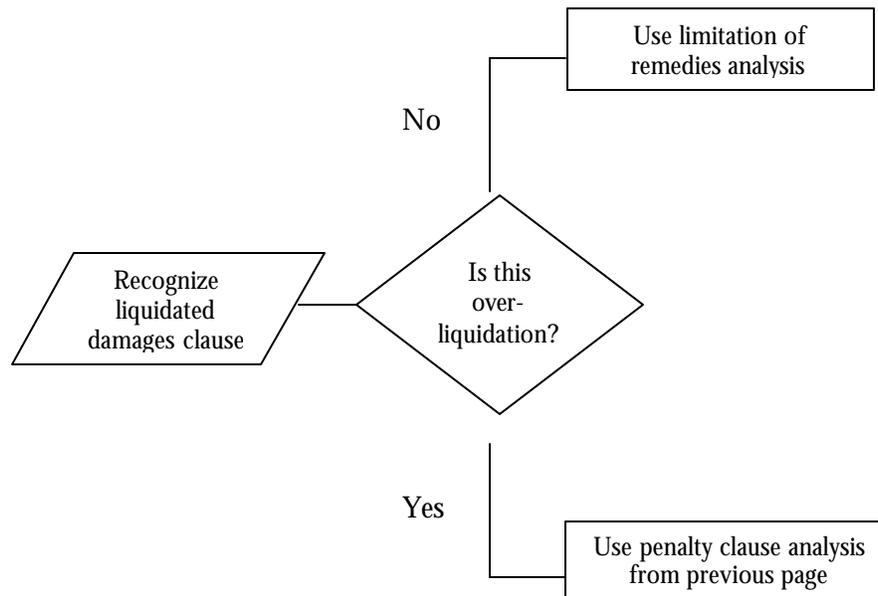
1. Select the grid with smallest holes on it.
2. Place an orange on the grid.
3. If the orange falls through hole, it gets the grade of the hole. Otherwise, go to step 4.
4. Is there a grid with larger holes? If so, increase hole size and repeat the process beginning with step 2.
5. Any remaining oranges are graded jumbo.

Here is an example of a procedure to determine whether a liquidated damages clause in a contract governed by the Uniform Commercial Code is unenforceable as a penalty:

1. Is the stipulated amount reasonable in light of the anticipated damages and the difficulty of estimating them? If so, enforce the clause. Otherwise, go to step 2.
2. Is the stipulated amount reasonable in light of the actual damages and the difficulty of estimating them? If so, enforce the clause. Otherwise, go to step 3.
3. Deny enforcement.

Grading oranges is a very simple procedure that has only one decision point. The enforceability of a liquidated damages clause is more complicated, because elements in the procedure require more judgment: what is reasonable? In addition, the immediately preceding example on liquidated damages includes decision steps in both steps 1 and 2.

Sometimes, it is helpful to use flowcharts to demonstrate procedures. The following page contains an example of a flowchart for liquidated damages under the U.C.C.

**A Flowchart for Liquidated Damages
under the U.C.C.**

This procedure has several characteristic features. First, this example of a procedure incorporates decisions that alter the branching of the procedure. In that respect, it resembles the verbal procedure given two pages ago. When procedures have branches, not all possible steps of a procedure need be completed in a particular run through the procedure.

Second, this procedure is an example of a procedure that incorporates steps that are themselves procedures. Teaching procedures in clusters like this is very effective, because it allows students to learn a limited subset of materials at one time, thereby facilitating learning.

Third, a procedure may exist, even though the steps of a procedure may be too ambiguous to be called procedures themselves. This is fairly common in legal problems. For example, in analyzing whether injunctive relief should issue, it may be possible to teach students the following procedure:

1. Identify the legal remedies.
2. Determine whether legal relief is adequate. If legal relief is adequate, deny equitable relief; otherwise, go to step 3.

3. (The step is reached only if legal relief is inadequate.) Consider the factors bearing on the court's exercise of equitable discretion.

Step 3 is far too ambiguous to be called a procedure. However, the overarching procedural structure provides useful knowledge for the students, even if parts of it require the exercise of large amounts of judgment.

Flowcharts can be good tools for teaching procedures. They can be easily produced with the aid of standard word-processing programs (for example, with Microsoft Word's® "draw" toolbar) and then saved as rich-text format files, for transmission over computer networks to students. With similar tools, they can be placed in Powerpoint® presentations to the class.

They have some limitations as classroom tools. First, flowcharts take a long time to comprehend or to copy. Hand-drawing diagrams on the blackboard (or whiteboard) has the advantage that the professor is unlikely to get very far ahead of the students.

Second, flowcharts become too visually cluttered to be useful in conveying a complex set of rules in one diagram. Chunking material, so that one flowchart has an overview that incorporates other charts, avoids some of this problem. That technique is used in this flowchart.

Flowcharts provide a useful alternative to text-based approaches for some students, but other students will not like them. One solution to this problem is to give students some background in using flowcharts—an example of a cognitive strategy, which we will discuss more later—and students should be encouraged to make flowcharts for themselves. Perhaps at the outset, the professor can do the flowchart entirely by herself. Later on, she can use questions to guide the students through the in-class construction of a flowchart. Finally, students can be assigned to do one or two flowcharts on their own. Those students who find flowcharts helpful will continue to use them.

Teaching procedures is like teaching principles, but be sure to describe the procedure and why it is useful. Do not use a discovery strategy, because that allows students to acquire alternative approaches to the one you are teaching. (Of course, if you do not think the procedure that you are teaching is more useful than alternatives, you may not care. But in that case, perhaps you should not bother to teach the procedure in the first place.)

Here is some advice on the best practices for teaching procedures:

1. Make steps in the procedure simple, imperative statements beginning with a verb.

Like this one!

2. At each step, state the correct approach, provide practice, and identify common errors.

For example, students usually assume that a liquidated damages clause will only be challenged as a penalty and not as an improper limitation of remedy. You should identify this common error in analysis while teaching the procedure.

3. When a procedure is complicated, start by teaching a simplified version of a procedure or the most commonly encountered paths in a procedure.
4. Include as the last step of a procedure a check to determine whether the result makes sense.

For example, a check for subtraction is adding numbers back up to make sure you have subtracted correctly. A practical difficulty with providing a check in a procedure is that checking whether a result makes sense may require the sort of experience or common sense that one would hope the procedure would obviate.

Procedures differ from problem solving, which we will cover next, in having an algorithm for their solution. We have come to believe that, especially for beginning or weaker students, things that could be seen as complex problem solving might be best taught as procedures, and that a professor will get better results by carefully outlining a procedure for students to follow in analyzing problems. Of course, a long-run goal should be having the students learn the capability of generating their own procedures for analyzing problems.

Domain-Specific Problem Solving

Problems are unsatisfactory situations that do not have clear-cut paths to a solution. Here are examples:

- How do I get compensation for my injured client?
- How can I obtain the evidence I need and the evidence the other side will rely on?
- How should I research an unfamiliar area of law?

The “domain-specific” in domain-specific problem solving refers to a particular area, or domain, of knowledge. The problem solving incorporates knowledge and skills from that area. Domain-specific problem solving requires knowing the relevant verbal information, concepts, procedures, and principles and being able to apply them in original ways.

As with procedures, it is best to start by teaching simplified or prototypical versions of the problem. In teaching domain-specific problem solving, teach both the underlying principles and how to combine them for problem solving, not just one or the other. (When we talk about teaching the underlying principles here, we are using the word in its non-technical sense to include things Gagné would categorize as principles, procedures, concepts, and verbal information.)

For several reasons, professors often fail both to teach a sufficient repertoire of underlying knowledge and to combine them. First, as we mentioned in our discussion of verbal information, some professors underestimate the importance of facts. Second, the rush at the end of the semester leads many to not teach how to combine underlying principles, thus neglecting instruction in problem solving techniques. Many professors assume, incorrectly, that students can figure out on their own how to combine principles to solve problems.

Teachers in the so-called substantive classes need to be teaching skills along with the doctrinal knowledge. Indeed, because experts have large amounts of factual knowledge, the need to amass factual knowledge to simulate the problem-solving techniques of true experts may mean that some problem-solving skills are best taught in the context of advanced substantive courses. Thus, it would be difficult for a generalist lawyer to engage in solving an environmental law problem with the same sophistication as an environmental law expert.

Many sources advise structuring instruction according to the four stages of problem solving:

1. Describing a Problem
2. Planning a Solution
3. Implementing a Solution
4. Evaluating a Solution

One can think of this problem solving approach generally as analogous to the tasks one would undertake when writing an exam answer:

| Four stages of problem-solving | Four stages of exam-writing |
|---------------------------------------|---|
| Problem description | Identifying the call, issues, and facts |
| Solution planning | Thinking through the analysis |
| Solution implementation | Writing the answer. |
| Solution evaluation | Reviewing the answer. |

Although this is a useful template, problem solving is often a recursive process, so that evaluating a proposed solution (step 4) may lead to another attempt at planning and implementing a solution (steps 2 and 3). In addition,

we have some reservations about this approach for many problem-solving tasks in law school or in any other domain where solutions are implemented merely through writing out exercises. In such areas, it seems to us, the process of implementing a solution is very similar to planning a solution. For example, the task of planning a memorandum (outlining it, say) is very similar to the process of implementing. By contrast, tasks that take place in three-dimensional reality—finding the best arrangement of furniture in a room, say—more often lead to insights in the process of implementing a solution.

Despite the limitations of this approach, we will use its steps to structure our own treatment.

1. Describing the Problem

In problem description, encourage students to express verbally the task requirements.

- “What does the client want?”
- “What theories are available?”
- “What are the constraints on the client?”
- “What is the call of the question?”

Encourage students to represent a problem in different ways. These alternative representations can lead to alternative solutions to a problem. For example, suppose the issue is whether someone should be held to a contract that she has not read. One initial phrasing of the problem is likely to be, “How should the courts deal with the problem of people who do not read the contracts they are signing?” Problem solvers might also mention the will theory of contracts as an obstacle to achieving a solution, because the signer of such a contract may not actually intend the terms of the agreement. Someone who phrases the problem in that way is likely to solve the problem by adopting an objective theory of contracts, protecting the reliance interest of the person who apparently contracted with someone who did not read her contract.

An alternative representation can lead to insight. To continue the example of the non-reader of the contract, one might phrase the problem as, “What can we do to promote people reading their contracts?” One might reach that statement of the problem by recognizing an inconsistency between reality and the assumption that people read their contracts. That representation of the problem would lead to an inquiry into how courts could encourage people to write contracts so that they would be comprehensible. This might lead to rules barring enforcement of terms that could not reasonably be read (because in small print or because long contracts were presented at the last minute) or comprehended (because of inscrutable language).

Later, the professor can guide the students through a think-aloud analysis by prompting them with cues and questions as the students work through their thinking in small groups, in pairs, or on their own. As students become more proficient, the questions can become less and less specific. Particularly useful is having the students generate analogies by asking questions like, “What is this like?” Or, “How have courts resolved similar policy problems in other doctrinal areas?”

Less focused questions can encourage students to develop more general problem-solving techniques that they can then apply on their own to problems different from those that they have encountered in course materials.

In general, the idea is to provide the students with the least support necessary for them to solve the problem. That way, they do more work on their own and learn more. Unfortunately, professors sometimes confuse the idea of providing the students with the least support necessary for them to solve the problem with the idea of providing the least support, period. Teachers should evaluate the students’ abilities honestly. Teaching to students as one wishes them to be is a recipe for failure. If students do not learn how to solve a problem, the teaching has failed. Blaming this on students may lead to professorial self-satisfaction, but the result is educationally the same.

4. Evaluating a Solution

Evaluating a solution involves asking the same sorts of common-sense questions that need to be asked after completion of a procedure. Is this reasonable? (How does your proposed argument square with fairness and common sense?) Does it have any bad effects in other areas? (For example, if you represent an insurer or the IRS, does winning this issue in this case expose you to very bad results in other cases?)

Example of Analyzing a Learning Task: Should a Court Grant Specific Performance of a Contract?

This is a complex problem, but much of the process for addressing the problem can be taught as a procedure, which includes problem-solving steps.

Step 1: Identifying the principles governing the question.

Solving this problem depends on knowing a principle regarding specific performance: “Specific performance will be granted only if the legal remedy is inadequate.” The words expressing this principle are verbal information (declarative knowledge), so the professor needs to teach these words, just as she would need to teach the words of a definition of a concept.

Step 2: Identifying a procedure to approach the problem.

The professor can teach a procedural approach to addressing the problem:

- To determine whether to grant specific performance,
1. identify the legal remedies;
 2. determine whether the legal remedies are inadequate; and
 3. if the legal remedies are inadequate, consider equitable remedies, balancing the public interest, the practicality of equitable enforcement in terms of the burden on the court and the burden on the defendant in relation to the benefit to the plaintiff, etc.

Especially in the early part of law school, many law students will benefit from the professor's expressly teaching a procedure, rather than stating a principle and requiring the students to acquire the procedure by themselves. At the same time, students should be taught the benefits of developing their own procedures for solving problems. This comes naturally to them in analyzing exam questions before writing their own answers.

The professor needs to teach the verbal information describing this procedure in much the same way as she would teach the principle.

Step 3: Identifying the subordinate concepts and declarative knowledge.

Applying the principle and the procedures requires the student to know the verbal information (declarative knowledge) and concepts contained in the principle and the procedure.

Example—specific performance:

The principle involved is: "Specific performance will be granted only if the legal remedy is inadequate." Underlying that principle are several concepts that require specialized legal knowledge—specific performance, legal remedy, and inadequacy. So, those concepts must be taught before the principle can be grasped.

Concepts have been learned when the learner recognizes something as fitting within a concept. Thus, an appropriate concept goal for "specific performance" would be:

- Being able to recognize a court order to deliver title for land she promised to sell, as an order for specific performance.

Concepts usually require knowledge of the underlying definitions of the concepts. The verbal information corresponding with this concept is the following:

- “Specific performance is a court order requiring someone to perform a contractual promise.”

Students would have to be able to state that verbal information or provide a paraphrase. (Recognition, although counting as the learning of verbal information, is rarely adequate itself in law.)

With this knowledge in hand, students can identify a possible goal—an order requiring the defendant to deliver title to land. If the goal is desirable to their clients (real or hypothetical), they can then work on the steps of the procedure.

Example—legal remedies:

The first step of the procedure requires identifying legal remedies. The concept of “legal remedies” is difficult for students to grasp, because it lacks a contemporary unifying principle. Students tend to believe that the concept of legal remedies includes solely monetary relief. Similarly, they tend to believe that anything that is non-monetary is equitable, and that tendency is particularly strong where the relief gives the plaintiff the exact thing to which he was entitled, as opposed to a substitute. Of course, that is incorrect: replevin and ejectment both involve non-monetary, specific relief. The prudent professor will address these common mistakes in attempting to teach the concept.

Example—equitable balancing:

Equitable balancing is probably too complex a topic to be taught as a procedure. Instead, the professor will have to list things to be considered—unclean hands on the part of the plaintiff, the degree to which legal remedies are inadequate, the seriousness of the defendant’s transgressions, the degree to which supervision is burdensome— and provide examples of how to address the problem.

Examples of balancing these considerations can come from judicial opinions. However, judicial opinions by themselves may be inadequate, because lawyers will generally have to strategize about how to structure cases so as to increase the likelihood of getting desirable relief. Judicial opinions do not have this perspective. Consequently, it is good practice for professors to provide a “think aloud” from the perspective of an attorney planning a case.

Closing Thoughts

In teaching complex problems, follow the steps that we have just used:

1. Break complex tasks into sub-tasks and continue decomposing the sub-tasks until you are done.
2. Identify the kind of knowledge or skill for each sub-task.
3. Use the best practices for each sub-task.
4. Teach the sub-tasks individually and then in combination.

Teaching the sub-tasks—concepts, principles, and procedures—requires use of examples, not just instruction in the definition of a concept or the words of a principle or procedure. This is an easy mistake for teachers to make because teachers, who are experts in a subject area, tend to know material as rules and derive specific applications from rules. Students, on the other hand, learn rules by generalizing from specific examples and have difficulty going from a definition to an example.

Because of the constraints of time, our initial presentation at the conference of the Association of Legal Writing Directors did not include material on teaching attitudes or cognitive strategies. We have included brief materials on them here in Appendix B.

In teaching attitudes, the importance of the professor as role model is critical. That has two aspects. First, you should make yourself someone whom the students view as a reliable role model. That does not mean brutalizing students with sarcastic comments, of course. Patient explanation can be as helpful as sarcasm in demonstrating knowledge of the subject matter and goes a good deal further in making one an attractive model. And, of course, one must model the desired behavior. The professor who wants student to arrive to class on time and frequently arrives late himself is going to find his words outweighed by his actions.

We have tried to demonstrate ways of teaching cognitive strategies throughout this material, such as diagramming and using tables, providing frequent cross references to build mental links between materials, and providing examples of concepts. We hope that we have made this material as clear as possible and that you find it helpful, but we fear falling greatly short of our aspirations.

Appendix A—Bloom's and Gagné's Educational Taxonomies

Types of learning categorize knowledge and skills in different ways. Two important ways of categorizing types of learning are those of Robert M. Gagné, contained in his *Conditions of Learning* (4th ed., Holt, Rinehart, & Winston 1985) and that of Benjamin Bloom and his co-workers. See Benjamin S. Bloom et al., *Taxonomy of Educational Objectives* (David McKay ed., 1956).

A difference between the Gagné and Bloom classifications is that the Gagné classification emphasizes a distinction between knowing the words of definitions and being able to apply definitions.

The following table relates the two taxonomies. However, no simple translation between one and the other is possible.

| Gagne's Taxonomy | Bloom's Taxonomy |
|--|---|
| <p>Declarative knowledge Knowing that something is so.</p> <p>One can recite a definition without being able to apply it. In Gagné's analysis, declarative knowledge is purely verbal and can further be classified by whether the definition is recalled or merely recognized, and by whether the knowledge is verbatim or paraphrase. Paraphrase resembles Bloom's category of comprehension, as demonstrated by translation.</p> | <p>Knowledge Being able to recall or recognize an idea.</p> <p>In Bloom's taxonomy, knowledge involves recalling or recognizing material in a form similar to that in which it was originally taught.</p> |
| <p>Concepts Being able to classify something.</p> <p>The ability to classify usually requires learning the definition of the category. In addition, it requires moving beyond the words to the underlying idea. An example would be the ability to classify conduct as a battery or to classify battery as an intentional tort.</p> | <p>Comprehension Being able to understand the meaning of material.</p> <p>Comprehension can be demonstrated by translation or paraphrase; by interpreting or explaining material; and by extrapolation, that is, by making inferences from the material.</p> |

| | |
|--|--|
| <p>Principle knowledge Being able to relate two or more concepts.</p> <p>Being able to decide that conduct was a battery and awarding damages as a remedy. That involves relating the concepts of battery and damages and knowing the underlying principle relating them.</p> | <p>Application Being able to select knowledge And use it to solve an Unfamiliar problem.</p> <p>Because problems involve a problem state and a solution state, this will require at least knowledge of principles, and perhaps what Gagné would call domain-specific problem solving. The example of battery, given under principle knowledge, would be an example of Bloom's category of application.</p> |
| <p>Procedural knowledge Being able to follow a set Of unambiguous steps to accomplish a goal.</p> | <p><i>No Special Category</i></p> |
| <p><i>No Special Category</i></p> | <p>Analysis Being able to break down Material into its constituent parts.</p> <p>Analysis often involves a procedure, but not always. Consequently, they are listed in separate rows. Briefing a case and interpreting a rule are examples of analysis.</p> |
| <p>Domain-specific problem solving Being able to apply other forms of knowledge to solve ill-defined problems in an area of knowledge.</p> | <p>Synthesis Being able to combine knowledge from multiple sources into a new organization.</p> <p>This requires creative behavior, and so would be a form of domain-specific problem solving.</p> <p>Evaluation Being able to use specified criteria and standards to make judgments.</p> <p>Judgment requires creativity, and therefore is also a form of domain-specific problem solving.</p> |
| <p>Attitudes A propensity to act in a certain way.</p> | <p><i>No special category</i></p> |
| <p>Cognitive Strategies Knowing strategies for learning and thinking and being able to use them.</p> | <p><i>No special category</i></p> |

The main reason we prefer Gagné's classification for purposes of lesson design is that it distinguishes between verbal information and concepts. This distinction is both elusive and important. It is elusive because the ability to paraphrase, which Gagné treats as verbal information, could come from the recognition of the reality behind the definition, and hence from knowledge of the concept. Thus, we can understand why many educators emphasize the Bloom classification.

Despite this difficulty, there are three reasons why legal educators may find the Gagné classification more helpful in lesson design.

First, formal definitions are unusually important in law. Therefore, law emphasizes teaching definitions with more attention to verbal precision than in other fields, so that the importance of paraphrase as an ultimate goal is reduced. (Of course, paraphrasing, as well providing examples, is a good way for students to monitor whether they have acquired a concept.) That makes the fuzziness of the Gagné distinction less important.

Second, many law students erroneously believe that memorizing the words of a definition automatically gives them mastery of the underlying concept. By emphasizing the distinction between verbal knowledge and concepts, Gagné's classification encourages law students to recognize the inadequacy of merely knowing the words of a definition.

Third, Gagné's classification provides easy access to specific implications for lesson design. Patricia L. Smith and Tillman J. Ragan, in *Instructional Design* (2d ed., Wiley 1999), provide a description of educational objectives and the best practices for attaining educational objectives that is far more detailed than any we could offer here. Of course, it is not at all oriented to the specific situation of law teachers or for law teachers' prior learning.

Of course, to say that we prefer Gagné's classification for purposes of lesson design is not to say that it is the classification to be preferred for all purposes. Both Gagné's and Bloom's classifications have their advantages. Gagné's classifications remind us that attitudes are a subject of instruction. Outside of professional responsibility classes, instruction in attitudes is not usually the ultimate goal of most law school classes, but it is an important subordinate goal. Much of what we want students to do in order to learn—for example, briefing cases outside of class—turns on successful attitudes, because they are activities that we cannot monitor directly.

On the other hand, Gagné's category of "domain-specific problem solving" tends to swallow up all others. Bloom's taxonomy allows for further discrimination of skills within that general classification and hence provides a useful stimulus to a more acute setting of learning goals and better examination techniques. On this last point, see Paul S. Ferber, *Bloom's Taxonomy: Teachers' Framework*, *The Law Teacher*, 4-5 (Spring 1997) (available at <<http://law.gonzaga.edu/ILST/Newsletters/Spring97/ferber.htm>>).

For a quick summary of Bloom's and Gagné's taxonomies, respectively, see *id.* and Michael Hunter Schwartz, *Teaching Law by Design: How Learning Theory and Instructional Design Can Inform and Reform Law Teaching*, 38 San Diego

L. Rev. 347 (2001). For more detailed treatments on the two taxonomies, see Benjamin S. Bloom et al., *Taxonomy of Educational Objectives* (David McKay ed., 1956), and Robert M. Gagné, *The Conditions of Learning* (4th ed., Holt, Rinehart, & Winston 1985).

**Appendix B—A Summary of the Types of Learning and
Best Practices for Teaching Them**

DECLARATIVE KNOWLEDGE

| Definition | Examples | Critical Learning Conditions | Specific Advice on Teaching |
|---|--|--|--|
| <p>Declarative knowledge is verbal information. In law, it is usually a definition. It can be tested through the learner's:</p> <ol style="list-style-type: none"> 1. ability to state a definition, either verbatim or as paraphrase; or 2. ability to recognize a definition, either verbatim or as paraphrase. | <p>Knowing that battery is defined as the intentional infliction of harmful contact.</p> | <ol style="list-style-type: none"> 1. Draw attention to distinctive features by variations in print or speech. 2. Present information so that it can be made into chunks. 3. Provide a meaningful context for effective encoding of information. 4. Provide cues for effective recall and generalization of information. | <p>Provide organization, and consider using these ways of doing it:</p> <ol style="list-style-type: none"> 1. Expository structures. These use story telling, chronology, or cause and effect to convey the material. 2. Classification frames. Basically, a table, comparing things item by item. 3. Concept mapping. A graphic means of depicting relationships among ideas. 4. Advance organizers, providing an overview of the lesson. 5. Metaphor. Can help create images. Learners may be unfamiliar with the vehicle for the analogy or fail to identify the limitations of the analogy. 6. Rehearsal. In its best form, rehearsal involves thinking aloud. 7. Mnemonics. Use mnemonics only where natural associations are unavailable. |

CONCEPTS

| Definition | Examples | Critical Learning Conditions | Specific Advice on Teaching |
|---|---|---|--|
| <p>Concepts are classifications. Conceptual knowledge can be tested through the learner's ability to:</p> <ol style="list-style-type: none"> 1. classify previously unknown things or fact-patterns correctly; and 2. supply her own examples of things or fact - patterns that fit or do not fit the classification. | <ol style="list-style-type: none"> 1. The learner can identify a fact pattern as raising a battery issue. For example, given the fact pattern, "Lizzy killed her step-parents by hitting them in the head with an axe," the learner can identify this as a battery. 2. The learner can supply her own example of a battery on demand. | <ol style="list-style-type: none"> 1. Call attention to distinctive features. 2. Stay within the limits of working memory. 3. Stimulate the recall of previously learned component skills, the definition of the concepts. 4. Present verbal cues to the ordering or combination of component skills. 5. Schedule occasions for practice and spaced review. 6. Use a variety of contexts to promote transfer. | <p>Like teaching declarative knowledge, but</p> <ol style="list-style-type: none"> 1. Stimulate recall of the definition of the concept, which will generally be prerequisite knowledge. 2. Proceed gradually from the best example to more difficult cases. Start with a clear example of battery, such as Lizzie Borden's using an ax on her parents, not with a doubtful example, such as the use of sound waves to stun people. (This is a doubtful example on the element of contact.) 3. Reduce over- and under-generalization by <ol style="list-style-type: none"> a. presenting paired examples and non-examples; and b. specifying or eliciting the relevant attributes when discussing examples and non-examples. |

PRINCIPLES

| Definition | Examples | Critical Learning Conditions | Specific Advice on Teaching |
|---|--|--|---|
| <p>Principles describe relationships among concepts. Knowledge of principles can be tested through the learner's ability to:</p> <ol style="list-style-type: none"> 1. state the principle; 2. identify the underlying concepts; 3. apply the principle correctly; and 4. evaluate an application of the principle for correctness. | <ol style="list-style-type: none"> 1. The student can state the principle, "One committing a battery is liable in damages even for unintended consequences." 2. Given the fact pattern, "Putney wanted to irk his schoolmate Vosburg and so kicked him in the shin, causing unexpectedly severe injury," the learner can identify this as a battery and apply the principle that one committing a battery is liable in damages even for unintended consequences. | <ol style="list-style-type: none"> 1. Call attention to distinctive features. 2. Stay within the limits of working memory. 3. Stimulate the recall of previously learned component skills, the concepts, and the definitions of the concepts. 4. Present verbal cues to the ordering or combination of component skills. 5. Schedule occasions for practice and spaced review. 6. Use a variety of contexts to promote transfer. | <p>Like teaching concepts, but</p> <ol style="list-style-type: none"> 1. Stimulate recall of: <ol style="list-style-type: none"> a. the relevant concepts; b. their definitions; and c. the statement of the principle. 2. Gain attention by presenting puzzling examples. Example two is puzzling because it may be an unexpected result. 3. Proceed gradually from the best example to more difficult cases. 4. Unlike teaching concepts, teaching principles does not require presenting paired examples and non-examples except when teaching the identification of the underlying triggering concepts. 5. Consider leaving on the board a statement of a principle during the early part of a lesson. 6. Explain the reasons underlying principles. Law students easily forget apparently counter-intuitive principles; explaining them increases retention. 7. The close of the lesson should state the principle, especially if the discovery method has been used, and indicate the future relevance of the principle. |

PROCEDURE

| Definition | Examples | Critical Learning Conditions | Specific Advice on Teaching |
|--|---|--|--|
| <p>A procedure provides an unambiguous series of steps to accomplish a goal. The steps may include decisions, which will trigger alternative branches of the procedure. Knowledge of procedures can be tested through the learner's ability to:</p> <ol style="list-style-type: none"> 1. state the procedure; 2. identify the underlying concepts; 3. apply the procedure correctly; and 4. evaluate an application of the procedure for correctness. | <ol style="list-style-type: none"> 1. Initiating a lawsuit by filing a complaint with the court and appropriately serving process. 2. The process for analyzing whether a liquidated damages clause is valid. | <ol style="list-style-type: none"> 1. Call attention to distinctive features. 2. Stay within the limits of working memory. 3. Stimulate the recall of previously learned component skills, the statement of the procedure, and any included concepts and their definitions. 4. Present verbal cues to the ordering or combination of component skills. 5. Schedule occasions for practice and spaced review. 6. Use a variety of contexts to promote transfer. | <p>Like teaching principles, but</p> <ol style="list-style-type: none"> 1. Use an expository strategy, not an inquiry strategy, and describe the utility of the procedure. 2. State the procedure as follows: <ol style="list-style-type: none"> a. Make steps simple. b. Make steps imperative statements beginning with a verb (like these!). <ol style="list-style-type: none"> c. Use dichotomous decision trees where possible. 3. At each step: <ol style="list-style-type: none"> a. Provide practice. b. State common errors, but only after providing the correct approach. 4. Distinguish between simple procedures (no branching, at most five to seven steps) and complex procedures (all others). <ol style="list-style-type: none"> a. For simple procedures, preview by simply going through the procedure. b. For complex procedures, preview by chunking steps into groups and move from a more common path to rarer paths or from one tree to multiple trees. <p>Example: Greg treats battery by starting with the simple case and moving to more complex cases with sub-rules.</p> |

DOMAIN-SPECIFIC PROBLEM SOLVING

| Definition | Examples | Critical Learning Conditions | Specific Advice on Teaching |
|---|---|---|---|
| <p>A problem is something which has no readily apparent solution. Problem solving involves combining previously learned principles, procedures, concepts, and declarative knowledge and using cognitive strategies to resolve a previously unencountered problem. It can be assessed by a think-aloud process in which a student receives a problem, describes how she or he would address it, and evaluates that solution.</p> | <p>Analyzing a legal problem, incorporating multiple legal principles and considering the client's needs. Many law school exams may be too well defined to be considered domain-specific problem solving, because they involve the straightforward recognition of concepts and application of principles.</p> | <ol style="list-style-type: none"> 1. Call attention to distinctive features. 2. Stay within the limits of working memory. 3. Stimulate the recall of previously learned component skills, the relevant declarative knowledge, concepts, principles, and procedures. 4. Present verbal cues to the ordering or combination of component skills. 5. Schedule occasions for practice and spaced review. 6. Use a variety of contexts to promote transfer. | <ol style="list-style-type: none"> 1. Problem solving has four stages: <ol style="list-style-type: none"> a. problem representation; b. solution planning; c. solution implementation; d. solution evaluation. 2. How to present: <ol style="list-style-type: none"> a. Use simplified or prototypical versions of problem first. b. Encourage verbalization of task requirements. c. Model think-alouds. d. Teach decomposition of problem into sub-goals. e. Teach isolation of critical attributes of given and goal states. f. Encourage alternative forms of problem representation. g. Encourage generation of analogies. 3. Common pitfalls: <ol style="list-style-type: none"> a. teaching underlying principles without combining them for problem solving; and b. teaching problem solving without covering the prerequisite principles. |

ATTITUDES

| Definition | Examples | Critical Learning Conditions | Specific Advice on Teaching |
|---|---|---|---|
| <p>An attitude is the propensity to act in a certain way. Attitudes have three components:</p> <ol style="list-style-type: none"> 1. knowing the desired behavior; 2. wanting to perform it; and 3. performing it. <p>You can assess on each aspect, but it is easier to assess knowledge of the behavior than actual use of the behavior. For example, it is easier to test knowledge of an ethical rule than students' propensity to adhere to it in practice.</p> | <ol style="list-style-type: none"> 1. When faced with a decision in which the lawyer's financial interests conflict with the client's, the lawyer will choose either to obtain informed consent after explaining the conflict to the client or terminate the representation. 2. When faced with the opportunity to use a canned brief or write a brief herself, the student will write a brief herself. | <ol style="list-style-type: none"> 1. Establish an expectancy of success associated with the desired attitude. 2. Assure student identification with an admired human model. 3. Arrange for communication or demonstration of choice of personal action. 4. Give feedback for successful performance or allow observation of feedback in the human model. | <ol style="list-style-type: none"> 1. In law school, the most important attitude is the propensity to work hard to learn, and the critical underlying belief is that the learner's efforts are efficacious. 2. Teach students the desired behavior. Many students with poor study habits want to study effectively, but do not know how. 3. Show how the attitude and the associated behavior create success – for example, that study efforts result in good grades and success in practice. 4. Provide early success, to persuade students that they can succeed and enhance your credibility. 5. Offer successful role models. Students and graduates may be easier objects for identification than faculty. Student tutors can more successfully model out-of-class behaviors (e.g., writing briefs) than faculty. Small-group work allows students to be models for each other and provides successful students with reinforcement. 6. Communicate the expertise of any role models, including yourself. 7. Be wary of the unintended effects of criticism. Criticizing a student's case briefing or classroom speaking may encourage canned briefs and silence, rather than promoting better effort. |

COGNITIVE STRATEGIES, PART I

| Definition | Examples |
|---|---|
| <p>Cognitive strategies can be either learning strategies or thinking strategies.</p> <p>Learning strategies can be assessed like principles and procedures. The learner must:</p> <ol style="list-style-type: none"> 1. state the strategy; 2. identify the underlying concepts; 3. apply the strategy correctly; and 4. evaluate an application of the strategy for correctness. <p>Thinking strategies can be assessed by a think-aloud analysis, as with domain-specific problem solving.</p> | <p>Learning strategies include:</p> <ol style="list-style-type: none"> 1. using a comparison table to summarize knowledge; and 2. using a single-use encoding device to learn the elements of a trust. <p>Successful thinking strategies vary, but include:</p> <ol style="list-style-type: none"> 1. analysis of the existing and desired states, to draw out all features of a problem. For example, redefining the issue of how to deal with unread contracts on page 279; 2. devices to provoke original thought; 3. staged analysis, with criticism deferred to encourage ideas; 4. devices to avoid individuals being identified with and advocates for particular ideas; and 5. ways of avoiding premature adoption of second-best solutions. |

Thinking strategies are an especially complex area. Moreover, there is less agreement on effective thinking strategies than on other types of learning. Consequently, the list of strategies we provide here is suggestive, rather than exhaustive. For more on thinking strategies, see such general sources as Edward de Bono, *Six Thinking Hats* (Viking 1986); Edward de Bono, *de Bono's Thinking Course* (rev. ed., Facts on File 1985); John D. Bransford & Barry S. Stein, *The Ideal Problem Solver: A Guide For Improving Thinking, Learning and Creativity* (2d ed., W.H. Freeman 1993); Roger Von Oech, *A Whack on the Side of the Head: How You Can Be More Creative* (3d ed., Warner Books 1998).

COGNITIVE STRATEGIES, PART II

| Critical Learning Conditions | Specific Advice on Teaching |
|---|---|
| <ol style="list-style-type: none"> 1. Describe or demonstrate the strategy. 2. Provide a variety of occasions for practice using the strategy. 3. Provide informative feedback as to the creativity or originality of the strategy or outcome. | <ol style="list-style-type: none"> 1. Teaching thinking strategies resembles teaching domain-specific problem solving. 2. Teaching a specific cognitive strategy is like teaching a procedure. <ol style="list-style-type: none"> a. Teach cognitive strategies with substantive knowledge, so that students see the benefits and relevance of cognitive strategies. b. Avoid overloading students. In the short run, adding cognitive strategies to regular instruction increases the amount they have to learn, so do not take a regular assignment and tack on additional work on cognitive strategies. c. Provide specific training in cognitive strategies. Students who are merely informed of cognitive strategies do not do as well as those trained in them. d. Meta-cognition, evaluating whether a strategy has been successful, is important for all strategies and for learning generally. e. Students' application of cognitive strategies (like mnemonics and graphics) will result in greater learning than their use of similar professor-supplied material. f. A serious obstacle to students' use of cognitive strategies is their generally low self-perceptions, so consider appropriate attitudinal instruction. |