Strategies for Declarative Knowledge Learning

Declarative knowledge strategies are strategies that can help the learner construct meaning by linking new learning with existing knowledge, stating instructional purposes and/or previewing the lessons, organizing and chunking information into recognizable patterns or mnemonic devices, and elaborating to fill knowledge gaps with the help of inference. There are three subtypes of declarative knowledge cognition: labels and names (pairing information), facts and lists (describing relationships), and organized discourse (thread of meaning running throughout).

I chuckled when I saw that most of the examples were music related as I thought about how I’ve been using most of these declarative strategies for a long time. Teachers use many of these strategies in instruction all the time. The great lakes spells HOMES, My Very Educated Mother Just Served Us Nine Pizzas for the planets, or Even George Bush Drives Fast for the music staff, are just some examples of declarative strategies at work. One thing I feel they may have left out, though it may go under pegwords, is the recall through song or melody. We would sit around and come up with all sorts of recall strategies to remember pieces of music and their historical information for “drop the needle” exams. For example, the first few phrases Mozart’s Symphony #40, which is played by the string section, can be sung: “It’s a bird, it’s a plane, it’s a Mozart, Symphony #40 in g minor, written in 1788, this is the molto allegro.”

Strategies for Instruction Leading to Concept Learning

Inquiry approach and expository approach are the two basic strategies for instruction leading to concept learning. The inquiry strategy gives the learner examples and nonexamples and encourages the learner to discern generalizations from them. The learner builds a hypothesis from these generalizations and applies them to examples they create. Expository approaches provide the specific characteristics early on, also providing examples and nonexamples with the characteristics of the best example explained. Learners are then asked to come up with their own examples using the criteria to organize and apply information.

I hadn’t realized that there were different strategies in the development of a learner’s ability to generalize. In my opinion, expository approaches are best for younger children because they need concrete rules for defining and generalizing a subject in order to avoid confusion. For example, if I’m designing a unit on family members, I must define aunt as another child of the learner’s grandparents, a sibling to the learner’s mom/dad. Some families refer to their friends as aunt for the learner and the learner begins to generalize that all female friends of the parent are aunts. At the young learner’s developmental stage, it is important to define using exact and precise terms to avoid confusion and allow the learner to develop his own examples. Concept trees are likely the most helpful in communicating learning concepts to younger students. In contrast, inquiry approaches are more appropriate for older learners because the approach provides qualities of authentic and intrinsically motivated learning responses related to life experiences. For example, a high school student is asked to explain the term “war.” When the learner views examples and nonexamples such as a school fight, Vietnam Conflict, and WWII, the learner is better equipped to reason out why a school fight is not war as traditionally defined in the context of WWII. This also leads the learner to explore the differences between the Vietnam Conflict and WWII to compare, contrast, and make their own determinations and definitions of war. Older students are better prepared to use concept trees, analogies, and imagery to relate these abstract concepts.

Strategies for Instruction Leading to Learning Procedures

The learning strategies for procedural knowledge are to provide learners with mnemonic devices or job aids and practice steps individually with instructor feedback. Smith and Ragan argue that it is often best to have the learner develop their own mnemonic devices or job aids. They say that the learner acquires a better understanding of the procedure when they
are required to develop and revamp as they monitor their progress through the procedure. Good practice involves the instructor reaffirming each step, allowing the learner to develop connections with each step and the step’s relevance within the procedure.

There were a few new items that popped out at me when skimming this chapter. The first is asking the learner to come up with their own mnemonic or aid. I usually fight that when teaching kids to read the music staff because they like to make up their own mnemonics, and I prefer to use the Every Good Boy Deserves Fudge model. I guess I prefer it this way because it is more cohesive when teaching a large group of learners, and it’s hard to change 23 years of doing using the same mnemonic. I need to allow my learners to develop the mnemonic they remember best because it provides ownership and memorable qualities to the experience. Second, under practice, Smith and Ragan talk about “learning to determine if the procedure is required” (p.193). If I’m designing for FFA, and the procedures students learn are for milking various animals, it’s important that students determine that the procedure for milking cows isn’t appropriate practice when given goats and that they need to employ goat milking procedures instead. (I’m no farmer, so maybe that isn’t the case.)

**Strategies for Instruction Leading to Principle Learning**

Principle learning is different than procedural learning because proper knowledge of concepts represented in the principle must be known beforehand to understand the principle. Similar to concept learning, the designer must choose an inquiry or expository approach. Smith and Ragan argue for the expository approach for similar reasons for why I argued expository approaches for younger learners under concept learning. The expository approach is less confusing to unskilled learners. Mnemonics and practice are both advocated strategies in principle learning, as well as illustrating and diagramming concept relationships. The steps for practice are different than concept learning. Learners should practice by stating the principle, recognizing applicable situations, applying principles to predict, explain, or control, and, once step three has been successfully completed many times, determine if the principle has been applied correctly.

The text was an eye opening example of the distinct differences between concept learning and principle learning, in terms of the if-then relationships required of principle terminology. Before reading the text, I would have described principle learning as a subtype of concept learning. I believe designers would best benefit from principle strategies in designing lessons for mathematics and physics because of the concrete rules the areas follow. Principle strategies could also be applied to metacognitive thoughts on behavior. If I scribble on my paper and the teacher sees me then I will have to stay in for recess and do it again. If I speed on the freeway and a policeman is taking radar then I will get pulled over.

**Strategies for Problem-Solving Instruction**

Problem-solving instruction strategies ensure that the designer is aware of all the prerequisite knowledge necessary to solve the problem. This required knowledge can be incorporated into prior knowledge representation models, solution planning, and solution implementation activities. This allows the learner to use the declarative knowledge and cognitive strategies to associate the problem with appropriate procedures and techniques.

The term “ill-defined problem” verses “well-defined problem” influenced a deeper meaning in terms of problem-solving instruction. I had never thought of problem solving in terms of answers that were not concretely definable or had multiple solutions. These types of problems sound as if they would be more difficult to design for, given the multitude of possible answers. However, they are also the problems that provide more authentic learning experiences for
the student. When designing for ill-defined problems, problems seem more applicable to life circumstances, such as how to go about the best treatment for a patient, or the least expensive way to fix a car. Such problems have greater consequences and therefore the designer has a greater responsibility when developing instruction. Well-defined problems are more easily applied to public school educational instruction, such as everyone’s favorite, the “if Billy starts biking at 5 miles an hour east, and Suzie starts biking at 10 miles an hour west, how many miles will they travel before they meet?” sort of mathematical problems.

**Strategies for Cognitive Strategy Instruction**

It is important to note that there are two types of cognitive strategies. Learning strategies is one type of cognitive strategy learners use to organize, manipulate, and retrieve knowledge, while the second, thinking strategies, are the ways learners go about discovering, inventing, and creating. The authors focus on learning strategies within the chapter, but do suggest role-playing, brainstorming, and forms of analysis to develop thinking skills, as well as providing an example model of thinking strategies within instruction. Smith and Ragan suggest learning strategies are strategies “built into” the learner using guided discovery, observation, guided participation, strategy instruction materials, teacher directed explanation, dyadic instruction, and self-instructional training.

I find the best routes for instructional designers to use within learning strategies to be guided discovery, observation, and guided participation in relation to authentic, learner-motivated experiences. I already knew about the uses of strategy instruction, dyadic instruction, and especially direct explanation as ways to instruct, but they seem to be just more of the same as far as issues in our current educational system, not to say that small forms of each are aren’t necessary.

**Strategies for Attitude Learning**

Attitude learning strategies are strategies which aim at changing the learner’s behavior and choices in a given situation. Three main instructional activities are important to the changing of attitudes. Learner must see the behavior demonstrated by a role model, practice the behavior, and receive reinforcement.

I was aware of the three conditions needed for successful attitude learning, but I feel they need to add something to the effect of “develop intrinsic motivation” which inhibits/prohibits behavior accordingly. If having a role model, practicing the behavior, and receiving reinforcement were enough, none of us would do drugs or have unsafe sex. One could say that receiving reinforcement and intrinsic motivation are the same, but I disagree. Reinforcement is too simplistic. Reinforced by what? Candy? Money? Trips? None of those reinforcers are the same as looking at or reflecting on the impact choices can have on ones self and inner circle (family, friends, etc). We need to take those strategies and apply them in a meaningful way, which is a difficult prospect in a school climate.

**Strategies for Psychomotor Skill Learning**

Strategies in psychomotor skill learning come from a combination of areas. Massed practice is where the learner has one or two long periods of practice without a break in between or if a break is needed, a very small one is given. Distributed practice is the opposite, where practices are short and happen over a longer period of time with bigger breaks. Whole or part practice can be combined with one of the two strategies mentioned above depending on the circumstances.
As a piano teacher, the concepts of massed and distributed practice are easily applied and encouraged. I encourage my learners to practice for short periods of time and span that practice over the days between lessons. We use massed practice within those periods of distributed practice work to build the psychomotor skills for trouble sections in the music. A student might play the same two measure section multiple times in a minute. That may not sound like mass practice, but two measures is generally between five and ten seconds, so practicing that much for a minute over and over again feels like a long time and hones the muscular skills necessary to play the section well. These strategies could easily be incorporated into other instructional design projects such as learning to type with a keyboard, correct movement when throwing the shotput, or how to cast when fly fishing.