Chapter 1

Decisions in Teaching

Educators have finally arrived at the understanding that professionals in medicine achieved when the latter discovered that germs, and not evil spirits, were the cause of many health problems. We now know of many cause-effect relationships in teaching and learning. As a result, we can use those causal relationships to promote student learning in the same way a doctor uses medical knowledge to promote health. In both education and medicine we are learning more each day even though there still remains much we don't know.

"Even champions have coaches."

Whenever humans are involved, we are dealing with probability, not certainty. Medication may increase the probability of a patient's recovery, but it does not guarantee it. In the same way, if teachers base their decisions and actions on the principles presented in this book, the probability of student learning will be increased, but it will not be guaranteed.

There is no question that genetic endowment and past experience influence student learning, but your own teaching decisions also have a powerful impact. Consequently, teaching can be defined as a constant stream of professional decisions made before, during, and after interaction with the student; decisions that, when implemented, increase the probability of learning. Students learn more through effective teaching than when they try to learn on their own. Even champions have coaches.

Since the 1960s, educators at the University of California, Los Angeles, have been studying teaching decisions and their implementation—the essence of the teaching process. They found that, regardless of who or

what is being taught, all teaching decisions can be placed into three categories:

1. What content to teach next
2. What the student will do to learn and to demonstrate learning has occurred
3. What the teacher will do to facilitate the acquisition of that learning

When professional decisions are made on the basis of sound psychological theory and if those decisions also reflect the teacher's sensitivity to the student and to the situation, learning will be increased. When errors are made in any of those three categories of decisions, student learning can be impeded. Consequently, it is important for teachers to identify consciously and deliberately the decisions they must make in each category and base their decisions on research-validated knowledge. Equally important is the teacher's ability to "read" signals from students and to assess the learning situation, so necessary adjustments can be made.

THE CONTENT DECISION

The first professional decision is to answer the question, "What will I teach?" Perhaps you believe that the decision has already been made. You're to teach honors English, first-grade reading, United States history, advanced placement computer science, fifth-grade mathematics, or French II. However, those subjects merely label the arena in which you will make this decision. In today's world of grade-level content standards, that arena has been even further defined, narrowing the focus of instruction. The content decision referred to here is the answer to the question "What do I teach this group of learners today*?*"

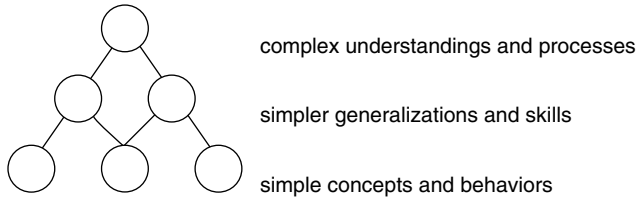
Dependent and Independent Sequences

Whatever the subject or the content standard within that subject, the answer to "What do I teach?" must reflect your knowledge of what that particular group of students already knows in relation to that content standard and what is next to be learned. This process is very different than having what comes on the next page in the textbook make your determination.

The psychological generalization that guides your decision should be that basic concepts, as well as simple generalizations and processes, must be acquired before more complex learnings can be achieved. Advanced processes and understandings are built on a pyramid of simpler ones.

Brain research identifies this process as building synaptic connections or programs through experience. Students arrive with differing educational

Figure 1.1 Pyramid of Processes and Understandings



and life experiences and, as a result, have different connections and programs on which to build new learning. Therefore, to make the decision about the content you are going to teach successfully tomorrow, you need to determine which prior learnings are prerequisite to more complex ones. Make sure those essential learnings have been acquired by your students (not presented to) before introducing advanced material. This is called a dependent curriculum sequence. In this sequence, prior, simpler learning must have occurred before more complex learning can be achieved. For example, a student needs to be able to write sentences before being able to write a paragraph, and write a paragraph prior to writing related paragraphs. The student must have one-to-one correspondence prior to dealing with quantities greater than one. The student must be able to solve for one unknown before solving for more than one. Much of our school curriculum is characterized by dependent sequences.

On the other hand, in some things we teach, the order of acquisition doesn't matter. One can first learn a noun or a verb. One can learn to add first or to subtract first. The Industrial Revolution can be learned prior to the American Revolution. There may be a logical reason for teaching in a certain order, but there is not a psychological reason. This is called an independent sequence: The order of learning doesn't matter. When dealing with a dependent sequence, assessment becomes essential to planning and implementing effective instruction. There is a myriad of assessment tools, ranging from performance assessments to informal, quick assessments used during teaching to determine students' current knowledge and skill levels. It is a waste of valuable instructional time to attempt to teach skills and concepts when there is insufficient prior learning to support the new learning or to teach skills and concepts already possessed by the student.

From Decision to Acquisition

Once the decision has been made about the *what* of teaching, the content decision, teacher and student effort should be directed to the acquisition of that new level of learning, not be dissipated on nonessential or tangential matters. It is tempting to spend class time on vivid or interesting

"bird walks" that may distract attention from, rather than enhance understanding of, more important issues. A typical example is, "By the way, that reminds me of something that happened. . . . " If "what happened" will help students understand what is being presented, by all means use the example. If "what happened" is tangential or only loosely related, don't waste time by introducing it. If you have loads of extra time or comic relief needs to be introduced to brighten up the lesson, a bird walk might be forgivable, but most of us find that time and energy are in too short supply to be expended on loosely associated material or random exchanges between students and teachers.

This does not mean you should ignore students' nonrelevant comments. It is a sign of skill in teaching to dignify a student's extraneous contribution without letting it dilute the lesson. "That's an interesting point that will come a little later," usually will handle a tangential contribution. Then do return to it later, either with that student after class or with the group at a time when it is relevant: "Remember when Dylan cited an example of . . . ?"

Don't believe that disciplining yourself with regard to your content decision imposes rigidity on your teaching—it doesn't. Rather, it adds the professional rigor that leads to successful learning. Remember, you're the decision maker. If, during class, a better idea emerges than the one you had planned, by all means, pursue it. Be prepared, but be flexible.

In some cases, you may wish to delegate the content decision to your students and let them decide when they have achieved sufficient mastery to move on. However, as their teacher, you can't delegate your responsibility for the results of that decision and for its potential to increase or interfere with the probability of student learning.

THE DECISION REGARDING STUDENT LEARNING BEHAVIOR

While the first decision of teaching is based on content, the *what* of teaching, the second decision is directed at the student behavior that makes learning possible, the student's *how* of learning. Two important factors affect student learning behavior: input modalities and output modalities.

Input Modalities

Input modalities are the channels through which we get information. Will our students read, discuss, listen, observe, or do? This is the only area in which models of teaching differ: Where does the new information come from? Does new information come from peers, activities, or from the teacher? There is no one best way to learn, and the use of a combination of these sources is usually more effective than relying on only one (see Figure 1.2).

The source of input should be based on the objective (learning outcome) of the lesson. If we want students to develop social interaction skills, we'll probably want them working together rather than listening to a lecture. If the ability to identify similarities and differences is paramount, then an activity requiring them to do so is warranted. If the initial acquisition of a new formula is the focus, a skilled teacher presentation may be most effective. If we want students to develop social skills as well as to interact with the content, we will probably want them working in cooperative groups.

This is why the content decision is so important. What is it that we want the students to learn? The selection of content, and specific learning outcomes from that content, must be the first decision in determining learning behavior that is appropriate to both the content and the learner.

How students get and process information is also affected by their preferred learning style. Some students like to listen, some like to touch, some like to see, some like to talk, and so on. However, all people have many avenues of learning available to them, even if they have a preferred modality. We also know that much modality preference is a result of practice using that modality. The more you use a modality, the better you get at it. Generally, the most effective instruction is that which addresses multiple modalities: instruction where students get to hear, see, touch, and discuss. Again, there is not one best way.

Output Modalities

The second aspect of the teacher's decision about learning behavior is focused on the student's output, which validates the acquisition of the knowledge or skill. That output must be perceivable, so you know—not hope—that one of the following has occurred:

1. The students have achieved mastery and are ready to move on to the next learning.
2. Mastery has not been achieved, and you must reteach or extend practice of the current learning.

Output behaviors that are perceivable and may validate learning include writing, telling, diagramming, solving (so the teacher can see it), reading (aloud), arranging, analyzing (verbally or in writing), evaluating (also so the teacher can see or hear it), and so on (see Figure 1.2). This list is by no means exhaustive, but it illustrates some output behaviors that the teacher can use to assess student learning. This differs from those behaviors that do not validate learning accomplishment. Questions such as "Do you all understand?" or "Do you have any questions?" do not require students to exhibit output behaviors that demonstrate acquisition of knowledge.

Figure 1.2 Examples of Input and Output Modalities

Input Modalities	*Output Behaviors*
Reading	Reading (aloud)
Listening	Writing
Discussing in groups	Diagramming, solving (so the teacher can see it)
Observing	Arranging
	Analyzing (verbally or in writing)
	Evaluating (so the teacher can see or hear it)

Output cannot be such that the students can bluff, guess, hide, or be lucky in their demonstration of accomplishment. The skilled teacher also gets validating output from a significant number of students—if not all students—not just the one or two who always volunteer. As with the content decision, the input and output student-behavior decision also can be delegated to students, but your responsibility for the results of their decision cannot.

Instructional Objectives

Your instructional objective specifies the first two teaching decisions—(1) content and (2) student learning behavior—and brings both of them to the level of conscious, professional decision making rather than leaving them as vague intentions or wishful thinking.

The following examples make those instructional objective decisions more identifiable. Note that the specific content is capitalized, and the validating student behavior is written in italics. All instructional objectives begin with, "The learner will . . .

The learner will . . .

- *Create* a SPREADSHEET using a computer.
- *Orally decode* words with CVC VOWEL PATTERNS.
- *Create* a T-chart to DETERMINE A FUNCTION.
- *Work in a group* creating a poster demonstrating the WATER CYCLE.
- *Prove in visual space* that πr^2 IS THE AREA OF A CIRCLE (πr^2 is the content but cannot be capitalized).
- *State* the SIX CATEGORIES OF PLANTS and *describe* the CHARACTERISTICS OF EACH.
- *Write* his or her INTERPRETATION OF ARNOLD'S POEM.
- *Answer orally in GERMAN* the QUESTIONS ON PAGE 37.
- *Diagram* the ASSERTIONS AND CONCLUSION.

- *Discuss* the CHANGES THAT RESULTED FROM THE TREATY.
- *Solve* the QUADRATIC EQUATIONS ON PAGE 97.
- *Use* ANAPHORA and EPISTROPHE in an oral speech.

Having an articulated instructional objective, rather than having an intuitive or a subliminal intent, accomplishes two things:

1. It helps you focus your teaching on the learning behavior that you will use to validate whether students have achieved the intended learning.
2. It encourages you to identify the prerequisite learnings that must be taught (and learned) for the students to achieve the intended results.

Objectives and Curriculum

This kind of teaching is essential in an objective or standards-based curriculum, which builds on itself from simpler to more complex learnings. Today's lesson is built on your analysis of the students' work from yesterday's lesson. How the students did yesterday determines what the teacher will have them do today. Are they ready for the next, more complex learning step, or did their output (student work) yesterday indicate that some reteaching or additional practice is necessary before moving on? This type of teaching is much more reliable and predictable in terms of student achievement of those standards than an activity-based curriculum.

An activity-based curriculum is one where students are given a series of activities that are related to the standard. These activities are not related to each other in any systematic fashion and do not necessarily build on each other. What the students will do today does not depend on how they performed yesterday. Clear learning objectives are not articulated nor do the activities build in complexity of demands on the learner.

THE DECISION REGARDING TEACHING BEHAVIOR

The third decision in teaching (note that this is the third decision, not the first) is directed to your own teaching behavior: what you will do to increase learning.

When teachers use learning principles that research indicates are accelerants to student achievement, they can have dramatic effects. Within your power is the ability to increase your students' motivation to learn, the speed and the amount (rate and degree) of their learning, their retention of what they learned, and the appropriate transfer of that learning to new situations requiring creativity, problem solving, and decision making. Principles of learning constitute a powerful pharmacy of alternatives

from which you can create an effective learning prescription. Knowing principles of learning and deliberately and artistically using them are the hallmarks of the master teacher. This book was developed to present some of these principles to you and thereby to help you consciously achieve mastery teaching.

"Principles of learning constitute a powerful pharmacy of alternatives from which you can create an effective learning prescription."

The responsibility for making the three decisions of content (what to teach today and tomorrow), learning behavior (what input modalities students are going to use and the student output that will validate successful accomplishment), and your teaching behavior (use of principles of learning to accelerate achievement) sounds like a lot of professional decision making. It is! But in reality you are already making these decisions—purposefully, intuitively, or by default—every day you teach. As you read this book, you will find that you already use much of what is described. However, this book provides you with categories and labels for the decisions you are making and the research that supports them. You may also learn some new techniques that will make your teaching both easier and more successful.

Each chapter in this book focuses on some aspect of professional decision making to help you become more conscious of why you do what you do. As a result, you will become increasingly effective as a teacher.

After you study this book, you will have deliberately constructed a professional launching pad from which your own particular style and artistry in teaching can soar. Bon voyage!