

## 1

# Making Decisions About Assessment

*The standard dictionary definition of learning is simple. Learning is related to knowledge and understanding. Yet, many of the world's top neuroscientists would have a tough time defining how to measure learning. Why? Much of what is important learning cannot be measured at this time. Examples of the hard to measure include our so-called mental models of how things work, critical neuronal connections, our values, our capability beliefs, the degree of personal transference and depth of meaning.*

—Eric Jensen, *Completing the Puzzle*

**A**ssessment is a fact of life, whether we like it or not. We are all being assessed daily according to the decisions we make and the way that we carry out those decisions. Our students are being held accountable to the public for declarative and procedural information through a myriad of tests designed to show competency and used at the state and national level for comparison of schools.

## 2 Student Assessment

Much of the controversy regarding testing is due to the fact that most assessment measures used for state and national standards rely heavily on declarative information (e.g., facts, formulas, places, people, and names) rather than procedural information (e.g., the ability to use declarative information). Many educators argue that testing primarily declarative information does not give a true picture of how well students understand the learning. Procedural knowledge, however, is difficult to measure on standardized tests and, although test makers have made significant progress in the last few years, most standardized tests do not truly measure the depth of knowledge required for real-world application.

### EXAMINING DECLARATIVE AND PROCEDURAL INFORMATION

Declarative information is the factual information that is a part of every subject's curriculum. Declarative information is what students know in terms of facts, dates, names, concepts, and so forth. An example of a declarative objective for a lesson might be, "Students will know the steps necessary to check subtraction." Note that at the declarative level, students can repeat the steps on paper or orally; it does not mean they can perform the steps. Being able to use the information in some way comes under the classification of procedural objectives. For example, a procedural objective might say, "Students will execute the steps necessary to check subtraction in a given problem."

I make this distinction because what we test most at this time is the declarative rather than the procedural. Just being able to write the steps does not mean that the student understands them or that he can use them. As Jensen (1997) said, we still do not know if the student has a mental model of how to execute the information. For that matter, we do not know that the student even understands the factual information he or she has learned. This is an important distinction as we look at meaningful assessment. What do we really want to know as a

result of the assessment? Do we want to know that our students know the steps, or do we want to know that they can use those steps in a meaningful way—or both?

## Designing Assessments

One of the dilemmas that we face as teachers is how to design an assessment that will tell us our students' level of understanding. So many times, classroom assessments that depend solely on paper and pen measure only show surface understanding of the principles involved in the learning. How, then, can we build assessment instruments that effectively measure student learning?

When designing assessment for the classroom, there is a series of questions that needs to be answered.

*What is important for students to know and be able to do?* This question is not just about assessing knowledge at a given grade level or in a subject sequence, but goes beyond to ask what students need to know and be able to do *in life*. Wiggins and McTighe (1998) say that learning should have “enduring value beyond the classroom.” What do they mean? Assessment should do more than determine facts, dates, times, and formulas. Assessment should provide information about what the students know and whether they can apply that information in a real-world context

*Is the knowledge or process critical to the discipline?* Teaching the genres of literature goes to the heart of the subject matter and would be important to assess in terms of declarative knowledge (being able to identify various genres and their characteristics) and procedural knowledge (being able to write in various genres). At this early stage of developing assessment instruments, it is important to use both declarative and procedural formats. Having students just repeat information learned is not enough; we must ask how students can use the information to make them better citizens, better readers, more effective leaders, more productive, and successful adults.

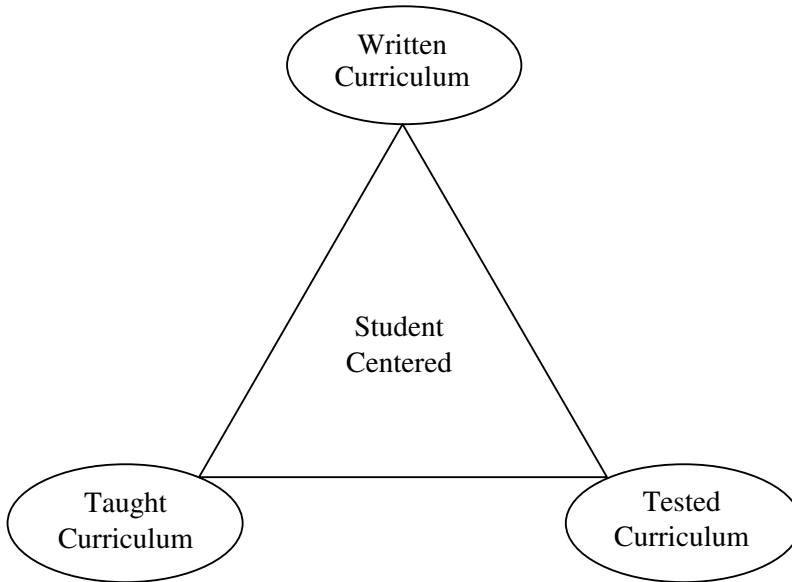
#### 4 Student Assessment

*How will we know that students understand the learning?* We have all had the experience of reading a page from a book and then at the end wondering what in the world we read. Minds wander, and we may go through the motions without really knowing what we read or listened to or talked about. As a teacher, it is important to design assessments that get at the heart of the learning. What misconceptions might students have? What are the underlying principles or concepts that might be missed? Is there evidence that the items being assessed have been taught (not just introduced) in the classroom? Do the items being assessed relate back to curriculum that has been deemed to be important for students to know and understand? Are there written declarative and procedural objectives that relate directly to the items being assessed?

In trying to gauge whether students understand the learning, we need to consider reliability and validity. Reliability and validity are critical to effective assessment, whether the assessment is at the classroom, district, state, or national level. If a test does not truly measure what we intend for students to know and be able to do, it has no validity. We have just gone through the motions. Where there is no validity, we tend to just teach to the test. Reliability goes to the source of the information. Is the test tied to the curriculum, or to local, state, and national standards? Will the information and processes necessary for success on the assessment be taught sufficiently so that students will be able to apply them to any test on the subject? We want to move away from the “gotchas” where students are tested on information they have not learned.

*Is the assessment in alignment with the written and taught curriculum?* Figure 1.1 shows how assessment should be aligned with our written and taught curriculum. We often see the model presented in Figure 1.1, but we may not have considered the implications, whether it is the teacher, the curriculum department, or the state.

Let's look at a sample test question and analyze it from the standpoint of the previous questions raised about creating

**Figure 1.1** The Aligned Curriculum

good assessments. Suppose that a question over *The Great Gatsby* on a given assessment asks, "Was Nick a true friend to Gatsby? Give reasons for your answer." On the surface, this is a great question, because it asks the student to read between the lines of the story, to make inferences, to put information into perspective, and to be able to explain his or her answers. However, some questions must be answered to determine if the question is appropriate. Can this question be traced back to written objectives in the curriculum that require the learner to make inferences, to be able to interpret, or to see perspective? Were students made aware of the objectives and how was this done? Were objectives given to the students in written form, or were they put up in the room so that students could see the expectations? Were the objectives a part of the rubric for the learning? Were students taught how to make inferences, to interpret, or to see perspective? If the answer to any of these questions is "no," then the assessment is not

## 6 Student Assessment

aligned with the written and taught curriculum. When we assess students on tactics or information that is not a part of the written or taught curriculum, we refer to the test question as a “gotcha.” Good assessments get rid of the “gotchas” by being aligned with the written objectives and the taught objectives for the learning.

I never give my students an assessment over anything for which they have not been given a rubric or a matrix that tells them exactly what the expectation is for the learning. I worked in a school that completely turned around the achievement level of its students, moving from being on the state’s endangered list for low test scores to absolutely knocking the top off of the state test. One of the things that we did that made the most difference in student success was to give students a matrix that told them what we expected—and we gave it to them in advance. We will discuss this more in Chapter 3 as we look at how to build a matrix or rubric.

### **BUILDING BRAIN-COMPATIBLE ASSESSMENTS**

We cannot fully take away test anxiety, nor can we remove nervousness about being assessed, even informally. We can, however, lessen the anxiety. We do this first by being sure that the written, taught, and tested curriculum is in alignment. By doing that, we get away from the “gotchas” and come closer to really assessing what is important for our students to know and be able to do.

Second, we can lessen the anxiety by providing adequate time for students to learn and by using both massed practice (i.e., practice provided in a concise amount of time) and practice that takes place over a longer period of time. For example, as a teacher, I might introduce a concept and work with my students on that concept for three days as massed practice. I know that they are more likely to remember and use the learning, however, if I return to the concept over time.

Third, we can help our students by providing adequate time and support as they learn the skills necessary to use the

learning. We need to provide opportunities for students to practice the learning in the presence of the teacher before moving them to independent practice—especially independent practice for which they will be assessed, as in the case of homework. In the studies conducted at Mid-continent Regional Educational Laboratory (McREL; Marzano, 1998), the effect on student learning was very high when students were given opportunities to practice the learning with specific feedback from the teacher.

Practice is only effective if students are given adequate and frequent feedback so that they know when they have perfected a tactic or algorithm necessary to carry out the procedural objective. Feedback is not simply saying, “Good job.” Feedback is specific, and it is both diagnostic and prescriptive. Tell students what they are doing right and what needs work, and make suggestions for how to make changes in the process. Marzano (1998) found that providing specific feedback to students at this stage of the learning has a profound effect on student learning. It can literally take a student from failure to success.

### **Guidelines**

Based on Jensen’s (1997) seven keys to helping us as we build brain-compatible assessments, the following questions are offered as a guide.

*Are there observable behavior changes as a result of the learning?* Students who are actively involved in the learning show it. They get excited, they are focused, and they tend to work in their preferred modality (auditory, visual, or kinesthetic) when given choices in the way that they are assessed. For example, when I give my adult learners a math question, I offer them choices for solving it based on their preferred way to learn. I tell the visual learners that they can draw the answer, the kinesthetic learners that they can act out the solution, and the auditory learners that they can work on the formula. I understand that this does not work well on a long

## 8 Student Assessment

assessment, but for day-to-day assessments, it is interesting to watch how students work out the answer. By observing my students in action, I am able to determine the learning and assessment preferences of my students, which helps me as a teacher to make the learning more meaningful. An added bonus is that when I give students choices, more students demonstrate understanding.

*Are we making a difference in the students' biases toward the learning?* I like to give my students a pre- and post-test on the subject matter that I am teaching—not on the factual subject matter but on their attitude toward it. Sometimes called *climate surveys*, such tests are great tools for discovering the hidden biases or fears of my students toward the upcoming learning, and they help me as I assure them that they can and will learn. A student's sense of self-efficacy—the belief by the student that he or she can learn, because he or she has had past success with the learning—is one of the most important aspects in getting and keeping our students' attention. Self-efficacy is different from self-esteem, because self-efficacy is based on fact, not just hope. Based on my climate survey, I can determine which students need help in building self-efficacy toward the subject matter. Students who have positive experiences with the assessment will have greater self-efficacy toward the subject.

*Do students exhibit rational thinking?* People who have rational thinking toward a subject are more likely to be able to transfer information learned in one subject to another. They will also be able to see the big picture of how the information fits into real-world activities. Good teaching and testing will lead students to have better rational-thinking abilities.

*What is the quality of the mental models?* According to Jensen (1998), "A mental model is a way of thinking about something. It is also a set of organizing principles which describe how something works (a democracy works best when we all participate). . . . In school, the best way to build mental models is



## Making Decisions About Assessment 9

through drawings, interviews, graphic organizers, projects, demonstrations, speeches, and role-plays." Students who understand the taught curriculum should be able to demonstrate on assessments that they have a clear mental model of the declarative and procedural objectives involved.

*Do students exhibit personal relevance and integration?* Students who truly understand should be able to apply the learning to themselves either through empathy, examples, relating the learning, or real-world examples. We should directly teach students how the learning is personal to them. Marzano (1998) found that when we make connections between the new learning and what students already know, we make a tremendous difference in the students' learning.

*What are the strategies and skills that students know?* Strategies and skills relate to the procedural knowledge that our students demonstrate. These strategies should be so embedded that they become second nature (i.e., students should be able to perform them without much conscious thought). For example, students who know the multiplication tables can perform multiplication strategies without a great deal of effort; students who know how to use a Bunsen burner can do so without deep concentration; and students who know how to speak a second language can answer questions in that language effortlessly.

*How do we identify whether students have mastered the content?* Students who have truly mastered the curriculum know what they know and how they learned it. Jensen (1997) says,

Rote math and trivia facts alone are of little value. Instead, assess your students' grasp of the big picture. For example, in mathematics, can your students take a concept like lines and demonstrate where and how they are expressed mathematically? Help your learners to see how lines are important in their lives.

## ALIGNMENT AND STANDARDS

The following exercise may be helpful as you look at your own state standards in light of alignment with what you are teaching and testing. Go to your state education Website and locate information about your state test. Most state education departments can be found by using this format: [www.\[state's first letter followed by \*ea\* or \*de\*\].state.\[state abbreviation\].us](http://www.[state's first letter followed by ea or de].state.[state abbreviation].us). For example, the Texas education Website is [www.tea.state.tx.us](http://www.tea.state.tx.us) and the Oregon site is [www.ode.state.or.us](http://www.ode.state.or.us). Not every state follows this pattern, but you can also find your state by using a search engine like Google ([www.google.com](http://www.google.com)) and typing in the name of your state plus the phrase *Department of Education*.

Once you have found the Website, locate the information about the test for your grade level and/or subject area, or the test that most suits your grade level. If you teach in an area that is not directly tested, choose reading standards for the grade level closest to the one you teach. Next, choose three objectives that will be covered on the state test. You have learned that all assessment should be aligned with written and taught curriculum: Can you align the three objectives that you have chosen to the written curriculum for the state or for your school? When and how is this information taught to students?

In summary, we cannot test or assess everything we teach, so it is important to decide what it is important to assess. What do students need to know and be able to do through this body of information?

Most researchers in the field of assessment call for a backward design of instruction; in other words, they suggest teachers begin with the end in mind. When planning lessons, start with the assessment. What kinds of things will you want to assess as a result of the lessons? What do you want your students to be able to demonstrate to you as a result of the learning? What do you want them to know? From that information and from the state objectives, build declarative and

## Making Decisions About Assessment 11

procedural objectives for the learning. Next, provide a matrix or rubric that tells students exactly what your expectation is for them in terms of the objectives. As a last step, check the objectives, the lesson activities, and the assessment instrument to see if they are aligned. If not, then the assessment is a “gotcha.”