

# Chapter II

## New Learning Paradigms for a New Millennium

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*... We have not been cognizant of the ways in which the basic inclinations of human learning turn out to be ill matched to the agenda of the modern secular school.*

—Howard Gardner (1993)

Learning is what human beings do to survive. Learning begins at birth (some argue that it happens earlier) and continues throughout life. Some of what we learn is hardwired into our human genes, such as talking and walking. Some of what we learn is planned, like learning to play the guitar or how to solve a quadratic equation. Sometimes we learn without meaning to, like the toothpaste jingle that won't stop repeating in our heads. Whether intentional or not, learning is a permanent change in what we know or what we do. What makes learning different from growing size 10 feet is that it results from our experiences with people, objects, and events.

### **THEORIES OF LEARNING AND CLASSROOM PRACTICE**

Many educators have little patience with the concept of theory, often connecting it to some abstract set of ideas that has no bearing on the reality of the classroom. However, whether we like it or not we all move through life on the basis of the theo-

ries we develop about the world we live in. We test the hypotheses generated by personal theories all the time. It is how we decide to cross the street (or not), invest money in stocks or a lottery ticket, buy a house in the city or a nest in the country. And theoretical assumptions (conscious or not) are at the heart of our decisions about

- How we define what we teach
- The way we organize and plan our instruction
- The way we relate to our students and to each other

It is crucial that we examine our beliefs and values regarding how students learn, why they learn, and under what conditions their learning is maximized. Let's briefly review what researchers, theorists, and researcher-practitioners have discovered about the ways human beings learn to navigate their worlds.

### **Behavioral Theory**

Until the middle of this century, human learning was conceived as a process in which individuals reacted to environmental stimuli and habitual responses were formed depending on whether the individual achieved a positive or negative result. The emphasis was on observation of learner behavior, primarily animals, in experimental

situations in which researchers controlled the variables. For example, cats in a box learned to press a lever for food because when they did they were rewarded with tasty morsels and if they did not press the correct lever they received a painful shock. Researchers observed that animals increased behaviors that brought positive or pleasurable results. This idea is called connectionism, which refers to the established stimulus-response connection that results in a “habit” being formed (Thorndike, 1913). The idea that practice makes perfect derives from connectionism.

B.F. Skinner (1953) developed a complex theory of behavior called operant conditioning, which has had a substantial influence on education, especially with special populations of students. Like most behavioral research the principles of reinforcement, behavioral consequences, and the role of antecedent behaviors were developed from experiments with animals. Skinner maintained that behaviors could be predicted and controlled through an appropriate schedule of reinforcement (Skinner, 1953).

Skinner developed an educational application of his theory called programmed instruction. Students were presented with incremental tasks; when they were successful with one part, they moved on to another part of the learning task. Organization of complex tasks into discrete skills became entrenched in classrooms. Mathematics and reading were delineated into a list of skills to be mastered and integrated into a complex performance. Teachers were encouraged to focus on behavioral objectives that could be directly observed and measured. Standardized tests became the primary assessment of student learning (Crain, 1985).

However, neo-behaviorists, such as Albert Bandura have conducted research and offered a theory that expands on past conceptions. Bandura’s social learning theory (1977) emphasizes the importance of modeling as a way of learning.

Individuals can learn from direct experience with a skill or process. One example might be a Navajo child who spends time watching her grandmother weave or create a sand painting, practices with the expert grandmother, and over time learns to weave a blanket or create a sand painting on her own. Individuals can also learn vicariously, that is, through text, film, video, and stories. Bandura has expanded original behavioral theory into a social cognitive perspective that recognizes the importance of social interaction, focused attention, self-efficacy, and scaffolding to optimize learning (Bandura, 1977).

Teachers use Bandura’s ideas every time they model or demonstrate a learning process. Using think-alouds in reading, for example, helps students to understand that they should be asking questions when they read, visualizing, and making connections to other books or their own life experiences.

During the past 30 years, theorists and researchers from many fields of inquiry have broadened our conceptions of learning to include internal processes, such as thinking and feeling. Psycholinguistics examined assumptions about language processes emphasizing an active and intentional role for language learners (Pearson & Stephens, 1994). From this perspective and the parallel research of sociolinguistics, we have learned that:

- Human beings construct meaning from their life experiences
- Language is used for purposeful interaction with others
- There is a dynamic relationship among language processes (reading, listening, speaking, and writing)
- There is more to context than the words on a page  
(Braunger & Lewis, 1997; Pearson & Stephens, 1994; Rosenblatt, 1994)

Sociolinguists challenged the conventional use of context in literacy. Prior conceptions of context were limited to the text—the physical marks on the page. Current theorists view context as part of the social process that includes the learner, the material to be learned, instructors, and other aspects of the environment in which the learning is situated (Pearson & Stephens, 1994).

The ideas of Piaget, Vygotsky, and Jerome Bruner have changed the way we look at learners. In constructivism (the idea that we construct our own knowledge), learners are viewed as active participants in the learning process as they use their prior experiences and knowledge to make sense of new information and events. Indeed, making sense of the environment is an essential brain function—necessary for our survival. The idea that making sense of the world is a primary human activity is supported by brain research. Historically, our survival has depended on our ability to detect patterns and determine relationships among objects, people, and events. Leslie Hart defines learning as the “extraction from confusion of meaningful patterns” (1983). This means that as we mature we gradually become experts at creating useful information out of what is a complex and often chaotic world. However, our level of expertise in sifting through this sensory data will depend on the knowledge and experience that we bring to the situation. This appears to be a natural process and can be readily observed as learners pursue topics of novelty and high interest (Hart, 1983).

### **Learning and the Brain**

While research in cognition has produced viable theories, only recently have we been able to see what happens in the human brain when learning is going on. Fast Magnetic Resonance Imaging (fMRI) allows us to observe the brain during cognitive activity and positron emission tomogra-

phy (PET) indicates how and where the brain processes a series of events (Sylwester, 1995).

The brain processes information in a parallel fashion, looking for emerging patterns. Through the emotional components of the brain our attention is focused on novel or dramatic changes in our environment. Our attention system is quick and effective as a survival mechanism, but it is less helpful in a stable environment, like a classroom, where change is gradual.

Physical changes occur in the brain as we grow in experience. This means that, while we all start out with a generic brain, individual life experiences change the physical structure of the brain, making each person’s brain unique. We can, and do, learn to engage in things that require an individual’s sustained attention and precision, but our brain prefers cooperation and conversation, conceptualization and storytelling as ways to learn (Sylwester, 1995).

Another aspect of brain research to consider as we plan optimal environments for adolescents is the idea of critical periods for learning. Critical periods of development relate primarily to species-wide systems like vision, hearing, and language. Human beings appear to develop specific aspects of visual, auditory, and language systems along a continuum. Some readers do not make sense of sound-symbol relationships until upper elementary or middle school, although they are able to make meaning from pictures and text. For example, several years ago a seven-year-old boy was brought to reading clinic by his parents who were concerned because he was failing reading. Assessment of decoding skill indicated that the child was unable to connect sounds with the graphemes representing the sounds. However, after reading several passages from an IRI the youngster was able to answer all the comprehension questions up to fourth-grade level which was two years above his grade placement. Oral

retellings after reading passages from trade books also indicated high levels of comprehension but miscue analysis showed limited use of the grapho-phonetic cueing system. This boy seemed to have an intuitive understanding of our alphabetic system but could not articulate this knowledge. We do not quite understand how this happens. Currently, there is only evidence that there are critical periods for many human functions but they vary within the same system (Bruer, 1998). This implies that we should maintain flexible timetables for student learning since not only do we develop skills at different rates but development within skill areas may vary.

### **Sociocultural Theory**

Research growing out of the sociocultural theory of Lev Vygotsky also has had a significant impact on how we organize learning situations and the roles of the teacher and the student in the learning environment. Vygotsky maintained that “every function of the child’s cultural development appears twice: on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological) ... all the higher functions originate as actual relations between human beings” (Vygotsky, 1978). This indicates that meaning is constructed with and through others.

The dialogue or “instructional conversation” facilitates meaningful learning (Tharp & Galimore, 1989). Learning takes place as the novice (student) moves from assistance from an expert (teacher or peer) to independent action or understanding. The distance between the need for assistance and independent functioning is the zone of proximal development (Vygotsky, 1978). An example of working with the zone of proximal development is learning to ride a bike. Most six-year-olds cannot manage a two-wheeled bicycle on their own. Parents start by modeling riding for the child so she can see what an expert perfor-

mance looks like. Parents then provide support for maintaining the upright position, steering the bicycle, and keeping it in motion. As the child gains more control over the bicycle, the parent begins to relinquish assistance in a series of steps. The parent moves from holding and guiding to running along as the child becomes a rider. The message from Vygotsky is model, support, and gradually release responsibility to the child. We will come back to this idea of gradual release of responsibility when we discuss explicit teaching of comprehension in Chapter III.

### **Metacognition and Self-Regulation**

Other research has examined human awareness and control over the executive processes of learning. Metacognition is an executive learning process defined as “knowledge and beliefs accumulated through experience and stored in long-term memory that relate to the human mind and its activities” (Flavell, 1985). The ability to plan, and to monitor understanding and effectiveness of learning strategies correlates with overall cognitive development (Flavell, 1985). The research in metacognition and metalinguistics has contributed to new understandings of literacy that recognize the importance of individuals coming to know themselves as readers and writers and to use this knowledge to implement learning strategies that optimize their understandings of text. Metacognitive research suggests that learning becomes more conscious and self-regulated as individuals grow in experience (Flavell, 1985).

The primary goal of any educational endeavor is to assist the learner to achieve control of the learning process. When learners regulate cognitive and affective processes for maximum understanding they are metacognitively skilled readers (Pressley, 2002). Since wide experience with text is crucial to development of metacognitive knowledge and skill, the admonition of researchers to read extensively in a variety of genres is good

advice. However, it is also important for many students to have teachers provide explicit instruction in metacognitive processes if we are to have highly sophisticated readers (Pressley, 2002; Schoenbach, et al., 1999).

Metacognitive knowledge develops over time with guidance from parents, teachers, and peers. It is information that we have about ourselves, the tasks we engage in, and the strategies that we know and use. Knowledge about ourselves tells us what we are good at—creating analogies, completing fill-in-the-blanks tests, or understanding that we need an outline to focus. Task knowledge involves our way of assessing the difficulty level of an assignment. Strategy knowledge includes the ways we remember information, how we access information, and changing pace when reading difficult material (Garner, 1994).

As I synthesized the research on learning, several principles emerged that made sense in terms of classroom instruction. These principles include construction of meaning, active engagement, and meaningful content. These principles applied to literacy provide a game plan for tackling the challenge of ensuring that students become actively engaged with content and develop a deep understanding of subject matter. The table on the next page outlines the characteristics of the principles and identifies researchers and theorists associated with each principle. It is important to note that these principles are separated only for the purpose of thinking through the scope of the learning process. In fact, when learning is optimal all areas will be integrated. In Chapter III, we will use these principles as a lens to identify ways to enhance literacy learning for all our children.

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## Learning Principles That Support Optimal Literacy Learning

### Key Principles

### Defining Characteristics

#### Construction of Meaning

Bandura, A., 1977

Bruner, J., 1977

Dewey, J., 1938

Palincsar, A.M., & Brown, A., 1984

Pearson, P.D., &

Stephens, D., 1994

Perkins, D., & Blythe, T., 1994

Piaget, J., 1952

Rumelhart, D.E., 1977

Vygotsky, L., 1978

- Knowledge is dynamic and individually constructed in a social context
- Learning occurs through active construction and reconstruction of prior knowledge and experience
- The learner's own efforts to understand are at the heart of the educational process
- Emphasis is on complex, challenging learning environments

#### Active Engagement

Bauman, J., & Duffy, A., 1997

Cambourne, B., 1995

Guthrie, J.T., & Wigfield, A., 1997

McCombs, B., & Whisler, J., 1997

Meier, D., 1995

Perrone, V., 1994

- Learning is both hands-on and minds-on
- Prior and current experiences are integrated
- Learners believe they can accomplish the task (efficacy)
- Learners use effective strategies to complete tasks
- Learning is connected to student interest as well as needs
- Individuals have some degree of control over their learning

#### Meaningful Content

Gardner, H., 1993

Hart, L., 1983

Newmann, F.M., &

Wehlage, G.G., 1995

Perkins, D., & Blythe, T., 1994

Wiggins, G., & McTighe, K., 1998

- Ideas are crucial to a deep understanding of the subject area
- Topics have the potential to engage students through exploration of essential questions, connecting ideas, or reorienting initial ideas
- Topics generate new questions and new understanding
- Topics or ideas have relevance and value outside the classroom
- Themes/topics are of interest to teachers and students