Session 1

How People Learn:
Introduction to Learning Theory

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I. Key Questions and Learning Objectives

Key Questions

- How do people learn?
- How can learning theory inform teaching practice?

Learning Objectives

- **History of learning theory**—Teachers will become familiar with the central debates and major concepts in the history of learning theory.

- **Learning processes and teaching for learning**—Teachers will begin to uncover and articulate their assumptions, understandings, and questions about how students learn and the nature of teaching. Teachers will become familiar with the main themes of the video course.

- **Theory and practice**—Teachers will begin to consider learning theory and its role in their teaching practices.

II. Session Overview

How do we learn? What helps us learn? How can teachers assist learning? In *The Learning Classroom: Theory Into Practice* we explore how people learn through examples of teaching and learning in practice. This course presents research about how we construct knowledge, develop skills, and build understandings for teachers to use in the classroom. Each session highlights a particular aspect of the learning process, while the course as a whole represents a body of ideas that reinforce and connect with other ideas. All of these ideas can help teachers make sense of what is going on in their classrooms and serve as lenses for understanding students' growth, development, stumbling blocks, and successes. Rather than a recipe book, we present here a set of ideas about how young people/students learn and how teachers can assist them in their learning that will help teachers develop the right mix of ingredients for *their* students in their unique classrooms.

This session introduces how philosophers, researchers, and educators have thought about learning. In the first section of this session overview, we review some central questions and debates about how people learn. We then give an overview of the main themes of the course, in terms of the learning process and the teacher's role in assisting learning. In the final section, we discuss the relationship between learning theory and teaching practice.

History of Learning Theory

> Profound differences in theory are never gratuitous or invented. They grow out of conflicting elements in a genuine problem.
>
> —John Dewey (1959, p. 91)

How Philosophers Have Thought of Learning

People have been trying to understand learning for over 2000 years. A debate on how people learn began at least as far back as the Greek philosophers, Socrates (469–399 B.C.), Plato (427–347 B.C.), and Aristotle (384–322 B.C.). The debates that have occurred through the ages reoccur today in a variety of viewpoints about the purposes of education and about how to encourage learning. To a substantial extent, the most effective strategies for learning depend on what kind of learning is desired and toward what ends.

Plato and one of his students, Aristotle, were early entrants into the debate about how people learn. They asked, "Is truth and knowledge to be found within us (rationalism) or is it to be found by using our senses to discover what is outside of ourselves (empiricism)?" As a *rationalist,* Plato developed the belief that knowledge and truth can be discovered by self-reflection. Socrates also believed strongly that certain knowledge was only attainable through reason. He developed the dialectic method of discovering truth through conversations with fellow citizens (Monroe, 1925). Teaching strategies that call for reflection and discourse as tools for developing thinking owe much to Plato and to Socrates. Aristotle, the *empiricist,* suggested that we use our senses to look for truth and knowledge in the world outside ourselves. From his empirical base Aristotle developed a scientific method for gathering data to study the world around him. Inquiry methods owe much of their genesis to the thinking of Aristotle and to others who followed this line of thinking.

The Romans differed from the Greeks in their concept of education. The meaning of life did not interest them as much as did developing a citizenry that could contribute to society in a practical way. The Romans' accomplishments in building roads and aqueducts, as well as cities and communities, reflect this practical bent. The Romans emphasized education as vocational training, rather than as training of the mind for the discovery of truth. Modern vocational education and apprenticeship methods are reminiscent of the Roman approach to education. As we will see, modern strategies to encourage "cognitive apprenticeships" combine the modeling inherent in guiding an apprentice to learn a trade with the discourse, reflection, and inquiry that the Greeks used to train the mind.

When the Roman Catholic Church became a strong force in European daily life (500 A.D. to 1500 A.D.), learning took place through the Church, through monasteries, and through an education system that included the universities (twelfth century) the Church built throughout Europe. Knowledge was transmitted from the priest to the people (Monroe, 1925). Much learning was the rote memorization and recitation of scripture and the learning of trades by apprenticeship. The primary conception of the purpose of education was to transmit information. Many classrooms today continue a transmission-based conception of learning as the passing on of information from the teacher to the student, with little interest in transforming it or using it for novel purposes.

II. Session Overview, cont'd.

The Renaissance (fifteenth to seventeenth centuries) revived the Greek concept of liberal education, which stressed education as an exploration of the arts and humanities. Renaissance philosophers fought for freedom of thought, and thus Humanism, a study of human values that are not religion-based, was born. By the sixteenth century, the control of the Catholic Church was being challenged on a number of fronts, from Copernicus (1473–1543) who suggested that the Sun rather than the Earth was the center of the solar system, to Martin Luther (1483–1546) who sought to secularize education (Monroe, 1925). The notions of individual inquiry and discovery as bases for learning were reinforced in the Renaissance. In a sense, the recurring ideological debates over education for "basic" skills—the reproduction of facts and rudimentary skills—vs. education for thinking—the effort to understand ideas and use knowledge for broader purposes—replay the medieval vs. Renaissance conceptions of the purposes of education.

René Descartes (1596–1650) revived the Platonic concept of innate knowledge and combined it with the view, once propounded by Aristotle, that we are shaped by experience. Descartes believed that ideas exist within human beings prior to experience and that God is an example of an innate idea. He believed that the body could be appreciated and studied as a zoological machine, while the mind was separate and free from the body. He was one of the first to seek to define precisely the ability of the environment and the mind to influence and initiate behavior. He also described how the body could produce unintended behaviors. Descartes' first description of reflex action was influential in psychology for over 300 years (Hergenhahn, 1976). While these findings supported the work of psychologists seeking to understand the genesis of behaviors, his focus on the mind also supported the work of later cognitive scientists who sought to understand the thinking process itself.

John Locke (1632–1704) also built upon Aristotle's empiricism with the concept that the child's mind is a blank tablet *(tabula rasa)* that gets shaped and formed by his or her own experiences. He believed the mind becomes what it experiences from the outside world. "Let us suppose the mind to be, as we say, white paper, void of all characters, without any ideas: How comes it to be furnished? ... whence has it all the materials of reason and knowledge? ... from experience" (Locke, quoted in Hilgard & Bower, 1975, p. 726). The mind gathers data through the senses and creates simple ideas from experience; these simple ideas combine to develop complex ideas. Locke believed that education should structure experiences for students and that one essential learning was the kind of discipline that could be developed through the study of mathematics (Hergenhahn, 1976). The idea that different disciplines provide qualitatively different mental experiences and means of training the mind undergirds the basis of discipline-based liberal arts education.

Jean-Jacques Rousseau (1712–1778) was one of the first philosophers to suggest that education should be shaped to the child. He celebrated the concept of childhood and felt that children should be allowed to develop naturally, suggesting that "The only habit which the child should be allowed to form is to contract no habit whatever" (Rousseau, quoted in Hilgard & Bower, 1975, p. 516). In Rousseau's novel, *Emile* (Rousseau, 2000), the hero learns about life through his experiences in life. Complex ideas are built from simple ideas that are gathered from the world around him (Hilgard & Bower, 1975). The child-centered philosophies of Dewey, Montessori, Piaget, and others follow in part from similar views.

Kant (1724–1804) refined and modernized Plato's rationalist theory when he suggested that *awareness* of knowledge may begin with experience, but much knowledge exists prior to experience (*"a priori"* knowledge). Kant argued that these ideas must be innate and their purpose is to create an organizing structure for the data that is received by the senses. Kant was one of the first to recognize the cognitive processes of the mind, the idea that the mind is a part of the thinking process and is capable of contributing to the thoughts that it develops. These learning theories opened the door to Jean Piaget and others who would further develop ideas about cognition (Monroe, 1925).

How Psychologists Have Thought of Learning

The nineteenth century brought about the scientific study of learning. Working from the ideas of Descartes and Kant, and influenced by Charles Darwin, psychologists began conducting objective tests to study how people learn and to discover the best approach to teaching. The twentieth-century debate on how people learn has focused largely on behaviorist vs. cognitive psychology. Psychologists have asked, "Is the human simply a very advanced mammal that operates by a stimulus response mechanism or a cognitive creature that uses its brain to construct knowledge from the information received by the senses?"

II. Session Overview, cont'd.

Edward Thorndike (1874–1949) is considered by many to be the first modern education psychologist who sought to bring a scientific approach to the study of learning. Thorndike believed that learning was incremental and that people learned through a trial-and-error approach. His behaviorist theories of learning did not consider that learning took place as a result of mental constructs. Instead, he described how mental connections are formed through positive responses to particular stimuli. For Thorndike, learning was based on an association between sense impressions and an impulse to action. Thorndike favored students' active learning and sought to structure the environment to ensure certain stimuli that would "produce" learning (Hilgard & Bower, 1975).

The father of modern behaviorism, B. F. Skinner (1904–1990), further developed Thorndike's behaviorist learning theory focused on stimulus and response. Skinner was responsible for developing "programmed learning," based on his stimulus–response research on rats and pigeons in experiments that provided positive reinforcement for "correct" responses. He considered learning to be the production of desired behaviors and denied any influence of mental processes. Programmed learning gave proper reinforcement to the student, emphasized reward over punishment, moved the student by small steps through discrete skills, and allowed the student to move at his own speed:

> There are certain questions which have to be answered in turning to the study of any new organism. What behavior is to be set up? What reinforcers are at hand? What responses are available in embarking upon a program of progressive approximation that will lead to the final form of the behavior? How can reinforcements be most effectively scheduled to maintain the behavior in strength? These questions are all relevant in considering the problem of the child in the lower grades (Skinner, quoted in Hilgard & Bower 1975, p. 612).

Behaviorist learning theory has had substantial influence in education, guiding the development of highly sequenced and structured curricula, programmed instructional approaches, workbooks, and other tools. It has proved useful for the development of some types of skills—especially those that can be learned substantially by rote through reinforcement and practice. However, evidence has accrued that tasks requiring more complex thinking and higher mental processes are not generally well-learned through behaviorist methods alone and require more attention to how people perceive, process, and make sense of what they are experiencing.

Jean Piaget (1896–1980) was the first to state that learning is a developmental cognitive process, that students create knowledge rather than receive knowledge from the teacher. He recognized that students construct knowledge based on their experiences, and that how they do so is related to their biological, physical, and mental stage of development. Piaget spent years observing very young children, mapping out four stages of growth: sensori-motor (birth to about two years), preoperational (roughly ages two to seven), concrete operations (encompassing about ages seven to 14) and formal operations (beginning around ages 11 to 15 and extending into adulthood) (Hilgard & Bower, 1975). His work acknowledged the utility of some behaviorally guided, rote learning while also arguing that other activities that support students' exploration are essential:

> Generally speaking, since every discipline must include a certain body of acquired facts as well as the possibility of giving rise to numerous research activities and activities of rediscovery, it is possible to envisage a balance being struck, varying from subject to subject, between different parts to be played by memorizing and free activity (Piaget, quoted in Hilgard & Bower 1975, p. 340).

The Russian teacher and scientist Lev Vygotsky (1896–1934) extended Piaget's developmental theory of cognitive abilities of the individual to include the notion of social-cultural cognition—that is, the idea that all learning occurs in a cultural context and involves social interactions. He emphasized the role that culture and language play in developing students' thinking and the ways in which teachers and peers assist learners in developing new ideas and skills. Vygotsky proposed the concept of the zone of proximal development (ZPD) which suggested that students learn subjects best just beyond their range of existing experience with assistance from the teacher or another peer to bridge the distance from what they know or can do independently and what they can know or can do with assistance (Schunk, 1996). His work led to an emphasis on the deliberate use of discourse and cooperative learning in the classroom and theories of assistance or "scaffolding" to help students learn in systematic ways. Building on Piaget, the developmental learning theorists brought to education the ideas that teachers can be more effective if they organize learning so that it is responsive to the child's stage of development, if they connect learning to the child's prior knowledge and experiences, and if they use social and natural environments as opportunities for learning.

II. Session Overview, cont'd.

Learning Theory in Practice

In the twentieth century, as schooling became compulsory, more widespread and more systematic large-scale reforms of practice were built upon these learning theories. The Progressives embraced Piaget's ideas about child development, Vygotsky's ideas about socially situated learning and the construction of knowledge, and the age-old emphases on both experience and thinking or reflection as a basis for learning. They endeavored to establish child-centered schools for students to approach learning through their own experiences with the understanding that all learning is situated. They sought to lessen the rigidity of the late nineteenth-century school with its focus on the transmission of knowledge. The debate they sparked, which continues today, is what is the proper balance of the traditional school's focus on teacher transmission and the progressive school's focus on the student learning from experience with guided opportunities to explore, discover, construct, and create.

Philosopher John Dewey (1859–1952) agreed in part with Rousseau that education should not be separate from life itself, that education should be child-centered, guided by a well-trained teacher who is grounded in peda-gogical and subject knowledge. Like Locke, he believed that structured experience matters and that disciplinary modes of inquiry could help develop the mind, thus creating a dialectic between the child and the curriculum that the teacher must manage. The teacher's goal is to understand both the demands of the discipline and the needs of the child and to provide learning experiences to enable the student to uncover the curriculum. Dewey believed that the ability of a person to learn was dependent on many things, one of which was the environment. Dewey, who established the first laboratory school, was one of the first to suggest that learning was a situated activity. Like Horace Mann (1796–1859), the first secretary of education for the state of Massachusetts and the founder of the common school, Dewey felt that education was the primary method of social progress and reform (Wirth, 1966): "When education is based upon experience and educative experience is seen to be a social process, the sit-uation changes radically. The teacher loses the position of external boss or dictator but takes on that of leader of group activities" (Dewey, 1938, p. 59).

In Italy, Maria Montessori (1870–1952), introduced a liberated concept of early childhood education that provided more opportunity for free expression, moving children away from their desks, providing them with hands-on activities, and respecting children as individuals. Like Dewey, she believed that students learn through carefully chosen activities: "The task of the teacher becomes that of preparing a series of cultural activities spread over a specially prepared environment and then refraining from obtrusive interference" (Montessori, 1995, p. 1). Montessori went beyond Friedrich Froebel (1782–1852), who is largely responsible for the invention of kinder-garten (which was originally banned in his native Prussia), to create K-fifth grade, child-centered schools (Monroe, 1925). Like Froebel, Montessori felt that children's play was an important aspect of their self-expression and their social and cognitive learning, and that teachers should be guides for their students instead of authority figures. Along with being the first woman in Italy to receive a medical degree, she was also nominated for the Nobel Peace Prize three times.

Building on these ideas, Jerome Bruner (born 1915) has further explored the notion that disciplines have certain structural elements—core ideas and approaches to knowledge and understanding—that should guide cur-riculum development in a manner that connects to the development of the child. Bruner developed the idea that if complex material is broken down into its essential ideas, any student can learn any subject matter, claiming that "Any subject can be taught effectively in some intellectually honest form to any child at any stage of develop-ment" (Bruner, 1960, p. 33). Bruner developed the concept of a spiral curriculum that returns to the same subject matter at periodic points in time, but at each "spiral" the material is substantially deeper in its intellectual demands (Hilgard & Bower, 1975).

Today teachers utilize a variety of classroom practices that are based on all of these ideas about learning. Con-temporary learning theory recognizes the role that both experience and reflection play in the development of ideas and skills. Researchers and practitioners appreciate that reinforcement and practice play a role in the devel-opment of skills, and so do cognitive intent, effort, and reasoning. They acknowledge the importance of develop-mental stages; they also recognize that development can be encouraged through social interaction and the structuring of experiences within the learners' sphere of readiness. Modern learning theories incorporate the role of culture and other influences on experience in views of how people construct their understandings and develop their abilities. Contemporary theories also recognize that the content matters—the nature of the disciplines has much to do with how they are learned and best taught. In large part because of differences in underlying views of the purposes of education, debates continue about "best" teaching practices. Effective teachers understand

that different strategies are useful for different kinds of learning. It is most productive to think of these issues in terms of what kind of learning is sought in what contexts and then deliberate about what strategies may be most appropriate for those goals.

The Learning Process

Learning theorists have provided us with a set of ideas about how people learn that have practical implications for teaching. Research has found that:

•   the brain plays a role in learning,

•   the way the learning environment is constructed makes a difference,

•   learning is based on the associations or connections we make,

•   learning occurs in particular social and cultural environments, and finally,

•   the different ways people think and feel about their own learning affects their development as learners.

These ideas provide a framework for teaching practice. As we discuss below, teaching involves assisting learners by organizing the classroom environment, structuring tasks and activities, and facilitating how students interact in the classroom. The more teachers understand the basis for learning theories, the better they can determine when and how these ideas might be useful in the classroom. Simply put, theories are explanations. These theories can be used to understand our own ideas about learning better and to help to explain how students learn.

The Brain Plays a Role

Our brains are set up to process information coming in from the outside world, to make sense of these stimuli, and to draw connections. Neuroscientists have found that different parts of the brain perform different functions, and that learning actually changes the physical structure of the brain by expanding the brain's capacity. We know that the development of the brain is lifelong and not predetermined at birth or even within the first three years of life. We also know that individual learners process information differently. This influences how each of us handles visual, aural, verbal, or tactile information. Information is easier to understand and use when it is introduced through learning pathways that are better developed.

Learning Is Based on Associations

Cognitive scientists have demonstrated how learning is a process of drawing connections between new information and what is already known. We learn by taking in, organizing, and storing information, and retrieving it at the appropriate times. For learning to occur, new ideas must be related to old ones. For this reason, prior knowledge is important to the learning process: People make connections and draw conclusions on the basis of what they already know and have experienced. Teachers can influence this process by organizing information and helping learners access their prior knowledge and draw connections to new material. Becoming aware of the central ideas in a subject area, and of how they relate to each other, can also help learners to make sense of information and use it more flexibly.

The Learning Environment Makes a Difference

As the debates among early philosophers suggested, learning involves both internal development and external interactions with the environment. People learn by making sense of the environment and stimuli around them. Behaviorists taught us that greater perceptual development and learning occur in environments that are rich with stimuli and provide feedback in response to a learner's efforts. Learning is also enhanced when content is relevant to students' lives, when teachers provide opportunities to build understandings and practice skills, and when students have choices that are interesting to them. In addition, access to teachers and peers who can model, explain, discuss, or critique shapes the learning process.

Learning Occurs in Cultural and Social Contexts

Sociocultural theorists have shown us that the way people make sense of information depends on what they encounter and what is valued at home, in the community, and in the classroom. Culture influences the experiences people bring to the classroom, how they communicate, how they expect to learn, and what they think is worth learning. Learning is facilitated when efforts are made to connect classroom activities to students' experiences at home. How teachers organize the culture of the classroom—how they communicate, define students' roles, and support or discourage collaboration—all influence what is learned.

People Learn in Different Ways

Understanding individual differences in how people learn can help us to understand and guide the learning process better. For instance, students have a number of intelligences beyond the language and mathematical abilities typically emphasized in schools. Learners also possess spatial, musical, and kinesthetic abilities. In addition, students demonstrate differences in how they prefer to take in and process information. Students' sense of their own abilities and expectations for success will influence how willing they are to engage in learning. Not only do people learn in different ways, but there are also different kinds of learning. Some learning is simple and repeatable, other kinds of learning require more complex thinking and strategizing.

People Think About Their Own Learning, and Their Feelings Matter

Finally, both thoughts and emotions shape the learning process. Being able to think about and monitor their own thinking enables learners to direct their own learning. Reflective learners are also good intentional learners. They are able to redirect the normal frustration that occurs when tasks are confusing, or when their efforts are not initially productive, into further learning.

Emotions also play a role. Students who are fearful, anxious, depressed, or distracted cannot focus to process information. Positive emotions—feelings of confidence and willingness to exert effort—can help students to think, perform a learning task, and process new knowledge. The ability to recognize and manage their emotions, to solve conflicts, to motivate themselves, and to persevere in the face of difficulty can help students become life-long learners.

What Teachers Can Do To Assist Learning

Teachers can be more effective in their work if they teach in ways that are compatible with the processes of learning. Sometimes schools seem to be set up to make learning difficult and unnatural. As Tracy Kidder observes:

> The problem is fundamental. Put twenty or more children of roughly the same age in a little room, confine them to desks, make them wait in lines, make them behave. It is as if a secret committee, now lost to history, had made a study of children and, having figured out what the greatest number were least disposed to do, declared that all of them should do it (Kidder, 1989, p. 115).

How can what we know about the learning process help us to think about effective teaching practices? The following points about teaching and learning are emphasized throughout the course. Effective teaching involves:

· organizing the environment,

· organizing knowledge, information, and activities, and

· organizing people.

Organizing the Environment

Effective teachers can organize the learning environment to provide students with hands-on learning opportunities and authentic tasks and audiences. Opportunities for "active" learning experiences—in which students are asked to write and talk about ideas, create models and demonstrations, solve complex problems, and construct projects that require the integration of many ideas—have been found to promote deeper learning, especially

II. Session Overview, cont'd.

when they are combined with reflection. Teachers can develop learning activities with real purposes, audiences, and structures that mirror those outside-of-school settings, providing rich materials (ranging from models and manipulatives, to learning centers, texts and computers) for students to work with, manipulate, and use to gather information and create representations of their learning.

When students are presented with choices about classroom work and feel a sense of belonging to a classroom community, their motivation to learn is increased. By encouraging discussion among students about ideas, concepts, and relationships, teachers can create environments where students are also sources of knowledge for one another.

Organizing Knowledge, Information, and Activities

Teachers can organize information in the classroom environment by taking into account how people process information, and by building on students' experience and prior knowledge. They can ensure that tasks are accessible and appropriate for their students and provide feedback that offers opportunities for revision of work. They can also teach students how to think about and monitor their own learning and performance by providing students with opportunities to plan and organize complex tasks and to use specific learning strategies.

Learning with understanding is more likely to occur when students are helped to see how concepts are related, and when a map of the intellectual terrain is provided, as opposed to an unrelated list of facts. Offering "advance organizers" can help students to structure new knowledge and information by making the big ideas in a content area clear. With an understanding of the structure of their subject matter, teachers can organize inquiries that represent how knowledge is built in a disciplinary field through, for example, scientific experimentation, historical research, or mathematical discourse. Teachers can skillfully choose examples, analogies, and diagrams to make material meaningful to students and to address common misconceptions.

Teachers can also foster students' understanding and ability to undertake complex performances by modeling and demonstrating how experts approach a task, scaffolding steps in the learning process, coaching learners, and providing specific, constructive feedback that enables learners to revise and improve their work.

Organizing People

Much learning occurs in groups and among individuals engaged in tasks together. Students learn from each other and from adults outside the school, as well as from their classroom teachers. Effective teachers organize learning opportunities in social contexts by enabling students and others to learn together. Teachers can create a sense of community within their classrooms by developing clear norms for behavior, creating an emotionally safe environment, and organizing productive, collaborative learning.

Facilitating students' interactions in the classroom involves paying attention to which kinds of tasks are group-worthy—that is, truly open-ended, intrinsically interesting and challenging, and requiring a range of skills and abilities to complete. Teachers can also use explicit strategies to encourage the participation of the entire group, not just those students who may otherwise tend to dominate discussions. Noting students' different competencies and assigning roles that build on students' strengths allows many students to act as experts in a group; this paves the way for those students with low academic, social, or peer status to feel more comfortable participating and making contributions.

Teachers can capitalize on the diversity within their classes by helping students make connections between their home experiences and school experiences, enabling them to teach each other about their experiences (thus expanding each student's knowledge base), and by providing students choices about how to pursue learning activities in ways that work best for them.

Teachers can also organize the adults in their environments as they work with colleagues to create coherent curriculum across grade levels and classrooms, share knowledge with one another, and collaborate to encourage learning for understanding throughout their schools.

II. Session Overview, cont'd.

The Relation of Theory to Practice

This course addresses the relationship among three fundamental aspects of the educational process: the subject matter of the curriculum, the diverse capabilities of students, and the teacher's responsibilities to design and implement instruction. While general principles about learning can be drawn from many disciplines—such as psychology, sociology, linguistics, anthropology, and philosophy—at a practical level, no two teaching situations are quite comparable. Learning to teach thus demands that we understand both the general and the particular, seek theoretical insights that give meaning to what we do, and raise skeptical questions about what we think we know.

Definition of a Theory

A theory is both an explanation and a model of how things work. Learning theories attempt to answer key questions: How does learning happen? What influences students' development? What motivates students to learn? A theory is not just an idea. It is an idea that explains a set of relationships that can be tested. If the idea is supported through rigorous research, that theory is said to have empirical grounding.

A theory is developed from research as well as practical experience and systematic observation. Any given theory is usually about one aspect of the learning process. For example, Piaget looked at the stages of cognitive development. He watched his own children and carefully observed how they learned and what they could do. From his observations, he proposed a theory of the stages of cognitive development. The theory that children progress more or less sequentially from one cognitive stage to another has been supported by thousands of subsequent studies.

A theory is modified over time on the basis of practitioners' insights as well as the work of researchers. Other theorists have tested Piaget's ideas by examining his stage theory from many different angles. Some have challenged Piaget's methods and the limitations that result from studying only a small number of children. Others have expanded on his ideas by taking into account the impact of the learning environment, the individual's motivation, and the nature of the social interactions involved in his work. For example, Vygotsky, who was a secondary school teacher as well as a researcher, observed how development is influenced by interactions with others. He proposed that learners can develop more mature cognitive abilities when provided with certain kinds of assistance. Vygotsky and other theorists have built on Piaget's theories by taking into account the larger social context of the learning process.

Theories are interconnected. Just as various theories describe different, interrelated parts of a more complex learning process, the individual sessions in this course are intended to form a more connected whole. The various learning theories exist to describe and explain different aspects of the learning process, which has many facets dealing with how people perceive and understand information, how they develop new ideas and skills, how they can be motivated, and more.
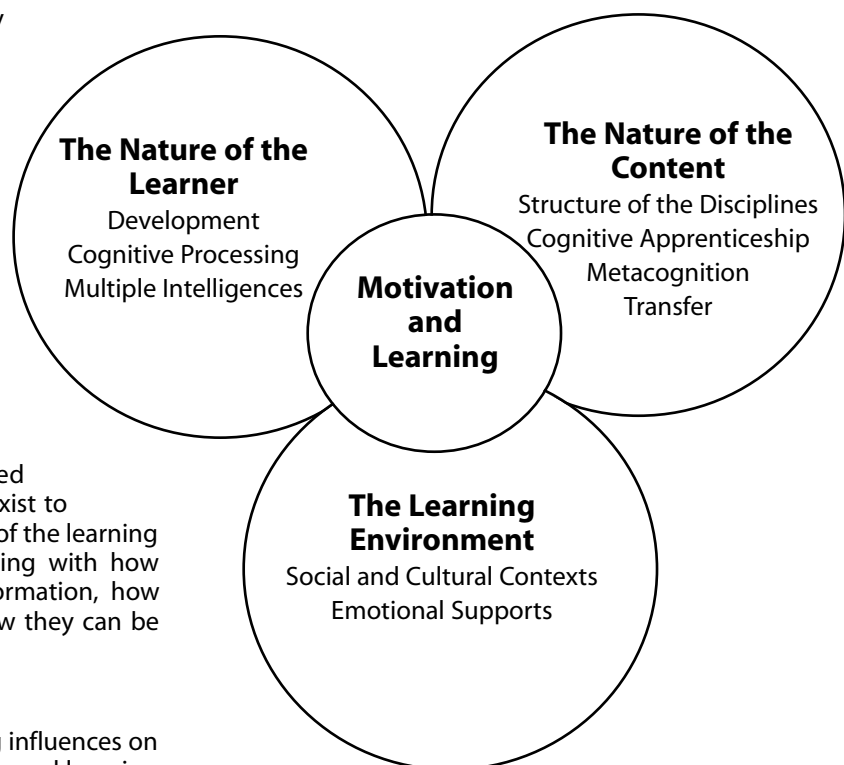

The Nature of the Learner
Development
Cognitive Processing
Multiple Intelligences

The Nature of the Content
Structure of the Disciplines
Cognitive Apprenticeship
Metacognition
Transfer

Motivation and Learning

The Learning Environment
Social and Cultural Contexts
Emotional Supports

Figure 1. Intersecting influences on motivation and learning

II. Session Overview, cont'd.

Applying Theory to Practice

To apply learning theories to instructional practices, we need to understand theories as principles that have been tested and that have some power to explain how things work across different situations and contexts. These theories can give us some consistent ways of looking at classroom practice and some rational explanations for what occurs. However, the events in classrooms are influenced by many variables, and no single theory explains how they will all come together under different circumstances. Teachers have complicated jobs. They have to consider many sources of knowledge and explanation, take into account their specific classroom situations and students, and determine when and how various ideas can inform their practice.

Teachers in the classroom experience what Dan Lortie (1975) called the "multi-dimensionality and simultaneity of teaching"—many things are going on all at once, and teachers have multiple goals that can compete with one another. Every student brings his or her idiosyncratic, individual challenges, personality, and abilities to the classroom. Even if there are some similarities in how first graders learn to read, or some commonalities in how high school students learn to develop a critical stance, every group of students is distinct and unique. If the teacher is to build a bridge between her students and the curriculum, she needs to acknowledge these differences and build on students' prior knowledge, languages, and cultures. The importance of these differences and ways of addressing them can be informed by an understanding of sociocultural theories about learning, as well as theories about students' multiple intelligences, and ideas about how to organize the specific content to be taught.

For these reasons, there is no one-to-one correspondence between theory and practice. Integrating theory and practice is a process of connecting what teachers know about their own students with what they know about learning, motivation, development, cultures, and social contexts, as well as teaching. Theory provides some guidance in making decisions about curriculum and teaching strategies. Perhaps more important, it supports some sensitivities that enable a teacher to ask useful questions about what may be going on with her students and some indications about hypotheses that might be helpful in solving particular problems. Theory does not give teachers a simple, direct answer to a student's problem or a recipe for how to teach on Monday. It provides some lenses and some insights to help a teacher determine what could be going on with a student and how the teacher might plan the next lesson, given what the field has learned about learning and teaching and what the teacher knows about her own teaching context. Excellent teachers use their storehouses of intersecting theories, research, and personal as well as professional knowledge to solve problems of practice that emerge in the classroom.

The Teacher Is a Theorist

In these ways, the teacher is also a theorist. Roland Barth (1990) suggests that all teachers and principals work from an "organizing principle" or "framework"; they are both "theory makers" and "theory consumers." The teacher theorizes about what is going on in the social dynamics of the classroom and what is going on with individual children and their particular learning process. The body of work contributed by researchers gives teachers more tools and resources for this kind of classroom theorizing and inquiry.

The teacher develops his own explanations or theories for what he sees. To make decisions, the teacher does his own classroom research by observing carefully what happens under different circumstances. Such "teacher research" occurs informally and formally as teachers use inquiry to make sense of their own practice, and as they interact with communities of other teacher scholars to create "practice-based knowledge" about learning and teaching (Cochran-Smith & Lytle, 2001; Shulman, 1993; Wells, 1994). Good teachers have a kind of "personal practical knowledge" that enables them to understand what is going on with their students. By watching students, observing them in action, examining their work, and talking and listening to them, teachers learn about what makes their students "tick" as learners. Teachers build this knowledge, in part, by creating opportunities to learn about how students think and using these insights to inform their teaching. One way teachers determine whether their instruction is effective is through assessing their students' progress. Decisions based on these on-site, in-the-moment understandings can be even more effective when coupled with knowledge about learning and learners in general.

II. Session Overview, cont'd.

The teacher has the job of bringing together what the profession, researchers, and other professionals have come to know about what matters and what works under different situations. The teacher must apply theories judiciously using careful decision-making informed by her own inquiry and her own understanding of the situation at hand. The theories illustrated in this course represent a sampling of what we know about learning theory today, which is constantly evolving. Teachers play an important role in building on and expanding what we know about how people learn.

III. Additional Session Readings

Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.). (2000). Learning: From speculation to science (Chapter 1). In *How people learn: Brain, mind, experience, and school.* Washington, DC: National Academy Press. [Online]. Available: http://books.nap.edu/html/howpeople1.

The following cases, written by Stanford University preservice teachers, are part of the long-term curriculum case study assignment. The text of these exemplary cases can be found in Appendix B and related discussion prompts are included under Long-Term Assignments below.

Marchetti, J. R. (2002). *It's a process! A case of teaching for "understanding" and "authenticity."* Unpublished manuscript, Stanford University School of Education, Stanford, CA.

Naughton, M. (2002). *Mental models and the car analogy: A case of two classes.* Unpublished manuscript, Stanford University School of Education, Stanford, CA.

Ochoa, E. (2002). *Deceiving myself: Building on a weak foundation.* Unpublished manuscript, Stanford University School of Education, Stanford, CA.

IV. Session Activities

Getting Started

Answer one of the following questions in a free-write, pair-share, or small-group discussion.

1. Write a brief reflection on your own learning. In general, what learning conditions and teaching strategies do you think enable you to learn most effectively? Then answer one of the following:

    a. Think back to a specific time when you tried to learn something, but felt you could not deeply understand it or become proficient.

        •   What was the nature of the learning situation?

        •   What impeded your learning?

        •   How did you feel?

        •   Can you imagine what would have allowed you to learn more effectively?

    b. Think back to a time when you successfully learned something that was especially challenging.

        •   What was the nature of the content or skill that you were trying to learn?

        •   What made it difficult?

        •   What finally enabled you to succeed in mastering these difficult ideas or skills?

OR

2. Teaching has been described in many different ways: as acting, as telling, as coaching, and many more. What simile captures your own ideas about teaching? What does your simile imply about how you think students learn and what teachers can do to assist that learning?

OR

3. Finish the following sentence in as many ways as you can:

    People learn by _____.

IV. Session Activities, cont'd.

Discussion of Session Readings

> **To the Facilitator:** You may want to select questions from the Other Learning Activities and Assessments section to launch a discussion of the session readings. The questions used for the Checking for Understanding activities may be a particularly helpful resource.

Session Video

The 13 sessions in this video course are grouped into four major areas that influence learning: the learner, the learning environment, the teaching/learning process, and the interactions among all of those areas that produce motivation to learn. In this introductory video, Professor Linda Darling-Hammond discusses these ideas with four teachers who are featured in the videos. Excerpts of their classroom videos are used here to illustrate key aspects of their practice.

Background on Teachers

Fe MacLean is a first grade-teacher at Paddock Elementary School in the small, culturally diverse town of Milan, Michigan. Ms. MacLean, with 36 years of teaching experience, holds a bachelor's degree in elementary education from the Philippine Normal College, and a master's degree in learning and cognitive development from the University of Michigan. She is a National Board-certified teacher and a winner of the Presidential Award for Excellence in Mathematics and Science Teaching (2000). In 2000, she received a Fulbright Memorial Award for Teacher Study in Japan.

Professor Darling-Hammond speaks with Ms. MacLean about how students develop, process information, and use their multiple intelligences, ideas represented in Sessions 2, 3, and 4 of this course. Ms. MacLean describes how she makes complex ideas accessible by assessing where her students are developmentally, by tapping into her students' prior knowledge, and by engaging their different intelligences with drawing, writing, and presentations.

Kathleen Hayes-Parvin teaches sixth-grade language arts and social studies at Birney Middle School in Southfield, Michigan. She has been teaching for 12 years. She received her master's degree in special education, with an emphasis in learning disabilities, and her bachelor's degree in English, both from Marygrove College. Ms. Hayes-Parvin is a contributing author of *Trends and Issues in Elementary Language Arts* (2000) published by the National Council of Teachers of English. She is also a writing project teacher consultant for the National Writing Project Network.

In the second segment, Professor Darling-Hammond speaks with Ms. Hayes-Parvin about how teachers can construct a productive environment for learning. Professor Darling-Hammond highlights several important aspects of the learning environment: the role of emotions, culture, and social interactions in learning, ideas that are the focus of Sessions 5, 6, and 7 of this course. In this segment, we see excerpts from Ms. Hayes-Parvin's family histories and memoir project. She describes how she creates an emotionally safe place for learning and how she manages the social interactions among her students.

Kendra Hearn was teaching 12th-grade English at West Bloomfield High School, Michigan at the time this program was taped. She has seven years of teaching experience. Ms. Hearn holds a bachelor's degree in English from the University of Michigan, Ann Arbor and a master's degree in education administration from the University of Detroit, Mercy. She is studying metacognitive theory and applications as part of her doctoral studies in curriculum and instruction at Wayne State University. She is certified by the National Board for Professional Teaching Standards in English language arts. Ms. Hearn is now a professional development consultant with the Macomb Intermediate School District.

IV. Session Activities, cont'd.

In the third segment, Professor Darling-Hammond introduces four ideas about teaching and learning—cognitive apprenticeship, metacognition, the structure of the disciplines, and transfer, which appear in Sessions 8 through 11 of the course. She discusses some of these ideas with Ms. Hearn. In her classroom Ms. Hearn creates an apprenticeship situation as she teaches her students how to write. She uses a wide range of strategies to help them to improve their work and understand how writers think.

Donald Johnson teaches seventh- and eighth-grade science at Christopher Columbus Middle School in southeast Detroit. He is active in the Detroit Area Pre-College Engineering Program (DAPCEP). He holds a master's degree in education from Marygrove College, and a bachelor's degree in biology from University of Tennessee, Knoxville. Mr. Johnson has six years' teaching experience. He is a member of the Board of Directors for the Metro-Detroit Science Teachers Association.

The final segment focuses on motivating students, the topic of Session 12 of the course. Mr. Johnson's high school engineering class is featured. He describes how he structures a bridge-building activity to engage and motivate his students.

Discussion of Session Video

> **To the Facilitator:** You may want to pause the tape at the following points to discuss these questions. If you are watching a real-time broadcast on the Annenberg/CPB Channel, you may want to consider the questions as you watch and discuss some of them afterward.

1. Understanding the Learner (Fe MacLean)

Video Cue: *The Learning Classroom* icon fades out at approximately 9:15 into the program.

Audio Cue: Ms. MacLean says, "Some of them just are just plain drawing. Some act them out. You know, they're going down or sliding down themselves, pretending they're sliding down with their drawing. Whatever will let me show, will let them show that they understood the concept that we are trying to learn."

• How do you think Ms. MacLean's strategies for having students show what they know enhance her students' learning?

• How do you prefer to learn new things—through listening, talking, writing, reading, drawing, exploring, role play, or other ways?

2. Building a Positive, Productive Environment (Kathleen Hayes-Parvin)

Video Cue: *The Learning Classroom* icon fades out at approximately 15:00 into the program.

Audio Cue: Ms. Hayes-Parvin says, "And these things really begin to translate and take a hold, and they internalize them so that they learn to be real writers together."

• How does Ms. Hayes-Parvin help her students learn to work together?

• What are some of the challenges you notice in this video that the teacher experiences in helping her students learn how to collaborate?

• What strategies have you found most effective in your classroom to accomplish this?

IV. Session Activities, cont'd.

3. Understanding the Teaching and Learning Process (Kendra Hearn)

Video Cue: *The Learning Classroom* icon fades out at approximately 20:00 into the program.

Audio Cue: Ms. Hearn says, "I refer to them as writers and then when they're talking with me, it's just as a coach of a writer, and we talk quite frankly again about what problems they're having in their writing and what sort of strategies we might use to overcome those."

- Why do you think Ms. Hearn feels it is so important to teach students to be reflective about their work?

- What have you found to be the most useful strategies for encouraging students to monitor and reflect on their own work?

4. The Interactions Among Theories That Motivate Learning (Don Johnson)

Video Cue: *The Learning Classroom* icon fades out at approximately 25:30 into the program.

Audio Cue: Kathleen Hayes-Parvin says, "So I think as lifelong learners, you know, we continue our journey and we can inspire them and keep motivated and fresh."

- What do you think are some of the reasons students were motivated to engage in this bridge-building project?

- Think about a time when you were highly motivated to learn something difficult. What about the instruction or learning environment sustained your interest?

V. Other Learning Activities and Assessments

To the Facilitator: These activities and assessments are for you to choose from according to your group's needs and interests. Many of the activities offered here would work equally well as assignments both inside and outside of class. You may want to use class time to prepare for and/or reflect on any activities assigned as homework.

Applications

1. Journal

Look at the table of contents for this video course and read each chapter title. Pick three chapters that sound most vital and interesting to you. Write a sentence or two that explains why you think each chapter will be valuable or interesting.

V. Other Learning Activities and Assessments, cont'd.

2. Speaker Panel

Invite several twentieth-century learning theorists to your classroom. Learners might "become" Skinner, Dewey, Bruner, Montessori, Vygotsky, or Piaget. The remaining learners are audience members learning what they can to inform their teaching practice and guide student learning.

> **To the Facilitator:** Think about your class size and time available, and structure this activity accordingly. For example: With a class of 15, you might include five theorists on the panel, grouping learners into five groups of three.
>
> • Each group uses the chapter information and outside resources (including Web sites listed in this session's references) to identify the main contributions of the theorist to the field of learning theory, reactions to other theorists, and possibly historical context. This advance work helps the actors/actresses in the group assume their roles.
>
> • Actors/actresses have 10 minutes to write an opening statement to introduce themselves to the audience. This statement should be in the first person and written in a persuasive manner. Audience members take this same 10 minutes to write two to four questions for the panel of speakers. These questions can be addressed to a particular theorist on the panel or a set of theorists.
>
> • The panel begins with actors/actresses sitting at the front of the class. Each speaker shares his or her opening statement and then the audience members ask their questions. One variation might be for panelists to withhold their names, with audience members having to identify each using their opening statements as guides. As leader, you moderate the panel, allowing all theorists to be heard and their ideas challenged.

3. Session Reflection

a. Consider this chapter's learning objectives:

Teachers will begin to uncover and articulate their assumptions, understandings, and questions about how students learn and the nature of teaching.

Teachers will begin to consider learning theory and its role in their teaching practice.

Write a reflection answering the following questions:

   • Did you meet this objective during this part of our course? If so, how? In not, why?

   • What particular content or activity enabled you to meet this objective?

   • What questions do you have that are relevant to this objective that might guide you later in the course?

   • How would you describe what you learned?

b. Revisit free-writes/reflections generated by prompts in Getting Started.

V. Other Learning Activities and Assessments, cont'd.

Checking for Understanding

1. Short-Answer Questions

a.   How is a teacher both a "theory consumer" and "theory maker"?

b.   Briefly describe a learning theory you have learned about that you find particularly useful.

2. Essay Question

Choose two learning theorists or a central debate in learning theory. Compare and contrast these two perspectives. (e.g., learning is an internal vs. external process, teaching is about transmitting knowledge vs. engaging in activities, learning is building skills vs. constructing knowledge, learning occurs individually vs. in interaction with others). What does each perspective contribute? What do you gain from the integration of these perspectives?

Long-Term Assignments

> **To the Facilitator:** Two activities extend over the entire course: writing a **Curriculum Case Study** and **Creating a Course Portfolio.** A brief overview of each of these long-term activities is included here. Please see Appendices B and C for complete information about each of these assignments.

1. Curriculum Case Study (see Appendix B)

The curriculum case study assignment (described fully in Appendix B) structures the writing of a detailed narrative that focuses on the teaching and student learning during a particular teaching event. The assignment asks learners to explore and apply the course's main concepts and theories by reflecting on a surprising or puzzling segment of either successful or unsuccessful teaching. Learners are asked to:

- Choose a time when they taught (or will imminently teach) an important concept in their field. They will report on this segment of teaching either in retrospect or as it occurs.

- Examine how they organized their instructional environment, activities, subject matter, and students to facilitate students' learning processes.

- Consider what they know about students' learning relevant to this particular teaching event.

- Use learning theory to inform their understanding of this particular teaching event and develop their own theories to explain the event and inform future teaching.

[continued next page]

> **To the Facilitator:** Using real examples and events from their own practice can help learners consider the complexities of teaching and learning and the importance of context. Writing a case narrative allows them to move back and forth between theory and practice and between the specific case and general principles of teaching and learning. This assignment conveys a conception of teaching as reflective inquiry and may encourage more reflective practice. Sharing, discussing, and commenting on one another's cases makes teaching more public and open to review, contributes toward building professional communities, and makes resources available for other practitioners. See Appendix B for a more complete description of this assignment.

V. Other Learning Activities and Assessments, cont'd.

Curriculum Case Study, cont'd.

Read one or more of the following cases found in Appendix B and use the questions below as a guide for your discussion.

> **To the Facilitator:** Have learners read a case and use this discussion to begin the long-term case assignment. Try to bring out some points about "what makes this a case."

> Marchetti, J. R. (2002). *It's a process! A case of teaching for "understanding" and "authenticity."* Unpublished manuscript, Stanford University School of Education, Stanford, CA.

> Naughton, M. (2002). *Mental models and the car analogy: A case of two classes.* Unpublished manuscript, Stanford University School of Education, Stanford, CA.

> Ochoa, E. (2002). *Deceiving myself: Building on a weak foundation.* Unpublished manuscript, Stanford University School of Education, Stanford, CA.

- Teaching is inherently problematic. What do you see as the problem(s) in this case?
    - What do you see as the underlying source(s) of these problems?
- Describe the key elements of the context for this case:
    - Who are the students?
    - What are the curriculum goals?
    - What is the content?
- How do these elements of context affect what happened in the case?
- Why do you think the author encountered the problems that she or he did?
- What evidence supports your interpretations?
- What do you think this is a case of?

2. Creating a Course Portfolio (see Appendix C)

The portfolio activity (described in Appendix C) asks learners to review and reflect on their work and learning throughout the course. The portfolio starts as a working portfolio where learners collect and reflect on the work they produce for different sessions. Near the end of the course, learners choose assignments to be included in a "showcase portfolio" as evidence of their "best work" or what they feel best represents their areas of learning. The assignments highlight personal growth in understanding and real (or anticipated) applications of learning theory in the classroom. Learners share their learning and portfolios with an audience, which might include their fellow classmates, professional colleagues, and/or friends and family. [See Appendix C for a more complete description of this assignment.]

Your leader will introduce this long-term assignment. Your first task is to create a safe place to put all the work you generate during the course. You might also start a journal of questions, wonderings, epiphanies, and things to pursue. You might also keep a journal of "things to remember for my classroom."

> **To the Facilitator:** You will find other learning activities on the course Web site at www.learner.org/channel/courses/learning-classroom. You will want to look ahead to assign learners the reading and any homework for the next session.

VI. Web Sites and Organizations

The Center for Dewey Studies: http://www.siu.edu/~deweyctr/index.html

Based at the Southern Illinois University at Carbondale, the Center for Dewey Studies provides extensive information and history about John Dewey's life and research. Annotated bibliographies, discussion groups, and relevant links are included.

Explorations in Learning and Instruction: The Theory Into Practice Database: http://tip.psychology.org/

This comprehensive Web site, created by Jacksonville State University, includes brief reviews of 50 learning theories and theorists. The Web site is organized and indexed by learning theory, subject area, and key ideas in learning. A reference list is provided for each learning theory/theorist.

Funderstanding: About Learning: http://www.funderstanding.com/about_learning.cfm

This Web site provides an overview of major learning theories developed by Funderstanding (a group of product development consultants). The site includes information about constructivism and behaviorism, and about Piaget, Vygotsky, and other theorists.

The Knowledge Media Laboratory at the Carnegie Foundation: http://www.carnegiefoundation.org/KML/index.htm

The Knowledge Media Laboratory (KML) of the Carnegie Foundation for the Advancement of Teaching researches and develops new uses of emerging technologies and new media to enhance the quality of teaching and learning. This site includes multimedia examples of teacher research and scholarship.

VII. References and Recommended Readings

Note that the recommended readings are marked with an asterisk (*).

Barth, R. (1990). *Improving schools from within: Teachers, parents, and principals can make the difference.* San Francisco: Jossey-Bass Publishers.

*Berliner, D. (1993). The 100-year journey of educational psychology: From interest, to disdain, to respect for practice. In T. Fagan and G. R. VandenBos (Eds.), *Exploring applied psychology: Origins and critical analysis* (Master Lectures in Psychology). Washington, DC; American Psychological Association. Retrieved February 24, 2003, from Arizona State University Web site: http://courses.ed.asu.edu/berliner/readings/journey.htm

*Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.). (2000). Learning: From speculation to science (Chapter 1). In *How people learn: Brain, mind, experience, and school* (pp. 3-27). Washington, DC: National Academy Press.

*Bruner, J. (1960). *The process of education.* Cambridge, MA: Harvard University Press.

*Cochran-Smith, M., & Lytle, S. (2001). Beyond certainty: Taking an inquiry stance on practice. In A. Lieberman & L. Miller (Eds.), *Teachers caught in the action: Professional development that matters* (pp. 45-60). New York: Teachers College Press.

*Dewey, J. (1938). *The experience of education.* New York: Simon & Schuster.

Dewey, J. (1959). *Dewey on education.* New York: Teachers College Press.

Hergenhahn, B. R. (1976). *An introduction to theories of learning.* Englewood Cliffs, NJ: Prentice-Hall.

Hilgard, E. R., & Bower, G. H. (1975). *Theories of learning.* Englewood Cliffs, NJ: Prentice-Hall.

Kidder, T. (1989). *Among schoolchildren.* Boston: Houghton Mifflin.

Lortie, D. (1975). *Schoolteacher: A sociological study.* Chicago: University of Chicago Press.

*Marchetti, J. R.(2002). *It's a process! A case of teaching for "understanding" and "authenticity."* Unpublished manuscript, Stanford University School of Education, Stanford, CA.

Monroe, P. (1925). *A text-book in the history of education.* New York: Macmillan Company.

Montessori, M. (1995). Education for a new world: The Clio Montessori Series. [Electronic version]. Oxford, England: Clio Press Ltd.

*Naughton, M. (2002). *Mental models and the car analogy: A case of two classes.* Unpublished manuscript, Stanford University School of Education, Stanford, CA.

*Oakes, J., & Lipton, M. (1999). Traditional learning theories and contemporary learning theories. In *Teaching to change the world* (pp. 39-65). New York: McGraw-Hill College.

*Ochoa, E. (2002). *Deceiving myself: Building on a weak foundation.* Unpublished manuscript, Stanford University School of Education, Stanford, CA.

Rousseau, J. J. (2000). *Emile.* London: Everyman.

Schunk, D. H. (1996). *Learning theories.* Englewood Cliffs, NJ: Prentice-Hall.

*Shulman, L. (1993). Teaching as community property: Putting an end to pedagogical solitude. *Change,* 25(6), 6-7.

Shulman, L. (1996). Just in case: Reflections on learning from experience. In J. A. Colbert, P. Desberg, & K. Trimble (Eds.), *The case for education: Contemporary approaches for using case methods* (pp.197-217). Boston: Allyn & Bacon.

Wells, G. (1994). *Changing schools from within: Creating communities of inquiry.* Portsmouth, NH: Heinemann.

*White, V. (1988). One struggle after another. In J. Shulman & J. Colbert (Eds.), *The intern teacher casebook.* Washington, DC: ERIC Clearinghouse; and San Francisco: Far West Laboratory.

Wirth, A. (1966). *John Dewey as educator.* New York: John Wiley & Sons.