

Rethinking Learning and Development

“Human development” refers to the way that people change over time (Thomas, 2001). We no longer speak strictly of “child development,” as if it were only in childhood that human beings developed intellectually, emotionally, socially, and morally. We know that development in all of these areas continues throughout a person’s life, hence the term human development. In this section of *The Diversity Kit*, we explore how different fields of study perceive human development and learning. Subsequent sections of the kit focus more specifically on the role of schools and formal classroom instruction in fostering development, especially in relation to culture and language.

Many of us learned a supposedly universal theory of development that was actually based on Western European and North American values and child-rearing methods; we now know that “normal” development varies from culture to culture, depending on how children are socialized by their parents and community (Greenfield & Cocking, 1994; Tharp & Gallimore, 1988; Vygotsky, 1978). The fact that parents from different cultures may have very different goals for their children (and therefore different ideas about how children or adults think and learn) allows us to understand why not all children learn the same skills and behaviors on the same schedule or in the same ways. One of the most important changes in views of human development is the recognition that culture plays a key role; for that reason, we have devoted an entire component of this kit to the topic of culture.

All learning is contextual (Jensen, 1998). Learners must make connections between their own understandings and the new ideas and information from the classroom—material that represents a cultural point of view that may not parallel their own. This means that students must do the work of establishing the relationship between curriculum and meaning in their daily lives. Even when students are learning by observing expert models (as in an apprenticeship approach) or participating in traditional teacher-directed instructional programs they are actively constructing their own meanings (Brooks & Brooks, 1999; Cobb, 1994;



Perkins, 1999; von Glasersfeld, 1992). Acknowledging the learner's active role does not diminish the important role of the teacher, but rather suggests that he or she must understand the student's point of view and prior knowledge in order to cultivate the most powerful learning experiences (Brooks & Brooks, 1999; Gardner, 1991).

In addition, we now understand that learning is a social process rather than strictly a function of individual effort and intelligence. In effect, learners co-construct meaning in dialogue with parents, peers, and teachers (Gutiérrez, Baquedano-Lopez, & Tejada, 1999; Perkins, 1999; Vygotsky, 1978). People learn in families, playgroups, and workgroups. According to Darling-Hammond (1997), "Social learning lends multiple methods to the process of making meaning.... Interactions with peers or more advanced 'teachers' provide an audience for trying out ideas, thinking out loud, and getting feedback" (p. 130). Teaching and grouping strategies that give students opportunities to observe, verbalize, interact, and learn from each other in the process of completing academic tasks result in powerful learning outcomes (Palincsar & Brown, 1984; Anderson & Pavan, 1993; Cohen, 1994; Oakes & Lipton, 1999; Slavin, 1995). Collaborative and cooperative group instruction are effective techniques that foster cognitive and social development.

Robert Sternberg, a cognitive psychologist at Yale University, suggests that educators must revise their assumptions about cognitive ability development—namely, the assumption that intelligence (IQ) scores reflect some largely inborn, relatively fixed ability construct. Instead, he suggests a construct of developing expertise. Developing expertise reflects the idea that expertise is not an end state, but rather a process of continual development (Sternberg, 1998).

New Understandings Lead to New Possibilities

If we combine what the past two decades have taught us about how students learn with a more inclusive philosophy—the belief that all students, not just a few, deserve a top-notch education—we can make great strides towards meeting the needs of all students and towards establishing a truly democratic society. Research in the fields of cognitive, developmental, and cultural psychology; biology and neuroscience; cultural anthropology; sociolinguistics; and sociology has provided valuable information to educators, families, and communities. We have learned at least three important and interrelated things from this body of research:

- Intelligence is malleable, molded by cultural expectations, experience, and opportunity (Brislin, 1993; Feuerstein, 1980; Resnick & Resnick, 1989). This means that educational opportunities can build any student's actual intelligence.
- Intelligence is not a single entity, but takes many forms; most schooling tends to draw upon only a fraction of students' intelligences (Armstrong, 1994; Gardner, 1988; Sternberg, 1985, 1997). This means that to teach more students successfully, we need to expand our repertoire of teaching methods.
- Both human development and schooling have a sociocultural basis. Cultural values influence both human development (including language, values, perceptions, motivation, emotions, and interpersonal behavior) and schooling (how we teach and learn) (Greenfield, 1994; Heath, 1983; Lustig & Koester, 1999; Wilkinson, 1990).
- Learning is not only an individual, psychological process but a social process involving a student's interaction with others directly or indirectly (Vygotsky, 1978; Wertsch, 1991). Therefore, we need to become more conscious of values held by students and their families and of the cultural values implicit in schooling. In short, we need to understand the nature of the social contexts in which learning takes place at home and in school.

Unfortunately, most current reform efforts have not offered strategies for meeting students' learning needs based on their life contexts and ways of learning. In actuality, culture is often considered an external factor that interferes with formal schooling. By understanding learning as a sociocultural process, we can figure out how to organize schools and instruction to meet the needs of students from many different cultural and linguistic backgrounds (Greeno et al., 1996; Sylwester, 1993; Wozniak & Fischer, 1993; Zeichner, 1996).

Changing Conceptions and New Educational Approaches

Historically, the *apprenticeship* model—that is, learning from people who know more—has dominated education. This model worked well for the agricultural societies of previous centuries and remains valid today, having been investigated cross-culturally by researchers in recent years (Lave, 1988; Lave & Wenger, 1991). The industrial revolution altered this process of education, however, and introduced what has been characterized as the factory model of education—a one-size-fits-all approach that aims to provide widespread and cost-effective education to large numbers of citizens.

apprenticeship

Learning from people who know more.

behaviorist

In the behaviorist view, learning is understood strictly with reference to people's behavior, which is shaped by external rewards or reinforcement.

The factory model of education operates much like the *behaviorist* approach to learning. During the 1950s and 1960s behaviorist theories of human learning, influenced by psychologists John Watson and B.F. Skinner, dominated educational thinking. In the behaviorist view, learning is understood strictly with reference to people's behavior, which is shaped by external rewards or reinforcement. Internal cognitive processes are considered unknowable or unimportant, and the concept of "mind" is rejected. For example, the complex accomplishment of acquiring language is seen simply as a set of behaviors that are the result of environmental feedback. In contrast, current theories of language acquisition posit a strong biological basis for language that interacts with environmental input and resulting internal structures that organize components of language. The behaviorist approach to learning is more compatible with the "training" or "factory" model of education in which children and adults learn skills in small increments and apply them with little imagination.

ACTIVITY: Exploring the Philosophy of Education

Table 1 below shows contrasts between the view of education in the industrial age and in the current information age. Note how educational goals have changed and, along with them, conceptions of who should be educated, how, and for what purposes. Refer to this table as you answer the questions that follow it.

TABLE 1

Characteristics of Education in the Industrial and Information Ages

	INDUSTRIAL AGE	INFORMATION AGE
PEDAGOGY	Knowledge transmission from expert to learner	Knowledge building
PRIME MODE OF LEARNING	Individual	Collaborative
EDUCATIONAL GOALS	Conceptual grasp for the elite few, basic skills for the many	Conceptual grasp and intentional knowledge building for all; “thinking curriculum” for every student
NATURE OF DIVERSITY	Inherent, categorical (i.e., determined by birth and non-negotiable)	Transactional, historical (i.e., socially-negotiated, changing over time)
DEALING WITH DIVERSITY	Selection of elites (ensuring continuing dominant status for dominant social/ethnic/racial groups), relegation of broad population to basics	Development model of lifelong learning for whole population
ANTICIPATED WORKPLACES	Factory-modeled workplaces, vertical bureaucracies	Collaborative learning organizations

Source: Keating, D. P. (1996). Adapted from *Habits of Mind for a Learning Society: Educating for Human Development*. In D.R. Olson & N. Torrance (Eds.). *The Handbook of Education and Human Development*. Oxford, UK: Blackwell Publishers.



In small groups, discuss your philosophy of education and what it is based on.

- *Should all students have access to a high-level, formal education? Why or why not?*
- *What is your view of the purpose of education? Of formal schooling?*
- *What is your vision for schooling?*
- *How does your practice reflect your vision?*
- *What is between you and the accomplishment of your vision?*
- *What can be done to overcome the barriers you have identified?*

Current conceptions of human development could be characterized as *cognitivist*. Cognitivists view learners as active constructors of meaning. As Shuell (1986) suggests, “Cognitive conceptions of learning.... focus on the acquisition of knowledge and knowledge structures rather than on behavior per se.... Cognitive approaches to learning stress that learning is an active, constructive, and goal-oriented process that is dependent upon the mental activities of the learner” (pp. 413-415). Human beings seem to have an inborn motivation to learn, so development is not simply dependent on an external system of reinforcement (Piaget, 1970; Piaget & Inhelder, 1969). Combined with educational approaches that integrate multiple disciplines, these conceptions have led to richer perspectives on teaching and learning, perspectives that are well-suited to help educators respond to the needs of increasingly global and information-based societies and increasingly diverse student populations.

cognitivist

In the cognitivist view, learners are seen as active constructors of meaning.

Greeno, Collins, and Resnick (1996) alert us to this shift toward a broader understanding of human development. They invite us to incorporate knowledge gained from many disciplines and then consider these new theories of human development when we weigh reform proposals that aim to improve practice and educational outcomes for all students. Similarly, Caine and Caine (1994) suggest that “What is needed is a framework for a more complex form of learning that makes it possible for us to organize and make sense of what we already know...” (p. viii). These scholars point to the need to integrate the physiological and emotional bases of learning into our thinking about how best to educate students.

What Is Intelligence?

The view of intelligence as a single construct that can be measured by verbal and mathematical items on a paper-and-pencil test has been deeply questioned in the past few decades (Gardner, 1983, 1988, 1991; Sternberg, 1985, 1997). Schooling places an inordinately high value on verbal and mathematical knowledge and skills; it relies on these capabilities to sort and select students, some for instruction that will give them access to broad opportunities (for higher education and employment) and others for instruction that is an endless cycle of basic skills. Even within the scope of verbal and mathematical knowledge and skills, schooling focuses on a very narrow band of tasks. In the verbal area, for example, schooling typically focuses primarily on reading and writing, paying only slight attention to oral expression. As a conse-

quence, teachers perceive many students to be deficient in verbal ability, when in fact they may have good oral skills—as teachers soon learn when they devise ways to connect popular forms of oral performance (rap or spoken poetry slams) to school activities. In addition, reading and writing can be more successfully connected to students’ knowledge and interests by expanding the topics and purposes for writing activities and by expanding the range of authors read. Some teachers are, of course, developing programs that address these very issues [see, for example, Freedman, Simons, Kalnin, Casareno, and The M-CLASS Teams (1999)].

Learning depends on the degree to which classrooms foster students’ belief in their own competence and their willingness to work hard.

In the area of mathematics, schools tend to value, develop, and assess computation skills, rote memorization of facts and formulas, and the ability to follow algorithms. Often, less attention is given to reasoning, problem posing, or problem solving in their broader senses. Children may be evaluated as lacking in mathematical ability even though they are good at inductive and deductive reasoning and can use logic to solve a wide variety of real-world problems. The consequences of evaluations like this are not innocuous. “[Teachers’] beliefs about students’ capability have enormous power. Learning depends on the degree to which classrooms foster students’ belief in their own competence and their willingness to work hard” (Oakes & Lipton, 1999, p. 228).

The view that intelligence is inborn and fixed rather than developing leads to inaccurate perceptions of students’ skills and keeps many educators from fostering children’s full capabilities. Too often students get tracked early on the basis of perceived ability and never have opportunities to move into new tracks (Oakes, 1990). When given opportunities to engage in challenging curriculum later on, students often show that they can perform at high levels (Sheets & Hollins, 1999). While some programs and instructional approaches incorporate thinking skills and mediated learning¹ in order to develop a broad range of cognitive abilities, these programs and approaches are

¹ Mediated learning refers to learning in which the teacher guides students strategically, thereby enhancing a discovery learning process and leading them to think about their own learning (Feuerstein, 1980; Fogarty, 1999).

often add-ons or isolated efforts, minimizing their power to develop students' abilities. To recognize existing student abilities and realize their potential, schools must sustain efforts to develop learning capacities throughout a child's school experience (Ceci, 1996). Students from poor families and communities, from homes in which English is not the first language, or who belong to an ethnic minority group are often characterized as simply lacking what it takes to learn (Herrnstein & Murray, 1994). Current theories of multiple intelligences and new theories of cognitive psychology refute the view that such students cannot learn and perform at high levels in school.

The work of Howard Gardner, David Perkins, and Robert Sternberg has expanded the concept of intelligence. Their work suggests that rather than the concept of general intelligence, denoted by the letter "g," individuals have multiple intelligences, or "MI." These intelligences, depicted on **Table 2** below, appear to be much more explanatory of students' abilities and learning. Gardner, whose work is perhaps best known to teachers, recently expanded multiple intelligence areas to include up to nine distinct areas that can be developed (Gardner, 1999).

TABLE 2

Gardner's Multiple Intelligences

linguistic	intrapersonal	interpersonal
spatial	logical-mathematical	musical
bodily-kinesthetic	naturalistic	spiritual

Multiple intelligence theory suggests that individuals possess each of the nine intelligences to some degree, but that some of the intelligences are more highly developed than others. Perkins (1999), Sternberg (1985), and Sternberg & Williams (1998) emphasize the existence of multiple intelligences (MI), but conceptualize the varieties of human intelligence differently from Gardner. Sternberg includes metacognition as one component, and Perkins includes reflective intelligence. Wilson & Jan (1999) offer the following definitions of reflection and metacognition:

- **Reflection** involves analyzing and making judgments about what has happened; it is integral to every aspect of learning. It precedes, is a part of, and occurs after learning.
- **Metacognition** refers to the knowledge individuals have of their own thinking processes and strategies, and their ability to monitor and regulate these processes. This requires learners to analyze, reflect upon, and monitor their own learning. Metacognition—i.e. knowledge, awareness, and control of cognition—is an outcome of conscious reflection (p.vii).

Each of these researchers holds the view that measuring or developing intelligence as a single capacity is incompatible with new understandings of human cognition.

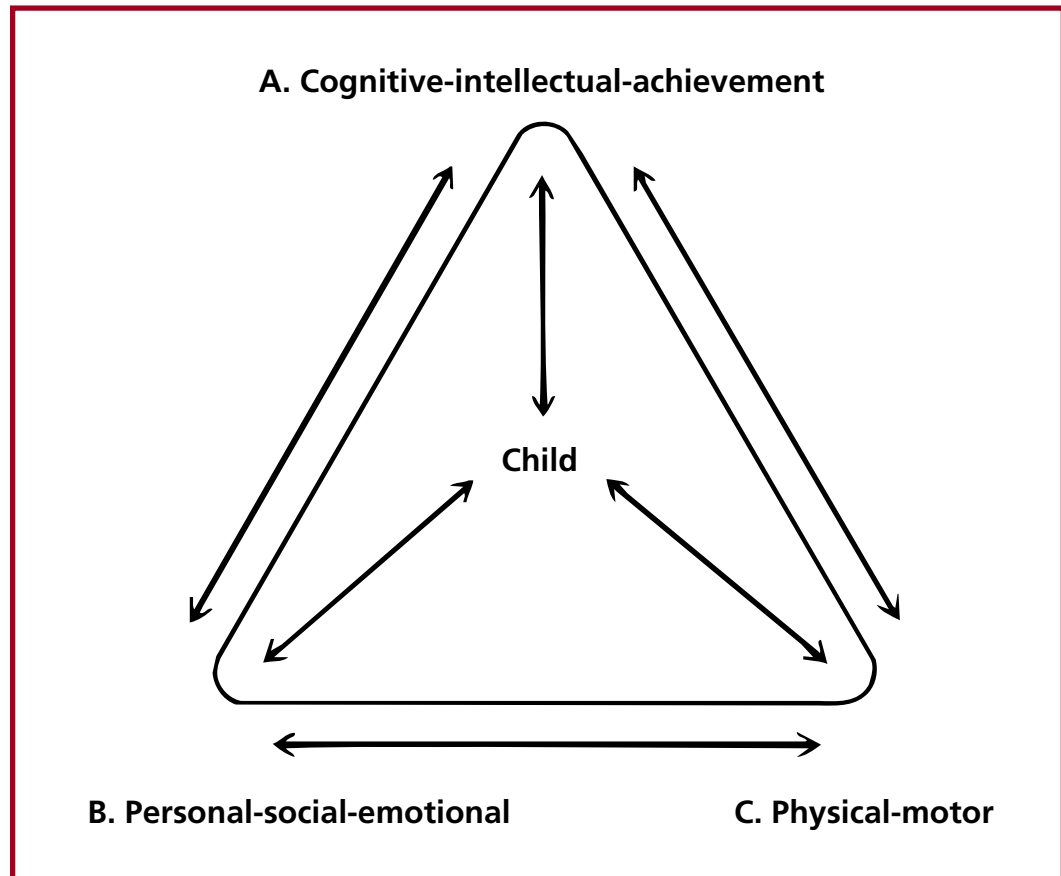
 **ACTIVITY:** Exploring Your Learning Experiences

- *Think about your own “multiple” intelligences. How did you develop them inside and outside of school?*
- *Sometimes we learn things alone, but more often we develop our knowledge, ability, and skills with the help of others. Think about someone who helped you learn. What did he or she do that was helpful?*
- *Think about a time when how you felt affected your learning — when you were confident, unsure, comfortable, uneasy, strong, or intimidated. Think about how you bring students’ feelings into learning.*
- *We often learn things without understanding their relevance to our lives until later. Think about an “aha” you had when something you had learned connected with a new situation.*
- *Talk with colleagues or friends about their experiences at times when they were “ahead” of the group, and times when they were “behind.” How did it feel? How did they cope?*
- *Share stories with others about challenging learning experiences. What obstacles did you encounter? How did you come to understand?*

More recent theories of learning represent cognitive development as social and cultural in nature. Contributing to this change from a psychological to a social understanding of learning are the disciplines of biology/neuroscience, cultural anthropology and cultural psychology, sociology, and sociolinguistics (August and Hakuta, 1997; Caine and Caine, 1994; Gardner, 1983; Resnick, 1995; Vygotsky, 1978). We are confident that when educators have access to the findings from these disciplines, they too will be convinced that it is possible to develop strategies that give each student a successful educational experience.

The rounded-triangle schema with three different corners depicts the areas A-B-C (**Figure 1**). Area A represents the cognitive-intellectual-achievement dimension, area B represents the personal-social-emotional dimension, and area C represents the physical-motor dimension. The arrows indicate interactions.

FIGURE 1



Source: McCandless B.R. & Evans E.D. (1973). *Children and Youth: Psychosocial Development*. Hinsdale, IL: The Dryden Press.



ACTIVITY: Exploring Teaching and Learning

In small groups, using the schema presented on page 37, discuss the role each of the areas plays in the thinking and learning process.

- *Which is the area that you, as a teacher, concentrate on? Why?*
- *When do you concentrate on the others (if at all)?*
- *How could the instructional strategies you use address all three areas?*



Biology and Neuroscience

The study of the brain in relation to learning has given us a deeper appreciation of the roles of experience, motivation, emotions, and memory. These elements interact in learning. While research in biology, neurology, and neuropsychology (the study of brain-learning-behavior relationships) has burgeoned in recent decades, the educational implications of such research remain largely undiscovered. Despite our fascination with the brain and best intentions to make use of new information from brain research, we must be very cautious in interpreting this research. Bruer (1997, 1999) cautions us to avoid simplistic

conclusions and applications as we attempt to assess and interpret brain research. Many neuroscientists believe that their science may one day provide solutions for real-world educational problems but it is premature to look for such applications now (Bruer, 1999). Bruer further cautions that the prestigious field of neuroscience is seductive for educators. For example, enriched experiences and environments during so-called “critical periods” in the development of rats apparently lead to more complex sets of connections and neural branching in the brain (Diamond & Hopson, 1998). Most people assume that the same would be true of children and that it would be a good thing. We need to be cautious about assuming what constitutes a lack of “enriched environment,” what is meant by “critical periods,” and whether knowing about critical periods can help us make appropriate educational decisions.

Critical Periods

A critical period is a limited time during which key experiences are necessary for certain skills or faculties to develop properly (Bruer, 1999). The notion of critical periods suggests that there are times when the brain is ripe for certain kinds of development. One might think that it would be a simple matter for teachers and parents to capitalize on critical periods, or developmental spurts, to maximize children’s learning. However, these critical periods apply to only a few basic abilities, such as seeing, hearing, acquiring a first language, and perhaps developing certain social and emotional skills. As it turns out, the notion of critical periods is most

useful in explaining the effects of extreme deprivation rather than variations in normal experience. For example, children who are not exposed to language prior to puberty are not likely to develop normal language. Or children who spend early childhood in an environment (such as an overcrowded orphanage) where there is little cuddling and holding may not form normal attachments or develop normally emotionally and intellectually (Ainsworth, 1973). In both cases, deprivation during a critical period led to developmental problems.

We must remember that the human brain is also tremendously capable of adapting and compensating. Even with serious damage, the brain can often compensate and function normally. We would surely do best as teachers to err on the side of expecting ongoing learning and ongoing capacity to build connections, both physiological and educational. So, it is not correct to think that particular instruction can be pinpointed to optimize a child's learning during a critical period or to think that if that period is missed, the child is doomed (or nearly so). The critical periods research is not particularly useful to teachers; it is merely part of a larger misperception that persists among educators (Bruer, 1999).

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Enriched Environments

The second issue, enriching environments to increase neural connections, proves to be equally inconclusive in what it suggests for education. Setting aside the issue of how we would actually know when we are increasing connections and neural branching within the brain, we turn to the issue of defining an enriched environment. Fogarty (1999) suggests that practitioners interpret an enriched environment to include vast amounts of printed posters, writings, mobiles, and student artwork; classrooms overflowing with beanbag chairs, rugs and pillows, and print materials; science corners replete with greenery, animals, and rock collections; and listening stations containing an array of musical selections. Even if we assume that research proves that enriched environments support brain growth, we are left with a serious problem: This characterization is based on a set of culturally-based assumptions

about what is enriching. Parents and children from different backgrounds would most certainly be stimulated by different environmental input. There is no universal formula for deciding what pictures or posters, music, or other visual, verbal, or tactile input is most desirable to stimulate development.

Lack of knowledge regarding what constitutes an enriched environment can result in the tendency to blame families for children's poor performance in school. Often these are families with culturally and linguistically diverse backgrounds or families from less privileged classes. Teachers erroneously believe that students from diverse backgrounds don't get the early stimulation they need to develop complex brain patterns. By relying on inadequate assumptions and explanations like this one, we pass on to others the responsibility for certain students' educational failure. The fact is, we might be more able than we acknowledge to address the needs of diverse students throughout their education.

Hemisphere Differences

Another area of neurological inquiry has been concerned with how the brain hemispheres work and, in particular, how the hemispheres have specialized in function over the course of evolution. Most teachers have learned that the left hemisphere (in most right-handed people) is dedicated to analytic, sequential, linear processing (including language) and that the right hemisphere is more concerned with holistic processing, the emotions, and visual-spatial and musical skills. In truth, even though the brain hemispheres are somewhat specialized, they work together; no complex intellectual act is exclusively left- or right-brained (D'Arcangelo, 1998). For example, certain aspects of language—the more emotional elements and intonation—seem to be controlled by the right hemisphere. Musical skill can require both hemispheres, depending on how natural or learned the person is. In addition, specialization of hemispheres varies from person to person, with females and left-handers tending to be more “whole-brained.”

Even though the brain hemispheres are somewhat specialized, they work together.

As interesting as the biological function of the brain may be, we must be cautious of oversimplifying its educational applications. We do not know, for example, that we are teaching to one hemisphere or the other by choosing a specific activity. Nevertheless, the left/right brain distinction is useful as a metaphor for how schooling is structured—i.e.,

the left brain as a metaphor for linear/analytical/linguistic/logico-mathematical thinking and the right brain as a metaphor for holistic/visual/artistic thinking—and as such can be used to help us think about balancing our instructional approach. We clearly would not want to draw upon only a limited range of students' intellectual abilities; nor would we want to exclude some students from classroom participation that could have academic and personal benefits.

Neuroscience research has contributed to new conceptions of intelligence. It suggests that there are somewhat separable components of intellect that can be selectively damaged or developed. Stroke or injury can cause loss of language, visual-spatial abilities, motor skills, mathematical skills, interpersonal skills, and ability to plan complex acts. One of the pieces of evidence for multiple intelligences is the very fact that people can lose one set of skills (or an intelligence) without serious loss to another capacity. Within the healthy, normal population there is considerable variation in the development of the different intelligences. We all know people who are extremely linguistic but not terribly mathematical. We may also know people who are very advanced in what Gardner (1988) refers to as “bodily-kinesthetic” intelligence (such as fine athletes or dancers) but are not particularly verbal. So, brain research has provided support for multiple intelligence theories and (indirectly) for personalized education that makes connections between each student's life, developing abilities, and learning in the classroom (Guild, 1997).

Currently, much instruction in school is presented in the form of separate disciplines. To a learner, these subjects may seem unrelated and disconnected from everyday life. A large-scale study conducted by Knapp, Shields, & Turnbull (1995) revealed that instruction that helps students perceive the relationship of parts to wholes provides students with the tools to make connections between academic tasks and the world in which they live. The research further revealed that instruction that makes explicit connections between one subject and the next, and between what is learned in school and in children's home lives, yields results superior to those of conventional practice. Caine and Caine (1994), who have analyzed the multiple complex and concrete experiences essential for meaningful learning and teaching, suggest that the brain has

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infinite capacity to make connections. They suggest further that excellent teachers make connections between subject material and the students' backgrounds and experiences. Teachers who integrate disciplines and draw upon not only intellectual but emotional resources help students recognize the connections among subject material, real-world issues, and the deeper meanings of their students' personal lives. These teachers understand the “plasticity” of the brain—how it changes and develops with experience and how “meaning making” affects intrinsic, or personally meaningful, motivation. Many educators and psychologists argue that successful education practice must operate under the assumption that the affective components of learning—emotions—are linked to thinking and learning (Caine and Caine, 1994; Goleman, 1995; Jensen, 1998; Sosa, 1995).

While schools might not always practice what is known about how students learn, students themselves do seem to understand how they learn best. Nieto (1996) reports that students identify caring as the most important characteristic they look for in a teacher. Students make decisions about whether the teacher cares about them

Students identify caring as the most important characteristic they look for in a teacher.

by observing whether the teacher makes educational experiences meaningful and relevant and takes time to establish personal connections with them. The teacher who asks students to work cooperatively to translate a meaningful passage from Shakespeare into their own dialects and languages understands the importance of integrating high expectations and making relevant connections with the lives and interests of students.

Cognitive Psychology

Cognitive psychology might be defined as “the study of how the brain processes information and makes meaning and of how intelligence is structured.” Again, it is impossible to discuss cognitive development meaningfully without acknowledging that it is affected by cultural context. How intelligence is structured is highly dependent upon what a child is exposed to and interacts with. As Rogoff (1995) notes, even Piaget was forced to reconsider the universality of his developmental stages in the face of research showing that achievement of “formal operations” was tied to children's experiences (particularly with specific kinds of schooling). He suggests that we can no longer assume that the results of a cognitive test are indicative of a general

ability unrelated to individual experience. Research in this discipline has helped us understand the importance of introducing complex and conceptually challenging educational experiences early on in children's schooling (Ceci, 1996; Gardner, 1983; Neisser, 1998). The explanation of a cognitivist approach to learning discussed earlier shows how very different this approach is from a view of learning as behavior. In a previous section, we discussed how views of intelligence as unitary, fixed, and unchangeable have been challenged by ground-breaking research and theory initiated by Howard Gardner and David Perkins at Harvard University, Robert Sternberg at Yale, and other researchers.



On page 45, we present a graphic (**Table 3**) that suggests ways to build upon students' many different kinds of intelligence. Each of the cells in **Table 3** presents examples of activities, materials, or strategies that tap a particular intelligence. Of course, this table is only a sampling and somewhat simplifies what occurs; in the classroom (as in the real world) many activities will integrate demands on several intelligences. Even activities that are primarily visuo-spatial, such as using a map, are likely to require some language usage. However, as with the left/right hemisphere metaphor, it is useful to use the construct of multiple intelligences to analyze the mix of ways students may participate in the classroom.

Classrooms that provide opportunities to use all of these intelligences in various ways give students a chance to exhibit and build upon their strengths. They also challenge students to use skills that may not come so easily to them. For instance, the student who usually shines at tasks that rely on linguistic and mathematical strengths may find himself stretched intellectually when asked to pantomime or draw. Complex activities, such as thematic projects (which may be multidisciplinary), are excellent vehicles for developing and using multiple intelligences and are particularly appropriate for classrooms of students from diverse cultural backgrounds. When these projects are conducted cooperatively, they allow students to recognize each other's forms of intelligence—something a teacher can promote by commenting on students' work.

TABLE 3

Summary of the “Eight Ways of Teaching”

INTELLIGENCE	TEACHING ACTIVITIES	TEACHING MATERIALS	INSTRUCTIONAL STRATEGIES
LINGUISTIC	lectures, word games, discussions, storytelling, choral reading, journal writing, independent reading in many genres	books, tape recorders, stamp sets, typewriters, books on tape	read about it, write about it, talk about it, listen to it
LOGICAL-MATHEMATICAL	brain teasers, problem solving, science experiments, mental calculation, number games, critical thinking	calculators, math manipulatives, science equipment, math games	quantify it, think critically about it, conceptualize it
SPATIAL	visual presentations, metaphor, art activities, mapping, imagination games, mind visualization	graphs, maps, videos, LEGO sets, art materials, optical illusions, cameras, picture library	see it, draw it, color it, mind-map it
BODILY-KINESTHETIC	hands-on learning, drama, dance, sports that teach, tactile activities, relaxation exercises	building tools, clay, sport equipment, manipulatives, tactile learning resources	build it, act it out, touch it, get a “gut feeling” of it, dance it
MUSICAL	rapping, songs that teach	tape recorder, tape collection, musical instruments	sing it, rap it, listen to it
INTERPERSONAL	cooperative learning, peer tutoring, community involvement, social gatherings, simulations	board games, party supplies, props for role-plays	teach it, collaborate on it, interact with respect to it
INTRAPERSONAL	individualized instruction, independent study, options in course of study, self-esteem building	self-checking materials, journal, materials for projects	connect it to your personal life, make choices with regard to it
NATURALISTIC	outdoor explorations, observations, experiments, tours of particular environments	notebooks, binoculars, tape recorders, books about nature and environments, photographs and films	observe it, explore it, listen to it, describe it, gather data or impressions about it

Adapted from Armstrong, T. (1994). *Multiple Intelligence in the Classroom*. Alexandria, VA: ASCD.



ACTIVITY: Multiple Intelligences

- *Think of a typical day in your classroom. Jot down the activities associated with each subject-area block or whatever blocks your day falls into. Using **Table 4**, on page 47, map your activities in terms of the intelligences they call upon. If something calls upon more than one intelligence, put it in all appropriate cells.*
- *Talk with colleagues about their understanding of intelligence. What is “intelligent behavior”? How do they know what their own intelligence is? How do they use it?*
- *Examine the multiple intelligence summary and discuss with colleagues the strategies you have used with your students. Do you use all sensory modes—visual, auditory, tactile, kinesthetic—when teaching concepts and skills?*
- *Think of a specific skill or objective that some of your English language learners are encountering. Review and discuss what teaching activities, teaching materials, and instructional strategies you would use in planning a lesson for a group of English language learners.*

**TABLE 4**

"Eight Ways of Teaching"

INTELLIGENCE	TEACHING ACTIVITIES	TEACHING MATERIALS	INSTRUCTIONAL STRATEGIES
LINGUISTIC			
LOGICAL-MATHEMATICAL			
SPATIAL			
BODILY-KINESTHETIC			
MUSICAL			
INTERPERSONAL			
INTRAPERSONAL			
NATURALISTIC			

Adapted from Armstrong, T. (1994). *Multiple Intelligence in the Classroom*. Alexandria, VA: ASCD.

VIGNETTE: Rethinking Assumptions and Expectations

DILEMMA:

While monitoring the implementation of a multiyear cognitive development project, the director of research and development observed first-grade teachers substituting coloring and comic books for the sophisticated volume of fairy tales selected for instruction by the district committee. The Cognitive Instruction Project (CIP) was specifically designed to enhance the problem-solving (cognitive) abilities of kindergarten and first-grade students (mostly of African American and Puerto Rican backgrounds) in a large, urban district in the Northeast. When the director inquired about the instructional substitution, the teachers explained, “The volume of fairy tales is too sophisticated for these children. . . they don’t have sufficient vocabulary to understand the story. . . they really love the coloring and comic book versions.” The teachers had not taken into account that the requirements for developing and strengthening problem-solving abilities include increased vocabulary, language skills, and comprehension.

DISCUSSION QUESTION:

- **What assumptions did the teachers make regarding developed and developing cognitive abilities?**



RESOLUTION:

To help teachers understand the importance of vocabulary development for culturally diverse students, the director asked teachers, “Do you limit conversation or reading good literature to your own newborn or young children because they have not learned vocabulary words?” The director further inquired, “If you limit conversation with your students and the literature you expose them to, when and where will children who haven’t been exposed to extensive conversation and vocabulary have the opportunity to learn?” The teachers realized that they had not considered the implications of their assumptions about their students in their decision making.

The director, a cognitive psychologist, was able to help teachers understand the importance of identifying unfamiliar vocabulary in literature and defining the vocabulary in words or language the children could understand. The teachers came to understand that if they continued the practice of substituting easier or more enjoyable material for challenging material, the children would fall further and further behind as they continued across grade levels. Indeed, they came to understand how their low expectations and deficit assumptions contributed to the widening achievement gap between culturally diverse students and their more advantaged peers. The fact that some urban children have not experienced more sophisticated vocabulary does not mean they cannot learn.

DISCUSSION EXTENSION:

- **What instructional decisions have you made which might reflect your assumptions about the cognitive abilities of groups of students in your classroom?**
- **With colleagues, discuss similar instructional decisions. What alternative instructional activities can you use to further develop the problem-solving abilities of your students?**



ACTIVITY: Multiple Intelligences and School Restructuring

A study conducted by Campbell & Campbell (1999) of the success of six schools that claim to have implemented Gardner's multiple intelligence (MI) theory concluded:

Perhaps the most surprising finding from our study of MI schools is that restructuring is not necessarily achieved through external programs, resources, facilities, or district or state mandates. Indeed, meaningful restructuring first takes place within the minds of teachers and their beliefs about the nature and possibilities of their students. From there, all else follows. (p. 97)

- *Have the teachers and administrators in your school defined restructuring? If so, what restructuring activities have been implemented?*

- *What are the implications of the above quote for restructuring that is designed to improve the achievement of culturally and linguistically diverse students in your school (i.e., professional development, standards, reduced class size, etc.)?*

Cultural Anthropology and Cultural Psychology

The field of cultural anthropology investigates how cultures conceptualize, develop, and transmit knowledge, skills, and values. As a discipline, it provides insight into the ways cultural beliefs and practices interact with thinking and learning. Cultural psychology examines how culture influences cognitive development. For anthropologists, the term culture refers to the complex processes of communication and human social interaction. These interactions and forms of communication include behaviors, values, and ideals shared among the members of a group. Culture reflects a group's shared understanding and meaning; it also guides the group's struggle for survival and goals for the future.

In many schools, awareness of culture leads to multicultural education that emphasizes varied cultural content in teaching material. But this is only one level of culture. There is a more deeply embedded cultural awareness that can inform teaching and learning; this level of culture includes how a group adapts to its environment in an effort to survive as a cohesive social unit. Guided by this latter, more profound understanding of culture and cultural awareness, the aim of multicultural education would be to teach about many social groups and their different designs for living and surviving in a pluralist society.

It is this deeper level of culture, the “design to strategies,” along with the essential values of a culture that are most important to understanding how students from different cultural backgrounds experience schooling. A great body of research from the related field of cultural psychology strongly suggests that cognition is intrinsically cultural (Cole & Scribner, 1977; Harkness, Raeff, & Super, 2000; Rogoff, 1995; Wertsch, 1991). If we are to be more successful in educating students from a wide variety of backgrounds, cultures, and languages, we must first understand how learning occurs for human beings in different contexts. The cultural values that guide child rearing affect (1) how children are expected to interact with each other and with adults, (2) how language is used by children and adults, (3) how knowledge is



acquired and displayed, and (4) what counts as knowledge or as an intelligent or educated person. We must also remember that to speak of culture is to speak of communities of people; and learning—whether in or out of school—is also a social enterprise (Vygotsky, 1978; Wertsch, 1991). Not only do we learn from and with other people, but we apply that learning within social settings.

The distinction between surface-level cultural content and the deeper function of culture helps us reconsider how awareness of culture might play an important role in understanding human development. For teaching to be effective, schools must engage the cultural minds of diverse learners. To do so, a teacher needs to develop the knowledge and skills that will allow him/her to teach cross-culturally (Trumbull, Rothstein-Fisch, Greenfield, & Quiroz, 2001). Villegas (1991) suggests that teachers can build cultural bridges between home and school by selecting meaningful instructional materials, using examples and analogies to clarify new concepts, and using varied teaching strategies that connect cultural experiences and academic content. Cultural differences in approaches to formal learning can be accommodated in the classroom as well. Teachers who are able to distinguish individualistic cultural values and independence from collectivistic cultural values and interdependence can be more deliberate in providing flexible instructional activities that allow students from varied cultural backgrounds to work both in groups and on independent tasks (Greenfield, 1994; Trumbull et al., 2001).

For example, if strong collectivistic values in students' home cultures are to help peers succeed, a teacher can capitalize on this by encouraging students to help each other with classroom tasks as often as possible. When the same groups of students are required to work independently (reflecting an individualistic value), as on a test, the teacher can make that explicit so that there are no misunderstandings.

For teaching to be effective, schools must engage the cultural minds of diverse learners.



ACTIVITY: Community and Group Cultural Styles

- *Consider a group in which you participate. How does the group work together? How do members deal with the diversity within the group? How do they signal appreciation for different viewpoints, cultural understandings, or abilities?*
- *How do people who consider themselves part of a community treat each other? How do they conceive of each other? How does “insider” or “outsider” status get conferred?*
- *How do students help each other in a group? What is the role of listening? How do students speak with each other? How do they accomplish their individual goals?*
- *How do students feel about themselves in relation to different tasks? Are they confident? Do they feel helpless? Are they afraid to try?*
- *How do you encourage or discourage joint productive activity among your students? How are seats arranged in your classroom to accommodate students’ individual and group needs to communicate and work jointly? How do you plan with students for work in groups and for movement from one activity to another (such as movement from large-group introduction to small-group activity or transition to clean-up or dismissal)?*
- *How have you helped parents and communities identify, build upon, and connect the knowledge and strengths that contribute to learning?*
- *How do your students’ parents envision a “good student”? A “good child”?*

To design effective instruction, the cultural background and context of the learner must be understood. This understanding benefits from the application of ethnographic methods. Ethnography focuses on studying and describing social interactions in context. Anthropologists use ethnography to describe cultures or to understand a particular phenomenon. When used in education, it generally is associated with the goal of understanding a phenomenon such as improving instruction (Zaharlick, 1992). For example, Luis Moll, professor of education at the University of Arizona, has teachers visit students' homes as if they were anthropologists. The purpose of the assignment is to acquire an understanding of students' cultural backgrounds and family life and to identify "funds of knowledge" to which they can make instructional connections (Moll & Greenberg, 1991).

VIGNETTE: Home and Community Contexts:**Uncovering Students' Funds of Knowledge**

Like many teachers across the country, the teachers in an elementary school in the Midwest do not live in the neighborhoods of the students they teach. Recognizing the opportunity to introduce the teachers to the wealth of knowledge in the neighborhoods and lives of students, the principal of the school scheduled a bus trip for the entire professional staff to tour the students' neighborhoods. The teachers left the bus and walked through the neighborhoods to observe and record the architecture of the homes, the names of the streets, the businesses, the churches, and the community activities. They listed the types of trees, the locations of brooks, ponds, lakes, and bridges. They identified community agencies and services. They interviewed business owners to get a sense of the history and life experiences of residents.

When teachers returned to the school, the principal scheduled a meeting to provide an opportunity for them to discuss their observations and data-collection experiences. He challenged the staff to identify themes and instructional projects and assignments that would get students to connect curriculum standards to community experiences, history, ecology, businesses, structures, and individuals. The teachers developed rich lessons and instructional units that actively engaged the students. (For example, the students created a mural on the cement wall outside the school to illustrate the history of the neighborhood and community. The students were given research and writing assignments to tell the story and history of the community depicted on the mural.)

DISCUSSION

- **Imagine and discuss with a colleague the instructional activities these teachers developed.**
- **Tour the neighborhoods of students in your school with colleagues or students. What do you learn?**
- **With your colleagues, discuss other activities that could be designed to build on the history, cultures, and experiences of students in their neighborhoods, communities, and cities.**
- **With your grade-level colleagues or across grade levels, plan instructional activities that build on the observed knowledge and themes.**
- **Develop lessons that build on the knowledge gained on the tour (for example, a language arts lesson, a research project, an art lesson, or a science activity).**
- **What have you learned that could help you further involve parents and other community members in learning experiences, projects, and assignments?**

Sociolinguistics

Sociolinguistics is the study of language as it is used in social contexts to communicate meaning (Au, 1980; August & Hakuta, 1997; Cazden, 1988; Mehan, 1979; Villegas, 1991; Wilkinson, 1990). While acknowledging the importance of the psychological aspects of language learning, sociolinguists understand language learning as a social and cultural process. They are concerned with how language is used and how language forms and language use vary depending on a person's social background or ethnic group membership. Classroom studies from a sociolinguistic perspective have examined how students' backgrounds affect how they participate in discussions, in other kinds of classroom talk, in language-based assessments, and the like. These studies (e.g., Heath, 1983) reveal that in order to understand what is happening between teacher and student and among students, one must understand how the students have been socialized to use language. If a student does not respond to questions, for example, this does not mean they do not understand the questions or do not know the answers. Rather, the ways they have learned to converse with adults or peers may be vastly different from what is expected in the classroom—so different that they do not know how to proceed. Wilkinson (1990) suggests, “To be able to participate in all classroom activities, students must develop a special competence; this involves both the production and the interpretation of language and nonverbal communicative behaviors” (p. 186).

sociolinguistics

The study of language as it is used in social contexts to communicate meaning.

From sociolinguistics, we know that the study of dialects and the learning of second languages must be embedded in a cultural context. It is not enough to simply study the forms of language that people use if we want to understand what language means to people. Noting the educational needs of students from multiple linguistic backgrounds, August and Hakuta (1997) suggest that the “key issue is not finding a program that works for all children...but rather finding a set of program components that work for the children in the community given that community's goals, demographics, and resources.” The authors stress the importance of context in issues related to language and education.

VIGNETTE: Confronting Language Differences

The monthly parent meeting is being held today. Most of the parents who attend this meeting are non-English speakers, but there are a few parents who have mastered some English. These limited- and non-English proficient parents faithfully attend nearly all meetings. The dominant² language parents don't appreciate the presence of these other parents. In their view, they slow down the meeting because information always has to be explained to them.

At one meeting, the experienced principal (of Filipino descent) of this school asks the ESL coordinator from the district office to speak to the group. The invited guest, observing several parents speaking Tagalog, begins to address the group in Tagalog. The native English-speaking parents at the meeting become frustrated and threaten to leave the meeting.

The school's principal addresses the comments of the complaining parents: "Most of the time we use English language at these meetings." The principal then explains his reasoning for inviting the ESL coordinator to the meeting. "I thought it was a good idea to see how it would feel to be an outsider."

DISCUSSION QUESTIONS:

- Do you think the principal's strategy was effective?
- How would native English-speaking parents be likely to react to such a strategy in your setting or in a school you know of that has families from more than one language group?
- How do you imagine the Filipino parents reacted to the strategy?
- Could this situation have been handled differently? If so, how?

² We use the term "dominant" to refer to that group whose norms prevail in school and throughout U.S. society.

Sociology

Sociology can be defined as the “study of the development and history of the social organization of groups in context.” Sociologists study group structures and relationships, examining the influence of social and economic conditions and considering such factors as status, power, poverty, racism, and politics (Rosenthal & Jacobson, 1968; Werner, 1990). For educators, sociology provides an important point of reference for understanding the contexts that profoundly affect how students approach schooling.

A major underlying cause of social problems in poor communities is the gradual destruction of naturally occurring social networks. Social, economic, and technological changes since the late 1940s have contributed to a fragmentation of community life, resulting in breaks in the networks between individuals, families, schools, and the like—in other words, disruption of the social systems that are necessary for healthy human development.

For example, it is well-documented that children in high-income households with highly educated parents tend to score higher on tests. Other predictors of achievement scores are smaller family size, age of mother at time of birth of children, and school and community characteristics (Neisser, 1998). These correlations reveal how various social factors can influence human development, learning, and achievement patterns. Berman et al. (1997) report that

Nearly all LEP and other language minority students are members of ethnic and racial minority groups, and most are poor. Their neighborhoods are likely to be segregated and beset with multiple problems—inadequate health, social, cultural services; insufficient employment opportunities; crime, drugs, and gang activity. Their families are likely to suffer the stresses of poverty and to worry about their children’s safety and about their future. (p. 1)

Of course, these correlations are not absolute determiners of student outcomes in school. Schools can and have succeeded in educating students from backgrounds like these. For schools and districts, awareness of social influences on student learning can be a starting point for addressing inequitable educational outcomes. Elizabeth Cohen, a research sociologist, and her colleagues at Stanford University have developed a successful approach to instruction in heterogeneous classrooms—one that recognizes the multiple abilities and strengths students are developing. Cohen

coaches teachers to observe the behaviors of students working in cooperative learning groups and to identify their developing abilities and contributions to the group (Cohen, 1994). Teachers then offer positive feedback and strategies to the students and the group to connect the students' abilities to the academic learning task. For example, a student who exhibits exceptional observational, graphic, or spatial relations abilities would be asked to offer those skills to complete the group task. Cohen reported that this approach is particularly effective in promoting equal access to learning opportunities in heterogeneous classrooms. A key element of success is the teacher's intervention at strategic times—pointing out student strengths and helping all students see how they can be used to the group's benefit.

A body of research on student resilience is emerging; this research extends our understanding of the role and influence of sociocultural environments (in and out of school) on the development and relationships among self-concept, motivation, and learning (Greeno et al., 1996; Werner & Smith, 1992). Werner & Smith (1992) cite Rutter:

If we want to help vulnerable youngsters, we need to focus on the protective processes that bring about changes in life trajectories from risk to adaptation.... among them (1) those that reduce the risk impact, (2) those that reduce the likelihood of negative chain reactions, (3) those that promote self-esteem and self-efficacy, and (4) those that open up opportunities. We have seen these processes at work among the resilient children in our study and among those youths who recovered from serious coping problems in young adulthood. They represent the essence of any effective intervention program, whether by professionals or volunteers. (p. 204)

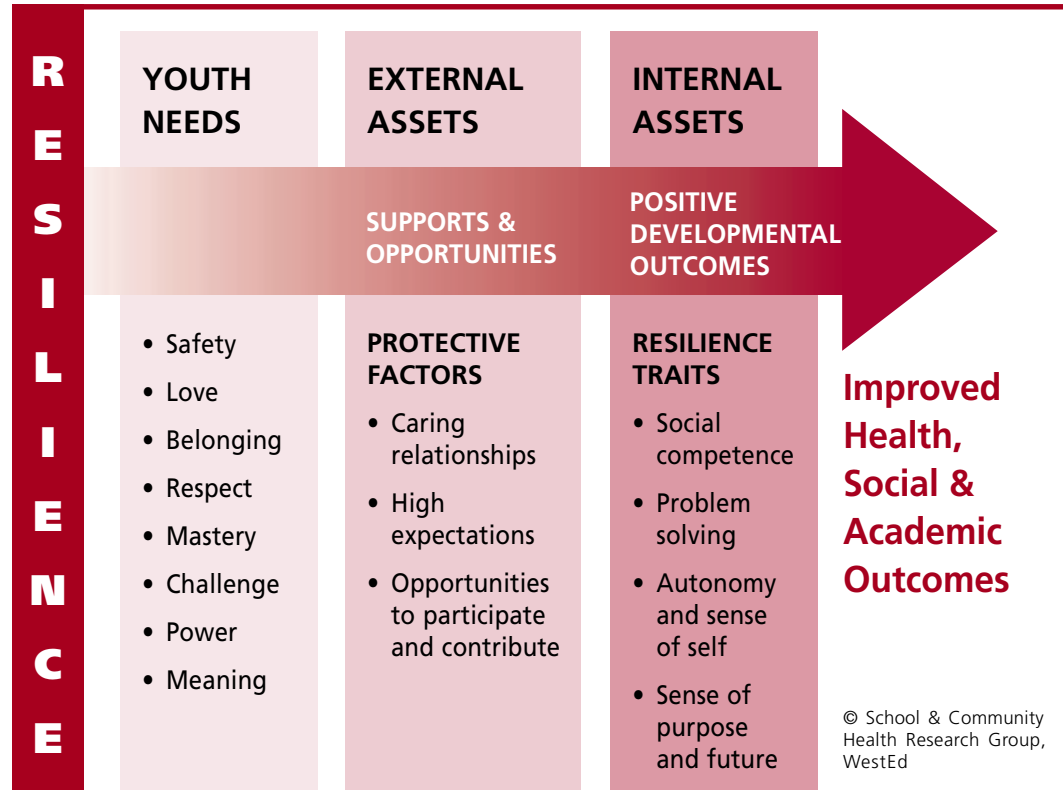
Benard (1996) identifies four traits demonstrated by resilient individuals:

- **Social competence**, which consists of the ability to establish positive relationships and the flexibility to successfully function within and between the primary and dominant cultures
- **Problem-solving skills**, which include the ability to plan and think critically, creatively, and reflectively about solutions to cognitive and social problems
- **Autonomy**, or the sense of one's own identity and independence
- **A sense of purpose and future**, including having goals, educational aspirations, achievement motivation, persistence, optimism, and spiritual connectedness

ACTIVITY: Resilience and Student Learning

Consider the following graphic representation of student resilience and the discussion that follows:

Youth Development Process: Resiliency in Action



The major tenet of this youth development framework is that resilience is a capacity for healthy development and successful learning innate to all people. It is an inborn developmental wisdom that naturally motivates individuals to meet their human needs for love, belonging, respect, identity, power, mastery, challenge, and meaning. When young people experience home, school, and community environments rich in the developmental supports (also called external assets or protective factors) of caring relationships, high expectations, and opportunities for meaningful participation and contribution, they meet these developmental needs. In turn, youth naturally develop the individual characteristics (internal assets, or resilience traits) that define healthy development and successful learning. These include social competence, problem solving, autonomy and identity, and sense of purpose and future.

These individual strengths are the natural developmental outcomes for youth who experience homes, schools, communities, and peer groups rich in the three basic developmental supports and opportunities. Moreover, these individual characteristics promote successful learning and protect against involvement in health-risk behaviors such as alcohol, tobacco, other drug abuse, and violence. Research on human development, brain and cognition, school effectiveness, family and community, and medicine clearly indicates the benefits of an environmental approach over an individual, skill-building approach, commonly referred to as a deficit or “fix-the-kid” model.

Education and prevention practices that do not pay attention to external assets—the quality of relationships, messages, and opportunities for participation—do not improve learning or behavior in the long term. Such practices are in contrast to environmental change approaches like cooperative learning, small group process, adventure learning, arts experience, peer helping, mentoring, and service learning. These latter approaches create opportunities in the context of relationships for young people; they allow them to achieve academically and learn positive life skills and attitudes through direct and ongoing experiences that meet their developmental needs for love, belonging, respect, identity, power, mastery, challenge, and meaning.

- *What evidence of student resilience have you seen in your classroom? Which parts of the description above apply to what you have noticed?*
- *Discuss with colleagues the positive effects student resilience has on learning.*
- *How might your teaching and school programs best take advantage of the benefits of student resilience?*

Rutter (1987) reminds us that for students coping with situations that place them at risk of school failure, effective intervention promotes positive self-concepts by providing caring and supportive environments, communicating high expectations, and connecting learning to future opportunities. Prevention efforts need to focus on building networks and intersystem linkages. Educators must build social bonds within families, schools, and communities by providing and identifying resources (for example, with agencies and community organizations) to ensure that all individuals experience caring and support. Educators can further strengthen social bonds by relating to students and families with respect and high expectations and by giving them opportunities to be active participants in their family, school, and community life (Wang, Haertel, & Walberg, 1998). Again, knowledge of students' cultures will allow educators to interact more knowledgeably with parents and students.

Deficit theories about the abilities and academic achievement of culturally and linguistically diverse students suggest they do poorly in school because they lack intelligence (Jensen, 1969; Herrnstein & Murray, 1994) or the “right” kind of background. When teachers and administrators evaluate through the lens of the dominant culture, they often cannot recognize the abilities and potential of certain groups of children. The knowledge, skills, attitudes, and values that these children

bring to school are often in conflict with those valued by the school. In other words, what they know, what they can do, their world view, and their priorities do not match what the school wants them to do, how it wants them to view the world, and what its priorities are. What is, in fact, the result of a mismatch is often explained by schools as the limited ability of the children, who end up being categorized as incapable, unintelligent, and lacking potential. In this way, resilient children who are very capable in other settings are often rendered ineffective. Numerous researchers have identified the negative influence of deficit assumptions on teachers' perceptions of students and their expectations for student success (August & Hakuta, 1997; Jencks & Phillips, 1998; Oakes & Lipton, 1999; Villegas, 1991).

When teachers and administrators evaluate through the lens of the dominant culture, they often cannot recognize the abilities and potential of certain groups of children.



ACTIVITY: Rethinking Learning Deficits

The “deficit hypothesis” suggests that some people cannot learn because of something they are lacking.

- *Think about a talent or ability that you originally felt you lacked but went on to develop later. What did you do to develop that latent ability? What made you try to develop it? Why did you think you could?*
- *Think about a time when someone treated you as if you could not do something. How did you feel about that person and yourself? How did you behave around him or her?*
- *Discuss with your colleagues times when your stereotypes about deficits and about who can and cannot learn have been challenged. What are some strategies for challenging negative generalizations about intelligence?*

Although in *The Diversity Kit* we have separated human development, culture, and language in order to focus on each in turn, these three areas are interrelated in educational practice today. We cannot advance our knowledge of human development without considering the interaction of culture and language. Further, because language is the principal medium for the cultivation of learning, it is at the heart of cultural transmission and education. Even though we have discussed human development explicitly in this section, we urge readers to consider this section as integral to and integrated with culture and language. We will explore culture and language more explicitly in the following two sections of *The Diversity Kit*.

