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ACCELERATING LEARNING FOR CHILDREN IN DEVELOPING COUNTRIES

JOINING RESEARCH AND PRACTICE

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ACCELERATING LEARNING FOR CHILDREN IN DEVELOPING COUNTRIES

JOINING RESEARCH AND PRACTICE

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The mind is not a vessel to be filled but a fire to be ignited.

Plutarch

Cover photo taken by Katy Anis

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EXECUTIVE SUMMARY

An educational and training revolution is underway in many places in the world. It is based on recent discoveries about the neurobiology of learning and on psychological and educational research about school and classroom strategies that accelerate student achievement. We know much more than ever before about learning, and this knowledge can be applied to accelerating learning for children in developing countries.

This monograph draws together knowledge from both the educational and the development literature on accelerated learning for the benefit of development and education practitioners. The education literature reviewed includes writings from the effective schools movement and from groundbreaking work in accelerated/natural learning. Development literature reviewed includes summaries of successful accelerated programs, girls' education initiatives, and use of media and communications technology in addition to general writings on improving primary education in developing countries.

The following definition consolidates the various meanings attributed to the term, accelerated learning:

An approach to learning that uses student-oriented teaching principles and practices to creatively engage students' multiple learning systems, resulting in faster, deeper, more effective learning.

Principal practices for accelerated learning programs in the developing world context include:

- Learner-centered instruction based on brain research and natural learning;
- Inclusion of students' emotional and social needs in teaching;
- Multi-sensory, mind-body activities;
- Active, problem- and project-based learning;
- Low-stress, stimulating environments;
- Collaborative and cooperative experiences; and
- Performance-based assessment with frequent, specific feedback.

This report explains a number of principles and practices that clarify and extend these concepts into ideas that teacher educators, trainers, consultants, master teachers, and teachers can use to guide changes in their teaching. Factors influencing the acceleration of learning in the developing world context are considered within a systems-thinking approach and with an awareness of the need to adapt the accelerated learning approach to various cultural contexts. Strategies for measuring the success of accelerated learning programs are provided.

It is the author's intention that this monograph stimulates and encourages you, the reader, in your efforts to nurture and stimulate children to use their great innate capacities for learning and to inspire and support teachers, trainers, consultants, and administrators in using their equally great capacities to be successful educators.

I. INTRODUCTION

ACCELERATED LEARNING AND THE GROWING MOVEMENT FOR EDUCATIONAL REFORM

An educational and training revolution is underway in many places in the world. It is building on recent discoveries about the neurobiology of the brain and on psychological and educational research about school and classroom strategies to increase student achievement. Research on teaching and learning and experience in practices that build on this research have already begun to provide a pathway to tap into more of our natural capacities for learning than most schools and training sites usually do. The results as reported by Le Hecka (2003, 130-139) are amazing, from a traditional perspective:

- In an American elementary school, learning disabled students gained over two years in standardized reading test scores in one school year.
- In the Paradise School District, CA, a two-year ESEA Title IV-C Project with regular and special education students in grades two to six resulted in gains on the California Achievement Test of over one and one-half times as much as control classes.
- In another American elementary school reading program students averaged four-month gains per month of instruction.
- Students in a township high school district in the United States where 37 percent were low income, 83 percent were black, and an estimated 75 percent were associated with a gang culture showed gains of from eight months to eight years in less than one school year on the standardized Normal Curve Equivalent test.

How do these results come about? They flow from a new set of assumptions about learning that are based on a belief in the "virtually limitless potentials of our minds and our creativity" (Beale 1997, 9-32). Tapping into these potentials are strategies and practices that incorporate a number of elements researchers and educators have been developing over the past 25 years, such as learning styles, multiple intelligences, cooperative learning, active engagement in relevant problem-based learning, and de-stressing schooling.

Development practitioners working in developing countries to accelerate learning will no doubt recognize some of these elements in their work. Indeed, a number of them, such as learning styles and active learning, are often aspects of plans for improving teaching practices in these countries. It may be helpful to clarify their meanings, underline them with an explanation of what is now known about learning, and put them in a broader context of successful implementation.

This major shift in learning and teaching toward accelerating learning by addressing the whole person in all his or her learning capacities can be seen as part of a general intellectual movement in the West toward a perspective based on wholeness, inter-

connectedness, and self-organizing systems (Beale 1997, 9-32). This perspective is reflected in the scientific fields of physics, chemistry, biology, psychology, and neurophysiology as well as education where new holistic paradigms are replacing earlier more linear and mechanistic ones.

MONOGRAPH PURPOSE AND ORGANIZATION

This monograph draws together knowledge from both the educational and the development literature on accelerating learning for the benefit of development and education practitioners. For those administering foreign aid programs and their colleagues in developing countries working in Ministries of Education, regional and district educational offices, and school offices and classrooms, this monograph provides:

- A clarification of accelerated learning concepts; why and how they work;
- An enriched understanding of teaching improvements proposed and begun; and
- A sense of connection with a growing movement for deep educational reform in both developed and developing countries.

Chapter II summarizes how accelerated learning is defined in education and developing world literature and offers a consolidated definition for development practitioners. Chapters III and IV provide reviews of the major principles and practices of accelerated learning from these two perspectives. The principles lay the theoretical framework while the strategies and practices offer concrete plans and examples of techniques for classroom use. Chapter V discusses the commonalities and uniquenesses among the principles and practices and presents an educational framework for accelerated learning programs in developing countries. Chapter VI includes descriptions of field-based applications of accelerated learning principles and practices. Final chapters provide measures of success and concluding thoughts. References and an annotated bibliography of the author's suggestions for further reading are provided at the end.

A NOTE ON TERMINOLOGY

We draw the reader's attention to clarifications in terminology in several areas that are mentioned throughout this text. First, in educational literature, the following definitions usually apply and will be used in this monograph:

- Approach - An overarching framework that guides thinking and acting.
- Principle - A fundamental motivating precept, tenet, or belief on which actions are based.
- Strategy - A plan to achieve a goal based on an approach.

- Practice - A practical technique of carrying out a strategy.

Second, it also is important to give an orientation to terminology about schools and schooling in this monograph. The development literature on accelerated learning includes programs carried out in both formal and nonformal school settings. Sometimes changes are implemented to accelerate achievement of public school students; sometimes countries establish separate nonformal schools or learning centers to house accelerated learning programs. These programs usually have the goal of assisting their students to re-enter public schools after an absence or to complete the national curriculum for basic education. In this monograph, the terms "school," "teacher," and "student" are used for brevity to mean anywhere that the national public school curriculum is taught, by whom, and to whom.

Finally, in distinguishing the terms "brain" and "mind," this monograph will consider that the mind is the content of the brain, like the radio program is the content of the radio transmitter (Dryden and Vos 1999, 369).[1]

[1] For a full treatment of this relationship, one could read *The Mind and the Brain: Neuroplasticity and the Power of Mental Force* by J. W. Schwartz and S. Begley, 2002.

II. WHAT IS ACCELERATED LEARNING?

"I'd like to support your work in education by infusing ideas from accelerated learning," offered the educational consultant. "Oh, we are already doing that in a number of countries," replied the consulting firm staff director. It took some clarifying of terms to realize they were not talking about exactly the same thing.

DEFINITION OF ACCELERATED LEARNING IN EDUCATION LITERATURE (AL-E)

In the 1970s and 1980s, the early years of accelerated learning in education, research and practice focused primarily on the learning of foreign languages. Dr. Georgi Lozanov, a Hungarian educator and a pioneer in this work, astounded people with demonstrations and publications and the amount of vocabulary and fluency that his students mastered in very short periods of time. Thus, the term "accelerated learning" was used. As people learned more about the systems and processes engaged in this learning, different terms were coined. Because people do learn more, faster, and retain it longer when using these strategies, it is widely known as accelerated or accelerative learning. However, other names emphasize different aspects: brain-based learning, whole brain learning, holistic learning, integrated or integrative learning, power learning, true learning, and natural learning. In general, "accelerated learning is more about deeper learning than faster learning" (Finnan and Swanson 1999, 9).

Dr. Jeanette Vos, another pioneer in accelerated learning in education literature (AL-E), defines and explains accelerated learning as:

> A multi-modal way of learning and teaching based on brain/body research. It addresses the needs of all learners, and works primarily with the enrichment of the learner's environment, both internal and external….An enriched environment is one that is free of harmful stress, yet filled with challenging learning activities that utilize all of the senses and appeal to a full range of intelligences. In an enriched environment, learners have the choice to progress at their own rate and in their own way. Movement and music are used liberally, and the surroundings are visually stimulating and exciting. Learners interact a great deal but are also given time to reflect (Dr. Jeannette Vos's website, learning revolution.com).

Although there are some similarities, AL-E can be distinguished from effective teaching and learning. In educational literature, the "effective schools" movement is a particular and widely used term used to describe approaches, strategies, and practices that flow from learner- and school-based research over the last forty years

by cognitive psychologists and educators. Fueled by the goal of improving student achievement, these researchers have documented a variety of factors that provide a learning environment that effectively raises student achievement levels (Marzano 2003; Marzano et al. 2001).[2]

While AL-E could be considered a subset of effective teaching and learning, it is actually a separate approach because of its basis in brain research. Both approaches outwardly manifest some principles, strategies, and practices in common. Yet there are some differences. Effective schools are focused more on the school and the creation of school climate, or environment, to improve student learning. AL-E focuses more on the student as a human being and how he/she learns and thinks.

As explained by Laura Erlauer (2003), AL-E is based on a paradigm shift from the way teaching and learning has been thought of before. "Accelerated learning involves a radical change in how and what students are taught and in the context in which they are taught. [AL-E] involves holding different assumptions about students, the role of adults in the school and classroom, effective educational practices, the value of change, and appropriate communication and discourse" (Erlauer 2003, 9). Because AL-E takes ideas from the effective schools movement yet puts them within a brain-based, holistic, integrative, natural learning paradigm, it offers a different and compelling perspective.

A working definition of AL-E that distinguishes it from effective schooling is: "an approach to learning that creatively engages the mind, body, and emotions of students and orchestrates their multi-faceted systems of learning capacities."

DEFINITION OF ACCELERATED LEARNING IN DEVELOPMENT LITERATURE (AL-D)

It is somewhat difficult to pin down exactly what is meant in the development literature by accelerated learning (AL-D). It is sometimes used synonymously with high quality schooling, meaning schooling that improves student achievement. Usually AL-D links learning with "pressing development needs and local, regional, or national strategic priorities—literacy, vocational training, or micro-enterprise development" (Intili and Kissam 2004, 9).

In other sources, the term is used in contexts where children's schooling has been interrupted—by social upheaval, natural disasters, or their dropping out for a while. In these contexts, the pace of learning is quickened to cover a set curriculum faster than formal schools normally do, in order to catch students up to their age-appropriate grade level. Generally, in AL-D literature there is the aspect of speed, so a definition of accelerated learning might be "to engage in an academic program that progresses faster than usual" (American Heritage Dictionary).

Development practitioners recognize that it is not sufficient or wise to simply cover the established curriculum more quickly. Therefore, they advocate and use one or both of the following strategies: (1)

[2] The seven correlates of effective schools are clear school mission, high expectations for success, instructional leadership, frequent monitoring of student progress, opportunity to learn and student time on task, safe and orderly learning environment, and home-school relations.

compress the curriculum; and (2) build students' skills as efficient, self-directed, and collaborative learners (Intili and Kissam 2004, 28). To build students' skills, practitioners include a variety of effective teaching techniques culled from current education literature that increase student interactions with teachers and create more active participation by students in their own learning.

A working definition of AL-D, which distinguishes it from high quality schooling is: "an approach to learning that compresses the time taken to teach and learn the basics of a certain curriculum using learner-centered teaching principles and practices."

In putting this definition into action, development consultants and educators in developing countries sometimes utilize a number of principles, strategies, and practices that are also found and promoted in current education literature (see Chapter III).

A CONSOLIDATED DEFINITION FOR DEVELOPMENT PRACTITIONERS

This idea of velocity in learning provides one thread of commonality between the two definitions. While faster learning is not the goal of AL-E as it is of AL-D, it is usually a result, often spectacularly so (see Section I. G. 2. for examples). Engaging the whole person in the process of learning naturally opens the door to a broader use of all of one's capacities to learn, which leads to more efficient and rapid learning. A second thread of commonality is found in the twin ideas of effectively engaging students in active, participatory ways of learning and increasing instructional interactions between teachers and students and among students.

Therefore, a consolidated definition for development practitioners is proposed:

An approach to learning that uses learner-centered teaching principles and practices to creatively engage students' multiple learning systems, resulting in faster, deeper, and more proficient learning.

Accelerated learning is an approach to learning that uses learner-centered teaching principles and practices to creatively engage students' multiple learning systems, resulting in faster, deeper, and more proficient learning.

III. ACCELERATED LEARNING IN EDUCATION LITERATURE: PRINCIPLES AND PRACTICES

THE PROCESS OF LEARNING

Before we can consider the principles of AL-E literature, we need to understand the basic foundation on which they are built. As the neurobiology of the brain has become better understood, we now know a lot more scientifically about how human beings learn and remember. As Erlauer writes:

> Until recently, our knowledge about the human brain was limited to what we could learn through the study of injured brains during surgery or from autopsies. Advances in medical technology over the past two decades, positive emission tomography (PET) scans, and functional magnetic resonance imaging (MRI) allow physicians and scientists to actually see how the brain functions while it is thinking or performing tasks. The implications of the current research on living brains are staggering, not only for the medical field, but also for the field of education. Educators are becoming privy to the biology of learning and therefore can discover which teaching practices actually maximize learning (Erlauer 2003, 1).

In addition, cognitive psychologists and educational researchers and practitioners have made other breakthrough discoveries in theories and practices of effective learning and teaching (Marzano 2003; Marzano et al. 2001). All these new understandings have laid the groundwork for teachers and trainers to become much more efficient and effective educators and learners of all ages to become much more successful students. It all starts with the brain.

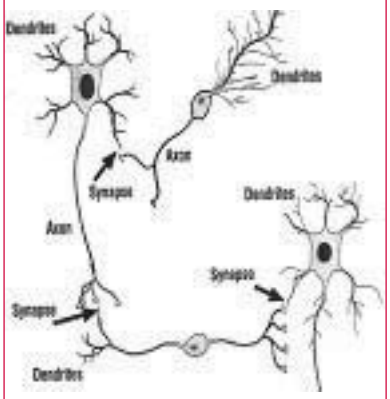
BRAIN FUNCTIONING IN THE LEARNING PROCESS

The brain—the spongy mass of fatty tissue inside the skull—is the master control center of the human body. This one organ controls all body activities, from heart rate and motor movements to emotions, learning, and memory. It shapes our thoughts, hopes, dreams, and imagination. The human brain is what sets us apart from all other species.

The brain is more complex than anything we know in the universe. Electro-chemically, the neuron, a specialized cell designed to transmit information to other nerve cells, is the basic working unit of the brain. In addition to its cell body and nucleus, each neuron is equipped with dendrites, branch-like elements that bring information to the cell, and axons with many terminals, that transmit information from the cell. Neurotransmitters move information from one neuron to another across small gaps between neurons called synapses. Each brain has literally billions of neurons from and to which messages could be moving.

If we imagine our 100,000 billion neurons, each with up to 20,000 dendrites, connecting with each other in every possible way, we get an idea of

Figure 1:
How Neurons Make Connections
(Jensen 1998, p. 12)



our brain's creative capacity (Dryden and Vos 1999, 117). We make more neuron connections "than all the leaves on all the trees in all the world" (Given 2002). Not only are these synapses vastly numerous, they instantly and constantly shift. "Counting synapses is like counting raindrops in a rainstorm" because they are so dynamic and seemingly chaotic, continually reconnecting and reconfiguring (Given 2002).

From birth to death, we continue to lose brain cells but, with stimulation, we also continue to grow additional dendrites and axon terminals on the nerve cells we keep, like branches and roots on little trees. The more dendrites and axon terminals we have, the more neural connections (synapses) we can make. These electro-chemical synapses are the biological substance of learning. The image in Figure 1 portrays this process (Jensen 1998, 12).

In addition to the electro-chemical level of learning, it is useful here to remember that the brain is made up of three basic regions (pictured in Figure 2):

- The lower "brain stem," controlling instinctual physiological behavior like breathing or swallowing.
- The central "limbic system," the key area for emotions and long-term memory.
- The upper "neocortex," the location of our abilities to see, hear, think, talk, reason, and create.

Scientists also have identified two hemispheres to our brain—the left and the right. Their main functions are summarized in Figure 3 (Dryden and Vos, 124). These two sides are linked by the "corpus collosum," whose 300 billion neurons have the same potential for 20,000 dendrites each as other brain cells. The more connections we can make to involve both hemispheres in the learning process, as in learning the words to a song (left side) and the melody (right side), the faster we learn. We can also make these connections with physical activity, where we crisscross the right and left sides of our bodies (see Chapter III, C, Principle and Practice 11).

Figure 2:
The Triune Brain Model
(Erlauer 2003, 8)

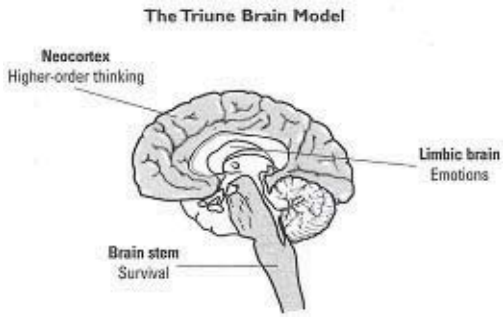
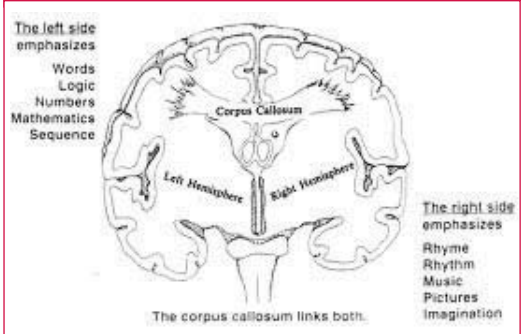


Figure 3:
The Two Sides of Your Brain
(Dryden and Vos, 124)



In sum, the learning process is not a linear, manageable activity as behaviorists once thought. Rather, it is the simultaneous activation of a maze of electro-chemical messages within a forest of dendrite-axon trees inside several brain regions, divided in two separate yet connected sides. As summarized by Given in her book, Teaching to the Brain's Natural Learning Systems (2002), "we now know enough about the brain to build a framework based on neuro-scientific research that…teachers can use to organize curriculum and develop lesson plans linking what is taught with how the brain actually functions" (Given 2002, 13-14).

While some caution is usually advised in applying these findings to classrooms until more is known (Marzano, 2003, 107), applications of accelerated learning in educational programs do suggest compelling ways to accelerate learning (see examples in Chapter VI).

OUR FIVE NATURAL LEARNING SYSTEMS

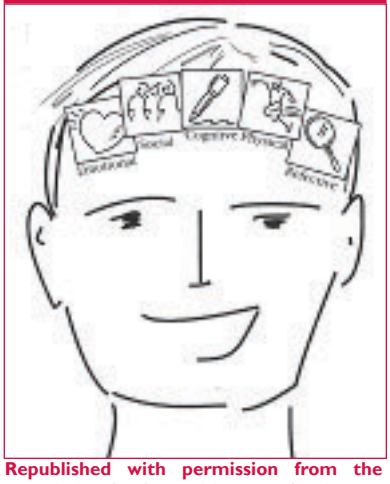
Today's understanding of the learning process encompasses more than the rational, cognitive activity that has dominated Western thought for at least three centuries. "Think of people as multiplex movie theaters with five movies showing simultaneously in 360-degree auditoriums." "That," writes Dr. Barbara Given, "is what we are as human beings and as learners." She describes five "theaters of the mind" where "at one moment, an emotional 'movie' may demand attention while the cognitive system struggles to make sense of new learning. At other times, hunger or illness may force consideration of the physical movie" (Given 2002, 128). Each theater continually "stimulates the brain's multimodal association areas" in varying intensities (Given 2002, 128). Remembering Given's theory, let us briefly consider each learning/movie system.

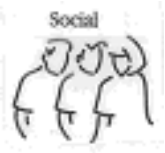
OUR EMOTIONAL LEARNING SYSTEM

Because of scientific discoveries about the connection of thought and emotion in the brain, we realize the central role that emotions, especially emotional and biological reactions to stress, play in the biology of learning (Erlauer 2003; Jensen 1998). The chemicals released with positive and negative emotions are the same as those involved in aiding or inhibiting memory (Dryden and Vos 1999, 141; Given 2002, 19; Sprenger 1999). In fact, our thinking and emotional processes are interwoven so completely in our biology that it is greatly misleading—even folly—to try to separate them. In addition, "emotional intelligence" is now a recognized concept in American educational circles and beyond, thanks in part to Donald Goleman's acclaimed book of that name. Goleman describes five parts to emotional intelligence: self-awareness; self-management; self-motivation; other-awareness; and relationship management. Given calls this system the most important one of the five.

The learning process is not a linear, manageable activity as behaviorists once thought.

Figure 4:
Theaters of the Mind
(Given, 129)





OUR SOCIAL LEARNING SYSTEM

Human beings are social animals and generally learn better working together. We have a strong basic need to belong. "The tendency to associate, establish links, live side by side, and cooperate is an essential characteristic of humans…. Consequently, even when we place a high value on independence, interdependence is a natural human trait" (Given 2002, 37). Thus, teachers support learning when they incorporate cooperation and group work in teaching. In addition, nurturing positive social relations in classrooms is important because "students in each class … will develop an unwritten code of conduct that either supports the curriculum or undermines it" (Given 2002, 57).

Before the cognitive system can concentrate on higher order thinking, it must manage the emotional and social systems.

(Given 2002, p. 61)

OUR COGNITIVE LEARNING SYSTEM

Most people think of cognitive thought processes when they think of learning, at least in relation to schooling. Indeed, the brain's cerebral cortex in humans has continued to grow over the millennia, and it provides us with extraordinary capacities for thought. This system takes information from all the other systems, interprets it, and guides problem solving and decision making. It is responsible for knowledge acquisition and thinking. However, before the cognitive system can concentrate on higher order thinking, it must manage the emotional and social systems (Given 2002, 61).

OUR PHYSICAL LEARNING SYSTEM

Stimulation is the key to learning and it begins with our sensory perceptions:

"All learning (abstract thinking and imagination included) originates with sensory input. All experiences, readings, discussions must enter the body/ brain through the senses before connecting to various sensory areas within the brain. The more senses involved, the more fertile ground within the brain for ideas to be planted" (Haebig n.d.).

A number of educational systems around the world today have divorced body movement from learning, requiring students to sit still and listen, read, or write and allowing limited time for recess. However, this body/brain dichotomy is an idea that limits learning (Dryden and Vos 1999, 371-373; Jensen 1998, 35). Motor stimulation directly impacts brain development and academic achievement, especially for young students but also for learners of all ages.

OUR REFLECTIVE LEARNING SYSTEM

It was Paulo Freire, the pioneer Brazilian educator, who used the metaphor of banking to describe the traditional model of teaching. The teacher makes deposits into the students' minds and later expects to withdraw the exact same material. However, human beings naturally do not work that way. We need to make information personally meaningful (Rose and Nicholl 1997). We normally evaluate, create interpretations, and attach significance to what happens to us, including stimuli for learning. In addition, we learn better when we can connect current information and experience to prior learning (Jensen 98, 92-93). When we are given time and support to ponder and connect lesson content to what we already know and our inner world of meanings, we remember better and our behavior is more altered (Erlauer 2003, 84-85).

These five learning systems form the basic framework of our human learning capabilities. In every learning situation, one or (usually) more than one of these systems is activated while our brains absorb, process, and direct our experiences. Using this learning systems framework and a basic understanding of brain functioning, we can reframe our understanding of how to accelerate learning.

The new knowledge of the neurobiological features of the brain and our five natural learning systems supports certain principles to guide the instructional process. After the first two, these principles are in no particular order. They interact and reinforce each other.

PRINCIPLES OF ACCELERATED LEARNING IN EDUCATION LITERATURE

PRINCIPLE 1: LEARNING IS CREATION, NOT CONSUMPTION.

Current Western ideas about learning are based on the principle that learning is an interactive process whereby a person absorbs information and skills within his or her current knowledge base and attaches personal meaning to them. In this context, learning is not "a process of passively receiving knowledge as an objective entity that learners must somehow assimilate into their minds" (Marzano 2003, 5). Making personal connections and meanings with information received is a creative act, with individually differing results.

This principle does not mean to suggest that students should be in complete charge of all they learn or that teachers should rarely, if ever, teach content to students. Such an approach is an exaggeration of "constructivism" in educational literature. Constructivists view learning as an interactive, constructive process that "involves the explicit and implicit negotiation of meanings" as students work through real-life problems (Cobb, Yackel, and Wood 1992, quoted in Marzano 2003, 107). Principle 1 is meant to be used in conjunction with the explicit teaching of content.

PRINCIPLE 2: LEARNING TAKES PLACE ON MANY LEVELS SIMULTANEOUSLY; IT IS NOT A LINEAR PROCESS.

Given the five learning systems and the velocity and complexity of the brain's synaptic connections, learning should be considered a multi-faceted, dynamic process rather than a series of precise steps. In addition, a great deal of learning occurs at the subconscious level. This level is working in perception, processing, and information recall (Dryden and Vos 1999). Because of the multi-level simultaneity of learning, no one order for learning certain content works best for everyone. In addition, we now know that large amounts of information presented pictorially and globally can be absorbed by the brain.

All this complexity means that we can absorb much more information faster than many people have thought, as long as it is presented in ways that interest the learner. Furthermore, to try to keep every student learning the same thing in the same way is a hopeless and undesirable task, usually resulting in bored and frustrated teachers and students and less learning than could have occurred.

For teachers, this is both good news and bad news. They do not have to present a curriculum in one particular, step-by-step sequence in order for students to learn, yet they have more of an active role to play in orchestrating learning than they may have thought. To accelerate learning, they should not present information in small, logical, out-of-context, boring bites. Rather, they need to stimulate students' brains with a variety and quantity of appropriately challenging and interesting information.

PRINCIPLE 3: MULTIPLE INTELLIGENCES AND DIFFERENT LEARNING STYLES EXIST; EACH LEARNER IS A UNIQUE COMBINATION OF THESE SETS OF CAPACITIES.

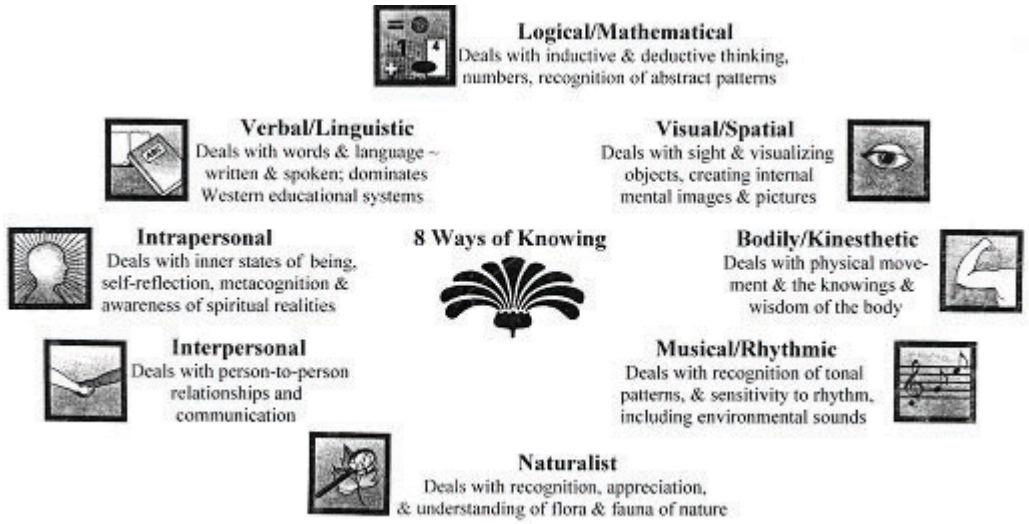
This principle combines two concepts that have broad acceptance within the field of education in the West: multiple intelligences and learning styles.

Multiple Intelligences—What Learners Learn.

In his book, Frames of Mind (1983), Howard Gardner opened the door to a complete overhaul of our understanding of intelligence. Rather than the one narrow set of criteria regarding language and math abilities so widely used in the West, he redefined intelligence to be the ability to (a) solve problems that one encounters in real life, (b) generate new problems to solve, and (c) either make something or offer a service that is valued within one's culture. Gardner identified seven intelligences, to which he soon added an eighth (see Figure 5).

Appendix B provides more description of these intelligences. Fuller treatment of this model can be found in almost every book in the annotated bibliography at the end of this monograph and especially in Silver et al. Many of the websites listed also include information on multiple intelligences.

Figure 5: Eight Ways of Knowing: Multiple Intelligences (adapted from Lazear 1999)



Learning Styles - How Learners Learn.

There are two commonly used typographies of learning styles: (a) styles based on the three learning processes of perception, processing, and recall, labeled the VAK system; and (b) styles based on Jung's psychological types. The VAK system includes three learning style preferences, keyed to our sensory system: Visual (V), Auditory (A), and Kinesthetic-Tactile (K). At times the Tactile is considered a distinct style (T) for a total of four; however, the most widely used system is the VAK trio. Everyone has a dominant preference, although that preference may switch depending on any particular learning task (see Figure 6).

The second learning styles typography, that based on Jung's work, describes four learning styles: a mastery style, built on sensing and thinking; an

Figure 6: Teaching to Visual, Auditory, and Kinesthetic-Tactile Learning Styles

Visual: Learn by Seeing	**Auditory: Learn by Hearing**	**Kinesthetic-Tactile: Learn by Doing**
Provide and have learners make and look at: books, booklets, posters, diagrams, pictures, charts and graphs, diagrams, flip charts, handouts, flash cards, written quizzes and tests	Provide and involve learners in hearing: explanations, discussions, demonstrations, lectures, question-and-answer sessions, reading aloud, oral quizzes and tests.	Provide and involve learners in working with: real objects, experiments, collections of samples, models-to-scale, tests and quizzes of actual performance.
Show videos, television programs, demonstrations. Involve in actual situations.	Play videos, radio and television programs, audiotapes.	Include practice applying knowledge, projects, role plays, simulations, doing demonstrations.

interpersonal style, based on sensing and feeling; an understanding style, based on intuitive thinking; and a self-expressive style, based on intuitive feeling (see Figure 7).

Generally speaking, the concept of multiple intelligences "is centered around the *content* of learning and the relationship between learning and eight distinct fields of knowledge or disciplines….The learning style model revolves specifically around the individualized *process* [author's emphases] of learning" (Silver et al. 2000, 41). In simple terms, multiple intelligences deals with what we are especially good at learning. Learning styles show how we prefer to learn. Both of these concepts fit within the overarching framework of our five learning systems (see Figure 8). They partly explain how we apply these systems in a learning situation.

PRINCIPLE 4: POSITIVE EMOTIONS AND A RELAXED, ALERT STATE GREATLY IMPROVE MOTIVATION AND LEARNING; THREATS IMPAIR THEM.

The vital role of emotions in learning was referred to above in the emotional learning system. Establishing an atmosphere of safety, trust, friendly cooperation, and appreciation makes an enormous difference in students' motivation and their access to and application of their learning abilities. On the other hand, "Excess stress and threat in the school environment may be the single greatest contributor to impaired academic learning" (Jensen 1998, 53). Stress from humiliation, punishment, or fear of failure can cause "illness, poor pattern recognition, and weaker memory" (Jensen 1998, 61).

Threats "activate defense mechanisms that are great for survival but lousy for learning" (Jensen 1998, 57) so they are

Figure 7: The Four Learning Styles; Styles Summary (Silver et al., 2000, 25, 28)

Sensing (S)
Bring step-by-step procedures and concreteness

Thinking (T) — Bring logic and objectivity

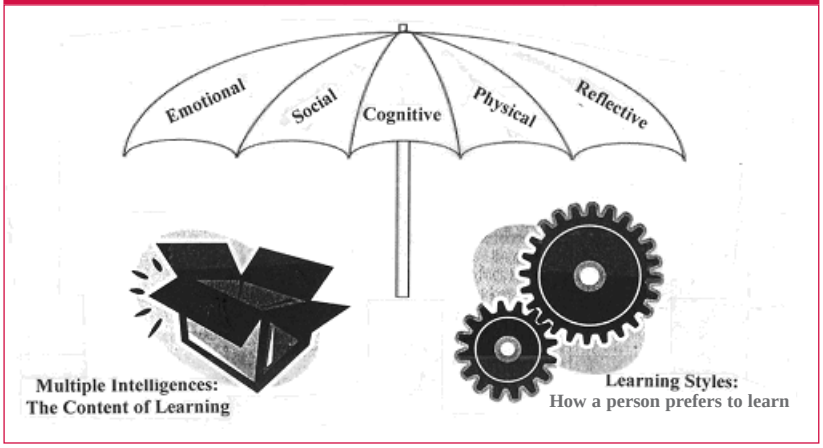
MASTERY STYLE *Sensing-Thinking (ST)* *Realistic, practical, matter-of-fact* • Good at organizing, reporting, building, planning, and carrying out projects • Like to remember, describe, manipulate, order	**INTERPERSONAL STYLE** *Sensing-Feeling (SF)* *Sociable, friendly, interpersonally oriented* • Good at building trust & rapport, empathizing, responding, teaching • Like to support others, personalize information, express emotions, learn from experience
UNDERSTANDING STYLE *Intuitive-Thinking (NT)** *Theoretical, intellectual, knowledge-oriented* • Good at arguing, researching, developing theories, explaining • Like to analyze, test/prove, examine, connect	**SELF-EXPRESSIVE STYLE** *Intuitive-Feeling (NF)** *Curious, insightful, imaginative* • Good at developing original solutions, thinking metaphorically, articulating ideas, expressing and creating • Like to predict/speculate, imagine, generate ideas, develop insights

Feeling (F) — Bring motion and spontaneity

Intuition (N)
Bring insight and abstraction

*Intuition is represented by the letter "N" rather than the letter "I" because in Jung's Theory of Psychological Types, the letter "I" is used to designate introversion

Figure 8: The Content and Process of Learning (adapted from Silver et al., 2000, 41)



"Excess stress and threat in the school environment may be the single greatest contributor to impaired academic learning." (Jensen 1998, 53)

actually counter-productive. When teachers threaten, ridicule, and punish students, students generally respond with biological reactions of fear and stress. When stressed, the body releases the chemical cortisol. Chronically high levels of cortisol kill off brain cells critical to memory formation. In addition, the body releases noradrenaline and rewires the brain to better survive these experiences. Consequently, a person becomes over-aroused and aggressive and more likely interprets others' behavior as threatening.

In school, students' energies and natural learning systems are diverted to concentrate on learning to survive, not learning the curriculum content. Chronic stress also limits the brain's ability to decide what is important. Defensively, people react from their limbic and brain stem systems and not from their neocortex. They simply do not think as well.

Stress, motivation, and success in learning are interrelated. Generally, teachers who use threats, ridicule, and punishment are seeking to motivate students to learn. An understanding of motivation from brain-based research offers new perspectives on this important factor in learning because it is based on the premise that human beings naturally want to learn.

In AL-E a distinction is made between students who are temporarily unmotivated from those who are chronically unmotivated because teachers' responses to re-engage their natural interest in learning may be different in each case (Jensen 1998). First, something in the environment—a past association with a current stimulus or a current physical, emotional, or mental discomfort—can temporarily disturb or distract a student. Second, some students who generally seem unmotivated have likely experienced severe threat or trauma coupled with the experience of no control in that situation. Students can have these experiences both outside and inside of school. In school, sometimes students are traumatized by a teacher's punishing behavior. Other students become unmotivated after being given a number of overwhelming tasks they do not think they have the skills to accomplish. In education and psychology, the resulting lack of motivation is labeled "learned helpless-

ness" (Jensen 1998, 57-59). Having decided that she or he cannot learn, the student stops trying.

Teachers generally know that rewards motivate better than punishments do. They may not know, however, that intrinsic motivation is generally stronger than extrinsic motivation. In other words, internal rewards (e.g., a sense of pride and satisfaction with one's accomplishments) work better than external ones (e.g., candy, money, or special privileges). Brain research tells us that we are naturally motivated by curiosity and novelty, meaningful activities, and successes (Jensen 1998, 65). When we pleasure our brains with these experiences, they release chemicals called opiates that produce a natural high and we feel good. Our brains respond by adding more receptor sites for these pleasurable experiences. Students respond differently to external rewards such as coupons or food because their biology and life experiences are different. "However, when a learning experience is positive, nearly all students will respond favorably in their unique biological ways" (Jensen 1998, 65).

For real learning to take place, people must be actively engaged.

(Rose and Nicholl, 1997, 64)

The best mental state for learning is one of relaxed alertness in which the conscious mind is linked with the sub-conscious, where most information is stored (Dryden and Vos 1999, 169). In this state we are receptive to new ideas, ready to be creative in exploring them, and most likely to retain them in our long term memories. We are also more likely to cooperate with others and to enjoy what we are doing, both of which accelerate learning.

Self-esteem, an aspect of our emotional system, has been called "the heart of learning" (Dryden and Vos 1999) and needs to be nurtured to accelerate learning. School administrators and teachers who expect and support every learner to succeed, rather than accept mediocrity for many and failure for some, can greatly improve student achievement. "Our self-image is probably the most important thing in determining whether we are good learners" (Rose and Nicholl 1997, 64).

PRINCIPLE 5: COLLABORATION AIDS LEARNING.

While most people can read, hear, observe, memorize, or figure something out by themselves, they are usually more efficient and effective learners if they work with others (Erlauer 2003, Chapter 8). Because human beings in all cultures are socialized to relate to others for their roles, functioning, and even their identities, they naturally learn better that way as well, as long as the group process is well managed.

PRINCIPLE 6: LEARNING COMES FROM DOING THE WORK ITSELF.

This principle contains two very important ideas: learning by doing and doing real work. We will look at each one separately.

For real learning to take place, people must be actively engaged (Rose and Nicholl, 1997). Most people retain very

little information taught in the traditional lecture style; it is a very inefficient way to teach. When learners are active, they are more likely to engage all their learning capacities because they seek something. They want to answer a question they have, they need information in order to solve a problem to their satisfaction, or they are figuring out how to accomplish a task they have taken on (Silberman 1996, 4). In 1983, Dr. Vernon Magnesen (in DePorter et al. 1999) proposed a guide (see Figure 9).

PRINCIPLE 7: LEARNERS NEED APPROPRIATE CHALLENGES TO USE AND EXPAND THEIR LEARNING CAPACITIES.

"Learning is a process of building neural networks" (Wolfe 1997, 135). Scientists have now concluded that the brain's process of making connections enhances learning capacity. The increased neural stimulation "grows a greater number of neural networks that are more intricately woven together." Therefore, "the brain cells communicate better with one another" (Ibid.), and more learning takes place

Figure 9: Vernon Magnesen's Sensory Modes of Learning (DePorter et al. 1999, 57)

We learn:

10% of what we read	20% of what we hear
30% of what we see	50% of what we see and hear
70% of what we say	90% of what we say and do.

These percentages may vary somewhat according to people's learning styles and intelligences (see Principle 3 above), but generally everyone learns better and faster by doing. This principle holds true across cultures, personality types, and age ranges.

The doing is more effective if it is real work, related to real-life situations, involving real materials. The more relevant and real students see the learning tasks to be, the more they will engage their learning capacities.

(Erlauer 2003). Figure 10 shows the difference between a brain cell that has had little stimulation and enrichment and one that has had a lot (Jensen 1998, 31).

Challenge and feedback are "the two critical ingredients" in enriching our brains' neural capacities for learning (Jensen 1998, 39) (see Principle 8 for a consideration of feedback). Learning challenges are ones that push us to reach beyond our current abilities and comfort zones to deal with new information and experiences in expanded ways (Silver et al. 2000, 44).

Students also need additional levels of difficulty to their learning tasks, but not so difficult that they become fearful, helpless, or extremely uncomfortable.

Figure 10: How Enrichment Changes the Structure of Brain Cells (Jensen 1998, 31)

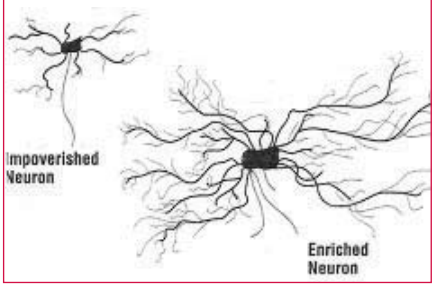
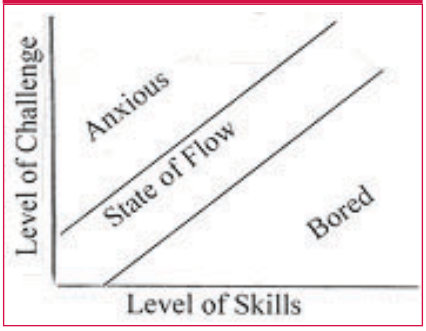


Figure 11:
Flow as the Optimal State for Learning (Vos Workshop)



From Vos, J. "The Learning Revolution in Action." (Training for Teachers and Trainers) January 2003, 2004. San Diego, CA.

Research studies have demonstrated "amazingly" high levels of retention of visual images over long periods of time; in fact, "the capacity for long-term memory of pictures seems almost unlimited."

(Wolfe 2001, 152)

The optimal mental and emotional state for learning in which challenge and comfort are balanced has been described in recent educational literature as "flow" (Csikszentmihalyi 1991), in which one's skills are in balance with the challenge. Too high a challenge for a low level of skills makes one increasingly anxious; too low a challenge for a high level of skills makes one increasingly bored. In a state of flow, learners naturally apply themselves to nonthreatening, mentally intriguing, and appropriately demanding tasks.

PRINCIPLE 8: LEARNERS NEED FREQUENT INTERACTIVE FEEDBACK.

In addition to challenges, our brains need feedback to maximize our learning. As they engage in learning activities, students need feedback on their performance and achievement in order to progress (Erlauer 2003, 8). In fact, the brain is a self-referencing learning system based on feedback; it continually decides what to do next based on an evaluation of what it experienced (Jensen 1998, 33). We ask: Am I doing this right? Is this working well? Did she understand what I said? Will they laugh if I say this? Students need teachers to provide frequent and useful information about their current status so they can adjust their behavior to reach desired goals.

PRINCIPLE 9: THE BRAIN ABSORBS INFORMATION IN IMAGES INSTANTLY AND AUTOMATICALLY; IT ABSORBS IMAGES AS EASILY AS WORDS.

No doubt, we have all at some point heard the folk wisdom, "A picture is worth a thousand words." Now research in neurobiology has scientifically validated this axiom (Wolfe 2001). "We take in more information visually than through any of the other senses" (Wolfe 2001, 152), and our brains actually perceive, process, and recall information in images as much if not more than in words. For example, when we recall memorable events in our lives, our minds remember the event mostly in images, augmented with sounds, tastes, and smells; then, we describe those images and other sense experiences with words (Wolfe 2001, 151).

Images are as valid and necessary as word representations in the stimulation of our learning systems. They are very efficient ways to convey and store a lot of information. Research studies have demonstrated "amazingly" high levels of retention of visual images over long periods of time; in fact, "the capacity for long-term memory of pictures seems almost unlimited" (Wolfe 2001, 152).

People working in the field of advertising understand and manipulate this brain capacity; educators and government officials communicating with semi-literate and illiterate adults engage the power of images as well. Now educators in schools and publishers of instructional materials are increasingly appreciating and utilizing

the depth of the brain's use of visual representations of objects and ideas to store and retrieve information. In sum, images are highly effective teaching tools for learners of any age and should not be considered an "artistic extra" or a "childish approach."

PRINCIPLE 10: MUSIC AIDS LEARNING.

Music is generally considered a cultural expression, but scientists have established that it is a very complex neural activity that is processed in both the left and right hemispheres of the brain, not just the right one (Wolfe 2001, 160). Music "can activate the cognitive, visual, auditory, affective, and motor systems" to varying degrees as we listen, sing, play, beat a rhythm, read, or compose music (Wolfe 2001, 161).

Research has shown how "deeply entwined" our mental processing of music is with "the brain's other basic functions, including emotion, memory, and even language" (Ibid.). We know that emotions are vitally important in learning. We also know that certain brain chemicals are linked with both emotion and memory. More recent studies have linked the emission of these same brain chemicals with the hearing of music (Wolfe 2001, 162).

As for language and music, "rhyme and rhythm provide great mechanisms for storing information that would otherwise be difficult to retain" (Wolfe 2001, 165). We know from experience that learning song lyrics is often easier than memorizing a passage of prose. In addition, our brains are predisposed to seek patterns in language and music, and we are both calmed and energized when we find these patterns (Wolfe 2001, 161).

In the United States and elsewhere, a renewed appreciation for music as an aid to develop reasoning skills was sparked in 1993 by researchers' work with "the Mozart Effect." Even though this research team never claimed long-term learning effects in that study, they and a number of other researchers have since established the important role that music plays in developing skills in spatial-temporal reasoning (Wolfe 2001, 163). Certain music stimulates the higher brain functions used in math and science to visualize a problem and a solution. Stronger spatial-temporal reasoning "generally results in increased conceptual understanding of a problem" (Wolfe 2001, 163). It seems that "music uses many of the same higher brain functions as math and science and that training in music can enhance these functions (Ibid.)."

In addition to these links with emotion, memory, language, and reasoning, using music in school provides a creative outlet for one of the eight multiple intelligences now beginning to be acknowledged and incorporated in mainstream schools in developed countries (see Principle 3 above and Practice 3.b. below). When students strong in this intelligence are allowed to play and listen to music in school, they learn better. With Apple computer's digital jukebox, the iPod, now enabling people to have literally thousands of songs at their fingertips, more incorporation of personalized music listening is technically possible.

PRINCIPLE 11: BODY MOVEMENT AIDS LEARNING.

The physical system affects learning in a number of ways. First, our bodies need to move to get our minds in gear. Moving the body sends new sensory stimuli and needed chemicals including oxygen to the brain. Second, current scientific findings indicate that memory is chemically stored throughout the body, not just in the brain (Dryden and Vos 1999, 143). Muscle memory helps us recall certain skills; it also helps recall information associated with certain actions. Third, physical exercise by children from birth to about age ten stimulates the growth of neurological pathways in the brain needed for learning that are otherwise impaired for life (Dryden and Vos 1999, 237). Crawling, climbing, skipping, spinning, rolling, and somersaulting activate physical capabilities to take in knowledge. Balancing, jump-roping, and other eye-body coordinating activities raise self confidence, increase attention span, quicken responses, and augment the ability to tackle increasingly complex learning activities. Fourth, kinesiology—the science of motion—has begun to show correlations of physical activity with improved learning, especially for those with learning difficulties (Dryden and Vos 1999, 371).

In addition, because we learn better when our left and right brain hemispheres are working well together, it is important to move in ways that increase cross-hemispheric connections in the corpus callosum (see page 10 above). Because our left and right brain hemispheres are connected to the right and left sides of our bodies respectively, a valuable way to make these connections is by cross-motor movement. Cross-motor moves that bring arms and legs across the center line of our bodies have been correlated with improved reading, especially for dyslexic people (Dennison 1981).

As the ancient Greeks knew, sports exercise both mind and body, with beneficial results in learning. For example, playing sports can teach mental and physical discipline, spatial-temporal strategic thinking, goal-setting, perseverance, and teamwork. These skills apply to learning in many ways.

PRACTICES OF ACCELERATED LEARNING IN EDUCATION LITERATURE

(Each practice below corresponds to the principle above with the same number.)

PRACTICE 1: INCLUDE TIME AND WAYS FOR STUDENTS TO PONDER AND ATTACH PERSONAL MEANINGS TO INFORMATION AND LEARNING EXPERIENCES.

As teachers plan their lessons, they need to incorporate time for students to think about what they are learning and to make the information personally meaningful. Making it personally meaningful means connecting it with what is already known. A number of ways to do this are available to teachers. Teachers can ask students to say or write in their own words the

main point of a textbook passage or a mini-lecture. They could ask students to talk in pairs or write briefly about how something just learned relates to something they knew already. Teachers could ask their students to do the same about what they understand and do not understand about a lesson just given. Expressing these personal meanings in a variety of forms, such as drawings or role plays, incorporates more learning capacities in this vital step in learning (see Practice 3 below).

PRACTICE 2A: PROVIDE OVERVIEWS; SHOW INTERRELATIONSHIPS; PROVIDE EXPERIENCES.

By providing overviews of the general topic and continually having students make connections and discover relationships in what they are learning, teachers help students to take advantage of the interconnected ways their brains work, including especially their subconscious minds. Teachers also need to orchestrate learning activities where students manipulate relevant objects and experience relevant contexts where the information they are learning is or can be put to use (see Practice 6 below).

Of course, there is an important role for step-by-step explanations and rational categorizations of information in teaching and learning. These modes of teaching just need to be balanced with the more holistic ways of presenting information.

PRACTICE 2B: PROVIDE AN ENRICHED LEARNING ENVIRONMENT WITH STIMULATING THINGS TO LOOK AT AND WORK WITH.

Teachers can powerfully augment and remind students about what they are learning by putting posters, maps, pictures, and graphic organizers or representations of information on classroom walls (see Practice 9 below). They can bring in a variety of items from the real world around them for students to look at, take apart, copy, and otherwise work with to stimulate curiosity and engage learning capacities. These objects to see and touch are perceived peripherally as well as directly by the brain; peripheral stimuli can play an important part in accelerating the learning process.

PRACTICE 3A: INCORPORATE MULTIPLE INTELLIGENCES IN INSTRUCTION AND ASSESSMENT.

Principle 3 of the AL-E literature referred to Howard Gardner's multiple intelligences–logical/mathematical, visual/spatial, bodily/kinesthetic, musical/rhythmic, naturalist, interpersonal, intrapersonal, and verbal/linguistic. Everyone is a composite of intelligences but people usually have one, or possibly two, dominant ones.

Schools that provide outlets for students to express all these intelligences in the processes of learning have seen great strides in achievement (see Chapter V). Not only do students learn better when they engage their own dominant intelligence(s), they expand their abilities to use other intelligences as the teacher incorporates them, and they develop fuller apprecia-

By providing overviews of the general topic and continually having students make connections and discover relationships in what they are learning, teachers help students to take advantage of the interconnected ways their brains work, including especially their subconscious minds.

tion for individual differences. Everyone has a chance to shine, and that feeling of success positively affects students' willingness to work at other learning tasks. (See Appendix B for more information).

PRACTICE 3B: TEACH TO DIFFERENT LEARNING STYLES.

As explained under Principle 3, two typographies of learning styles are commonly used: styles based on the Visual (V), Auditory (A), and Kinesthetic-Tactile (K) system; and styles based on Jung-defined psychological types (mastery, interpersonal, understanding, and self-expressive).

These two typographies can be used together. The VAK model can guide teachers' initial presentation of information and their means of review and assessment. Teachers do well to present and review information in all three modes, both to be effective with all their students and to reinforce learning with a variety of stimulation. The Jungian model can guide their lesson planning to incorporate a variety of active learning practices—activities that involve thinking and feeling as well as logic and intuition. It is also important for educators to identify their own learning style preference patterns for two reasons: so that they consciously realize that all learners do not learn like they do; and so that they recognize and then teach to diverse learners. More information on Jung's four learning styles is provided in Appendix A.

PRACTICE 4A: HELP STUDENTS TO RELAX AND TO BUILD THEIR SELF-ESTEEM; ELIMINATE THREATS.

Maintaining a positive learning atmosphere and building students' self-confidence and self-esteem begin with eliminating all threats. Teachers can eliminate threats in two ways: by reducing conditions that create them, and by helping students release stress (Jensen 1998, 59-60).

First, teachers need to eliminate threats from other students in school and from teachers themselves. Threats from other students can be reduced by setting clear expectations of respectful classroom behavior and enforcing them. Involving students in setting these rules makes them more effective. Threats can also be reduced by using partners and work groups that strengthen friendships and communication skills.

Teachers can alter their own class management behavior to emphasize what they want instead of what they do not want. They can ask unruly students what is keeping them from concentrating on learning, then willingly listen to their answers, and respectfully deal with their impediments. They can help students understand the connections between positive actions and their desired educational outcomes. Teachers can avoid stressfully short times for learning tasks by periodically observing where students are in the work assignment and by asking students if they need more time. This can also eliminate stressfully boring wait time. A teacher's

kindly, patient, good-natured yet firm approach will generally elicit reciprocal behavior in students.

Releasing stress is the second way to eliminate harmful effects of threats and build self-esteem. Ways teachers can assist students to de-stress include transition time and relaxation practices in class. Although teachers can do little about the environment outside school, they can provide transition time at the start of class. Transition activities can include doing something physical—like stretching, or brain gymnastics (see Practice 11 below), interpersonal—like a small group or paired discussion, or personal—like listening to some music or writing in a journal. Relaxation practices include short "relaxation moments" in class where everyone (a) takes a few deep and calm breaths and relaxes tense muscles, (b) says or sings positive slogans, chants, or songs to counter negative self-talk, or (c) visualizes personal and group goals. Occasional use of humor and appropriate background music to learning tasks also helps release stress.

To strengthen student self-confidence, teachers need to liberally sprinkle their talk with praise, encouragement, and appreciation of students' positive contributions of all kinds as well as their learning efforts and achievement. As teachers reinforce desirable behavior, they stimulate the brain's pleasure chemicals, which increase self-esteem and intrinsic motivation.

PRACTICE 4B: ENGAGE LEARNERS' NATURAL MOTIVATION.

Teachers can encourage learning by engaging learners' natural curiosity through the use of many of the practices discussed in this section. The accelerated learning approach actively and fully involves students' learning systems and appropriately challenges and respectfully supports their learning. When students temporarily stray off task, rather than reprimand and ridicule them for inattention and stupidity, teachers can redirect students by gently reminding them of the task at hand or engaging them in an activity.

When faced with students who are unmotivated due to learned helplessness, teachers can increase their efforts to reduce threats, apply stress management techniques, and express encouragement and appreciation. They can also provide choices, wherever possible, to give these students some sense of power and structure small successful learning experiences to build their self-confidence.

PRACTICE 4C: ADD PLAY, FUN, AND JOY TO LEARNING.

Unfortunately, too often we expect schools to minimize play, fun, and joy. They seem a waste of time in the serious business of schooling and more suitable for after school hours or at least for breaks from schoolwork. Most people know that taking time to relax and release stress through play and laughter is helpful after any hard work. This practice, however, involves using play, fun, and joy within a lesson as instructional elements.

Play in this context does not mean simply amusement. It means pleasurable activities with learning content. "Play generates positive emotional states" (Given 2002, 57). If people are happily

enjoying a learning activity, they will learn better than if the learning is boring or fear-inducing. That outcome results from people's creative thought processes and memory-storing capacities being more available to apply to learning. Children learn more rapidly when they have fun (Given 2002, 49). Adults generally do, too. We now know that connecting learning with positive emotions improves the learning process because the mechanism in the brain that transfers information to long-term memory is closely linked with the brain's emotional center (Dryden and Vos 1999; Jensen 1998).

Two essential conditions must exist for effective cooperative learning: a group goal; and individual accountability for both self and group learning.

(Robert Slavin 1987, 7)

PRACTICE 5A: GROUP STUDENTS FOR COLLABORATION.

Collaboration can take many forms. The lowest level of collaboration involves students doing together what they would otherwise do as individuals to reinforce learning sourced by the teacher. An example of this is paired question-and-answer reviewing of given facts or reciprocal grading of a quiz. Moving up the ladder of collaboration, teachers can put students in small groups for discussions or jointly performed tasks or projects.

PRACTICE 5B: INCLUDE COOPERATIVE LEARNING ACTIVITIES.

Cooperative learning as a term in educational literature means more than putting students into groups. Robert Slavin, one of its early proponents in education literature, explains that two essential conditions must exist for effective cooperative learning: a group goal; and individual accountability for both self and group learning (Slavin 1987, 7). First, groups must have an incentive goal that is important to its members, such as special privileges or bonus points, in addition to the learning goal. Second, group success must depend on the individual learning of all group members, such as measuring its success by the average test grade of the group. With these conditions, students are likely to overcome reluctance to ask for or offer help, high achievers are less likely to do all the work and ignore low achievers, and low achievers are more likely to participate.

Cooperative learning normally follows a teacher's direct presentation of information. With that information base and other instructional materials, student groups "take over and own it [the taught content],… and translate it, and make it their own, and begin to really make sure not only that they understand it, but that the people that they are sitting with understand it" (Roger Johnson, another pioneer in cooperative learning, on www.ascd.org/tutorials/cooperative).

A variety of cooperative learning techniques exists. Suggestions of techniques begin with pairing students for simple activities and advance to team tasks. Some examples are:

- Pair and Compare: Partners coach each other on worksheet

problems, check each other's work, or use flashcards to quiz each other until both have 100 percent correct.

- Team Achievement: Teams of three or four receive a worksheet or questions to discuss and complete. Then the teacher tests either a team representative or each member on mastery of the material and awards individuals both group and personal scores.
- Group Investigation with Individual Subtasks: Groups take on learning more about a topic of the curriculum, and each member chooses an aspect of the group's topic on which to work. Members educate each other, then the whole class. Individuals are assessed on personal performance as well as on group and whole class scores.

When teachers include Slavin's two conditions in planning cooperative learning, students are likely to learn more content. They also are likely to increase their self-esteem, interpersonal communication skills, and teamwork skills—all valuable ingredients in learning. Attendance also generally increases because students feel personally needed at school.

PRACTICE 6: INCORPORATE ACTIVE LEARNING, PROBLEM- AND PROJECT-BASED LEARNING, AND DISCOVERY LEARNING.

The traditional approach to teaching emphasizes the memorization, recall, and recitation of facts. The accelerated learning approach emphasizes the application and manipulation of facts in real-life contexts. Teachers ask students to categorize, compare and contrast, summarize, analyze, evaluate, and make recommendations about facts as they relate to real situations. Examples are comparing prices, testing which products work best, or collecting samples of rocks or leaves and identifying them.

Active learning ranges from answering questions, to doing experiments, collecting information from experiences outside of the classroom (walks, visits), and designing and executing projects that incorporate and extend the knowledge provided in the classroom. It can be used before, during, or after such knowledge is provided. AL-E literature suggests that active learning be used throughout the teaching process because it operationalizes so many of its principles. Beginning a lesson with an activity that activates the learning systems right from the start is particularly helpful in accelerating learning.

PRACTICE 7: PROVIDE LEARNING TASKS THAT STIMULATE STUDENTS WITHOUT FRUSTRATING THEM.

Because teachers cannot know the best combination of challenge and skill levels that creates optimum conditions for flow for each student for all learning tasks, the best thing to do is offer a variety of learning tasks and activities, with some student choice available. Teachers can vary classroom practices in the dimensions considered here, all of which adjust learning conditions to encompass student differences. Additional adjustments can come from offering students some choices in what

and how they learn. Provided that students' natural motivation has been engaged to learn the particular content and the classroom atmosphere is well-managed, structured choices in using different learning styles and intelligences to learn and demonstrate achievement can be offered.

In general, instructional tasks that offer the best challenges for all involve problem solving, critical thinking, relevant projects, and complex activities (Erlauer 2003, 97; Jensen 1998, 33). These task characteristics take us back to Principle and Practice 6 above regarding active, problem-based, and discovery learning.

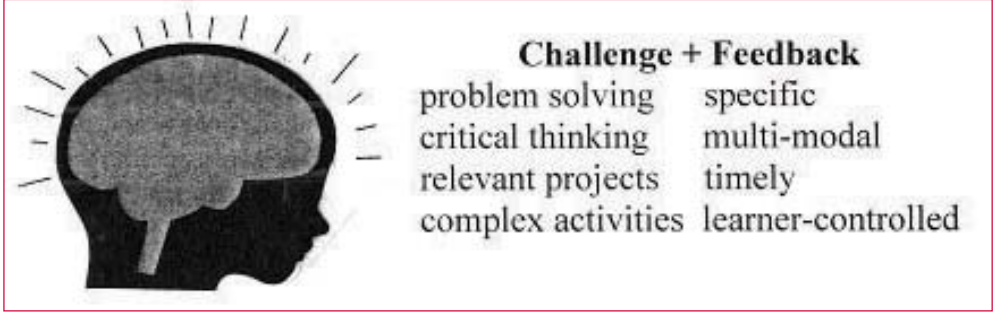
PRACTICE 8A: PROVIDE FOR SPECIFIC, VARIED, AND FREQUENT FEEDBACK WITH SOME LEARNER CONTROL.

For assessment and feedback to be most effective for learners, teachers need to provide for specific, varied, and timely feedback, with some learner control (Jensen 1998, 33). First, specific, clear references to places where a learner's work does not meet expectations are far more useful than general comments such as "very good" or "needs improvement." Students need to know explicitly where to calibrate their understanding and behavior to what is expected.

Focused and specific feedback requires clear criteria for success, something teachers need to develop or fully understand from curricular documents. Teachers can also lead students to establish valid criteria for success themselves as a class or group, based on samples of excellence. This process takes more time than providing the criteria, but it often enhances achievement in the long run by engaging students more fully in striving for excellence.

Second, feedback from a variety of people and processes works well to accelerate learning. Expanding the number of people giving students feedback beyond just the teacher aids learning. Teachers can have students perform self- and peer assessments based on teacher-accepted criteria. This task trains students to take more responsibility for their own and each other's learning, thereby increasing internal motivation. Varied feedback processes include receiving spoken or

Figure 12: Maximizing Brain Growth (Jensen 1998, 33)



written comments or corrections (words or images), building something that either works or does not, and/or playing a review game with points immediately given for right answers.

Third, assessment and feedback are usually most useful when done immediately after the learner's behavior. With behaviors fresh in their minds, students can receive immediate pleasure by improving their work, especially if they get positive feedback for their efforts. Timely feedback can involve short daily quizzes that are graded right away, questions directed at specific individuals on specific information or application of that information, and actions to apply learning that outwardly demonstrate understanding. Written work needs to be graded and returned promptly (within a day or two). Teachers who give tests or accept homework and do not return the results right away (or not at all) lose a valuable opportunity to use the brain's feedback system to its best advantage to increase learning.

Fourth, some control by the learner is helpful. Control can come with self-assessment using established criteria by the teacher, class, or student. It can come with the opportunity for students to choose to redo their work and generate new, and hopefully more approving, feedback. In addition, choice concerning when they are to be assessed provides some control to students. Finally, teachers can sometimes give students choices in what they do to be assessed, especially in performance-based assessment. Examples include making a model or display, creating a short play or song, and creating teaching materials for others (see Practice 8b below).

PRACTICE 8B: EXPAND FEEDBACK BEYOND REPETITION OF INFORMATION TO PERFORMANCE-BASED AND INTERACTIVE FORMS.

Varying the assessment activity and the source of feedback increases the activity's effectiveness for accelerating learning. Teachers can expand the test items they use, adding the performance of tasks to the usual written tests of simple memory. Examples of tasks might be to draw a diagram of a process, solve a story problem in mathematics, or show how to prepare or repair something. Performing tasks that apply learning to situations that are relevant, interesting, and/or useful to students is more motivating than writing or reciting. Performing tasks also requires a higher level of understanding than repeating information. Performance assessment provides a concrete demonstration of students' understanding that can help students with a mastery-oriented learning style.

PRACTICE 9: USE LOTS OF IMAGES IN LEARNING: PICTURES, CHARTS, OBJECTS, AND METAPHORS.

Teachers should include many images—pictures, wall posters, photographs, symbols, graphic organizers such as pie charts, videos, movies, and computer images when available—and real-life objects in the presentation of information. If current instructional materials have few pictures, symbols, or graphic organizers, teachers and students can find or make

them to aid in explanations or memorization. It is not necessary for teachers to be excellent at drawing. They can request the assistance of others who are, including especially students, or just do the best they can, knowing how important images are. Teachers should have lots of posters and charts on classroom walls to take advantage of their students' subconscious learning powers.

In addition to written and drawn materials, teachers can use real objects in their teaching. They can bring items that are relevant to lesson content, which can serve first as motivators and later as reminders of information or as mechanisms with which to study or demonstrate performance. Parents and other community members can be of assistance here.

An important aspect of images is color. Adding colored ink or marker writing, colored paper, colored ribbons, or other colored symbols and objects to instructional materials of all kinds, including wall posters and charts, provides interest and delight to the eye. The resulting emotional response to that pleasure aids learning.

Metaphors are powerful learning tools because they engage mental images and prior learning at the same time. Mental images can be as powerful a learning tool as physical ones. Metaphors make associations between things or experiences; they can be a strong bridge. For example, a teacher could say, "Dividing numbers is like figuring out how to give each friend an equal piece of your banana," or "This year we are going on a journey of learning together."

PRACTICE 10: USE MUSIC TO SET LEARNING ATMOSPHERES AND TO AID THE PROCESS OF STORING AND REMEMBERING INFORMATION.

Teachers can use music in two ways to accelerate learning: (1) to create conducive emotional states; and (2) to carry information to memory. Teachers can play music (recorded or live) at the beginning of a lesson to calm, energize, or focus students. Many kinds of music work well for this purpose, except that which is disturbing in sounds or words, such as Western punk rock. When using music as a vehicle for reinforcing lesson content, teachers can either play instrumental music (no words) in the background as they read important information in measured speed or they can compose a song or put relevant words to a familiar melody. Better yet, they can ask for student volunteers to do so.

Many kinds of instrumental music are appropriate for reinforcing content so long as they are pleasing to the listeners. AL-E practitioners from Western cultures often use European classical music from the 18th and 19th centuries (for example, Beethoven, Mozart, or Vivaldi) as a background vehicle because its 4/4 time and stately musical structure have been found to be especially effective. Teachers should feel free, however, to use calming music

from their own cultures. Music can be played on the radio, tape recorder, CD player, or an instrument.

PRACTICE 11A: MAKE FREQUENT BODY-MIND CONNECTIONS FOR LEARNING.

Most adults in learning situations need to move after sitting for about 20 minutes in order to stay alert and efficient; the rule for children is the number of minutes for the number of years old. These guidelines may vary slightly across cultures according to different socialization patterns, but we all share the same human physiology. To move students' bodies, teachers can (a) have students turn to another and do pair work, (b) have students move into work groups, (c) lead students in standing and stretching, (d) give students a ten-minute outside activity break, or (e) take students outside for project-based or discovery learning.

Teachers can take advantage of muscle memory, cross-motor movement, and role plays to accelerate learning. Associating gestures and other seated or standing body movements with information can boost memory. If singing or chanting is added to movement, the effect on accelerating learning increases. Cross-motor movements and other "brain-gymnastics" boost the brain's capacities, calm the nerves, and create pleasant emotions (Dennison 1981). Teachers can use role plays in which students act out historic events or physically represent different steps or stages in a process, for example the body's circulatory system. Having students wear an identifying sign or bit of costume or hold a prop imprints the lesson even stronger in everyone's memories.

Students who are bodily-kinesthetic learners do much better in school when they have a chance to move around. They are sometimes the ones who disturb a class's passive learning atmosphere, innocently or mischievously, out of their deep-seated, natural need to get out of their seats and move. Rather than punish "bad behavior," teachers can harness that need to "do" to an activity relevant to the student's learning.

PRACTICE 11B: PROVIDE SPORTS ACTIVITIES FOR ALL IN SCHOOL.

If possible, teachers and administrators need to include sports in the school schedule in ways that include all students appropriately. Playing sports provides a more vigorous outlet for emotional stress and body tension than body movement in class. It can teach relevant skills, as mentioned above, and allow learners with bodily-kinesthetic intelligence to increase their self-esteem.

SUMMARY

In education literature, the basic foundation for the principles and practices of accelerated learning is the brain and the way that human beings learn and remember. The brain's electro-chemical processes and the functions of its hemispheres and regions, together with peoples' natural learning systems, multiple intelligences, and differing learning styles, result in a complex set of variables around which students can be helped to learn more efficiently and effectively. Principles and practices identified in the literature build upon these new findings. A summary is provided in Figure 13.

Figure 13: Summary of Accelerated Learning Principles and Practices in Education Literature	
Principles	**Practices**
1. Learning is creation, not consumption.	1. Include time and ways for students to ponder and attach personal meanings to information and learning experiences.
2. Learning takes place on many levels simultaneously; it is not a linear process.	2a. Provide overviews; show interrelationships; provide experiences. 2b. Provide an enriched learning environment with stimulating things to look at and work with.
3. Multiple intelligences and different learning styles exist; each learner is a unique combination of these sets of capacities.	3a. Incorporate multiple intelligences in instruction and assessment. 3b. Teach to different learning styles.
4. Positive emotions and a relaxed, alert state greatly improve motivations and learning; threats impair them.	4a. Help students to relax and enhance their self-esteem; eliminate threats. 4b. Engage learners' natural motivation. 4c. Add play, fun, and joy to learning.
5. Collaboration aids learning.	5a. Group students for collaboration. 5b. Include cooperative learning activities.
6. Learning comes from doing the work itself.	6. Incorporate active learning, problem- and project-based learning, and discovery learning.
7. Learners need appropriate challenges to use and expand their learning capacities.	7. Provide learning tasks that stimulate students without frustrating them.
8. Learners need frequent interactive feedback.	8a. Provide for frequent, specific feedback from various sources. 8b. Expand feedback beyond repetition of information to performance-based and interactive forms.
9. The brain absorbs information in images instantly and automatically; it absorbs images as easily as words.	9. Use lots of images in learning: pictures, charts, objects, and metaphors.
10. Music aids learning.	10. Use music to set learning atmospheres and to aid the process of storing and remembering information.
11. Body movement aids learning.	11a. Make frequent mind-body connections for learning. 11b. Provide sports activities for all in school.

IV. ACCELERATED LEARNING IN DEVELOPMENT LITERATURE: PRINCIPLES AND PRACTICES

BACKGROUND

The often-stated goal of AL-D is to improve the levels of educational achievement in developing countries quickly. It has been somewhat difficult, however, to find written records of principles of AL-D. It has been easier to find descriptions of strategies and techniques but not the basic assumptions about learning and teaching on which they are based. Some synonyms found for AL-D are "effective learning" and "high educational quality," which provide some direction, but these are very general terms. They are often discussed in relation to student performance levels on standardized tests of achievement of the national school curriculum. However, "because there is so rarely an articulated vision of what a quality education would 'look' like, and even more rarely a vision shared by various stakeholders, it is difficult to talk about the characteristics of an effective school" (O'Gara et al. 1999, 6).

The USAID website on its Improving Educational Quality (IEQ) program offers a relative, rather than absolute, working definition of quality "because of the complexity of the issue." Essential elements include:

- "Dynamic dialogue among policy makers and practitioners.…"
- "Student progress and teacher performance in meeting or exceeding appropriate standards (e.g., agreed upon objectives in knowledge, skills, attitudes, values.…)"
- "Outcomes related to teaching and learning… set in measurable terms."

This definition is meant to "offer a framework to stimulate dialogue." While a relative definition has its value in honoring the diversity of points of view, it does not lend itself well to clarifying operational principles. Questions remain about what educational philosophy is expected to frame and drive the ways practitioners are to go about producing high levels of achievement by their students.

Identifying one set of principles for AL-D has been difficult. The following principles are found in AL-D literature to varying degrees. They offer a fairly complete set of assumptions as a whole, but most AL-D materials read for this monograph included some but not all of them. In addition, they are often implicit in what is written rather than identified explicitly as guiding principles.

PRINCIPLES OF ACCELERATED LEARNING IN DEVELOPMENT LITERATURE

PRINCIPLE 1: ALL CHILDREN NEED TO BE IN SCHOOL.

This principle, which is generally considered foundational, includes access, enrollment, attendance, and retention. "The challenges raised by the lack of access for and the poor retention of students in the primary school system are so fundamental that they threaten the development of the entire educational system" (SARA 2002, 12).

With modernization, urbanization, globalization, and the gradual spread of ideals of human rights, more people in developing countries now believe that at least a primary school education is a necessity and even a right. Parents and leaders at all levels of society in these countries are increasingly aware that the prosperity of families, communities, and countries in the modern era greatly depends on basic educational skills for work, whether in a cottage industry or in public places. Some believe that in the twenty-first century, a basic education is the right of every person, child, or adult. AL-D literature assumes that premise.

PRINCIPLE 2: GIRLS AND OTHER UNDERSERVED AND DISADVANTAGED POPULATIONS NEED SPECIAL SUPPORT TO BE IN SCHOOL AND TO BE EQUITABLY TREATED THERE.

Equitable treatment in school attendance and participation in class is a factor that affects every student's achievement. Categories of students sometimes treated inequitably include girls and young women, students from language minority groups, those with physical handicaps, and young men–and woman–back in school who fought in wars. Although the AL-D literature focuses mainly on the equitable treatment of girls and young women, one can validly substitute any one of these other groups in many statements below.

Many countries have particular challenges in increasing access to schooling for girls and other underserved and disadvantaged populations such as linguistic minorities or students with physical handicaps. Beliefs and assumptions about the unworthiness and inabilities of these children can be deeply engrained in a country's culture. In some countries, these barriers to children's basic education are lowering. In other countries, especially in rural areas, they remain strong. In either case, cultural sensitivity is needed to find common ground that honors everyone's perspective and yet allows all children to get a basic education.

Policies at the educational system level that support equitable treatment for girls and boys are sometimes subverted in the classroom by teachers' conscious and subconscious discrimination against girls. "Throughout the world, boys consistently receive more (and more challenging) instruction from teachers" (O'Gara et al 1999, 7). As with educational system-level issues of equity, a lot of written material can be found elsewhere about instructional factors that create disadvantages for girls in the classroom, primarily based on stereotyping women and girls to be less intelligent and less important than boys (O'Gara and Kendall n.d., Tietjen 1991). Instructional factors include:

- How often and how helpfully teachers interact with girls compared to boys, including eye contact and talking;
- How equitably teachers communicate high expectations for achievement both to individuals and to groups and how they grade assignments; and
- How equitably teachers assign positions of responsibility.

Some researchers have found gender differences in the way girls and boys learn, think, and relate (O'Gara and Kendall n.d.), which could impact the way teachers instruct them, even if teachers had no prejudices. Fundamental gender differences have been found in perception, cognition, and learning style preferences. Girls often use different learning and problem-solving strategies than boys do. At least in Western cultures, girls generally prefer to learn cooperatively and boys prefer competition; boys think more linearly than girls do.

Some educators claim that in most cultures gender differences in learning are institutionalized in instructional methods that benefit boys and men over girls and women because schools were originally developed by men to teach boys. These methods include "didactic instruction, debate… solitary students learning 'facts,' mastering skills, and taking competitive tests" (O'Gara and Kendall n.d., 55). On the other hand, girls prefer and do well at cooperative problem solving and other group tasks. There continues to be controversy about the extent to which these learning, thinking, and relational differences are primarily personality- or gender-based and to what extent they are natural or socialized. In any case, they do exist, and they do affect student achievement.

In sum, the obvious and subtle ways in which girls are disadvantaged in instructional methods—whether from personal prejudice or long-standing teaching practices—affect the acceleration of learning of many students in a chain of causes and effects.

> What goes on inside the classroom may program girls for academic failure by affecting their attainment and achievement. In a vicious cycle, girls' poor performance in school influences societal and parental perceptions of girls' ability and the quality, utility, and relevancy of female schooling…. These negative impressions, perpetuated by the school itself, keep other girls out of school (Tietjen 1991, 36).

PRINCIPLE 3: LEARNING INCLUDES SKILLS IN HIGHER ORDER THINKING AND TEAM WORK IN ADDITION TO GAINING INFORMATION; PROJECT-BASED LEARNING MAKES LEARNING MORE RELEVANT.

In response to a growing awareness of the expectations of foreign and modern national employers, government officials in developing countries are adding these skills to national curriculums and directing teachers to teach them. In discussing the preparation of students for the world of work in sectors connected to the global economy, AL-D literature often mentions the importance of

critical thinking and problem-solving skills. This emphasis is supported by the SCANS Report, U.S. Departments of Labor and Education, extensively referred to by Intili and Kissam. "A well-developed mind . . . and the ability to put knowledge to work are the new keys to the future" (Dryden and Vos, 276). The SCANS Report also emphasizes the need for good communication, cooperation, and conflict-resolution skills as a team member and leader.

These skills are implicit in references to "problem-based" and "project-based" learning and using small group activities. AL-D literature refers to the application of knowledge and skills learned in classrooms to practical problems faced in local communities. These applications not only strengthen children's skills and knowledge but provide a service to the community. This service, in turn, strengthens community support for schools in general and individual students' attendance in particular.

Sometimes terms such as "discovery learning" or "a more participatory and exploratory approach" are used. These terms seem to be somewhat limited, however, to students' exploring the application of given information rather than discovering new information on their own as in AL-E.

Classrooms where teachers generally include more teacher student interactions are more likely to improve learning outcomes than those in which students always work as a class or on their own.

PRINCIPLE 4: LEARNER-CENTERED INSTRUCTION IS MORE EFFECTIVE THAN TEACHER-CENTERED INSTRUCTION.

From an awareness that traditional teacher-centered instruction has limitations in engaging students in schooling come attempts in AL-D literature to relate instruction to students' human needs and interests, including some references to teaching with different learning styles in mind. Classrooms where teachers generally include more teacher-student interactions are more likely to improve learning outcomes than those in which students always work as a class or on their own. Teachers who provide more individualized instruction are more supportive of accelerated learning than those who give everyone the same instruction and almost always speak to the class as a whole.

Concern is sometimes expressed in the literature that teachers are confused about what really constitutes learner-centered instruction (Craig 1998, 50). To some, having students talk to each other or work in groups fulfills that requirement. While those practices may provide evidence that the principle involved is being used, learner-centered instruction means having student learning processes drive teachers' actions rather than teaching practices force students into a narrowly confined, usually traditional learning process.

PRINCIPLE 5: LEARNING IMPROVES WITH THE INCLUSION OF CONTINUOUS AND PERFORMANCE-BASED ASSESSMENT.

Assessment can be thought of in four dimensions: (a) formal/informal; (b) final/continuous; (c) written/oral; and (d) question-and-answer/performance. While all assessment can be written or oral, usually assessment in a traditional approach is formal, final (or at least infrequent), and question-and-answer. In an accelerated approach, teachers add informal, continuous, performance-based assessment.

Continuous assessment "operates at the classroom level and is integrated with the instructional process" (Capper 1996, 32). It can be formally developed as a standardized tool and procedure across a system or informally created and done by individual teachers. A teacher uses a variety of ways "to tell whether his or her instruction has been effective and to target those students who have and have not mastered" certain knowledge and skills (Ibid.). These ways include observation, questioning, or tests and quizzes. Developing countries are increasingly using course grades, based on an accumulation of continuous assessments, together with end-of-cycle examinations "to make promotion, certification, and selection decisions" (Capper 1996, 33).

Performance-based assessment consists of authentic tasks that students do to concretely demonstrate their mastery of certain knowledge and skills (Miske 2003). Often teachers use locally available materials, either found or made by themselves or their students. Continuous, performance-based assessment and feedback do a better job of accelerating the learning process for a number of reasons (Miske 2003, 4-6). Students learn better with more frequent testing that lets them see how they are progressing week to week. They take more responsibility for their learning when they see concretely how well they have learned to do something. Teachers are led to reinforce the importance of active, project- and problem-based learning by testing authentic application rather than rote recall. They also use results to individualize their teaching, treating students differently and increasing student participation. Teachers report that this type of assessment and feedback is more time-consuming, yet is worth it for their students' achievement in knowledge and problem-solving skills.

PRINCIPLE 6: EMOTIONAL AND SOCIAL NEEDS OF STUDENTS NEED TO BE ADDRESSED IN SCHOOL.

Students' attitudes and satisfaction with school affect their attendance and participation, therefore their levels of achievement. Of course, conditions in the social, physical, political, and economic world of family and community outside of school affect students' emotional states in school. These conditions can include natural or human-caused disasters. Teachers and other school staff cannot nullify all the emotional distress of these conditions, nor can they correct all the reasons students may be dissatisfied with school. Still a teacher's job is seen to include being mindful of these emotional and social conditions and

A teacher uses a variety of ways "to tell whether his or her instruction has been effective and to target those students who have and have not mastered" certain knowledge and skills.

(Capper 1996, 32)

addressing them as much as he or she can. Students achieve more academically when they feel a safe, positive, caring, and friendly classroom and school atmosphere surrounding them. They are more emotionally stable and motivated to learn and more able to work on learning activities cooperatively with other students.

PRINCIPLE 7: WHEN USED WELL AND ESPECIALLY WHEN PAIRED WITH DISTANCE LEARNING, MEDIA AND INFORMATION AND COMMUNICATION TECHNOLOGY ARE IMPORTANT TOOLS IN INCREASING THE REACH AND QUALITY OF SCHOOLING AND TEACHER TRAINING.

Because of limited resources of many kinds and the economies of scale and expertise available, the use of information and communication technology can be an important aspect of accelerating learning, if used well (Castro and Verdisco 2002, 42-43). "Technology—as a source of problems and as a source of solutions—runs like a bright red thread through the fabric of critical issues surrounding school improvement" in both developed and developing countries (Bradsher 1999). The use of media and communication technology, particularly the use of Interactive Radio Instruction (IRI), Educational Television (ETV), and Computer-Assisted Instruction (CAI), offers tremendous instructional potential to accelerate the learning of both learners and teachers. "It is logical to look to communication and information technologies for ways to make education more relevant, accessible, equitable, and cost effective" (Bradsher 1999).

Radio now brings the voices of expert teachers and trainers to urban and rural populations, providing high quality instruction and up-to-date information. Television programs add images to voices, which greatly expands their instructional powers of conveying information in brain-compatible ways. Computers can make practically unlimited information available to anyone. In addition, computer capabilities for individualizing instruction with instant feedback and for tirelessly providing repetition and review outstrip even the most patient teachers in those instructional tasks, allowing learners to teach themselves. As Dryden and Vos state, "Not to make full use of instant electronic communications in education would be like our ancestors failing to use the alphabet, refusing to produce typeset books, or rubbing sticks together to start a fire" (Dryden and Vos 1999, 93).

IRI has the distinction within the field of distance education of having the improvement of educational quality as its primary goal (Bosch et al. 2002). Most distance learning programs were designed to address issues of access and equity. Although IRI does increase access and instructional equity, it was developed "to counteract inadequate teacher training, poor achievement among learners, and few resources" (Bosch et al. 2002, 135). To accomplish its primary goal, IRI:

> [O]ffers a combination of delivery systems and pedagogical practices that incorporates interactive strategies, positive role models, hands-on experiential learning using local resources, and a strong role for the teacher or facilitator in the learning process. (Hartenberger and Bosch 1996, 5).

More specifically, IRI asks students questions, invites call-in discussion, and gives them physical and intellectual activities, such as short experiments or imaginary situations to do during the program. The pedagogy uses modeling of learning activities, activities connected to measurable learning objectives, and the spiraling of lessons that connect previous knowledge to new concepts and skills. Woven throughout are stories, music, and role plays that engage students' and teachers' multiple intelligences, creative capabilities, and emotional states. IRI can be the "glue" that holds together a nationwide program of educational improvement, as it was in Guinea (Bosch et al. 2002, 138-139).

Actual results of the use of IRI demonstrate its effectiveness (Bosch et al. 2002, 136-140). A multiple-country comparison of mean post-test scores for experimental groups who received IRI and control groups who did not shows a range of 4 to 19 percent improvement advantage to the experimental group, with an average advantage of 10 percent. Students in South Africa and the Dominican Republic have experienced increases in learning when participating in accelerated learning programs.

In addition, evidence from pre- and post-achievement tests suggests that IRI may benefit girls more than boys because it impacts factors often associated with barriers to girls' participation in learning such as distance to schools, lack of role models, and irrelevant curriculums (Hartenberger and Bosch 1996, 31). It also incorporates more of the ways that girls generally prefer to learn, such as interactive learning. "IRI fills a needed gap and provides an impartial educational catalyst for teachers and learners across traditional boundaries, such as gender, distance, and access to quality schools" (Bosch et al. 2002, 140).

A report on the use of IRI to teach English concluded that:

> Radio in general and IRI programming in particular, offer a unique opportunity to provide much needed resources to even the most remote schools at a relatively low cost. Thus, the one-time investment in extending transmission may be fully justified on the basis of both equity and efficiency (Imhoff and Cristensen 1986, 243).

Regarding ETV, after some disappointing and very visible failures of bold experiments in using television for educational reform in the 1960s and 1970s, early visions of its potential were revised and ETV was usually excluded from the list of suitable strategies for teaching students in developing countries in the 1980s and 1990s (Wang 2000, 1-2). A few countries, however, have continued to pioneer its use, with success. Brazil has

"IRI fills a needed gap and provides an impartial educational catalyst for teachers and learners across traditional boundaries, such as gender, distance, and access to quality schools."

(Bosch et al. 2002, 140)

a number of programs, and Mexico's "Telesecundaria" now reaches a large proportion of that country's rural secondary students (Wang 2000, 2).

Special mention needs to be given here to improving teachers' skills by using information and communication technologies because instructional strategies and practices are such a vital part of accelerating learning. IRI and ETV programs for students provide the means to improve teachers' skills through modeling and structuring the instruction desired of teachers. In addition, pre- and in-service teacher training programs can be augmented with technology.

For example, China chose ETV as the most cost-effective way for a massive in-service teacher education program begun in 1987 to address its urgent problem of a large number of under-qualified teachers and limited financial resources (Wang 2000). Within a few years, two million primary and junior secondary school teachers had been trained. By 1994, largely due to ETV training, the percentage of under-qualified primary teachers had dropped from 39 to 14 percent and that of under-qualified junior secondary teachers had been lowered from 73 to 36 percent (Wang 2000, 4).

PRINCIPLE 8: COMMUNITY INVOLVEMENT IS IMPORTANT IN DEVELOPING AND SUSTAINING SCHOOLS AND IN IMPROVING STUDENT ATTENDANCE AND ACHIEVEMENT.

Community involvement is important for resource sharing and increased attendance. Local communities have resources that schools need and from which they can benefit. The involvement of community members in establishing and running a local school is also vital, given limited resources and monitoring by officials. Community involvement can include constructing or altering the building where schooling takes place. It can also include playing a role in helping to make policy decisions that reflect local conditions and holding school officials accountable for staff behavior that affects students' learning.

A study of community involvement in schools as part of programs to improve the quality and delivery of education (Rugh and Bossert 1998, xiv-xv) tentatively concluded the following:

- "Community involvement in decisions about scheduling, school conditions, and facility location" was useful in increasing the attendance of "disadvantaged groups, such as the poor, the rural, and girls;"
- It was more likely to be helpful where local demand for education was not met by an adequate governmental supply of schooling opportunities;

- To be valuable, it needs careful planning of appropriate purpose and manner.

This study suggested three models of mobilizing community participation in schools: an accountability model, a partnership model, and a demand model (Rugh and Bossert 1998, xviii-xix). The first one fits settings where the government is generally providing educational services but certain issues concern parents and others; often the issue is "a lack of accountability of staff to parents for program quality." Here parents, with facilitator help, hold officials to account and negotiate quality improvements. The second model applies to settings where many community children are not attending school or government educational services are greatly lacking. In this case, facilitators empower parents to contribute a variety of materials and labor on their own. The demand model applies when facilitators assist communities to "order" certain schooling services that fit their needs and to organize local resources to support the choices.

Some caution is expressed in AL-D literature about potentially negative effects of community involvement in schools. Local customs may work against change from the traditional approach to teaching or against expanded enrollment. For example,

> "Community participation—especially if only women are involved—does not always eliminate community resistance to girls' education, and may exacerbate it. When powerful people in a community disagree with educating girls, the girls who go to school may suffer hostility and rejection [in the community]. Teachers who eliminate gender bias in their classrooms may be criticized" (Rugh and Bossert 1998, 22).

PRINCIPLE 9: CHILDREN WHOSE SCHOOLING HAS BEEN INTERRUPTED MAY NEED SPECIAL CURRICULA AND INSTRUCTION TO CATCH UP TO THEIR AGE-APPROPRIATE GRADE.

At times, special nonformal schools are established specifically to speed up learning so students can enter formal schools at their age-appropriate grade level. At other times the national school curriculum is adapted to teach vocational or micro-enterprise skills rather than a curriculum designed to prepare students for the next level of schooling. It is valuable to note that this principle focuses on the curriculum aspect of accelerating learning whereas most of the other principles focus on instruction.

PRINCIPLE 10: TEACHER STANDARDS AND TRAINING ARE KEY COMPONENTS IN IMPLEMENTING ALL THE ABOVE PRINCIPLES.

Many teachers in developing countries do not have much training in effective teaching, including instruction, assessment, and classroom management skills. In addition, many teachers in rural areas are not much more educated than their students. Under those conditions, they are likely to have a variety of difficulties in teaching that affect the acceleration of their students' learning. It is important, therefore, to include significant training in the principles and practices that accelerate learning in both teacher training colleges and in-service training courses.

PRACTICES OF ACCELERATED LEARNING IN DEVELOPMENT LITERATURE

PRACTICE 1A: PASS LAWS AND MAKE POLICIES TO PROMOTE FREE UNIVERSAL PRIMARY EDUCATION.

Government policymakers can create a legal framework for the right of children to obtain a basic education and for parents to be required to send them to school. By making this education free, they lessen the financial barrier faced by many parents, particularly those in rural communities. Policies to promote universal primary education sometimes include programs of school construction to limit the distance children must travel in rural areas. Other policies include incentives, discussed in Practice 2.a.

For children who work outside the home or have significant responsibilities at home, flexible schedules can greatly improve their attendance.

PRACTICE 1B: ESTABLISH FLEXIBLE SCHEDULES AND DOUBLE SHIFTS AS NEEDED TO PROMOTE ACCESS.

As explained by Karen Tietjen (1991), the establishment of flexible schedules and double shifts is one of several ways that government officials, working with school administrators, can promote access to school for children in developing countries. School administrators can work with government officials to modify the school schedule to accommodate certain children's needs. For children who work outside the home or have significant responsibilities at home, flexible schedules can greatly improve their attendance. School breaks can be scheduled to accommodate planting or harvesting seasons. The school week can be extended through Saturdays in order to allow children the opportunity to work some part of each regular school day. The passage of universal free primary school laws can create sudden increases in enrollment, which in turn can overwhelm the physical capacity of some schools. In this case, and hopefully as temporary measures until additional schools are built, a morning and an afternoon shift of teachers and students can be instituted. In areas that are more sparsely inhabited by school-age children, multi-grade classrooms can allow them to have access to nearby schools.

PRACTICE 2A: CONDUCT CAMPAIGNS AND PROGRAMS TO RAISE AWARENESS AND PROVIDE FAMILY ASSISTANCE IN SENDING GIRLS AND OTHER UN- OR UNDER-EDUCATED CHILDREN TO SCHOOL.

At the central government level there are a number of policies, practices, and programs that can be revised or created, improved, or implemented to encourage families to send their un- or under-educated children to school (Kane 1996; O'Gara and Kendall n.d.; O'Gara et al. 1999; Prather 1996; Tietjen 1991). Although AL-D literature deals primarily with girls, some of it can be applied to children of language minorities, those with physical disabilities, or older boys not graduated from primary school. Practices and programs include the following:

- Financial incentives and subsidies for parents to offset lost family

income from children's labor and other costs associated with going to school;

- Scholarships for tuition and other costs of attending levels of school where tuition is charged and students must live away from home;
- Concepts and images of equity expressed in nationally provided instructional textbooks, other instructional materials, and ccompanying teachers' guides and manuals;
- Provision of single sex schooling, which can benefit girls, especially when separate schools are equal;
- Appropriate facilities for modesty and security, such as latrines and boundary walls;
- Education of teachers in pre-and in-service training as to the value of education for girls and other under-educated groups of children;
- Awareness campaigns that educate the general public, including parents and the children, other community members, and government officials as to the value of education for girls and other under-educated groups of children;
- Policies extending employment opportunities for educated girls and people with physical disabilities, such as job training for higher paying, higher-status positions and the legal status of women in the workforce; and
- Policies regarding extending women's rights in marriage (minimum age, girls' consent) and divorce (women's right to divorce) (Tietjen 1991).

Although rates of attendance vary widely and depend on many factors, some success has been documented in using incentives to bring and keep students in schools (Prather et al 1996). "In the context of international education, the term 'incentive' more often is used to describe a form of compensation—whether monetary or non-monetary—that fulfills a need or minimizes an opportunity cost so that a desired goal can be achieved" (Prather et al 1996, 2). Examples of incentives that improved girls' attendance are summarized in Figure 14.

Figure 14: Incentives That Improved Girls' Attendance (Prather et al 1996, 74; Tietjen 1991, 48-54)

Monetary Incentives	Non-monetary Incentives
Free schooling	Schools constructed locally
School fee waivers	Flexible scheduling so students can still do work at home or outside the home
Supplied books, other school materials, and school uniforms	Hiring and training of more female or bilingual teachers
Stipends to families	Girl-friendly physical facilities
School feeding programs	Equitable treatment at school

Although this study focused on improving girls' participation in school, many of the findings can apply to children in poor families or inequitably-treated categories of students. While cautioning that incentives seem to have affected enrollment and attendance more than performance and achievement, Prather offers many conclusions. The first three relate to incentive program contexts, and the last four address program features (Prather 1996, 95-98). These conclusions can inform program planning:

- "Programs that use incentives that fit the local economic and cultural contexts are more likely to be successful...
- Incentives are more likely to be effective in a political environment that legislates educational participation by girls [or other targeted categories of students]...
- Incentives are more likely to be effective if implemented with specialized populations..."

Incentive programs are more likely to be effective if:

- They include a 'critical mass' of program elements for increasing girls' [or other targeted students'] participation;
- Interpersonal contact and meaningful community involvement are part of program implementation;
- There is guaranteed funding for at least a primary school cycle; and
- A local organization is involved in program implementation.

PRACTICE 2B: PROMOTE CLASSROOM PRACTICES THAT ENCOURAGE THESE CHILDREN'S ATTENDANCE, PERFORMANCE, AND ACHIEVEMENT.

Teachers and school administrators can do a great deal to create classroom and school climates that support attendance and achievement of un-educated and under-educated children (Tietjen 1991, 23-43). The first step is to take an introspective look at their own attitudes, beliefs, and values and decide to change exclusionary ones. The second step is to discover and acknowledge the ways in which they have behaved, consciously or unconsciously, that excludes these children from equitable treatment. For example, teachers and administrators could consider the frequency and quality of their interactions, their communications about expectations, and their assigning of responsibilities. The third step is to realize ways in which male preferences in learning styles and multiple intelligences, problem-solving, and thinking modes are culturally embedded in their instructional principles and practices (Kane 1996).

As teachers and administrators see these discriminatory practices, they can take measures to change them, in order to accelerate the learning of these categories of students. The best way to do so is to vary their instructional and personal interactions following the practices of accelerated learning. In honoring and incorporating individual differences in learning and teaching to all the learning systems, teachers will more likely treat each child equitably.

PRACTICE 3A: REDUCE EMPHASIS ON ROTE MEMORY AND INCREASE FOCUS ON CRITICAL THINKING AND PROBLEM-SOLVING SKILLS.

Problem-based learning can be considered a subset of active learning. Problem-based instruction uses a problem or question to provide the organizing principle for instructional content, rather than topics within bodies of knowledge. This type of instruction usually breaks down the walls between bodies of knowledge. Teachers can cover many aspects of the curriculum in a problem-solution process. For example, an instructional plan might have a multi-week unit on "Why do we grow so much cotton in our region and should we use our land differently?" This question draws together aspects of history, economics, social studies, science (including health and nutrition), and probably other bodies of knowledge as well.

The best problems are those that concern the students and their families or concern their communities, such as a health issue or a recent major occurrence. Involving students in choosing the problem immediately increases active learning and interest to continue. Even fairly young students care about the world around them and can sometimes make a valued contribution with their inquiries and simple fact-gathering.

When a curricular unit theme is framed as a question, critical thinking skills are immediately invoked. Indeed, teachers can accelerate learning by using questions to stimulate critical thinking and personal discovery throughout a curricular unit. The human brain naturally responds to questions by seeking answers. Questions put the brain into "probe mode"—an excellent state for learning (Vos, 2003/2004).

PRACTICE 3B: INCORPORATE ACTIVE, PROBLEM- AND PROJECT-BASED LEARNING, WITH PROJECTS PREFERABLY FOCUSED ON THE NEEDS OF LOCAL COMMUNITIES.

AL-D and AL-E literature both discuss these participatory learning-teaching methods. As stated earlier, the accelerated learning approach emphasizes the application and manipulation of facts in real-life contexts. Active learning ranges from answering questions, to doing experiments, managing experiences outside of the classroom (walks, visits), and designing and executing projects that incorporate and extend the knowledge provided in the classroom (Please see Practice 6 in the AL-E literature section above for more details).

By addressing local community needs as the focus for discovering and applying information, teachers and students accelerate learning. They engage their natural curiosity and motivation with personal relevancy as well as family and community resources. When the classroom is expanded to encompass the world, students employ more of their natural learning system, and learning broadens and deepens.

Teachers can accelerate learning by using questions to stimulate critical thinking and personal discovery throughout a curricular unit.

PRACTICE 3C: INCLUDE INTERACTIVE METHODS AND SMALL GROUP WORK.

Communication between teacher and student and between student and student can be augmented, principally by the teacher using personalized questioning and discussion and small group work. Rather than asking the whole class, "Does everyone understand?" teachers can ask particular students to explain what they have learned about a topic. Teachers can also put students into small groups to work on an assignment together. What is not clear in development literature is whether small group work is structured to ensure effective interaction and learning, as it is with cooperative learning (see AL-E Principle and Practices 5 above).

PRACTICE 4: PRACTICE LEARNER-CENTERED INSTRUCTION.

Learner-centered instruction in AL-D usually involves the following practices:

- Increasing the amount of student talk and decreasing the amount of teacher talk;
- Organizing instruction so that students sometimes teach other students, either younger students as tutors or their peers as group members and leaders;
- Assisting students to connect new knowledge with what they already know,
- Helping students to relate lesson content to their personal lives and to create personal meaning;
- Using self-paced learning, as in some Escuela Nueva programs.

PRACTICE 5: EXPAND ASSESSMENT TO INCLUDE CONTINUOUS AND PERFORMANCE-BASED TESTING.

Infrequent formal testing is supplemented by more frequent informal assessment by such means as short oral or written quizzes and by teachers observing student performance of tasks that require the application of knowledge rather than the repetition of facts. Informal assessment can beneficially include students assessing their own work, based on criteria given by the teacher.

An IEQ project in Malawi implemented continuous assessment in primary school classrooms in order to strengthen teacher's capabilities in diagnosing children's learning problems and to increase students' alarmingly low achievement levels (Miske 2003). Teachers utilized locally available materials to make learning aids that they then also used to assess student mastery of the concepts taught. Teachers then gave useful feedback to their students as well as to parents and others. Sometimes students were involved in making the learning aids and in assessing their own performance.

The Namibia Ministry of Education and Culture included continuous assessment in the teachers' guides to its syllabi for Grade 5 natural science and health education and for social studies. In addition to explanations and directions, it provided "several scales

that help teachers assign marks for various types of competencies," emphasizing applications to new situations (Capper 1996, 37).

PRACTICE 6A: RESPOND TO SIGNIFICANT EMOTIONAL AND SOCIAL NEEDS OF STUDENTS AS MUCH AS POSSIBLE SO THEY CAN FOCUS ON LEARNING.

Teachers can and should assist students in dealing with emotional trauma and social upheaval caused by natural or human-caused disasters. In such circumstances, teachers and administrators need to create safe havens at school and offer personal comfort and support to students, rather than take an aloof, pre-occupied, or traumatized approach.

As much as possible, teachers can be mindful of and intervene to stop bullying or discriminatory behavior among students, including the belittling of girl students by boys. Classrooms with large numbers of students in traditional row seating facing front make this particularly hard to do. Teachers can change the seating to face a center aisle and be better able to circulate, monitor, and be a regulating presence. This practice also expresses Principle 2 above on equitable treatment and Principle 4 on learner-centered instruction.

PRACTICE 6B: TRAIN TEACHERS AND PROVIDE MATERIALS TO INCLUDE LIFE SKILLS INSTRUCTION AND HIV/AIDS COUNSELING AND TRAINING.

Many sources provide training and materials for teaching needed life skills at school, particularly about teaching HIV/AIDS awareness, prevention, and treatment. Since most primary school children in developing countries do not go to secondary school and many of their parents are under-schooled, it is important that they learn life skills for the betterment of themselves and their families as part of the school curriculum. In addition, given the enormity of the HIV/AIDS epidemic, every teacher has a role to play in addressing the emotional and social as well as the physical aspects of this disease with their students.

PRACTICE 7: EXPAND EFFECTIVE USE OF DISTANCE LEARNING, MEDIA, AND INFORMATION AND COMMUNICATION TECHNOLOGY IN CLASSROOMS AND TEACHER TRAINING.

Effective use of these electronic tools entails incorporating other principles and practices of AL-D, such as showing the real-life relevance of particular lessons, using the information to solve problems, or creating follow-up activities that incorporate other intelligences and learning styles A number of electronically-presented programs include modeling and directions for teachers to pause or wait until the end of the program and lead discussions or other activities that deepen student's learning. Teachers who simply turn on, then turn off the radio, television, or computer, without following these directions or changing their traditional modes of teaching, will most likely not induce accelerated learning in their students.

Recent developments in electronic technology offer developing countries renewed possibilities for using ETV (Tiene 2000, 39-43). Television programs can now be recorded on videotape for playback at times chosen by teachers, so scheduling problems are less of a limitation. Videotapes are widely available in developing countries because movies on tape are so popular. Today programs of fairly high quality can be recorded by one person in nearly any location with relatively inexpensive equipment and the raw footage edited using low-cost computer software packages. The digitalization of television and videotapes, "perhaps the most significant technological advance of all… promises to be clearer, capable of more dynamic special effects, reproducible without signal degradation, and easier to edit" (Tiene 2000, 39).

Whether or not to use computers often triggers the debate of whether poor, rural communities should be provided with computer technology.

While rural areas in developing countries are difficult to reach with ETV, urbanization has brought large numbers of people to cities that are served by television stations. Many of these stations have solid support from the government. A number of their broadcasting systems "are currently superior to television that was broadcast in the United States just a few decades ago" (Tiene 2000, 42).

Whether or not to use computers often triggers the debate of whether poor, rural communities should be provided with computer technology. Despite their advantages in accelerating learning, computers and—to a lesser extent—television can seem prohibitively expensive to educational systems struggling to provide basic materials and supplies. Often communities face the reality of minimal or no resources available to power and/or maintain the hardware. Sadly, this resource limitation is creating "a major gulf between information haves and have-nots;" furthermore, the "have-nots become the know-nots and the do-nots" who are "developmentally disadvantaged" (Dryden and Vos 1999, 91). This gap will widen in developing countries in the coming years as the use of computers grows among the younger, better educated generation and those working with Western businesses and non-profit organizations.

In addition, the outwardly high costs of media and communications technology need to be examined in more depth. "A number of cost-effective studies have also found IRI to be a highly competitive educational strategy, compared to other interventions" (Bosch et al. 2002, 140). The cost of TVs and VCRs has greatly decreased over the years so that now their purchase can be considered for many schools in the developing world (Tiene 2000, 43). In addition, media and communication technologies can offset their costliness somewhat with savings in textbook production, distribution, and replacement. Educational leaders in some countries, notably Singapore and Finland, are finding the money to provide Internet links in every classroom and computers for every one to two students. Their business sectors are supplying some of this money as an investment in a computer-literate work force.

Teacher pre- and in-service training is particularly vital for the implementation of information technology. Central and

regional governmental officials need to provide a great deal of initial and ongoing training, coaching, and monitoring of teachers to counter a reluctance to embrace these electronic tools in classroom instruction. Teachers need to take responsibility for learning and applying workshop training to these instructional resources, since they can enrich a number of AL-D principles and practices.

PRACTICE 8A: INVOLVE THE LOCAL COMMUNITY IN ESTABLISHING, BUILDING, AND MAINTAINING SCHOOLS.

Community involvement can take a number of forms in varying stages of a school's existence. Community members may be asked to enroll students or to identify a site for an alternative learning center. They might need to construct or alter a local building to be suitable for instruction. Community leaders can press government officials for a local school and demonstrate their support for its construction and maintenance with a variety of materials and labor.

PRACTICE 8B: INVOLVE THE LOCAL COMMUNITY IN SUPPORTING CLASSROOM ACTIVITIES AND SCHOOL POLICIES AND PROGRAMS.

Community members can provide a variety of support services and resources to teachers. Some have materials they are willing to donate for use as learning aids or materials to make them. Parents can be tutors in both formal and non-formal schools. Men can provide security as needed for students going to and coming from school, especially girls, in order to improve attendance. Community members can support the value of education by participating in school activities and by helping to make policy decisions that reflect local conditions. They can also hold school officials accountable, formally and informally, for staff behavior that affects students' learning. Local accountability can help school staff use resources wisely to accelerate learning, especially at schools that receive limited official supervision.

When students carry out learning projects in the community that result in concrete benefits, community support for schooling among adults—especially parents of girls—increases. This increased understanding, appreciation, and support helps increase attendance and achievement.

PRACTICE 9: AT TIMES, CREATE SEPARATE SCHOOLS OR LEARNING CENTERS WITH A COMPRESSED CURRICULUM, SMALL CLASSES, AND MORE PERSONALIZED TEACHING.

Some AL-D literature describes schools or learning centers established specifically to use accelerated learning techniques to either speed up children's learning so they can enter formal schools at their age-appropriate grades or prepare students with vocational or micro-enterprise work skills. In Iraq, for example, an accelerated learning program piloted five different interventions that combined a compressed version of the national curriculum with various community-influenced interventions. In Afghanistan, special teachers and tutors trained in accelerated learning principles and strategies are teaching

classes to bring children to the appropriate grade level within a relatively short period of time (see Chapter III descriptions).

The curricula for these two programs were handled in different ways. In Iraq, syllabus developers of the accelerated learning program worked with the American Islamic Congress to identify what would be included as the core curriculum for each of the combined grades, and condensed versions were developed. In Afghanistan, on the other hand, individual teachers were guided in using textbooks as effective classroom tools rather than as the only source for all of the classroom instruction. Teachers were taught skills in developing quality lesson plans that focus on what students were expected to learn. The standard curriculum, however, served as a reference only.

PRACTICE 10A: ESTABLISH AND MEET EFFECTIVE STANDARDS FOR TEACHER QUALIFICATIONS.
Central governmental officials need to periodically review the level of teacher qualifications established, especially for rural primary school teachers. Necessity may require low levels of education and training in initial hiring but as the national level of learning rises, officials can upgrade their expectations.

PRACTICE 10B: CONTINUALLY IMPROVE AND EXPAND TEACHERS' KNOWLEDGE AND SKILLS, ESPECIALLY INSTRUCTIONAL AND CLASSROOM MANAGEMENT SKILLS THAT ACCELERATE LEARNING.
At the same time as governmental officials upgrade standards for teacher qualifications, they can expand in-service training and mentoring by master teachers. In-service training is increasingly seen as a process more than a series of disconnected events, with more support for and accountability from teachers between in-service workshops.

SUMMARY

The often-stated goal of accelerated learning in development literature is to improve the levels of educational achievement quickly. While it is difficult to identify principles of accelerated learning from a development perspective, descriptions of strategies and techniques are much more prevalent. A summary of those principles and practices is provided in Figure 15.

Figure 15: Summary of Accelerated Learning Principles and Practices in Development Literature

Principles	Practices
1. All children need to be in school.	1a. Pass laws and make policies to promote free universal primary education. 1b. Establish flexible schedules and double shifts as needed to promote access.
2. Girls and other underserved and disadvantaged populations need special support to be in school and to be equitably treated there.	2a. Conduct campaigns and programs to raise awareness and provide family assistance in sending girls and other under-educated children to school. 2b. Promote classroom practices that encourage these children's attendance, performance, and achievement.
3. Learning includes skills in higher order thinking and team work in addition to gaining information; project-based learning makes learning more relevant.	3a. Reduce emphasis on rote memory and Increase focus on critical thinking and problem-solving skills. 3b. Incorporate active, problem- and project-based learning, with projects preferably focused on the needs of local communities. 3c. Include interactive methods and small group work.
4. Learner-centered instruction is more effective than teacher-centered instruction.	4. Practice learner-centered instruction.
5. Learning improves with the inclusion of continuous and performance-based assessment.	5. Expand assessment to include continuous and performance-based testing.
6. Emotional and social needs of students need to be addressed in school.	6a. Respond to significant emotional and social needs of students as much as possible so they can focus on learning. 6b. Train teachers and provide materials to include life skills instruction and HIV/AIDS counseling and training.
7. When used well and especially when paired with distance learning, media and information and communication technology are important tools in increasing the reach and quality of schooling and teacher training.	7. Expand effective use of distance learning, media, and information and communication technology in classrooms and teacher training.
8. Community involvement is important in developing and sustaining schools and in improving student attendance and achievement.	8a. Involve the local community in establishing, building, and maintaining schools. 8b. Involve the local community in supporting classroom activities and school policies and programs.
9. Children whose schooling has been interrupted may need special curricula and instruction to catch up to their age-appropriate grade.	9. At times, create separate schools or learning centers with a compressed curriculum, small classes, and more personalized teaching.
10. Teacher standards and training are key components in implementing all the above principles.	10a. Establish and meet effective standards for teacher qualifications. 10b. Continually improve and expand teachers' knowledge and skills, especially instructional and classroom management skills that accelerate learning.

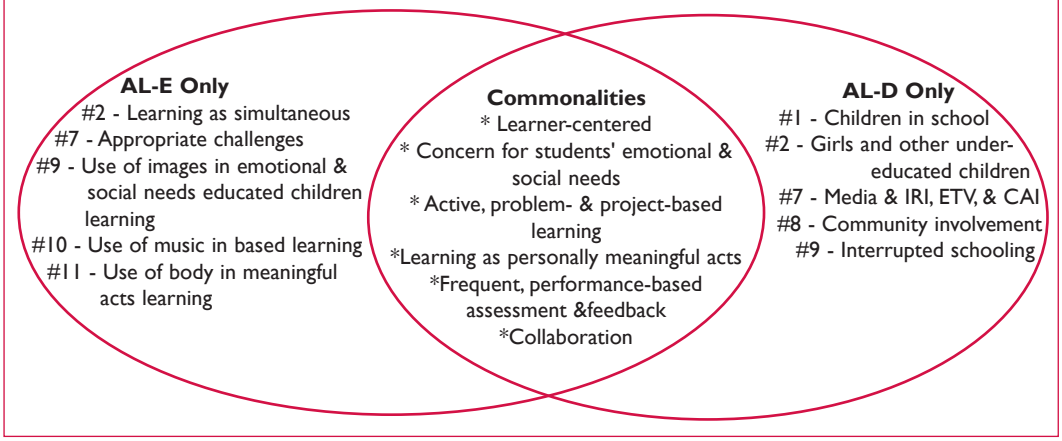
V. COMPARING THE FINDINGS: EMERGING TRENDS

COMMONALITIES AND DIFFERENCES

A number of commonalities become apparent when comparing accelerated learning in both AL-E and AL-D literature. With some caution about the implied nature of some AL-D principles, they are brought together in the Figure 16. Some commentary on these commonalities follows:

- Learner-centered instruction is the foundation on which all the AL-E principles and practices are built and is well articulated as such. AL-D includes learner-centered instruction (Principle 4) as one principle and implies it in four others: Principle 2, girls and other under-educated children; Principle 3, higher-order thinking and team work skills; Principle 5, continuous, performance-based assessment; and Principle 6, emotional and social needs of students, with attending practices. Thus, while learner-centered instruction seems to be a central concept in AL-D, it is not as well articulated as it could and should be.
- Concern for students' emotional and social needs in AL-E invokes two of our five natural learning systems; therefore, these needs are seen as central capacities available for accelerating learning. In AL-D, this concern is not described as central to learning and its inclusion is either implied in learner-centered instruction or mentioned as a pre-condition for learning. Thus, the degree of emphasis is different in the two types of literature.
- Active, problem- and project-based learning has a different emphasis in the literatures. In AL-E, as Principle 6 states - "Learning comes from doing the work itself," which puts this type of learning foremost in teachers' instructional repertoires. In AL-D, Principle 3 "includes" and "incorporates" this type of learning, which places it of less importance than AL-E does.
- Learning as personally meaningful acts has the same distinction of roles in AL-E and AL-D as the two elements just above it. Principle 1 in AL-E states that "Learning is creation, not

Figure 16: AL-E and AL-D Commonalities and Differences



consumption," thus putting personal meaning central and foremost. Principle 3 implies the need for learners to apply personal meaning-making and co-creation of learning in group work. One of its practices calls for a reduction in rote memory, which again implies more personal involvement. In sum, in AL-E this element illuminates learner-centered instruction as the foundation of all learning and in AL-D it is one of the walls but not the foundation.

- Frequent, performance-based assessment and feedback is perhaps the closest commonality in importance given. The main difference here between AL-E and AL-D is that AL-E adds the aspect of varied sources of feedback. In AL-D teachers are usually the only sources of feedback from assessment, with occasional use of students themselves or their peers. In AL-E there is more of an emphasis on involving students, including giving them a role in co-creating the criteria for assessment with their teacher. A secondary difference in feedback lies in emphasis. AL-E makes a point of calling for specific feedback that makes clear exactly where and how students need to improve; AL-D makes passing reference in its coverage of the topic.

- Collaboration is stated as Principle and Practice 5 in AL-E and is implied in Principle and Practices 3. Again, these relative positions indicate relative importance.

MERGING THE RESEARCH: A FRAMEWORK FOR ACCELERATED LEARNING IN DEVELOPING COUNTRIES

Both sets of principles and practices have valuable contributions to make to the other. Some of the ideas from accelerated learning in Western contexts could effectively expand academic achievement if applied to accelerated learning programs in developing contexts. Admittedly, there is no mention in the AL-D literature read of the simultaneous nature of learning, nor the use of images or music in the learning process. It seems likely, however, that the use of visuals and music, with some adaptation to culture and available resources, could make some contribution to the learning process in developing countries.

The use of body movement in AL-D, primarily confined to sports activities as recreation and a respite from learning, could, with direction, also be integrated into classroom learning. As is evident in the literature, the AL-D only elements have been used in existing developing country programs with some success (see Chapter III). As these elements and those from AL-E may be adopted or adapted to new countries and contexts, academic achievement is likely to increase.

The comprehensive framework in Figure 17 for accelerated learning in the developing world context has been composed to unite the ideas from both literatures. This framework includes 14 key elements with their descriptions.

SUMMARY

As reported in the literature, accelerated learning means different things to different people. In Western education literature, accelerated learning is defined as a multi-modal way of improving learning and teaching using brain/body research. In the developing world context, accelerated learning often refers to increasing the pace of learning to cover a curriculum faster than formal schools normally do so that students can catch up to their age-appropriate grade level. Principles of each school of thought guide application in the classroom. A consolidated definition of accelerated learning for developing country practitioners takes elements from the education and development literature, applying learner-centered teaching principles and practices to help children, particularly those whose schooling has been interrupted by social upheaval or natural disasters, to experience faster, deeper, and more proficient learning.

With its focus on the learner, children's varied ways of learning, and the intricate connection of emotions and rational thought, accelerated learning differs from effective teaching strategies of the West and the teacher-centered, group-oriented, memory-and-recall type of instruction that often characterizes traditional classrooms in the developing world. A framework — with a comprehensive set of elements — helps to define what an accelerated learning program in the developing context might include.

With this framework in mind, let us now turn to review some actual examples of accelerated learning programs.

Figure 17: An Educational Framework for Accelerated Learning Programs in Developing Countries

Element	Description
Instructional Philosophy	The mind is not a vessel to be filled but a fire to be ignited Learning is creation; not consumption Learning takes place on many levels simultaneously; it is not a linear process
Instructional Basis	Uses all five learning systems -- cognitive, emotional, physical, social, and reflective (referred to as holistic instruction) Instructs to engage the whole -brain Integrates curriculum topics
Instructional Goals	Reduce the time it takes students to complete a desi gnated level of instruction Reengage out-of-school students with in -school peers
Target Population	Students of all ages and levels of schooling Children who need to "catch up" with other learners of similar age. Special emphasis on girls, children from i solated areas, children from war -torn or other crisis situations, or other children whose schooling has been disrupted in some way
Instructional Venue	Formal or nonformal schools
School and Classroom Learning Environment	Classrooms that are safe, welcom ing, and unthreatening, even to anxious or traumatized students Classrooms that stimulate all five senses; include visuals and real -life objects to handle and examine Room arrangement and furnishings that facilitate individual, small group, and large group activities Flexible schedules where necessary to accommodate student needs
Curriculum	Principles/practices can be applied to any curriculum Condensed curriculum can be created Incorporates specific needs (e.g., life skills, HIV/AIDS prevention, vocatio nal skills, etc) and local problems and contexts
Teaching	Is learner-centered - Acknowledges and addresses children's physical, social, and emotional needs - Minimizes rote memorization, recall, and recitation of facts - Promotes understanding in personally meaningful ways - Reflects connection between emotions and rational thought - Provides opportunities to learn by doing and doing real work Uses active, problem - and project-based activities - Helps students discover, apply, and manip ulate facts in real - life contexts, preferably in local community situations - Frames learning as a creative adventure with appropriate challenges - Provides opportunities to categorize, compare and contrast, summarize, analyze, evaluat e, and make recommendations

Figure 17: An Educational Framework for Accelerated Learning Programs in Developing Countries (Continued)	
Element	**Description**
	Acknowledges multiple intelligences and different learning styles - Uses lots of visual images in presentations, practice, and assessments - Presents ideas and information through various senses and with various experi ences Augments presentations with numerous collaborative activities to encourage students to cooperate and teach each other Uses technology to supplement and enhance personal instruction
Instructional Materials	Traditional textbooks and guides as we ll as instructional aids, locally - developed learning materials, and materials collected from the surrounding community Technology used to provide and/or enhance instruction
Student Learning	Learning through doing as well as seeing and hearing Individual, paired, and small group activities Learning through cooperation and collaboration as well as competition Some choices of instructional materials and methods guided by students' natural curiosity and motivation to learn Learning through structured play
Classroom Management	Rules of expected behavior explained and positively reinforced Corporal and other physical punishment prohibited Emotional putdowns and other abuse highly discouraged Classroom "controlled" through positive experiences, success in lear ning, incentives, and rewards
Community Participation	Families encouraged to send children to school and to support classroom activities and school policies and programs through outreach campaigns and community-based learning projects
Performance Monitoring	Continuous and informal assessment to begin and implement program Specific, varied, frequent, and performance -based feedback provided to students Standardized testing used to enter formal school or desired grade level
Teacher Training	Sustained in-service training in AL principles and practices Technology used, where possible, to extend/complement teacher training programs

VI. JOINING RESEARCH AND PRACTICE: FIELD-BASED APPLICATIONS

In moving from the conceptual framework for accelerated learning into program applications, the review of the education and development literature revealed numerous examples of uses of one or more aspects of accelerated learning in classroom situations. Indeed, field-based applications of the various principles and practices of accelerated learning exist in a number of countries. Applications have resulted in improvements in student cooperation with one another, time-on-task, academic learning, and self-esteem.

The author identified various formats for applying an accelerated learning framework in the classroom (Details about these four formats are provided in Appendix C). Although these formats have differently titled stages or steps, they generally address four basic elements:

- Prelearning: The students' minds and bodies are made ready for and open to learning a new concept or skill or to take in new information.
- Learning: New information is presented to students through any variety of multisensory experiences, in order to reach children with different learning styles and intelligences.
- Practice: Students master the new information by explaining it to others, solving potential or real problems, relating it to real-life situations, and/or integrating it with previously learned information.
- Reflection: Student learning is monitored and evaluated, through self-evaluation, feedback from peers and teachers, testing, and real-life applications.

This chapter provides descriptions of the range of applications of accelerated learning principles and practices. Beginning with brief descriptions of representative projects identified through the education and development literature, the chapter then provides case studies of five programs in the developing world:

- Afghanistan: The Afghanistan Primary Education (APEP) Project
- Iraq: The Revitalization of Iraqi Schools and Stabilization of Education (RISE) Project
- Malawi: Improving Educational Quality (IEQ) Project
- India: The Child and Police Project (CAP)
- India: Pratham's Read India Programme

Different formats have been applied in these programs. (For example, the accelerated learning program in Iraq applies the third format, A. Smith's "Accelerated Learning Cycle," as one component of its post-conflict educational program.)

Finally, at the end of the chapter, a figurative summary of the five programs provides a comparison of the elements of each one.

EXAMPLES FROM THE EDUCATION LITERATURE

Space does not permit a long set of examples here. Below is a sampling of documented results of the use of aspects of accelerated learning.

FROM THE JOURNAL OF ACCELERATED LEARNING AND TEACHING (JALT), KUYPER-ERLAND, ON THE USE OF A SET OF ACCELERATED LEARNING PRACTICES

This author reports on her experimental study of 14 classrooms of grade four through eight students in two schools in which she documented statistically significant gains in all academic achievement areas from the use of brain-based, accelerated learning methods in a "Bridge to Achievement" program. She had 11 experimental classrooms and three control groups, and gains were measured over two years by the nationally standardized Iowa Tests of Basic Skills.

FROM JENSEN (2000), ON THE CONNECTION BETWEEN THE BODY AND THE BRAIN

A one-year study in Quebec of 546 primary school children looked at the effects of physical exercise on academic achievement. All the students received the same academic lessons, then the experimental groups spent one hour a day — about 14 percent of the instructional day — in a physical education class while the control groups continued to study their academic subjects. Students were pre- and post-tested in language arts, foreign language, science, math, and overall academic performance. That 14 percent difference in school activities resulted in significantly higher grades by the fitness group.

FROM RAMASWAMI (1993), ON USING ACCELERATED LEARNING WITH AT-RISK STUDENTS OFTEN MADE TO REPEAT A SCHOOL YEAR

The Newark, New Jersey School District officials implemented Project Accelerated Curriculum Classes Emphasizing Learning (ACCEL) to try an alternative to failing underachieving sixth and seventh grade students, a practice they considered ineffective. Results from achievement tests and surveys of teachers, students, and parents indicate improvements in academic learning and self-esteem.

FROM WWW.ALCENTER.COM ON APPLYING ACCELERATED LEARNING PRINCIPLES AND PRACTICES TO ENCOURAGE STUDENT PARTICIPATION

In Bankside Primary School, England, teachers in several early grades were concerned that too many children gave up on their learning too quickly and frequently, especially with new information. They created a special activity during morning "circle time" where children gave advice to Freddy the Frog puppet on "his" (actually their) learning problems and checked back with Freddy before school let out that day to see if their ideas had helped. An

indoor plant in the classroom held paper shapes of flowers and fruits that children had drawn or written on to celebrate their own learning successes. When the tree was full of these paper shapes, the class earned a reward.

Before this activity, the children were easily distracted, quickly lost interest in the learning, behaved in disruptive ways, and wanted help as soon as they didn't know something immediately. The children benefited from this activity by becoming more purposeful in their learning, behaved more on task, helped each other, became better listeners, felt more satisfied and successful, and were happier as a group. The teacher had more time for individual student attention.

In Hillcrest Primary School, Leeds, England, teachers with parent helpers organized review sessions in science to prepare older primary students who were generally lagging in learning for a standardized achievement test. The teachers planned activities using the visual, auditory, and kinesthetic learning styles. Students made posters and displays. They did mock interviews, role plays, and games and performed simple scientific experiments. In addition, they reviewed information by making memory maps, linking movements to learning, doing brain gym exercises, using partners and cooperative learning groups, and solving real life problems that required applying the information under review.

Before this activity, the students had low levels of motivation, attention, and achievement and "lots of attitude." During this period of study they became more focused on their learning, stayed more on task, and contributed their own ideas of ways to help remember key information. They worked cooperatively and praised each other, which raised their motivation to continue. They spoke enthusiastically to the teachers about what was next to learn and showed greater curiosity and interest in science.

FROM DRYDEN AND VOS (1999), ON APPLYING PRACTICES TO IMPROVE BASIC READING AND MATH

At Don Buck Elementary School, in W. Auckland, NZ (p. 385), teachers were concerned that a number of first grade children were having great difficulty in learning to read. They identified each child's preferred learning style and noticed that many of these children favored the kinesthetic style. They then implemented a program called "Jolly Phonics" in which each sound of English is linked with a specific action and finger movement.

Before the program was introduced, 40 percent of first grade children were not reading. Within a few months, all the students were reading, and some had advanced to 12 to 18 months above their chronological age in reading ability.

In the Flaxmere School District in Auckland, NZ (pp. 387-389), primary school teachers wanted a way to increase reading skills for slow readers. They instituted a peer tutoring program in reading using "pause, prompt, and praise" with student tutors who were just a bit more advanced than their buddies, so both benefited. Tutors were trained to (a) pause for ten seconds when a buddy had

With Jolly Phonics, where each sound of English is linked with a specific action and finger movement, all students were reading within a few months. Some had advanced to 12-18 months above their chronological age in reader ability.

difficulty so the buddy could think and the tutor could figure out a way to help, (b) prompt with a hint or suggestion, and (c) praise good work in everyday kid language.

Before they began using this program, teachers had a number of readers 12 - 18 months below their chronological age. With this program, tutors gained up to two years reading age in just ten weeks. Over six months, tutors gained an average of four reading years, and their slower reading buddies gained more than two years.

In Oakland, CA (p. 397), a mathematics program called Special Elementary Education for the Disadvantaged (SEED) taught advanced high school mathematics to ten-year-old African-American children from low-income families using a number of accelerated learning practices. These students had been up to two years behind in math achievement before the program started, yet were successful in learning advanced math concepts.

EXAMPLES FROM THE DEVELOPMENT LITERATURE

FROM CREATIVE ASSOCIATES INTERNATIONAL, INC. (1998) ON THE COMPLEMENTARY OPPORTUNITY FOR PRIMARY EDUCATION (COPE) PROJECT IN UGANDA

From 1995 to 1998, UNICEF funded the development of teaching/learning materials for the Complementary Opportunity for Primary Education (COPE) project in Uganda, an instructional program outside of the national formal school system to provide primary schooling for rural, out-of-school youth. The program was characterized by several innovative elements:

- Relatively small class size of 30-40 children per class, with two classes per learning center;
- A compressed time frame for instruction—five years of schooling to be completed in three years;
- A condensed, skills-oriented curriculum culled from the formal school curriculum and enriched with ten life skills identified by the World Health Organization: decision making, critical thinking, creative thinking, problem solving, communication, interpersonal relations, self awareness, empathy, coping with emotions, and coping with stressors;
- Highly participatory teaching and learning methods;
- Instruction that reflected children's various learning styles, incorporating poster-sized charts, manipulatives, music, and physical activity into regular classroom activities;
- A system of continuous, skills-oriented assessment of learner achievement.

By 2001, 187 COPE centers were operating in nine districts in Uganda, providing access to basic education for over 12,000 children. Retention rate was over 85 percent. Those who transferred to the formal schools were reported to perform very well (Mumbe n.d.).

FROM CASTRO AND VERDISCO, (2002, 149-160) AND CRAIG ET AL. (1998, 77-92) ON THE ESCUELA NUEVA (NEW SCHOOL) APPROACH IN COLOMBIA

The Escuela Nueva program was designed in 1975 to address the needs for improved quality and efficiency of basic primary and secondary public schools, especially for poor rural students. Multi-grade schools were created and with them came the realization and acceptance of the need for innovative teaching approaches that included children, teachers, school administrators, parents, and other community members as partners in transforming curriculum and instruction. The role of teachers shifted from presenter of facts to guide and facilitator of small group and individualized learning processes. Active learning involved student participation in many activities, including applying acquired knowledge to situations outside school. As reported by Castro and Verdisco:

> The initiative emphasized peer tutoring, child-centered teaching methods and self-instructional and interactive learning guides and textbooks. It shifted the standard school model away from the transmission of knowledge to the social construction of knowledge, and showed that democratic behavior and citizenship skills can be actively cultivated at school (Castro and Verdisco 2002, 149).

Craig et al. add that students worked independently in a discovery approach, their work was evaluated frequently (continuous assessment), student promotion was flexible and based on student self-guided workbooks, and parents participated in the school (Castro and Verdisco 2002, 78).

Fifteen years later, the Escuela Nueva program had been expanded throughout Colombia and had proven that even poor, rural children could improve their academic achievement with this innovative teaching approach that incorporates a number of principles and practices of accelerated learning. Evaluations from 1982 to 1997 found that Escuela Nueva students scored higher in language and mathematics in the third and fifth grades than urban counterparts in regular schools. They also had significantly lower dropout and repetition rates, and improved self-esteem and civic behavior (Castro and Verdisco 2002, 155). Escuela Nueva "demonstrated that traditional teacher-centered practices can be changed to a more child-centered, participatory, and personalized learning approach" (Craig et al. 1998, 150).

Other countries, including Brazil, Chile, El Salvador, Guatemala, Guyana, Panama, Paraguay, and Uganda, have implemented similar programs or at least components of Escuela Nueva. Its influence can be seen in the fact that most countries in Central and South America now incorporate child-

centered learning, cooperative learning, interactive instructional materials, and teacher training that is itself reflective of the same accelerative learning and teaching ideas (Castro and Verdisco 2002, 156).

FROM AFRIDI, ON IMPROVING THE QUALITY OF PAKISTAN'S PRIMARY EDUCATION FOR GIRLS

Pakistan's Primary Education Quality Improvement Program (PEQIP) placed major emphasis on teacher training as the key to quality improvement for girls' schooling and incorporated many accelerated learning principles and practices in that training. From 1996 to 1999, teachers and teacher trainers were trained in leading activity-based learning, using small group work, creating a pleasant and friendly atmosphere, giving positive feedback, building an expectation of quality work, and using a variety of low-cost local resources as learning aids. After the basic training of six to ten days, teachers were supported with follow-up training and classroom support by mentor teachers.

PEQIP trained nearly 1,800 women primary teachers, who have been "transformed." They now have more confidence in their classrooms; they can comfortably stand before a class and demonstrate something. They show better command of the content they teach and are effectively using a child-centered approach in their multi-grade classrooms. They use low cost teaching aids which come from local materials and conduct continuous assessment. They keep good records of attendance and achievement. They also effectively participate and solve problems with school administrators and government officials, providing good models for their students.

HIGHLIGHTED PROGRAMS

AFGHANISTAN: ACCELERATING OUT-OF-SCHOOL STUDENTS AND OVERAGE YOUTH AFTER YEARS OF NEGLECT

In Afghanistan, after decades of neglect of its educational system, national leaders pronounced that education would be the foundation of economic growth and poverty reduction. The Ministry of Education (MOE) began rebuilding Afghanistan's school system, and students of all ages returned to school or enrolled for the first time.

In January 2003, USAID funded the Afghanistan Primary Education Project (APEP) to assist the MOE in selecting, certifying, and overseeing accelerated learning programs. These programs would be designed to increase the education levels of overaged students—especially girls between the ages of ten and seventeen—and usher them into age-appropriate education levels for absorption into the system. Scheduled to continue until December 2005, the project is to provide more than 170,000 out-of-school students and overage youth in over 5,000 communities educational opportunities to catch up, that is, complete at least two grades in one school year.

APEP Strategies for Accelerating Learning

- **Smaller class sizes and more "time on task" (i.e., increased contact hours)**
- **Enhanced capacity through teacher training and supervision to engage learners in the classroom using learner-centered approaches**
- **Increased and improved teacher/student and student/student interactions, including the promotion of respectful and conscientious engagement**
- **The availability of textbooks, teacher guides, and other learning materials in the classroom**
- **Cooperative learning practices, where students interact with and support each other as peers while working with the teacher as a facilitator and guide**

Preparing teachers for the accelerated learning programs is an important part of APEP. Master trainers are selected and introduced to the new concepts, principles, and practices. Then, through a cascade model, these trainers teach trainers throughout the provinces, who in turn train teachers. Teacher training does not end there, however. Teachers receive reinforcement in-service workshops and supervision at each level of the cascade.

Another important element of the APEP program is radio-based, in-service teacher training, through which rural teachers receive training via weekly radio broadcasts on methods and techniques of teaching language, math, and other topics. An educational radio-drama also is broadcast to raise community interest in the available educational opportunities and to promote the new educational practices to families and communities. The radio programs are aired nationally via short-wave, FM, and satellite radio. This weekly in-service, radio-broadcast teacher training reaches out to the primary school teachers nationwide and serves to further enhance the training offered to AL class teachers and trainers.

The typical accelerated learning class is held in a small room in one of the adobe compounds that make up rural Afghan villages—for example, a teacher's house or a guest room maintained by the local shura. When the weather is nice, classes are often held in the open garden space of the

compound. The classes typically are "small" with an average enrollment of about 20, but the rooms are also small. Students sit and work close together. As part of the AL program's efforts to provide a rich learning environment, the walls of the classroom are decorated with student work. Most also have a map of the world and, often, pictures taken from a magazine (thereby expanding the very small local universe in which children and youth have grown up). Each student has his/her own notebook for writing exercises, math, or drawing. Notebook pages are filled—evidence of students' enthusiasm for all aspects of learning (even homework).

Although the first full cohort of APEP students who began the accelerated learning program were all in Grade 1, because of the overwhelming enthusiasm about learning, students in a typical classroom now include both children and youth—ranging in age from 7 to 18. Despite the wide age range, the classes are typically very orderly and cooperative. Students who are called to the blackboard to solve a math problem or write a letter, a word, or a sentence are routinely applauded for their effort and, when necessary, helped to successfully complete their task by the AL Mentor. This warm social context nurtures cooperative learning and facilitates students working in small groups or pairs.

Teachers in the APEP accelerated learning classrooms apply student-centered learning strategies and use instructional resources that help them engage students in active learning. One of the instructional resources developed by the APEP program consists of small folded pieces of paper hung on a taut string stretched along one wall of the classroom. Students who are beginning to learn the alphabet are encouraged to find a particular letter hanging on the string; slightly more advanced students are encouraged to rearrange the letters into a word of their choosing and read it aloud. A student may hold up the piece of paper with the letter to help a student who is writing the letter on the blackboard. To build letter recognition, a teacher may ask students how many letters there are in a word and then have students read each letter in the word in question and then write the word on the board.

Math instruction in APEP, like verbal arts, relies heavily on use of local materials and physically active learning. Students are typically introduced to addition, subtraction, and multiplication using pebbles, beans, or sticks and students are asked to come to the front of the class to sort pebbles into small piles as part of their work with each operation. Humor and encouragement for self-expression are sometimes part of instruction also. For example, in a class in Ghazni province students and the teacher were delighted and amused as a girl who was asked if she could show the class what made 15, held up her two hands and raised one foot (demonstrating

3x5=15). Another active learning technique observed was for pairs of girls to go to the board with one girl writing the 2-digit number and the other counting out the right number of beans.

APEP instruction builds on Afghan students' strong orientation toward collaboration by including work in pairs and small groups. Typically, students read a short 2-3 page lesson from the first grade textbook together, helping each other as necessary. At the same time, there is also a strong emphasis on presentation skills. Students have many opportunities to receive individual recognition and encouragement—for reading aloud, writing a word on the board, solving a math problem, or participating in a group skit.

Both the unspoken and the spoken messages running through all of the learning activities in APEP classrooms are to value learning, work collaboratively, and respect individual differences. APEP program's success in conveying this message to its students is an important contribution to positive educational outcomes for these students. Those students who have not had any previous opportunity to attend a formal school program will need to be highly motivated and to strongly aspire to lifelong learning to move beyond basic skills development given the reality of Afghanistan's secondary school capacity, which is about 10 percent of expected demand.

APEP's monitoring and evaluation system includes regular classroom observations and a panel study of AL student experiences and outcomes to describe and assess the ways in which accelerated learning techniques are being implemented and the impacts on student experiences and skills development. This feedback will provide input to the ongoing program of recurrent in-service training as the first grade cohort of accelerated learning students progress (at a rate of two grade levels per year).

To date, nearly 170,000 learners have been enrolled in the APEP accelerated learning program. Through the AL program, APEP is present in 17 provinces and has established 6,800 classes, trained 6,800 village teachers, enabled 680 provincial trainers to provide ongoing support to teachers, and trained 51 master trainers to reinforce and strengthen the program. With its other two components—which are responsible for producing and distributing 26 million textbooks and providing radio-based distance teacher training for accelerated learning teachers and other rural teachers—-and the accelerated learning component, APEP has generated a momentum in basic education in Afghanistan.

Afghan administrators are excited about the participation. Commented Mullah Ayubi, an active community member, "Education is a very important thing, and it is the responsibility of every man and woman to obtain an education. . . . No one should be left behind; everyone should be educated. We know that there is nothing in Islam that prevents women and girls from going to school and obtaining an

Both the unspoken and the spoken messages running through all of the learning activities in APEP classrooms are to value learning, work collaboratively, and respect individual differences.

education." Program mentor Nafisa offered: "I believe in this program. It can help those overage students a lot so they can finish six years of school within three years. It has tremendous effect on their learning ability."

IRAQ: ACCELERATING EDUCATION IN A POST-CONFLICT ENVIRONMENT

In Iraq, with many children already forced out of school for economic and other reasons, public schools were closed for almost a year following the United States invasion and occupation in 2003. Planners, educators, and parents were seeking a way for school-age children to quickly learn the content they had missed before and during the war and to prepare them academically and emotionally to participate in school once again.

In 2003-04, USAID responded with a one-year pilot accelerated learning program under the Revitalization of Iraqi Schools and Stabilization of Education (RISE) Project. RISE's accelerated learning component targeted out-of-school, traumatized, and disenfranchised students in urban and rural poor neighborhoods within post-war Iraq. Dissatisfied with simply adopting another country's accelerated learning program, Iraq chose to pilot five separate interventions, each involving 100-150 students, to identify what accelerated learning strategies would be most effective in the Iraqi context. All of the programs were designed to accelerate children through the equivalent of two years of schooling in one calendar year, allowing them to "catch up" to their appropriate grade. Children from ages 6-14 were targeted. Stress was placed on reaching out-of-school girls, since girls were the group most affected by drop out. Adolescent mothers and young women also were targeted, since they were forced by poverty and lack of educational facilities to leave the education system prematurely. Depending on the program, instruction was provided for grades 1-2, 3-4, 5-6, and/or 7-8.

To accelerate the instructional process, a committee within the Ministry of Education reviewed the national curriculum and the related textbooks and selected the key topics and concepts for each of the two grades being combined. A syllabus for each subject for each grade was created, and teachers' guides were prepared.

This content was combined with "intervention" subjects or activities also developed by the Ministry of Education to entice out-of-school youth to enroll and participate in the accelerated learning program. Interventions were developed for each participating region, with the program's content, methodologies, and materials tailored to the needs of that community's target group. In one program with children exposed to the trauma of war, teachers used art with students to improve their self-esteem, reduce aggression, and provide relief from anxiety, disorientation, and claustrophobia. In other pilots, instructors included art, sport,

and visits to local parks and museums, with opportunities for students to select other generally unavailable extracurricular activities such as dance or music. Still another pilot supplemented the national curriculum with a handicrafts program to help students master the craft skills of the region, thus enhancing their heritage and economic viability.

To further encourage participation, students received various incentives, depending on the program in which they participated. Incentives included transportation to and from school, hygiene kits, and a school bag with notepads, calculator, pens, and pencils. Teachers received an incentive salary per month and a certificate for participating, as well as teacher kits and classroom equipment such as a computer and printer, sets of Deniz cubes for mathematics, and soccer balls.

The basic accelerated program methodology for all of the pilots was based on Alastair Smith's Accelerated Learning Cycle (1998) (see box and Appendix C), which outlines a seven-stage process for instruction.

A pre-condition of Smith's Accelerated Learning Cycle is that teachers create and sustain a positive and supportive learning environment, where the individual learner feels safe to engage in risks to learning such as learning new topics and concepts. Teachers then begin by connecting learning to what students have already experienced and what is to come and describe the expected outcomes.

Once the stage is set, teachers present the academic content in new and exciting ways. Program planners encourage use of the Visual, Auditory, and Kinesthetic (VAK) model of learning styles (see Chapter II). Within any given school day, students might act, sing, dance, paint, draw, demonstrate, tutor, mime, run, and play. With limited numbers of textbooks and more traditional educational materials, teaching to the VAK model

"We like the accelerated earning program because we learn more and do more than regular schools."

Mustafa Jabar Hamid, 16, grade 5/6

RISE Seven-stage Accelerated Learning Process

- **Connect the learning**
- **Draw the big picture**
- **Describe the outcomes**
- **Provide a range of inputs**
- **Provide activity**
- **Demonstrate**
- **Review for recall and retention**

provided students in Iraq with alternative, multi-sensory instruction that they had not experienced in the restricted, regimented classrooms under Iraq's previous regime.

Teachers were selected and trained from a pool of teacher trainers who were being groomed as master trainers for the national educational system. This smaller group, who received additional training in accelerated learning principles and practices, was responsible for training the teachers for the participating pilot schools. An Accelerated Learning Team Leader coordinated the development of the syllabus and the work of the master trainers/mentors, and provided in-service monitoring and feedback to the classroom teachers. Master trainers/mentors worked with 8-14 teachers in each location. In addition, community outreach workers, provided through local NGOs, worked closely with families and communities to motivate children to attend school and to mitigate a potentially high dropout rate. The Accelerated Learning Team Leader also monitored the community workers' performance.

Time in class also was extended, again based on local interest and desire. In some classes, students chose not to have breaks between classes and to do more homework than normally required. In one region, students and teachers chose to work through the mid-year vacation.

Implementation resulted in a renewed interest in learning, as was evidenced by the attendance and performance rates. During its one year of operation, RISE's Accelerated Learning Program enrolled 699 students across Iraq (52 percent boys and 48 percent girls), with an average attendance rate of 84 percent for boys and 91 percent for girls. After six months, 92 percent of students passed the mid-year examinations and after eight months, the dropout rate was only 12 percent.

Students participating in all of the five accelerated learning programs were tested by the MOE at the end of the school year and certified. If the newly appointed MOE decides to incorporate accelerated learning as a national strategy for bringing out-of- school children back to school, graduates of the pilot program will be reintegrated into the school system at their appropriate levels during the October 2004 school term.

MALAWI: IMPROVING STUDENT ACHIEVEMENT WITH ACCELERATED LEARNING PRINCIPLES AND PRACTICES

Longitudinal data collected for Malawi's Improving Educational Quality (IEQ) project uncovered that "a majority of pupils were unable to read, write, or perform simple mathematics tasks after spending several years in primary school, and teachers were unable to diagnose the reasons pupils were performing so poorly." As a result, a one-year Continuous Assessment Feasibility Study (CAFS) was implemented in 21 primary schools in

one district where class sizes ranged from 41 to 119 and average 55 pupils.

Although not titled an accelerated learning program, the CAFS assessment incorporated a number of accelerated learning ideas: teaching to differing learning styles, active learning, immediate and specific feedback, visual learning aids using color, objects to learn and be assessed with, small group collaborative study, and continuous and performance-based assessment. In addition, five key programmatic elements were incorporated into this project (see shaded box)(Miske 2003).

All teachers in the district who taught Standard Three level participated in this project. They were trained in the value of continuous and performance-based assessment as a way to better identify pupils' levels of knowledge and skills in English, Chichewa, and mathematics and to better instruct them. They learned about remediation and enrichment activities and about varying their teaching strategies. They also began to make learning aids from local resources and to use them in various teaching techniques, for example using math flash cards with large or small groups. Among the simple yet effective learning aids teachers were assisted to make were reading and math cards and charts, bead counters, clay numbers and letters, and number wheels. They

Elements of IEQ Continuous Assessment Feasibility Study in Malawi

- **Incremental training during four one-week residential workshops for gradual and thorough training**
- **Teacher collaboration expected and structured into joint training and teaching hours**
- **Parental involvement through meetings to explain the innovations resulting in parents eagerly assisting in materials collection for learning aid construction**
- **Regular supervision by a Technical Support Team of three teacher colleges and the districts Education Advisors**

  Two one-day visits per term for observation and supportive consultations on both teaching and assessment recording techniques

- **Locally available resources collected and used in constructing learning aids**

  New term coined,"TALULAR," now widely used in the district. Teaching and Learning Using Locally Available Resources

were encouraged to ask parents for such things as trays and containers for the aids with many parts and containers of various sizes for math concepts.

In addition to learning aid objects, teachers made "rainbow charts" to record pupils' progress through the year's academic tasks. These charts had different colored vertical sections for progressively more difficult levels of content or skills. These levels were based on the national curriculum for the Standard Three grade. Each pupil had a smiley face circle with his or her name on it which he or she could move to the next color level once he or she performed at least 18 out of 20 tasks correctly at the current level.

Qualitative data were collected from documents, observations, interviews, and videotapes, and quantitative data were collected from student testing. Comparable testing data from control groups were collected from schools in a nearby district. Qualitative data included reports by teachers such as:

> "I am producing teaching and learning aids and using the aids appropriately, managing large classes, making continuous assessment records and making lesson schemes, encouraging pupils to learn, co-teaching with my fellow teachers, and using various strategies when teaching pupils…. I do not harass pupils any more" (Miske, 2003, 8).
>
> "There were discussions in groups; pupils were interacting among themselves; pupils were able to ask the teacher questions. Gender bias was minimized. Pupils were thinking fast" (Ibid, 9).
>
> "The introduction of the lesson was lively and linked to the subject matter. The TALULAR materials used were clock faces, which were correctly used. He used group work, which allowed pupils to participate fully in the lesson. He used other pupils to correct those who gave wrong answers. Mr. K. gave written exercises and went round checking the pupils' work. The class was well controlled" (Ibid, 13).

The study's positive outcomes, which were reported by Shirley Miske, are extensive and are fully enumerated here in order to show how a fairly simple innovation based on accelerated learning ideas, can have widespread positive ramifications. In this case the innovation was continuous assessment using learning aids for instruction and performance assessment and colored poster charts of progress.

Miske cautions against thinking that this program provides the magic solution to educational quality; however, she states that "the evidence is undeniable that something significant is going on in CAFS schools, which has important implications for primary education" (Miske 2003, 6).

The study lists the following outcomes:

- Students learned the expected language and mathematical skills:

  - They performed significantly higher on English and mathematics tests;
  - All students randomly chosen to perform a continuous assessment task did so to the level shown on the rainbow chart;
  - Students reported that they liked school better because they were learning.
- Teachers gained knowledge and skills and became better teachers:
  - Teachers learned how to assess students, record the results, and adapt their teaching to these results;
  - Teachers made and used some new instructional materials and learned how to make other materials at very little cost;
  - Teachers experienced that although making materials was time-consuming, students' academic skills greatly improved because of them;
  - Having been introduced to new teaching concepts and vocabulary such as "curriculum-based assessment" and "enrichment" they no longer thought only of tests to evaluate student achievement;
  - Teachers collaborated with other teachers; making learning materials, sharing new skills, and talking about teaching and learning together; and
  - Teachers became more assertive learners themselves; asking questions of the study's instructors, speaking up in plenary sessions, and showing increased confidence.
- The classroom atmosphere became more child-friendly and less fearful, and both teachers and students liked the change:
  - Children were not as afraid of continuous assessment as they were of tests; they did not run away as they did for tests and they reported that teachers were friendlier when conducting continuous assessment;
  - Teachers stopped yelling in the classroom; they also stopped hitting or whipping students and used more motivational language with students;
  - Teachers helped students focus on their studies and some stopped giving students manual labor to do instead of going to class; and
  - Student attendance improved.
- Parents were pleased with evidence of student achievement and teacher performance, and they were increasingly more supportive of the teachers and the school:
  - Parents praised the teacher and head teacher, sometimes in public meetings;
  - They encouraged their children to attend school;
  - They offered resources to make learning aids and increasingly supplied other items and services to the school.

- Head teachers supported these changes, and their relationships with teachers improved:
  - Head teachers helped teachers find storage places for learning aids;
  - They arranged meetings with parents to inform them about continuous assessment and ask for their support;
  - Generally, head teachers had more supportive relationships with their teachers.

INDIA: ACCELERATING LEARNING TO COMBAT ABUSIVE CHILD LABOR

In Andhra Pradesh, India, an innovative program is helping to eradicate child labor by helping poor working children in urban areas to "catch up" academically with their peers, and enroll into regular schools.

The program, the Child and Police Project (CAP), is sponsored by the Dr. Reddy Foundation for Human and Social Development, an organization founded in India in 2001. The primary aim of CAP is to minimize exploitation and deprivation in the lives of children and instead offer them a life of dignity and opportunity. CAP particularly targets children who are being exploited while working in hazardous work environments like welding and mechanic shops, quarry, and foundry shops.

Under the CAP program, staff members interface regularly with police, various local organizations, the MVF, the labor department, and the social welfare department to identify working children and motivate them to join the project. Enrollees are placed in a six-month residential camp, where the objective is to prepare them for a regular school life. The camp provides shelter and a safe environment that teaches values of caring, sharing, and co-existence. The camp also serves as a residential "bridge school" where enrollees learn what is needed to be admitted and retained in mainstream government schools.

In the bridge school, children are put through an individualized, rapid, or accelerated, learning program that allows them to acquire the necessary

CAP Program Elements

- **Regular interface with social organizations to identify participants**
- **Residential program that provides safe, caring enviroment and accelerated learning**
- **Low teacher-pupil ratio**
- **Locally developed nontraditional teaching, learning materials**

competencies in a shorter-than-normal period of time. As is the procedure in the mainstream government schools at the beginning of the academic year, children are administered an entry level test to assess their existing competency levels. Based on the entry level test results, an individual plan is prepared for each child. For the first one to two weeks, teaching/learning is informal in order to help the children who have never been to school or had dropped out for some reasons feel more comfortable with the school and the teaching learning environment. After the brief adjustment period, each child is guided through his/her learning program.

These bridge school classrooms have several features to help the children master the concepts quickly. The teacher-pupil ratio is kept low—around 1:20—to enable the teacher to pay individual attention to each child and help him/her learn at his/her own pace. (In government schools the teacher student ratio is quite high—it may vary from 1:60 to 1:100.) Teachers use non-traditional teaching/learning materials prepared by the teacher such as charts, flash cards, models, and games. Teachers also encourage student story telling or "story creating" and use objects from the surrounding environments as teaching aids. In addition, the teacher provides remedial and reinforcement classes after school hours for the children who need them. Typically, children in the bridge schools/camps take six to seven months to achieve the competencies for the grade that is appropriate for his/her age.

At the end of the camp, the children are admitted into one of ten schools that have been selected based on location and agreements with principals and area police. Caseworkers monitor the children's school and family circumstances to help ensure that the children do not drop out and return to work. Simultaneously, local monitoring committees, consisting of a social worker, the inspector of police, and the principal, are organized at each school to further monitor children's performance.

During its three years in operation, CAP has had a positive impact on the overall educational system in Andhra Pradesh.

In 2003, CAP reached over 20,000 children covering 112 government schools and included mobilizing and mainstreaming over 6,000 children out of work and into school.

INDIA: ACCELERATING LEARNING TO IMPROVE PRIMARY SCHOOL PERFORMANCE[3]

In India, a country with about 33.7 million children under 14 years (World Fact Book 2004), Government of India statistics showed that 89 out of 100 children enter schools but 30 percent drop out before completing primary education (grades four and five) and another 30 percent drop out before reaching grade eight. An estimated 50 percent of children who complete four years of primary school are unable to read or write.

In response to these challenges, two committed individuals came together to start Pratham, an NGO with a targeted mission: "every child in school . . . and learning well." Since its inception in 1994, Pratham has been engaged in various types of grassroots-level activities, including mainstreaming out-of-school children, providing

[3] Pratham. "Read India (from 'learn to read' to 'read to learn')" http://www.pratham.org (accessed August 9, 2004).

The "magic" of the [Pratham] program is an approach by which learning is treated as a game, with planners integrating four types of class activities. In a standard learning sequence, children say something, do something, read something, and write something.

remedial education to in-school children, and preparing pre-schoolers to enter formal school. Programs reported mixed success with limited numbers of participating children, but were not tested in large-scale settings. Alarmed by the huge number of children unable to read and write and the years predicted to reach universal primary education, Pratham began a search for a "magic wand" that would ensure that children in school would learn to read and do basic math in three months or less so that they could begin to "read to learn." Planners wanted a way to accelerate learning on a massive scale with considerable predictability using the human resources available.

Pratham's solution was the Read India Programme, a scaleable, replicable campaign designed to get "every child reading in a short-predictable time frame." From January to June 2003, the program was piloted with children in Pratham schools and summer programs throughout India and in a government school pilot effort in Maharashtra. Since the pilot ended, the program has been spreading rapidly to different parts of India in Pratham's own programs and in governmental school systems. It also is being adopted by some non-governmental organizations.

In testing this approach with math instruction, planners noted that children learned numbers and addition/subtraction with carrying over/borrowing in less than a month and multiplication and division in another month. Fueled by this success, planners adapted the approach to reading instruction.

The reading instruction proceeds as follows. To assess reading ability at the start of the program, students are asked to read alphabets, words, paragraphs, and short stories. Ability is recorded. Then, guided by a trained instructor, children begin to 'read' from the first day.

Four types of teaching/learning materials are used:

- A set of alphabet cards;
- The "barakhadi" chart — an Indian consonant vowel chart;
- Paragraph cards — simple paragraphs of four to five lines, with short, simple sentences in big font; and
- A set of six to eight simple stories printed on separate sheets, with a slightly higher degree of difficulty than the simple paragraphs.

During about 90 minutes each day, the instructor guides the following main activities in the class, depending upon its composition:

- Reading aloud (20 minutes) — A four-step process where the teacher reads the story aloud with children following on their page and listening, children discuss the story, teacher reads the story again while children read, and children attempt to read;
- Using the barakhadi chart (20 minutes);
- Learning with rhyming words (10 minutes or as needed); and
- Saying anything, writing anything (no time limit).

Children are shown and encouraged to "read" sentences, even if they struggle to make sense and guess what the words might be. Instructors do not teach but rather "encourage" by smiling, nudging, and posing occasional questions. Children begin to feel more confident and comfortable about trying to read. As children become familiar with the forms in the barakhadi chart and the sounds that they represent, they use the stories and paragraphs to practice reading more and more.

For the initial pilot, notes describing the procedure were created and distributed to key people. Leading Pratham persons held one-day workshops and meetings to explain key points. Clear goals, and do's and don't's were explained, but training was kept short. As stated by Madhav Chavan (2003), "People were encouraged to observe and improvise as long as they allowed children to learn."

Program monitoring is conducted through social audits - with people from the outside community observing every class, community, and school. Open testing and the performance of children in front of parents, community members, and other witnesses help to raise parent/community awareness and expectations, and to build community support.

Post-program assessments show large numbers of children moving from being nonreaders to readers. During the six-month pilot, where over 150,000 children were covered, the number of participating children unable to recognize their alphabets dropped from 33 percent to 5.6 percent, while the combined number of children who could read stories or paragraphs jumped from 10 percent to 54.5 percent (Chavan 2003). In less than two months, over 40,000 children learned to read at least simple paragraphs. Chavan (2003) concluded that "an average child being taught by an average teacher would take no more than four to six weeks to become very fluent in reading" and be ready to move to more advanced activities.

A summary of the five programs is provided in Figure 18.

Figure 18: Selected Applications of Accelerated Learning — A Summary		
Feature	**Afghanistan**	**Iraq**
Target Population	Thousands of returning refugees Overaged students, especially girls ages 10 -17	Out-of-school, traumatized, and disenfranchised students in urban and rural areas who had not previously participated in school
Instructional Venue	Community identified si te; Nonformal sites	Government schools with special classes for target population
Instructional Goal	Completing at least two grades i n one school year	Completing two grades in one school year
School/Classroom Learning Environment	Small class size/learning activities Increased contact hours Learning resources	Socially and emotionally comfortable classroom atmosphere
Curriculum	National curriculum, enhanced with life skills, including peace education, land mine awareness, etc.	Condensed version of national curriculum Intervention subjects (e.g., art therapy, art, sports, dance, music, and handicrafts) based on local requests
Teaching/ Classroom Practices or Activities	Teacher works as facilitator and guide Improved teacher/student and student/student interactions Promotion of respectful and conscientious engagement Cooperative learning activities	Uses visual, aud itory, and kinesthetic (sight, sound, and movement) modes to instruct students Students engaged in active learning Teacher provides different activities to allow learners to explore content in a variety of ways Students are guided in connecting learning , associating it with a big picture, and demonstrating their understanding of the information
Instructional Materials	Textbooks, teacher guides, and other learning materials in the classroom Classroom, teacher, and student kits provided	Limited numb ers of textbooks Alternative, teacher -generated materials available
Performance Monitoring/ Testing	According to MOE policy: grade level equivalency exams given	Students receive regular feedback from teachers and peers through talks and paired/sma ll group activities
Special Features	Not applicable	Student incentives, to include transportation, hygiene kits, and/or school bags Teacher incentives

Figure 18: Selected Applications of Accelerated Learning — A Summary (Continued)

Feature	Malawi	India – CAP	India - Pratham
Target Population	Government primary schools	Children in abusive/exploitative child labor situations	Primary-level students in India unable to read or write
Instructional Venue	Government primary schools	CAP "bridging" schools	Pratham schools, summer schools, and government school pilot schools
Instructional Goal	Increased student performance in English, Chichewa, and math	Achieved competencies for the grade/class appropriate for participating students in six months	Reading of alphabet, words, and paragraphs in three months
School/Classroom Learning Environment	More small group work and learning activities, supportive friendly atmosphere; pupils enjoying being assessed and seeing their learning progress on charts	Safe environment Values of caring, sharing, and co-existence promoted Small class size -- 1:20 (app) vs. govt. schools 1:60 - 1:100	Classroom presented as fun environment
Curriculum	National curriculum	Not Available	Condensed literacy and numera cy
Teaching/ Classroom Practices or Activities	Teachers use locally acquired or teacher-made learning aids for both teaching and continuous, performance-based assessment Pupils are supported to learn by various teaching techniques such as small group work and activities Colorful progress charts motivate pupils and teachers Teachers use remediation and enrichment and collaborate in making learning aids and planning lessons	Teachers provide individualized attention Encourage use of nontraditional teaching/learning materials Provides remedial and reinforcement classes after school hours	Ideas/concepts taught via integrated instruction involving seeing, doing, reading, and writing Instruction involves learning of the basic alphabet and consonant vowe l Students "read" every day
Instructional Materials	Teacher-generated learning aids made from local materials to augment textbooks	Nontraditional teaching/learning materials prepared by teacher (e.g., charts, flash cards, models, and games) Use of materials/objects from the surrounding environment	Alphabet cards, consonant-vowel chart, paragraph cards, and simple stories
Performance Monitoring/ Testing	Continuous, performance-based assessment combines with term-end grade level testing	Not available	Student testing at program start Social audits by outside community
Special Features	Students aid teachers in making learning aids; parents also involved	Not available	Daily student writing and reading

SUMMARY

This chapter gives actual examples of how theory and practice have been joined together to accelerate learning for children and youth. Education literature provides examples of schools in Western countries using principles and practices of accelerated learning outlined in Chapter III with significant increases in academic achievement. Overviews in development literature of varied field-based projects demonstrate how principles and practices of accelerated learning are being applied in various developing world contexts to address differing needs.

Five programs are particularly highlighted in this regard. In Afghanistan, accelerated learning is being used to attract both out-of-school students and overage youth into school after years of governmental neglect of the educational system. In Iraq, accelerated learning is being used to jumpstart children whose education was recently disrupted by political upheaval and war. In Malawi, continuous assessment and the use of child-centered learning materials have resulted in improved school performance for large numbers of children who were unable to read, write, and do basic mathematics. In India, accelerated learning programs have been used both to draw children from exploitative and abusive work situations and also to increase literacy levels for masses of children.

These programs, which show the widespread applicability and potential of accelerated learning principles and practices, share several common elements. All of the program designs reflect the principles common to accelerated learning programs in both industrialized and developing world contexts: concern for students' emotional and social needs; learner-centered instruction; active, problem- and project-based learning; learning as personally meaningful acts; and performance-based assessment and feedback. Some accelerated learning programs are being implemented in formal school situations; other programs are implemented in schools established especially for them. Unlike most programs from the education literature, all are intended to reduce the time needed to complete a particular course of instruction.

Research-based examples document how accelerated learning practices such as participatory, child-centered teaching practices, teaching to different learning styles, physical activity, and regular feedback have led to increases in motivation and attention as well as gains in academic achievement. Children around the world—from the United States, Canada, and New Zealand to Colombia, Pakistan, and Uganda—have benefited from accelerated learning principles and practices.

VII: MEASURES OF SUCCESS

FROM THE EDUCATION LITERATURE

Measures of success in AL-E literature are two-fold. First, there is an acceptance of the measures of success usually used in non-accelerated-learning-oriented schools. These measures generally include standardized tests as well as individual teacher-made written and oral tests. Students taught with the AL-E approach are usually quite successful on all these measures because their learning has effectively engaged all their learning capacities and they have learned the content well. Second, there are measurements of the extent to which schools and teachers use the principles and practices of accelerated learning and the extent to which students demonstrate high levels of intelligence as defined by Gardner (1999, 15; see Chapter III, Principles of AL-E, Principle 3) through a variety of multiple intelligences.

From the effective schools movement comes a set of factors affecting student achievement that can be considered measures of success in creating highly effective teaching and learning (Marzano 2003). This information is based on extensive, longitudinal research by many scholars. Using these factors, ways can be devised for measuring how well each school, teacher, or student reflects the tenets of teaching and learning that accelerate learning.

FROM THE DEVELOPMENT LITERATURE

As reflected in the development literature, high quality education and academic achievement can be measured in many ways. According to the USAID IEQ website:

> IEQ's working definition of quality is relative, not absolute. It views the following elements as essential. Quality is dynamic—a work in progress characterized by dialogue among policy makers and practitioners. Quality is reflected in student progress and teacher performance in meeting or exceeding appropriate standards (e.g., agreed upon objectives in knowledge, skills, attitudes, values… socialization). Progress in outcomes related to teaching and learning must be set in measurable terms.... Definitions vary

Figure 19: Factors Affecting Student Achievement (Marzano 2003, 10)

Factor Level	Factor
School	• Guaranteed and viable curriculum • Challenging goals and effective feedback • Parent and community involvement • Safe and orderly environment • Collegiality and professionalism
Teacher	• Instructional strategies • Classroom management • Classroom curriculum design
Student	• Home atmosphere • Learned intelligence and background knowledge • Motivation

because of the complexity of the issue.

In addition, different stakeholders will have their own prioritized measurements of quality, which sometimes conflict with each other.

The authors of USAID Program and Operations Assessment Report No. 25 on improving girls' education have summarized indicators of success found in development literature using economic terminology (O'Gara et al. 1999, 6-7). Indicators are categorized into one of three groups: inputs, processes, and outputs. Inputs are the supplies of teachers, schools, curricula, materials, training, and supervision; processes are effective teaching and learning; and outputs are students' achievements in knowledge, skills, and productivity after schooling, as well as rates of school drop out, completion, and grade repetition (Figure 20).

O'Gara et al add a few comments. They acknowledge the limitations of a supply and demand model applied to education. They also remind readers of the growing importance of active local community participation in considerations of school quality. "The relevance and responsiveness of schools to local political, social, and cultural contexts and values are important elements of a current definition of quality" (O' Gara et al. 1999, 6).

Another report from development practitioners puts overall emphasis on student achievement but reminds us that indicators of success in the category of processes could be greatly expanded as we consider accelerating learning (Intili 2003). While some items may be less quantifiable than most of the indicators above, they are no less important:

- Level of learners' satisfaction with their learning, positive attitudes toward school, active participation in learning activities;
- Extent teachers are maintaining a pleasant, friendly learning climate;
- Extent teachers are managing classroom instruction to include all learners, especially girls;
- Extent teachers are using:

Figure 20: Examples of Commonly Cited Indicators of School Quality (O'Gara et al. 1999, 7)

Input	Process	Output
Teacher-pupil ratios	Completion of curricular units	Completion rates
Pupil-space ratios	Teacher-pupil interactions	Achievement scores
Pupil-textbook ratios	Teacher attendance	Promotion rates
Supplies and distribution	Student attendance	Acceptance rates to next cycle
Teacher qualifications	Parent participation	Performance in next cycle
Special or supplemental programs	Continuous assessment	Graduates' income levels
Supervision of teachers*	Local community support of teachers and schools*	Graduates' career choices and success

*** Added by this author based on O'Gara et al's list of inputs just above and their note just below.**

  - a variety of teaching methods beyond rote memorization to engage learners,
  - a variety of instructional resources to make lessons more understandable and relevant;
- Level of teachers' positive, supportive interactions with students.

CONSOLIDATED MEASURES OF SUCCESS IN IMPLEMENTING ACCELERATED LEARNING

The following table presents measures of success proposed for implementing accelerated learning projects and programs. It brings together an emphasis on process as well as product and expands outcome measures to qualitative as well as quantitative measures.

The measures of success proposed in Figure 21 place a great deal of weight on the process of implementing an accelerated learning approach in addition to the outcome measures. Accelerated student achievement is seen as the ultimate outcome goal, but that goal is embedded within a framework of participatory processes.

Two principles drive this recommendation for emphasis on process. First, current wisdom in organization management and systems change indicates that the people whose cooperation and creativity are needed must be involved in decision-making all along. They must feel some control over the ways that potential changes

Figure 21: Measures of Success in Implementing Accelerated Learning (AL): from National to Local Level

Phase	Resources	Processes	Outcomes
Strategic Planning at National, Regional, and Local Levels	Major stakeholders at national, regional, and local levels, including representatives of teachers, school administrators, and local community leaders; Actively engaged AL consultants	Educate them well about AL: basis, benefits, principles and practices, fit with national goals	Levels of their understanding, commitment, and active support of AL
	Actively supportive major stakeholders at all levels; Actively engaged AL consultants	Construct a systematic, strategic plan for AL implementation that involves both top-down and bottom-up innovations	A strategic plan appropriate to the culture; Approval by major stakeholders
	Knowledge, skills, and commitment of local school staff; Actively engaged AL consultants	Construct a draft systematic strategic plan for AL implementation	Levels of satisfaction of local school staff with draft strategic plan
	Knowledge, skills, commitment of local school staff, and draft strategic plan for AL implementation	Educate and involve parents, community leaders, and other community members; Review draft plan and adjust as needed	Appropriate adjustments to strategic plan; Levels of active support among parents and community for AL and for strategic plan

Figure 21: Measures of Success in Implementing Accelerated Learning (AL): from National to Local Level (Continued)

Phase	Resources	Processes	Outcomes
Training of Teachers and Administrators; Preparation of Materials	Strategic plan and committee(s) to develop training plans and materials; Actively-engaged AL consultants	Incorporate AL into pre- and in-service teacher, supervisor, and school administrator training, including modeling AL in the training	Levels of AL knowledge, applied skills, and commitment to implementation by teachers, supervisors, and school administrators trained
	AL-based school instructional materials and teacher's guides well-done and well-distributed	Train teachers and supervisors in using AL-based materials and guides; give them practice with coaching and feedback	Levels of ability to instruct with AL approach and materials; Levels of ability to professionally reflect on own AL instruction
	Interest in producing AL-based programs in distance education, and media and communications technology	Produce such programs; distribute information on them and teach skills in using them within AL context	Number of such programs produced and distributed; Number of teachers trained in their use; Numbers of needed equipment distributed
School-based Instruction	Knowledge of all aspects of AL by teachers, supervisors, and school administrators trained	Continually train, coach, monitor, and support local teachers and administrators in implementation of AL	Levels of increased implementation of AL in local schools, using materials and guides provided and adding locally produced ones Levels of increased implementation of AL in local schools
	Programs in distance education, media and communications technology, needed equipment, and trained teachers	Transmit and/or distribute tapes	Levels of use of such AL-based programs
	Leadership, management, and cooperation in implementing AL strategic plan	Develop AL-based policies, practices, and instructional materials; Establish ways to continually share ideas, materials, coaching, and support at local and regional levels of schooling	a. Students' levels of attendance, class participation, achievement, grade promotion, attitudes about school; b. Teachers' levels of attendance and cooperation, attitudes about students, job satisfaction; c. Parents' and community leaders' levels of satisfaction and support of AL and student outcomes

influence their lives. This wisdom indicates that, to accelerate learning, people need knowledge and skills, practice, and support in accepting and incorporating the principles and practices called for.

The second principle, from effective project management, states that a well-designed planning phase that includes all stakeholders and their interests makes project actions flow. Put succinctly, the set-up is the work. It is important to tolerate not producing measurable outcomes right away in order to concentrate on laying a solid foundation for sustainable success. Once people's energies are truly engaged and synchronized by relationship-building and inclusive planning, their actions are more likely to accomplish and even exceed the project's goals than when the planning phase is not well done.

While having a carefully drawn up and agreed upon comprehensive plan can make a project run smoothly, it is not a requirement and sometimes not realistically likely in a process of change. Just as learning is simultaneous and not linear, so change is the same way. Inputs or resources, processes, and outcomes can be discussed in a linear framework, but in real life they are experienced as a web of interrelationships or a three-dimensional spiral with loops going both up to new phases and back down to earlier ones.

The simultaneous and interrelated nature of learning and change and the interrelated nature of organizational relationships need to be used to good advantage in considering measures of success in implementing accelerated learning. A centrally-developed plan implemented from the top down is one approach. Another is for interested people to start making changes wherever they are in the organizational structure and process of the educational system and not expect or wait for a fully formed, top-down plan to logically guide the changes.

Experience teaches us that centrally-devised plans have a role to play, but initiative at the local and regional levels also makes an enormous difference. Many times national resources, capacities, and commitment at the central ministry level are insufficient to carry through ambitious strategic plans as a study of education reform in five Sub-Saharan African countries documents (Moulton et al, Ch. 7).

While Moulton et al determined that the cases they studied fit the structural top-down type, they suggest that people choose the incremental bottom-up strategy "to allow for more diversified attempts to reach more limited objectives" (p. 211). This choice would "foster more decentralized, participatory, learning-governed policies and programs" that "are driven by the will and preferences of schools and communities, regional and district officials, not just central planners" (Ibid.). Their suggestion fits the nature of learning and change and the myriad opportunities individuals actually have in any system for making a difference.

Measures of success in implementing programs of accelerated learning, therefore, need to reflect the nonlinear reality of change and the multiple levels of the educational system. These measures need to include not only outcomes from the system as a whole but local initiatives, pioneering imple-

mentation, creative materials, and outstanding student projects in their communities.

SUMMARY

The success of an accelerated learning program can be measured both by participation in the process of developing and implementing an accelerated learning approach as well as the outcomes resulting from that participation. In terms of process, success of the program as a whole requires the full engagement of the various stakeholders, relationship building, and inclusive planning, all of which help to ensure that the project will accomplish and exceed its goals. Since change is a nonlinear phenomenon, success should also be measured in outstanding local initiatives by teachers, administrators, students, and community leaders.

Outcomes can be measured by a variety of factors, including the levels of understanding and satisfaction of the teachers, school administrators, and other stakeholders; the effectiveness of program planning and implementation; the quality of instructional materials; parent involvement in school and related activities, and perhaps most importantly, student participation and performance.

VIII. CONCLUDING THOUGHTS

Accelerating student achievement is no doubt a high priority goal for educational systems around the world. High quality schools are generally recognized as a vital ingredient in personal, family, and community welfare as well as national economic development, political stability, peace, and justice. For developing countries with limited resources, accelerated educational programs are especially important because schools with low achievement levels are a waste of resources. For example, low achievement is directly connected with high absenteeism, high grade level retention rates, and overall low productivity (O'Gara & Kendall, 11).

Developing countries often face a particular challenge in raising or even maintaining student achievement levels when they rapidly increase student enrollment and construct new schools (SARA, p. xiv). These changes place heavy demands on educational systems and often overwhelm the resources and administrative capabilities to manage them. As a result, quality can easily decline, especially in the lower primary grades where the increases are usually the highest. It is, therefore, all the more important that educational officials, consultants, and practitioners utilize ideas from both educational and development literature on accelerated learning to support fuller expression of the capabilities of everyone involved.

It is clear from the AL-D literature that development practitioners have been applying some accelerated learning principles and practices in a variety of ways for some time now. Practices such as putting students into small groups to work and creating a more pleasant learning atmosphere seem to have spread widely in donor-sponsored educational programs. Some programs, such as Escuela Nueva, have incorporated a large number of accelerated learning aspects, unleashing a great deal of children's and teachers' capacities for high quality achievement.

Yet there remains a great deal more potential in accelerated learning to produce the quality results that stakeholders in education are calling for in developing countries. The principles and practices of AL-E offer a wealth of ideas to help bring into being the types of teaching and learning that engage teachers and students to a deeper and broader extent than before. This fuller engagement is one key to accelerating learning. When the Minister of Education in Afghanistan calls for "novel, innovative, creative, and cutting edge teacher education in Afghanistan," adding that "we must train a new breed of teachers in an entirely new way for a new national and global reality (www.UMASS.edu/cie/afghanistan), his call can be answered most completely by the principles and practices of accelerated learning, which can be effectively applied in existing classrooms or in separate, nonformal schools.

In the developing world context, planners might consider an accelerated learning program in any following situations within regular formal school settings or in special programs in nonformal schools or learning centers:

- If overcrowded classrooms due to universal primary education or other school enrollment initiatives have forced the system to double shifts or half-day classrooms of instruction;
- If whole groups or communities of children have been out of school for a term or more due to seasonal work;
- If education is being initiated in isolated, rural communities where children previously did not have an opportunity to attend school;
- If school has been disrupted for one or more school terms due to some crisis-induced emergency (e.g., natural disaster, war, community epidemic); and
- If national leaders are or can be persuaded that significant change is needed and possible in their country's educational system in order to attain the student achievement goals they desire for their country's future.

At the same time, in keeping with the recognition that change can come at any point in a structure or set of processes, educators at the regional or local level can begin to use accelerated learning principles and practices. Classroom teachers can consider altering some of their teaching methods and techniques. They can begin with a small change in their behavior toward students, a homemade learning aid to augment a textbook lesson, a rearrangement of classroom furniture into groups, a little music to settle students down or new lyrics to a familiar melody to aid memorizing facts. Mentor and supervisory teachers can do the same and support their mentee teachers. Supervisors can encourage innovative teachers who use accelerated learning principles and practices and lead in educating parents and local leaders in the benefits of these changes.

As educators and others contemplate adopting and adapting principles and practices of accelerated learning in the developing world context, it is important to note that accelerated learning does not advocate disrespect for elders, teachers, or tradition (Baxter 1996, 4). Certainly the principles and practices are different from those in the traditional way of teaching, and they will require cultural sensitivities and adjustments. Giving students a much more active role than before, however, does not have to mean that they act disrespectfully.

Active, problem- and project-based, discovery education can be seen as preparing students to better serve their families, communities, and countries in today's and tomorrow's world. In many developing countries, leaders and foreign aid donors are empowering people to participate more actively in a variety of social sectors. As countries' economies develop more global connections, the next generations will need different knowledge and skills to create prosperity.

These conditions require that we educate children differently in both curriculum content and instructional methods from what past generations needed. It also requires that we explain accelerated learning and why it works to the adults in their lives—family members and community leaders—and involve them in making the called-for changes in education. In that way we are extending the benefits of accelerated learning appropriately throughout the society and supporting countries' goals to take their rightful places in the 21st century.

Accelerating the learning of students everywhere is an idea whose time has come. We know it can be done because literature in AL-E and AL-D continues to document compelling and inspiring results that provide experience that others can draw on. As described in this monograph, some developing countries with few of their own resources have been able to institute aspects of accelerated learning in a variety of contexts, usually with the assistance of international aid donors. Even so, Castro and Verdisco (2002) conclude the following:

> Some educators, professionals, and policymakers . . . assume that the traditional, teacher-centered method of rote learning presents too formidable a barrier to new methods, . . . However, without such a change, quality education cannot be introduced rapidly in any country (Castro and Verdisco 2002, 52).

Those concerned with the barriers to implementing accelerated learning can take heart from the extraordinary natural capacities of each of us for accelerating our own learning as adults and accelerating the learning of children. These capacities are much better understood now, thanks to the researchers in neurobiology, psychology, and education. They can also take heart from the growing body of books, articles, web sites, and monographs written by researchers and educators to translate research findings into practical applications for educators. These resources offer us the "shared vision and coordinated components" needed for quality improvement (O'Gara et al. 1999, 55).

In conclusion, as education and development practitioners, we are called upon to inform ourselves about this new era for teaching and learning and to spread the application of principles and practices that free and support our human potential as natural learners. It is our privilege to do so, and we owe it to the world's children and our collective future.

Be the change you want to see in the world.

Gandhi

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Beale, D. D. "Accelerative Learning and the Emerging Science of Wholeness." *Journal of Accelerated Learning and Teaching* 22 (Spring 1997): 9-32.

This article, available at html://tec.camden.rutgers.edu/JALT, provides links between the ideas of accelerated/integrative learning and the "new sciences." Beale sees both as providing "breakthrough suggestions on how we can dramatically expand, not only our learning and creativity, but also our consciousness of the human condition and our place in the universe."

DePorter, B., M. Reardon, and S. Singer-Nourie. *Quantum Teaching: Orchestrating Student Success*. Boston: Allyn and Bacon, 1999.

For a teacher's manual of how to put into practice in the classroom all the principles and components of AL-E, this book cannot be beat. It is full of practical ideas and tips on creating an empowering atmosphere, a supportive physical environment, dynamic lesson designs, powerful presentations, and effective facilitation of learning.

Dryden, G., and J. Vos. *The Learning Revolution: To Change the Way the World Learns*. Torrance, CA: The Learning Web, 1999.

This compendium of theory and practice, analysis and inspiration, case studies of schools and businesses, and step-by-step guides is an excellent resource book on AL-E. The authors bring together discoveries in a variety of related fields with the opportunities of electronic communications to describe a major shift or revolution now in progress in how people learn and, therefore, teach and train. Parents, teachers, trainers, managers, students, and entrepreneurs will find this book a goldmine. What is more, the book itself is innovative; you find a memorable quotation, chart, table, or graphic organizer on the back side of each page for fast and efficient learning of the book's main messages.

(Purchase through www.learning-revolution.com)

Erlauer, L. *The Brain-compatible Classroom: Using What We Know About Learning to Improve Teaching*. Alexandria, VA: Association for Supervision and Curriculum Development, 2003.

After "a walk through the brain," Erlauer explains the connections we now understand better between learning and (a) emotional wellness and a safe environment, (b) the body and movement, (c) relevant content and student choices, and (d) time. She provides teachers with ideas on how to enrich students' brains and how to assess and provide feedback to promote learning. A discussion of collaboration and leadership strategies that provide teacher support end this very readable and practical book.

Gardner, H. *The Unschooled Mind: How Children Think and How Schools Should Teach*. New York: Basic Books of HarperCollins, 1991.

By the originator of the concept of multiple intelligences, this book deeply analyzes our assumptions about how schools and learning should be organized. Albert Shankar, President of the American Federation of Teachers, wrote: "If we closed schools today and asked ourselves how we could reinvent them to work for all youngsters, my answer would be: 'According to the ideas and models in Howard Gardner's *The Unschooled Mind*.' Visionary yet practical, scholarly yet accessible, this book is a stunning achievement."

Given, B. *Teaching to the Brain's Natural Learning Systems*. Alexandria, VA: Association for Supervision and Curriculum Development, 2002.

In 140 very readable pages, Given provides an excellent understanding of the brain as an interweaving of five major learning systems: cognitive, emotional, physical, social, and reflective. She explains each neurobiological system in terms of its structure, functions, driving forces, and behavior patterns. With her connecting of each system to teaching roles and behaviors, teachers can better understand how they inhibit or facilitate their students' learning.

Jensen, E. *Teaching with the Brain in Mind*. Alexandria, VA: Association for Supervision and Curriculum Development, 1998.

This book is a great introduction to AL-E. The information in its 114 pages opens up new and exciting ways to think about learning, readiness for learning, motivation and attention, threats and stress, memory and recall—all based on a layman's explanation of what brain research is telling us about learning and teaching.

Jensen, E. *Learning with the Body in Mind*. San Diego, CA: The Brain Store, 2000.

With graphics and metaphors, Jensen explains the physiology of learning and the symbiotic relationship of brain and body. He includes a number of practical applications and exercises, a list of supplemental resources, and a complete bibliography.

Marzano. R. J. *A Different Kind of Classroom: Teaching with Dimensions of Learning.* Arlington, VA: Association for Supervision and Curriculum Development, 1992.

Part of ASCD's "Dimensions of Learning Program," this book emphasizes the organizing of teaching around "a truly learning-based model." Marzano provides a research-based theory of learning and five dimensions for learner-centered instruction, which he calls five types of thinking: positive attitudes and perceptions about learning; acquiring and integrating knowledge; extending and refining knowledge; using knowledge meaningfully; and productive habits of mind. While Marzano focuses on cognitive learning, his framework is very useful. Teachers can utilize all five natural learning systems to address his dimensions.

Meier, D. *The Accelerated Learning Handbook.* New York: McGraw Hill, 2000.

The subtitle provides a capsule description: a creative guide to designing and delivering faster, more effective training programs. After informing readers about the learning revolution in progress and how brains work in natural learning, Meier explains his four phases of learning: preparation, presentation, practice, and performance. He adds tools and techniques for leading learners through these phases, ideas on using computers, and a seven-step rapid process to design training sessions. This book "walks the AL talk" in its writing and presentation, providing readable explanations of AL ideas and applications to training more than schooling.

Nagel, N.C. *Learning Through Real-world Problem Solving: The Power of Integrative Teaching.* Thousand Oaks, CA: Corwin Press, 1996.

Nagel uses integrative teaching to mean interdisciplinary as well as integrating our personal learning systems and focuses on the interdisciplinary aspect. She provides concrete lesson plans and results from four different American classrooms as well as recommendations for implementation.

Rose, C., and M. J. Nicholl. *Accelerated Learning for the 21st Century.* New York: Dell Publishing, 1997.

After a review of the brain's learning processes, Rose and Nicholl present their MASTER Plan for learning the accelerated learning way: motivate your mind, acquire the information, search out the meaning, trigger the memory, exhibit what you know, and reflect on how you've learned. They also discuss the use of music, the thinking process, early childhood, successful teaching and schooling, and successful corporate learning.

Silver, H. F., R. W. Strong, and M. J. Perini. *So Each May Learn: Integrating Learning Styles and Multiple Intelligences.* Arlington, VA: Association for Supervision and Curriculum Development, 2000.

This is another book designed to explain psychological and educational theory in terms that ordinary people can understand and to apply the concepts to classroom teaching. The authors provide explanations and self-assessment for both frameworks, then show teachers how to audit and realign their curriculum and instruction to take advantage of these learning abilities. They also discuss how to align assessment of students' achievement with these abilities, making tests part of the learning process.

Wolfe, P. *Brain Matters: Translating Research into Classroom Practice.* Arlington, VA: Association for Supervision and Curriculum Development, 2001.

Wolfe does just what the subtitle of her book says. She explains the structure and function of the human brain so non-scientists can clearly understand, and she walks you through the process of sensory perception to information storage. Then she provides 55 pages of very practical ideas, including a "toolkit of brain-compatible strategies," for teachers to use Monday morning.

APPENDIX A

FOUR LEARNING STYLES BASED ON JUNG'S PSYCHOLOGICAL TYPES EXPLAINED IN DETAIL (Silver et al 2000, 28)	
The Sensing-Thinking (ST) or Mastery Learner	**The Sensing-Feeling (SF) or Interpersonal Learner**
Prefers to learn by: • seeing tangible results • practicing what he has learned • following directions one step at a time • being active rather than passive • knowing exactly what is expected of her, how well the task must be done, and why	Prefers to learn by: • studying about things that directly affect people's lives rather than impersonal facts or theories • receiving personal attention and encouragement from his teachers • being part of a team --collaborating with other students • activities that help her learn about herself and how she feels about things
Learns best from: • drill • demonstration • practice • hands-on experience	Learns best from: • group experiences and projects • loving attention • personal expression and personal encounters • role playing
Likes: • doing things that have immediate, practical use • being acknowledged for thoroughness and detail • praise for prompt and complete work • immediate feedback (rewards, privileges, etc.)	Likes: • receiving personal attention and encouragement • opportunities to be helpful in class • personal feedback • sharing personal feelings and experiences with others
Dislikes: • completing tasks for which there are no practical uses • activities that require imagination and intuition • activities with complex directions • open-ended activities without closure or pay-off • activities that focus on feelings or other intangible results	Dislikes: • long periods of working alone silently • emphasis on factual detail • highly competitive games where someone loses • detailed and demanding routines

APPENDIX A

FOUR LEARNING STYLES BASED ON JUNG'S PSYCHOLOGICAL TYPES EXPLAINED IN DETAIL (CONTINUED)	
The Intuitive-Thinking (NT) or Understanding Learner	**The Intuitive-Feeling (NF) or Self-Expressive Learner**
Prefers to learn by: • studying about ideas and how things are related • planning and carrying out a project of his own making and interest • arguing or debating a point based on logical analysis • problem solving that requires collecting, organizing, and evaluating data	Prefers to learn by: • being creative and using his imagination • planning and organizing her work in her own creative ways • working on a number of things at one time • searching for alternative solutions to problems beyond those normally considered • discussing real problems and looking for real solutions
Learns best from: • lectures • reading • logical discussions and debates • projects of personal interest	Learns best from: • creative and artistic activities • open-ended discussions of personal and social values • activities that enlighten and enhance -- myths, human achievements, dramas, etc.
Likes: • time to plan and organize her work • working independently or with other intuitive-thinking types • working with ideas and things that challenge him to think , explore, master	Likes: • contemplation • being able to learn through discovery • opportunity to plan and pursue his own interests • recognition for personal insights and discoveries
Dislikes: • routine or role assignments • memorization • concern for details • rigid rules and predetermined procedures	Dislikes: • too much attention to detail • facts, memorization, rote learning • tasks with predetermined correct answers • detailed and demanding routines

APPENDIX B

GARDNER'S MULTIPLE INTELLIGENCES EXPLAINED IN DETAIL (Silver et al 2000, 11 with Images from Lazear 1999, 5)

Disposition/Intelligence	Sensitivity to:	Inclination for:	Ability to:
Verbal-Linguistic Intelligence	The sounds, meanings, structures, and styles of language	Speaking writing, listening, reading	Speak effectively (teacher, religious leader, politician) or write effectively (poet, journalist, novelist, copywriter, editor)
Logical-Mathematical Intelligence	Patterns, numbers, and numerical data, causes and effects, objective and quantitative reasoning	Finding patterns, making calculations, forming and testing hypotheses, using the scientific method, deductive and inductive reasoning	Work effectively with numbers (accountant, statistician, economist) and reason effectively (engineer, scientist , computer programmer)
Spatial Intelligence	Colors, shapes, visual puzzles, symmetry, lines, images	Representing ideas visually, creating mental images, noticing visual details, drawing and sketching	Create visually (artist, photographer, engineer, decorator) and visualize accurately (tour guide, scout, ranger)
Bodily-Kinesthetic Intelligence	Touch, movement, physical self, athleticism	Activities requiring strength, speed, flexibility, hand-eye coordination, and balance	Use the hands to fix or create (mechanic, surgeon, carpenter, sculptor, mason) and use the body expressively (dancer, athlete, actor)
Musical Intelligence	Tone, beat, tempo, melody, pitch, sound	Listening, singing, playing an instrument	Create music (songwriter, composer, musician, conductor) and analyze music (music critic)
Interpersonal Intelligence	Body language, moods, voice feelings	Noticing and responding to other people's feelings and personalities	Work with people (administrators, managers, consultants, teachers) and help people identify and overcome problems (therapists, psychologists)
Intrapersonal Intelligence	One's own strengths, weaknesses, goals, and desires	Setting goals, assessing personal abilities and liabilities, monitoring one's own thinking	Mediate, reflect, exhibit self-discipline, maintain composure, and get the most out of oneself
Naturalist Intelligence	Natural objects, plants, animals, naturally occurring patterns, ecological issues	Identifying and classifying living things and natural objects	Analyze ecological and natural situations and data (ecologists and rangers), learn from living things (zoologist, botanist, veterinarian), and work in natural settings (hunter, scout)

APPENDIX C

FRAMEWORKS FOR PLANNING ACCELERATED LEARNING LESSONS

1. "THE FOUR PHASE LEARNING CYCLE," MEIER 2000, 53

4. Performance ~ the *application* of the new knowledge and skill to real-world situations	1. Preparation ~ the *arousal* of interest
3. Practice ~ the *integration* of the new knowledge or skill	2. Presentation ~ the *encounter* of new knowledge or skill

2. "THE SIX-STEP PLAN TO UNLOCK YOUR MASTER-MIND," ROSE AND NICHOLL 1997, CH. 4

MIND — RESOURCEFUL AND RELAXED
- Create a state of mind in which you are ready to learn and expecting success

ACQUIRE THE FACTS
- Start with the big picture and the core idea; clarify what you already know; use visual, auditory, and kinesthetic ways to take in information

SEARCH OUT THE MEANING
- Use multiple intelligences to explore the meaning and application of facts

TRIGGER THE MEMORY
- Decide to remember; review often; create multisensory memories; use acronyms, flash cards, stories, music

EXHIBIT WHAT YOU KNOW
- Practice, test yourself, correct errors, apply learning, get support

REFLECT ON THE PROCESS
- Monitor and evaluate yourself; chart your progress, reward yourself

3. "ACCELERATED LEARNING CYCLE" SMITH 1998.

PRE-STAGE: CREATE THE SUPPORTIVE LEARNING ENVIRONMENT
This stage helps learners feel free from high levels of anxiety and encourages them to be challenged. Challenges are structured so that a perceived threat never overwhelms the students.

STAGE ONE: CONNECT THE LEARNING
The lesson is connected with work that has gone before and with what is to come. This stage:

- Helps learners explore connections with previous work.
- Makes new information easier to assimilate.
- Provides learners with outcomes, essential vocabulary, and questions they will be able to answer by the completion of the experience.

STAGE TWO: DRAW THE BIG PICTURE
An overview of the content and processes of the lesson is given. This stage:

- Provides a set of landmarks for the learning experience.
- Continues to engage with the questions embedded earlier.
- Makes links between content and process.
- Continues to alleviate anxieties over the material.

STAGE THREE: DESCRIBE THE OUTCOMES
The learners are informed of what they will have achieved by the end of the lesson and given an opportunity to set personal performance outcomes. This stage:

- Declares the outcomes.
- Begins to put the content into 'bite-size' pieces.
- Has the learners affirm for themselves personal performance targets.
- Encourages learners to make choices and measure their own progress.

STAGE FOUR: PROVIDE A RANGE OF INPUTS
The content of the lesson is given in Visual, Auditory, and Kinesthetic (VAK) modes. This stage:

- Inputs new information through the use of sight, sound, and movement/action.
- Is distinctive and promotes active engagement.
- Requires lots of opportunities for structured language exchange.
- Is limited in duration to allow for added reflection, assimilation, and review.

STAGE FIVE: PROVIDE ACTIVITY
Different activities are used to allow learners to explore the content in a variety of ways. This stage:

- Accesses a range of intelligences over time.
- Provides a 'balanced diet' of activities (over time).
- Encourages learners to reflect on their own learning preferences.
- Immerses language in the learning activity itself.

STAGE SIX: DEMONSTRATE
The learners demonstrate their understanding of the new knowledge. This stage:

- Further optimizes purposeful language exchange.
- Requires learners to share understanding through a variety of outcomes.
- Encourages further reflection on processes used.
- Creates opportunities to 'model' success.

STAGE SEVEN: REVIEW FOR RECALL AND RETENTION
The learners review individually and in structured groups. This stage:

- Consolidates the learning through individual, paired, and shared review.
- Teaches different memory and recall techniques.
- Provides feedback for performance improvement.
- Previews what is to come next.

4. THE SIX STAGES OF ACCELERATED LEARNING VOS 2003, 2004

STAGE 1: Get into a resourceful state of relaxed alertness

STAGE 2: Explore the information through different learning styles and intelligences

STAGE 3: Think and reflect about the information; store it in deep memory using memory techniques including music

STAGE 4: Use the information; activate the learning through practice

STAGE 5: Apply the information to real-life situations

STAGE 6: Review – Evaluate - Celebrate through showing what you know, reflecting on successes and what is next, acknowledging the learning

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