

**BRIDGING THE ACHIEVEMENT GAP:
THE CENTRAL PLACE OF
COGNITIVE EDUCATION**

David S. Martin, Ph.D., President, North American Feuerstein Alliance
(non-profit)

Irv Schein, Director, International Consulting and Trade Associates, Inc.

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THE ACHIEVEMENT GAP—A PERSISTING CHALLENGE

Most educators in American schools today are acutely aware of a serious and continuing gap between student academic achievement and their real potential. While the gap is not found among all students, it exists in great proportions in some segment of many school districts—rural, suburban, and urban. Some of the reasons for the gap are hypothesized to be the result of:

Economic disadvantage

Poor student motivation

Inadequate parental involvement in their children's education

A first language other than English

Learning disabilities of numerous kinds

A curriculum which emphasizes only factual memorization

Schools exerting extreme pressure on teachers to “teach to the tests”.

Numerous remedies have been recommended and tried, with only inconsistent results or lack of any significant results. Yet the gap has been rightfully characterized by some as a kind of “national emergency”. A systematic and well-conceived approach is needed at this time.

A NEW BUT TESTED APPROACH—COGNITIVE EDUCATION

If we look carefully at all subject matter in the curriculum (math, language, science, social studies, the arts, etc.), they all appear to have different foci because of their different domains. Yet, underlying all subject matter is a core of transferable Cognitive Strategies. This core includes such skills as:

Analysis

Organization

Comparison

Categorization

Sequencing

Synthesis

Logic

Reflection

Divergent or creative thinking, and more.

However, in a great many classrooms, these strategies (if they are included at all) are only **implicit**, and students are not led to any awareness of the **universality** of these strategies. Consequently, when students need to become independent problem-solvers, they have no systematic repertoire of strategies to call upon.

Two new developments are occurring nearly simultaneously. (1) The newly-adopted Common Core Curriculum Standards, being used in nearly every state, specify laudable curriculum goals for every subject matter, but systematic and explicit cognitive strategies are largely missing from the Standards. (2) The No Child Left Behind Law's requirement for improvement based on mandated test scores is being waived in some states, with many other states seeking similar waivers; however, no plan seems to be in place to replace or improve upon the NCLB requirements.

On the other hand, a systematic and explicit focus on cognitive strategies which is **integrated across all subject matter** will provide: (1) a repertoire of strategies that is usable by the student in every context, (2) an opportunity for making meaningful relationships among subject matter, and (3) the means by which students can apply these strategies also outside school—to family life, social life, and work life.

But if a school, school district, or classroom is serious about integrating cognitive strategies within the curriculum for these purposes, how should the process be carried out? Several criteria are relevant to making a careful choice of a cognitive curriculum to supplement the regular curriculum; they include:

No promise of a “quick-fix” solution to students’ thinking skills; changing thinking takes time

In-depth professional development for teachers—a different way of teaching

Comprehensive coverage of a full range of cognitive strategies, not one or two of the

list on the first page

A clear and strong theoretical basis

A strong record of positive results from research and evaluation studies.

A PROVEN PROGRAM—“INSTRUMENTAL ENRICHMENT”

At least one long-standing cognitive curriculum exists which unquestionably meets all of the five above criteria for quality. That program is known as “Instrumental Enrichment”—the brain child of Dr. Reuven Feuerstein, an Israeli psychologist, who developed and proved the program carefully since the 1950's. The cognitive theoretical base of the program is “cognitive modifiability”—it is never too late to improve the thinking powers of any individual, no matter

where she or he is at the moment. This program is now used in more than 70 countries, and has had its success documented by well over 1000 research studies.

The program uses three critical methods, all of which comprise a different approach to instruction:

1. The process of “**mediation**”, in which the teacher coaches, asks questions, leads, guides, and acts as an intermediary between the student and the problem-solving tasks, but requires the student to develop the solution and thus build the thinking skill rather than providing solutions from the teacher.
2. **Metacognitive reflection**, in which students are guided to be explicitly aware of the thinking strategies used in their problem-solving so that they can later retrieve and practice those independently.
3. “**Bridging**”—a process by which the teacher guides the students to make the application of every strategy to the subject-matter topic of the day, as well as applications to social life, work life, etc. outside of the classroom.

The program has two versions—one designed for ages 3-8 and anyone with a disability (known as “Basic”) and one designed for ages 9 and up through adulthood (known as “Standard”). Anyone planning to implement the program must complete in-depth professional development in the theory, methods, and materials of the program. Detailed descriptions of the cognitive tools or “instruments” for the “Basic” program are found in Attachment A, while similar descriptions for the “instruments” of the “Standard” program are found in Attachment B.

The results from research and evaluation studies are provided in Attachment C, which clearly shows that both programs have repeatedly resulted in significant growth in numerous important areas for students; positive effects for teachers and parents are also reported in the Attachment. The reader is urged to review these important outcomes. Attachment D lists research references for further investigation.

NEXT STEPS

Thus, the Instrumental Enrichment program meets all of the five criteria for a high-quality cognitive intervention. How, then, could a teacher, principal, curriculum specialist, or superintendent move to investigate the possibility of incorporating this program in a school or schools? An ideal action is to schedule a free Decision-Making Workshop, in which the theoretical basis, program outcomes, program descriptions, and training expectations are fully explained for everyone present; it is recommended that teachers as well as administrators participate in the Workshop because of the commitment required to both training and implementation on a regular basis. If a decision is then made to begin training and implementation, several plan options are available:

The training of a cadre of teachers in a school, perhaps from two or three grade levels.

The training of a cohort of teachers from the same grade level across several schools

or a school district, so that implementation is cross-district

The training of all of the teachers in a school (elementary, middle, or high school) so that the school becomes a “Thinking Academy”—a school where cognitive education is the core around which the subject-matter curriculum is built, by agreement among the entire staff and administration.

Parent orientations are recommended for each of the above plans in order that parents can support the development of the thinking strategies that are being incorporated in the school or classroom(s).

Highly-trained trainers, approved by certification from the world headquarters of Instrumental Enrichment in Israel, may be engaged for training and follow-through assistance in implementation. The classroom materials may be ordered by anyone who completes the training.

For further information, see the website www.thinkingconnections.org, the site for the non-profit North American Feuerstein Alliance; a list of trainers is contained on the site. For organizing a no-cost Decision-Making Workshop, and possible later training and implementation, contact IC&TA, Inc., one of the authorized training centers for the program, through ISchein123@cs.com; for questions and further explanations, check www.ictaweb.org or contact David Martin at davidchina_2000@Yahoo.com.

Remember the well-known saying of Confucius: “Give me a fish, and I shall eat tomorrow; but teach me HOW to fish, and I shall eat for a lifetime.” This saying summarizes the rationale for all cognitive education.

ATTACHMENT A

INSTRUMENTAL ENRICHMENT, BASIC VERSION: AN OVERVIEW

Reuven Feuerstein, a cognitive psychologist in Israel, developed a special program of cognitive education for young children and for functionally delayed adults, known as “Instrumental Enrichment Basic.” (A separate program, designed for learners of ages 9 through Adult is also available, known as “Instrumental Enrichment Standard”). The Basic program has ten separate segments—called “instruments”—which are targeted to early learning needs in mathematics, literacy, and social interaction. Teachers are trained to mediate the students’ use of the instruments and strengthen their processes toward readiness for mathematics and literacy.

Each instrument involves the application of principles, thinking strategies, and application of discovered rules, in a variety of tasks; thus, the program enables students to better identify problems, form hypotheses, test hypotheses, make comparisons, and solve problems.

Each instrument focuses on one particular cognitive function that is pre-requisite to successful school learning; the tasks become increasingly complex and abstract. Implementation is recommended for one half-hour daily over a period of two years.

Teacher training for the program requires one day of training per instrument.

The cognitive functions for the instruments and their titles are:

1. Tri-Channel Attentional Learning: Using touch, learners first form mental images of three-dimensional objects hidden from view, focusing on number, orientation, size, types of sides, angles, etc., followed by then recognizing the object visually and reproducing it by drawing. Thus, tactile, visual, and verbal modalities are used.
2. Organization of Dots: Students identify geometric shapes, comparing shapes to a model; figures rotate in space and become increasingly complex; emphasis is on finding and describing different kinds of patterns.
3. Orientation in Space: Students learn to recognize, differentiate, and label positions in space; learners also identify relative positions of objects and events.
4. Identifying Emotions: Students learn to identify feelings and emotions by interpreting facial expressions and understanding the appropriate use of emotions in various situations. The aim is reduce ego-centrism and initiate empathy.
5. From Empathy to Action: This instrument helps create a state of empathy by identifying a state of mind, deriving from the facial and bodily expression of a pictured person in some critical situation. Alternatives are presented, and students select options and their consequences.
6. From Unit to Group: The learner manipulates geometric shapes to discover the idea of units, groups of units, and units as groups. The instrument sets up operations which underlie mathematics, focusing on ways in which objects can be aggregated, separated, summarized, and described.
7. Compare and Discover the Absurd: Students discover and understand the nature of an absurdity (or incongruity) between two situations. They analyze, control, and compare relationships between the situations. This instrument is divided into 2 levels.
8. Know and Identify: Students investigate how familiar objects are made and work as well as their properties, including structures and functions, using pictures and words. They name, define, identify common and different attributes of objects, and categorize them.
9. Thinking to Learn and Prevent Violence: The instrument presents pictured situations in a variety of types of conflicts; teachers ask a series of questions related to each situation, and the student then predicts the outcome from each of four alternatives, including the evidence available and the likely responses of people in the situation.
10. Learning to Question for Reading Comprehension: The instrument has a series of pictorial

sentences, with questions to be answered about each one. The focus is on comprehending what is read, teaching that a sentence which is heard or read is a source of information leading to deeper information that is embedded.

ATTACHMENT B

INSTRUMENTAL ENRICHMENT, STANDARD VERSION: AN OVERVIEW

The Instrumental Enrichment program consists of two versions—“Basic”(for ages 3-8) and “Standard” (for ages 9-adult). Each version has a number of instruments, each of which are separate groupings of student activities (some of which are paper-and-pencil), each on a specific cognitive strategy. The Standard version of the program contains 14 instruments; again, one day of training for each instrument is required for teachers and others who will implement the program. The instruments are:

Projection of Virtual Relationships—Identify patterns which are

present but not immediately obvious, using clouds of dots to find a series of overlapping geometric figures

Orientation in Personal Space—Understand point-of-view, and orient oneself to the

four positions of right, left, front, and back when detached from the learner’s own point of view

Comparisons—Find similarities and differences using pictorial, geometric, and verbal

input, leading to spontaneous comparative behavior

Analytic Perception--Analyze different geometric designs through understanding of the

relationships between wholes and parts

Categorization—Acquire classification processes according to labelled underlying

principles, applied to objects, figures, numbers, and pictures

Instructions—Use verbal input to both follow instructions precisely and create

verbal instructions for others to follow, using the processes of encoding, decoding, and inference

Illustrations—Perceive, recognize, and solve situational problems that involve ingenious solutions, distinguish between what is absurd and/or humorous, and understand the need for reflective thinking

Temporal Relations—Reorient one’s perceptions of time and increase one’s capacity to register, process, and sequence different types of time relationships

Numerical Progressions—Seek “laws” or “rules” which form the basis for events, and deduce the relationships between events

Family Relations--Use the terminology of the family to label and then understand and generalize about relationships among people in different organizations

Orientation in Universal Space—Build on one’s understanding of the relative relationships derived from the earlier Orientation in Personal Space instrument to now grasp the stable system of reference of cardinal directions (north, south, east, west), thus integrating both systems

Transitive Relations—Infer new relationships from those existing between objects or events that are described in terms of greater than, equal to, or greater than, using simple mathematical operations

Syllogisms—Use formal operational logic, manipulating the concept of sets and the laws governing them and their members

Representative Stencil Design—Use all the previous cognitive strategies acquired in earlier instruments to mentally (not motorically) construct colored composite designs using representations of stencils; students must identify both the individual stencils being used and the order in which they are mentally superimposed on each other.

ATTACHMENT C

EDUCATIONAL OUTCOMES FROM INSTRUMENTAL ENRICHMENT

1.THINKING SKILLS AND YOUNG CHILDREN(Pre-K through Grade 3)

The Feuerstein program for children of ages 3-8 is known as Instrumental Enrichment Basic (FIE-Basic) and is also intended to be used with students of any age who have identified disabilities. The following results of the program have been reported in the research literature in several countries, including the United States:

Significant improvement in students’--

Motor Development

Reduction of Anti-Social Behavior

Language Development

--Verbal Concepts

--Visual Discrimination

Logical Relationships

Knowledge Acquisition

General Reasoning

On the WISC-R Intelligence Test

--Picture Arrangement

--Picture Completion

--Similarities.

A newly published journal article provides elaboration on several of the above effects, and is entitled “Feuerstein’s New Program for the Facilitation of Cognitive Development in Young Children”, by Meir Ben-Hur and Rafi Feuerstein. It is published in the Journal of Cognitive Education and Psychology, Volume 10, Number 3, 2011, pp. 224-237. A copy of the article can be mailed upon request to David Martin at davidchina_2000@yahoo.com.

See detailed description of this program within the book, The Thinking Academy, Appendix A, Program Description for FIE-Basic, pages 50-71, and Appendix F, Summary of Evaluation Studies, pages 122-132.

2. THINKING SKILLS AND OLDER STUDENTS (age 9 through high school; a version of the program has also been designed for adults in business, industry, and senior centers)

The Feuerstein program for older children through adults is known as Instrumental Enrichment Standard (FIE-Standard); the program has existed since the 1950’s and has been the subject of more than 1000 research studies in numerous countries, including the United States. The effects of the program have been reported for students, teachers, and parents, as follows:

For Students, significant improvement in—

Reading Comprehension

Mathematical Concepts

Mathematical Computation

Observed Thinking Behaviors

General Reasoning

Real-World Problem-Solving Situations

Awareness of their own Thought Processes

For Teachers, improvement in—

Dialoguing with Students

Asking Higher-Level Questions

Using Reflective Thinking with Students

Using the Thinking Pre-Requisites behind all curriculum subject matter

For Parents or Guardians, improvement in—

Giving children more responsibility for problem-solving

Using “thinking” language with children

Understanding children’s thought processes

Active engaging with their children’s learning.

For further details, see The Thinking Academy, Program Description, Appendix B (pp.50-71) and Evaluation Studies, Appendix F (pp. 122-132).

A list of published references on the effects of both programs is available at the website www.ictaweb.org by clicking on the Home Page tab for “Program Outcomes”, or through David Martin at davidchina_2000@Yahoo.com; 508-527-0460(phone); and 508-420-1588(fax).

ATTACHMENT D

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