Will Our Educational System Be

The Solution or the Problem?

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Introduction

For time immemorial, all organized societies, from the simplest tribes to the most advanced, have looked to the education of their young as a means to guarantee their survival. One way or another, the objective of society has been to transmit to the next generation, the accumulated wisdom and experience of the past. This objective remains in all societies today, even after thousands of years. There have been ongoing debates, however, regarding what things are so important that everyone should know them, how best to teach and how to determine if they have been learned. Regardless of the outcomes of the debates, the prevailing view has always been, "We, the elders, know what you need to know."

But, within the last half-century, some things have changed. The change is graphically displayed in the following diagram, which I showed in a presentation in Sydney last year:

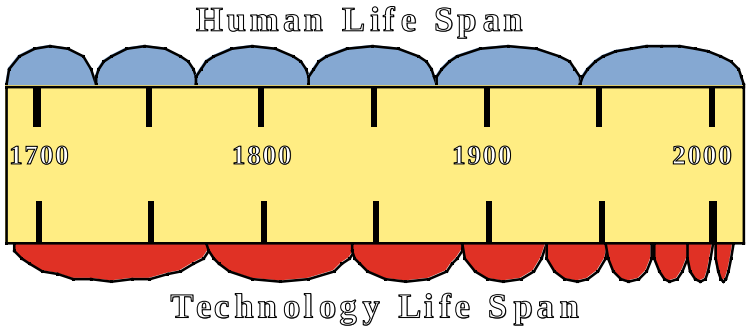

Figure 1. Human lives keep getting longer while the lives of technologies grow shorter.[1]

Only a hundred years ago it was possible for a man to leave high school and get a job, in which he could remain until he retired. He needed to learn very few things that were not known to his grandfather. It is now predicted that most working men and women will be forced to change their careers as many as eight times in a lifetime. It is not just that technologies associated with our jobs have been changing. Our economic, social and political institutions are also changing, *continuously*, at a dizzying rate.

The forces causing these changes are not going to go away. About 18 years ago I described some of them[2]. Very little has changed. They are still active, only more so.

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[1] My thanks to Peter Scholtes for this diagram. He said he first got it from Malcolm Knowles

[2] Tribus, Myron "Managing to Survive in a Competitive World", in Quality First
(Available from the National Society of Professional Engineers, NSPE Publication #1459, 1420 King Street, Alexandria, VA 22314)

Forces for Change on a Global Scale

1. **Population Explosion…No one has a plan to turn it off.**
2. **Resource Depletion…Easy to obtain energy and materials have been extracted. Even renewable resources are pushed to extinction.**
3. **Rising Expectations…More people expect more things, now!**
4. **Interdependent Economies…Every nation is affected by international trade; no nation can 'go it alone'.**
5. **Money flows around the globe at the speed of light…Electronic funds transfer moves wealth instantly.**
6. **Technology flows at the speed of air travel…technically trained people can be moved around the Earth in a few days. Students from developing countries travel to the most advanced universities and learn how their country can shorten the time of development.**
7. **Uncertain Supplies…No one can be certain about sources of raw materials and energy.**
8. **Unstable Governments…It is difficult to foretell who will be an ally.**
9. **Shared Environmental Decay and Hazards…Acid rain toxic wastes, nuclear radiation, affect one World.**
10. **Although international cooperation is essential for the planet to survive, new forms of conflict are being invented daily, from economic, to religious, to terroristic…**

We no longer be confident that, we, the elders, know what our children must know. We do not know the right answers to the questions of today. As for tomorrow, we do not even know the questions! What we can say with assurance is this:

Our descendents must become lifelong continuous learners.
Creating a yearning for learning should be the primary aim of education.
An Educational System Which Kills the Thirst for Knowledge
Is a Menace to a Nation's Survival.

If the Knowledge of Yesterday is Not Adequate for Tomorrow , What Should We Teach? What Should Students learn?

Let us be clear about the difference between teaching and learning.

Teaching occurs when I show you how I solve a problem.
Learning occurs when you figure out how to solve your own problem.

What is most valuable about our past experience, and worth passing on to the next generation, is our ability to learn. It is fundamental to all progress. The next generation should, above all, learn how to learn. Our task is to mediate their experiences so that they enhance their learning potential. This may be done in a variety of ways, in a variety of environments (not just a school) and with a variety of subjects (not necessarily existing disciplines). The objective of each interaction should be the same – increase the learner's ability and desire to learn.

There is Hope to be Found in the New Knowledge of this Century

The list of forces that are changing our lives is depressing, but there is another list. New knowledge and capabilities are also being created and these provide hope for the future. Dr. Deming used to say that a system can be changed, but only if new knowledge is brought to it from the outside. Einstein said something along the same lines when he remarked that we cannot solve the problems we face if we only use the knowledge that created the problems in the first place. This new knowledge is now available but it is not being used.

In the last fifty years there have been two important developments, which provide a potential to improve education in ways not heretofore believed possible. These developments are:

1. Feuerstein's Theory of Cognitive Modifiability

   This theory has been used to improve the way people think. It can be and has been used to raise the level of intellectual attainment of people of all ages and all levels of intellectual accomplishment. This theory improves the performance of *individual* humans.

2. Quality Management

   The quality approach to managing the affairs of organizations, by focussing on improving the quality of every action and interaction, improves the performance of *groups* of humans.

Together, these developments may be used to improve how we help students, of all ages, to learn and to create systems for learning that improve performance and reduce cost. Let us now review these two developments and, using that knowledge as a background, discuss the things that are wrong with current approaches to education and how to develop a strategy to correct them.

Bringing the Results of Brain Research to Education

Reuven Feuerstein's theory of structural cognitive modifiability (SCM) is based on scientific observations in brain research and cognitive psychology plus over fifty years of application in many cultures with many types of learners.[3] His methods change the way people use their brains. Feuerstein's approach makes you aware of how you are communicating with your brain. It is an entirely new experience. The SCM approach is so different from conventional education, that it can only be discussed after an experience with it. For that reason, I intend, now, to give you an experience in SCM.

Figure 2 The sky in September over Melbourne

[3] On December 29, 1998, a workshop on this theory, and its applications, will be given by Dr. Louis Falik, in Sydney, under the auspices of the Western Center for Cognitive Learning and Development. For more information, e-mail to: admin@ncgu.edu

Imagine, for a moment,that my Australian friend and I are outside in the evening, under a clear moonless sky, with thousands of stars visible in the black canopy overhead. We look overhead and see something like the above picture. Have you ever seen anything like Figure 2? I have been told that it is a common sight, here in the Southern Hemisphere. It is not visible to me when I am in San Francisco. People tell me that they recognize something called the "Southern Cross" in this image. I cannot see it. Can you?

My friend helps me isolate just a portion of the sky by using a low power telescope. He shows me this. Now do you see the “Southern Cross”?

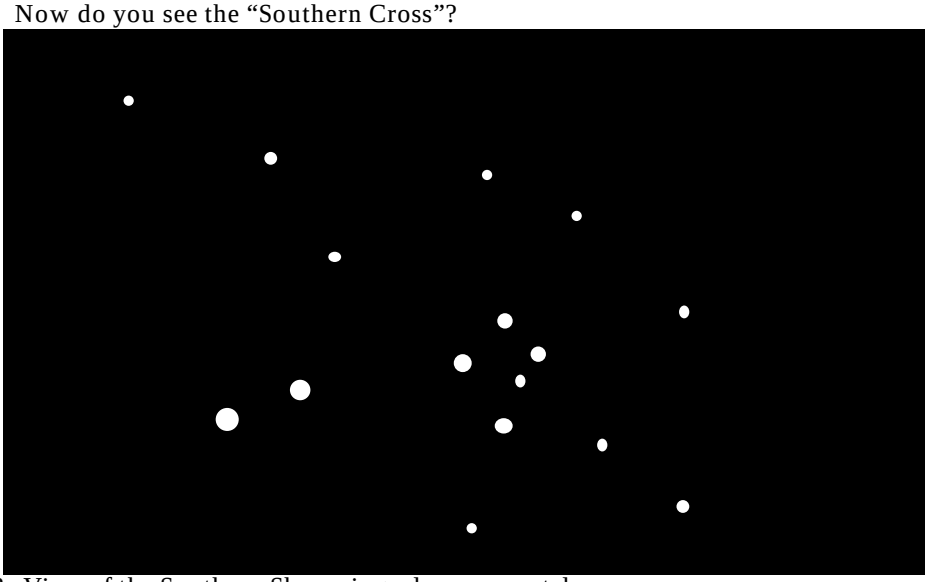

Figure 3. View of the Southern Sky, using a low power telescope.

I still couldn’t see it, so my friend told me where to draw lines in the next picture.

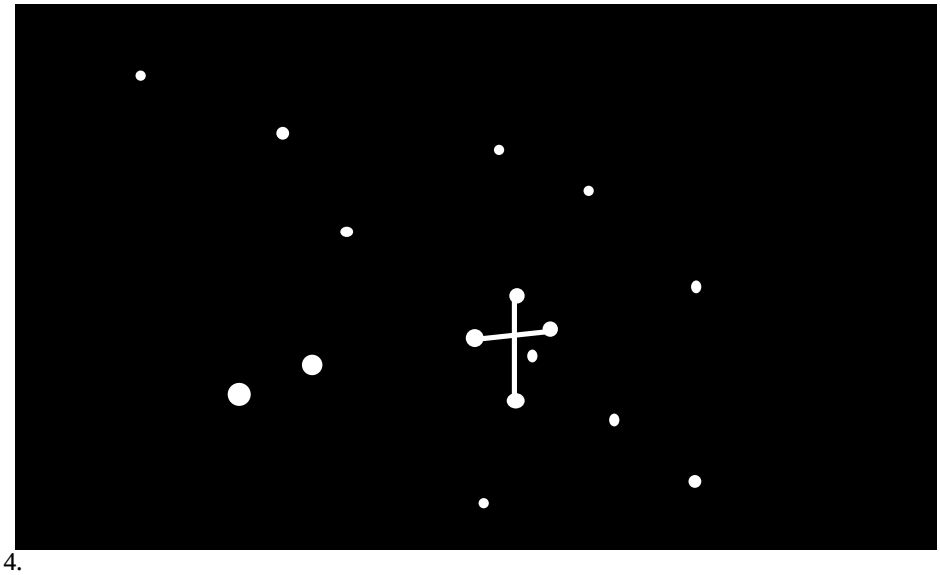

Figure 4.

Now suppose you were to go out in the evening with a friend who, like me, has never seen this constellation. How would you help him to see it? Remember that you cannot draw lines in the sky, as I did. How would you do it? What will you say?

Now I ask you this, "Is there really a Southern Cross in the Sky?" How is it that you can see something that is not there? What do you do with your brain that allows you to "see" it?[4]

A Little Test

The upper left frame of figure 5 shows a square and two triangles. Can you recognize these three shapes in the cloud of dots in the other three frames? The **rules** are these: 1) Use each dot only once. 2) Use all dots. 3) Figures are all the same size, but they may appear to be rotated. 4) Figures may overlap. 5) Do not rotate the paper; rely on your head to do the rotation.

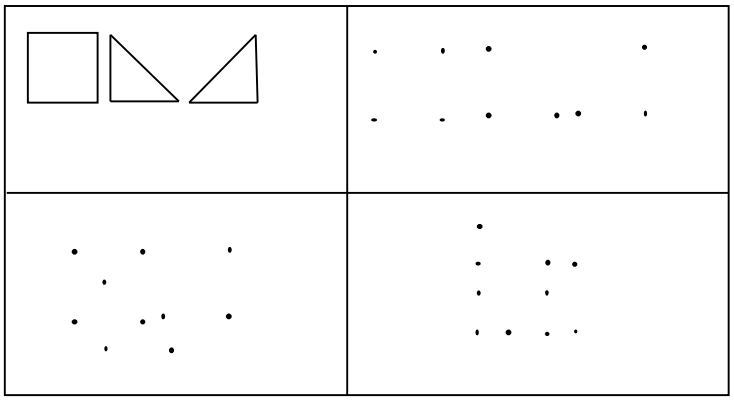

Figure 5

Because the shapes in Figure 5 are so easy to see, most people do not have much difficulty with the first two frames and, after awhile, most people can solve the last one. Now consider the four slightly more difficult tasks in the frames of figure 6.

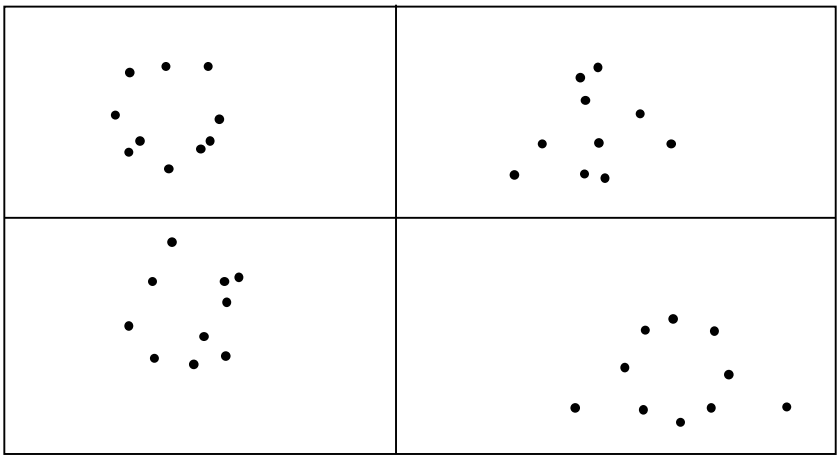

Figure 6

[4] It is always fascinating to me to know that you see things that aren't really there, your friend cannot see them and you think *he* is the one who needs help!

In this exercise we are not interested in whether you can find the three figures. The question is: “Do you know **how** you do it?” Or if you cannot, do it, “Do you understand **how you are trying** to do it?” The whole objective of the exercise is to help you to understand how you are trying to use your brain.

Some people stare at the dots until the image they seek seems to just leap off the page. They tell me that they do it without thinking. That's fine. Go ahead. Put your brain on auto-pilot! That's how we recognize many objects, such as the face of a loved one. But what do you do when the auto-pilot doesn't work? If you rely upon solving problems without thinking, what will you do when thinking is required? People habituated to solving problems either through memory or just "knowing the answer without thinking" are easily frustrated and become discouraged. They often give up and convince themselves, "I can't do it."

How much of current education is devoted to teaching students how to ‘know’ the answer without actually thinking?

Some Elements of the Theory of Structural Cognitive Modifiability

Through the previous little exercises, I trust that you have learned that *your brain has a mind of its own!* The challenge in learning to think better is to become aware of how you interact with your brain. Through the theory of structural cognitive modifiability, you can learn how to gain mastery over your brain and how to get it to do more of what you want it to do. More importantly, with the proper training, a teacher can help you to gain a better understanding of how your brain works and through this understanding, greatly improve the intelligence with which you approach all types of learning.

The theory of Structural Cognitive Modifiability has several basic postulates.

1. The brain is infinitely plastic. It can be modified even if damaged by accident, age, drugs or failure to be developed in childhood.

1. The brain functions by calling upon structures, already in place, to allow it to build new structures when needed. "Learning" consists of the creation of *cognitive structures*. Missing structures can be identified and corrected. The absence of certain key structures can be fatal to a learner’s development.

2. Learning disability is due to the absence of required cognitive structures. Faulty or absent structures may be replaced at any age. You are, literally, never to old to learn.

3. Through the "Learning Propensity Assessment Device", a trained mediator and a learner, working together, can identify missing or faulty structures and remedy them.

4. Instrumental Enrichment, that is intellectually enriching experiences provided through specially designed *instruments*, may be used to enhance learning.

5. New structures are created only in response to a *felt need*. There is always an emotional component in every aspect of learning.

Let me close this topic by mentioning a few successes obtained SCM. It is well known that Down syndrome is caused by chromosome damage. The result is that Down syndrome children have an odd appearance. In addition, their tongues are often too large for the mouth cavity and they cannot speak. The combination of inability to speak and an odd appearance has caused people to treat them as though their brains were afflicted, too. However, Reuven Feuerstein's evaluations of Down syndrome children indicated that they have brains that are quite as good as children who do not have this syndrome.

The next picture shows an Israeli soldier who was born with Down syndrome. He has had extensive surgery, which shortened his tongue and changed his facial appearance. He now leads a normal life, thanks to Dr. Feuerstein's intervention through cognitive modifiability.

Figure 7. Israeli soldier, born with Down syndome

The next picture is even more dramatic. The young boy with me in the picture below had a brain operation when he was around two years of age. To save his life it was necessary to remove half of his brain.

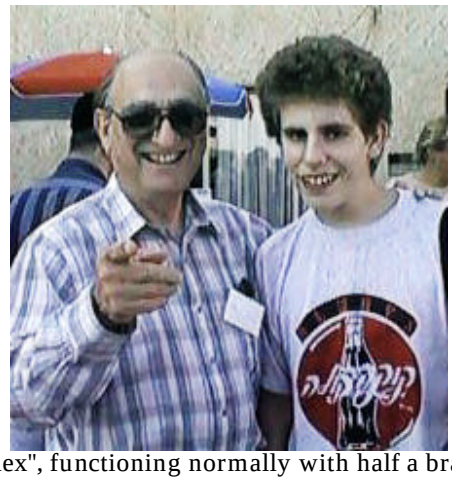

Figure 8. "Alex", functioning normally with half a brain removed.

Through the theory of Structural Cognitive Modifiability, the remaining left half of Alex's brain has been taught to take over the functions normally assigned to the right half. When I last met Alex he was learning to speak, read and write Hebrew, which is not his native language. He was also helping to mediate the learning of Down syndrome children at Dr. Feuerstein's center in Jerusalem.

There are references at the end of this essay, which may be used to learn more about the theory of structural cognitive modifiabilty.

Experiences with the Application of SCM

So called "normal" people can profit from SCM. Before the teaching/learning process was modified, the Israeli Aircraft Industry (IAI) required 18 months to train flight line technicians and only achieved a 50% pass rate for the licensing examination. After changing the approach, to

follow Feuerstein's methods, the IAI achieved a 90% pass rate with only *eight months* of instruction.

In Israel it was decided to use Instrumental Enrichment (IE) in a select number of Israeli high schools. Four years after graduation, these students were drafted into the Israeli Army where they were given a battery of "intelligence tests". The students who had experienced IE had scores that were significantly higher than the general population. These data are important, because they show that the effects of IE are permanent; they last. They reveal a genuine structural modification.

South Africa has an overwhelming problem as black people, breaking out of apartheid, apply to the University without a proper prior education. Professor M. C. Mehl, at the University of the Western Cape, has redesigned the entry physics class so that, with the same final examination, the flunk rate was reduced by 50%.[5]

One Large Scale Application of SCM in Education

In Taunton, Massachusetts, the Taunton Public School District adopted Instrumental Enrichment in 1986. By 1988, enough teachers had been trained and had "bought in", that formal instruction could begin.[6] In 1986 the Commonwealth of Massachusetts began a comprehensive program of testing all children in public schools. The results are analyzed for the entire state. Results for individual school districts are given to each district. In 1988 Instrumental Enrichment had just begun on a large scale in Taunton. The following figures show how the results for Taunton compare to the composite average used by the state. The data, up to 1992, were analyzed by Jane Williams and William Kopp.[7] The data after 1992 were added in a separate analysis.

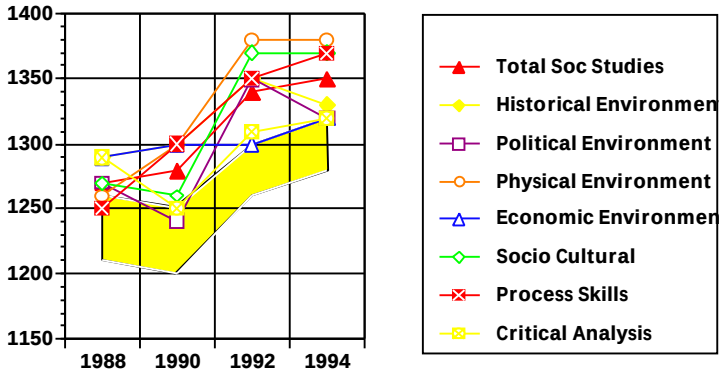

Figure 9. Improvement in social studies scores. The shaded band represents the comparison scores used by the Commonwealth, representing other school districts.

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[5]Mehl, M. C. "Mediated Learning Experience at University Level--A Case Study", Mediated Learning Experience (MLE) Theoretical, Psychosocial and Learning Implications Edited by: Reuven Feuerstein, Pnina S. Klein and Abraham J. Tannenbaum, Freund Publishing House, Suite 500, Chesham House, 150 Regent Street, London (1994)

[6] Jane R. Williams and William L. Kopp, "Implementation of Instrumental Enrichment and Cognitive Modifiability in the Taunton Public Schools: A Model for Systemic Implementation in U.S. Schools" in On Feuerstein's Instrumental Enrichment: A Collection (Meir Ben-Hur, editor) IRI/Skylight Publishing, Inc., Arlington Heights, Illinois (1994)

[7] Williams, Jane R. and Kopp, William L., "Implementation of Instrumental Enrichment and Cognitive Modifiability in The Taunton Public Schools: A Model for Systemic Implementation in U.S. Schools" July 1993 Hadassah-Wizo-Canada Research Institute, Jerusalem.

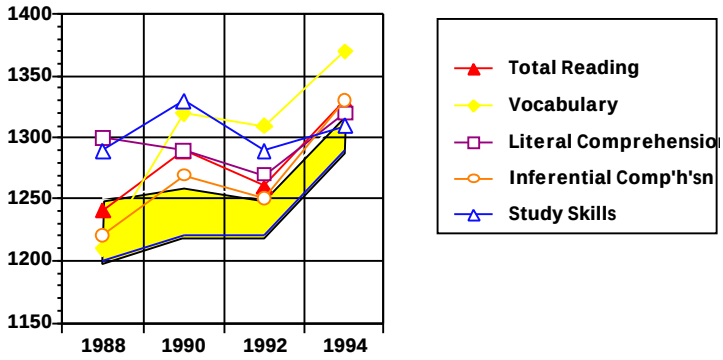


Figure 10. Improvement in reading.

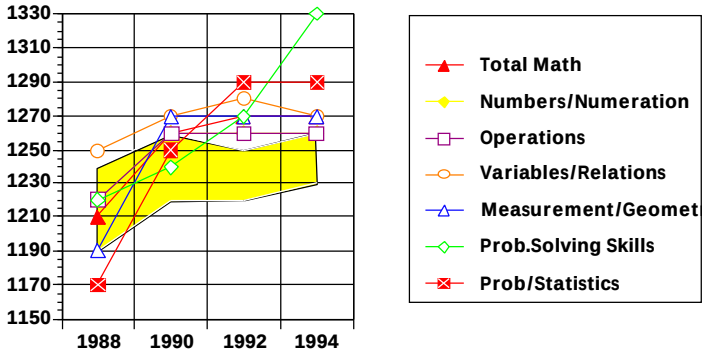


Figure 11. Improvement in Mathematics

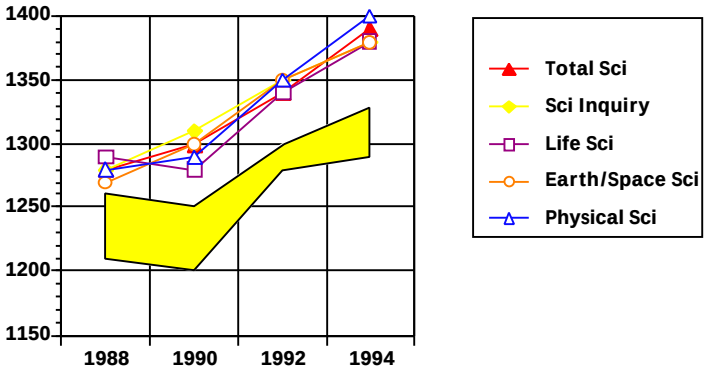
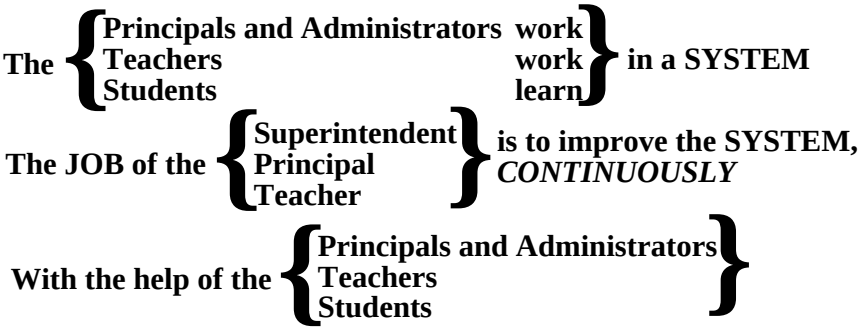


Figure 12. Results in Science

Full advantage of the fruits of brain research cannot be attained without making important changes in how the classroom is managed. Coordinated changes in the classroom cannot take place unless the method of management of the school is changed. The methods of management of a school cannot be changed unless the management of the entire school system is changed. There is, therefore, a link between the application of the theory of Structural Cognitive Modifiability and Quality Management.

Quality Management in Education

I have written on how to apply quality principles at all levels of education, from the national level[8], to the district[9], to the school[10] and to the classroom[11]. There is no need to repeat this material in this paper. In his presentation, later in this conference, David Langford will cover quality methods and philosophy in the classroom. Here I shall state only the broadest concepts as they apply to the redesign of the entire system. It begins with a new understanding of the job of any manager.



At all levels the job is the same, fix the system, not the blame. Teachers should improve learning systems, with the help of the students. Principals should improve school-wide systems, with the help of the teachers, students and *all* who must work in the system. Superintendents should improve district wide systems, responding to the needs of the people working *in* the system.

Only the people working IN the system know what is going wrong and creating waste.
Only the managers, working ON the system, have the authority to change it.

Success requires that everyone in the system speaks the same language and works towards the same ends. Only the top management can see that the training is provided, at all levels, to make this coordination and cooperating possible. When I say *all levels*, I include the students, too. David will elaborate on that concept. David was the first teacher to understand and deliberately, knowingly, apply quality management principles in the classroom, by teaching his students the tools of quality management. Together they set about improving their teaching-learning system.

One Thing to Do—Starting Tomorrow

If there is one thing about the current system of management of education which I would like to see changed, it is the way the top managements relate to the people who work in the systems for which they are responsible. I see and hear top managements say they want to encourage *continuous improvement*, but they do not know how to do it. It was never part of their training. They have no experience with leadership in continuous improvement. The following deployment flow chart illustrates one way to provide leadership to a district.

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[8] Langford, D. and Tribus, M., "Transformation of American Education" (Available on the internet at: http://deming.ces.clemson.edu/pub/den/deming_tribus.htm)
[9] Tribus, M., "When Quality Goes to School, What do Superintendents Do to Put It to Work" (same website as above)
[10] Tribus, M., "TQM In Education" (same website as above)
[11] Tribus, M., "Quality in Education According to the Teachings of Deming and Feuerstein"
"The Theory of Quality in Education"
Webb, Ivan "Quality Education at Riverside School in Tasmania" (all three essays are at the same website mentioned above)

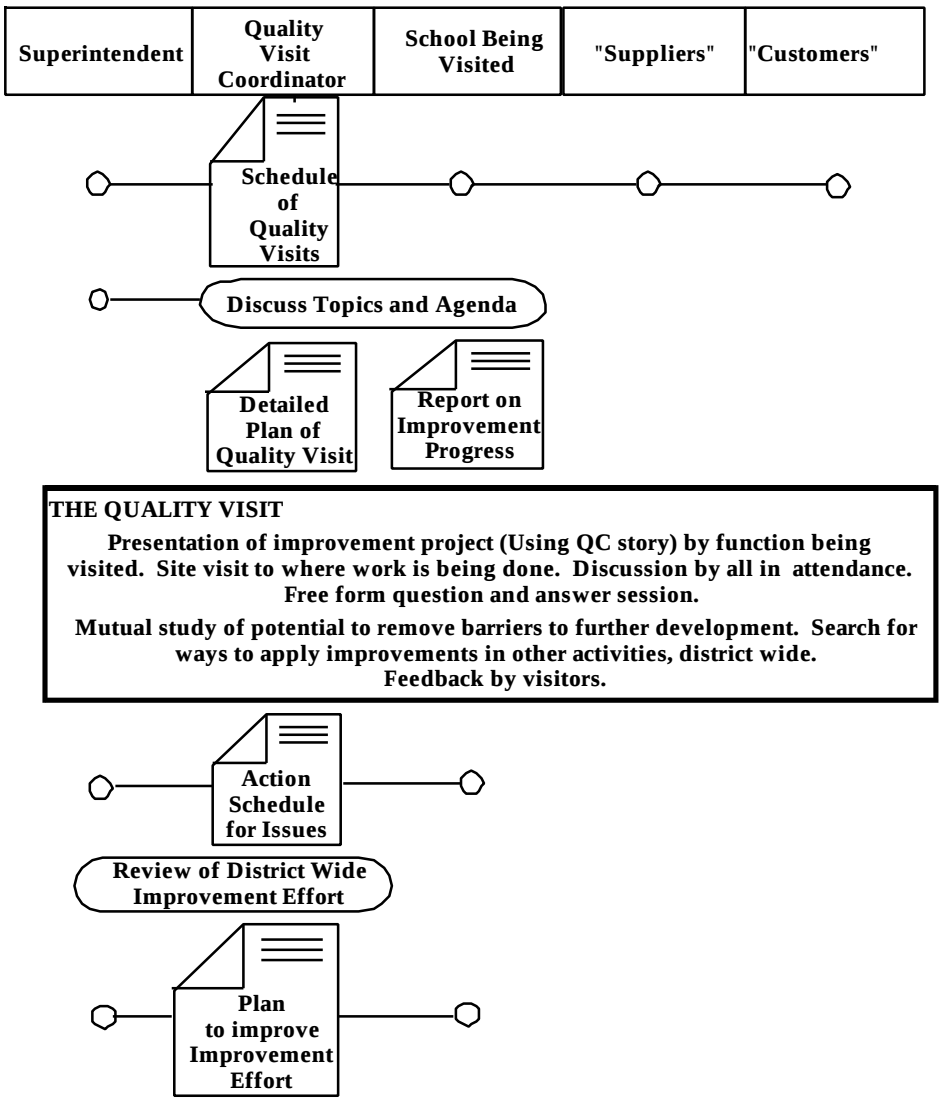

Figure 13 Deployment flow chart for a quality visit by top management to lower levels. Success depends upon the spirit behind the visit. It is not an *audit.* It should be a *learning opportunity for all participants.*

I have described, elsewhere, how a quality visit is conducted in industry.[12] The application in education is similar, for the need is the same. The people at the top need to understand how things are really working out at the bottom. The mine owners must visit the coal-face once in awhile, or they will not understand the realities of coal mining and they will not know the consequences of actions taken. *How* they conduct their visits makes all the difference in the world. The deployment flow chart, in Figure 13, shows an overview of a process. I would urge every high level administrator try this process, starting at once.

The most important concept about this process is the spirit behind the visit. The purpose is to ask the questions, "How's it going? What changes should be made in the system to make it go

[12] Tsuda, Yoshikazu and Tribus, M., "Planning the Quality Visit" (see website, cited earlier)

better?", "What have you learned here that can be used elsewhere?" The visit is not a disguised game of "Gotcha". The purpose is *learning for everyone in attendance.*

Reconsidering the System of Education

A little over a quarter century ago, the European Cultural Foundation sponsored a series of studies under the general title, "Plan Europe 2000". Volume 8, "Permanent Education", was written by my colleague, Dr. Bertrand Schwartz.[13] I urge anyone, who is at all serious about educational reform, to read this little booklet[14]. The Schwartz report makes several important points:

1. The entire educational system must be treated as a system. It is foolish to think that the education of a society can be improved by working on the parts of the system, independent of one another. The education begins at birth and ends only at death. Schooling is only one part of the system.
2. If democratic institutions are to survive, people must not be passive viewers of the changing scene. Today, too many people find they are not equipped to understand what is happening, and they give up trying. This presents a clear and present danger to democracy.
3. The instrument for survival is education, but this education should not be viewed as 'schooling' as we know it. When considering education as a system, we need to keep in mind that most learning occurs *outside* the typical classroom.
4. It is not possible, in the first twelve to sixteen years, to equip everyone with the education they will need for life. Therefore, it is essential, if the succeeding years are to be devoted to 'permanent education', to make learning to learn, and the enjoyment of learning, priority considerations in the early years.
5. Unless every child is taught, at the earliest possible age, to become a co-manager of his or her education, and to become competently responsible for the design of his or her own education, the entire system will fail. The adult education system relies upon citizens who are autonomous learners. If the system does not develop autonomous learners, adult learning opportunities will not be grasped by the people for whom they were intended.
6. The principle of equality of opportunity means that any natural, econmic, social or cultural inferiority should be compensated as far as possible by the educational system itself. Making education freely available, however, does not suffice to ensure equality of opportunity. The prejudices of certain sections of the society (the lack of ambition even for very gifted children) must be compensated by universal application of the principles of orientation and guidance, which allows each individual to discover and transform his or her aspirations and talents.
7. Education can be the solution to society's need for continuous learning. However, democracy cannot survive if its educational institutions promote and exacerbate economic and social inequities, as now most of them do.

From the Bertrand Schwartz study, and from my own experiences in over 50 years as an educator, I conclude:

Unless some very fundamental changes are made in the educational system,
As we know it,
The vast majority of students will not develop a yearning for learning,
And continuous education will not take place.

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[13] Schwartz, Bertrand Permanent Education Martinus Nijhoff/The Hague/1974

[14] Alas, the publisher tells me the book is out of print. Copies should be available in libraries and permission to photocopy is easily obtained.

What is the Aim of the Educational System?

It would probably be better to ask, "What are the aims of the people who must support the educational system?" The more I dig into understanding the aims of people whose support is required, the more obvious it becomes that there exist some very fundamental disagreements among them. We can easily recognize two sets of aims. On the one hand there are people who see education as primarily a way for society to reproduce itself, to insure continuity. At the level of the family, it is, in the words of Reuven Feuerstein[15], "a way to cheat death." On the other hand, many parents, particularly immigrant parents, want to see their children become whatever they can be, to go beyond whatever the parents have been able to accomplish, even if it means relinquishing inherited traditions.

Because the setting of the aims of education is a *political* decision, the best that any one person can do is propose an aim and attempt to rally supporters to it. In that spirit, therefore, I offer the following statement of purpose:

The proper aim of education should be:
Prepare people to live and prosper
Now and in the future.

All components of the Educational System should support this aim:
Continuous learning from the beginning to the end of life.

Developing A Vision of Education for the Future

We could spend a great deal of time discussing what is wrong with education today, but this would not only be unfair it would be useless. It would be unfair because I believe that the education I received, and many of us received, was quite good for the world in which we have lived; it just will not be good enough for the world of tomorrow. It would be useless because we need to identify what we want and then discuss how to turn what *is* into what we think *ought to b*e.

When I was a young man, we used to judge a person's education by seeing how many different questions on different topics he or she could answer. We equated education with *knowing*. This made sense because we had a pretty good idea of the world into which young people would be going. That is no longer true.

In the future, we shall judge a person's education, not by how many answers they can give, but whether they know how to raise the right questions. Education in the early years should focus on teaching students to raise important questions and then seek answers.

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[15] Reuven Feuerstein and Mildred B. Hoffman, "Intergenerational Conflict of Rights: Cultural Imposition and Self Realization" in Viewpoints in Teaching and Learning, Journal of the School of Education, Indiana University v58, N 1, Winter 1982

Criteria by Which to Judge Education

I suggest that any educational system be judged in four categories:

1. **Knowledge**… which allows us to understand.
2. **Know-How (or Know-How-To-Do)…** which enables us to put our knowledge to work.
3. **Wisdom**… which enables us to decide whether, where, or when to do it.
4. **Character**… which makes us decent human beings, fit to live nearby.

Once we free ourselves of the notion that during the years of schooling, we have to teach each child everything needed for a lifetime, we can turn our attention to setting the priorities for the first dozen years of schooling. We recognize, as Bertrand Schwartz has written[16], that there are at least six phases of education:

1. Preschool
2. Grammar or Grade School
3. Intermediate School
4. High School
5. University
6. Adult Education

It is Schwartz's opinion, and I agree wholeheartedly, that these six phases of education should be *designed* together, and that choices made about priorities at one level should be made with knowledge of what occurs at the other levels. Taken together they constitute a *system*. What happens in one part is greatly influenced by what happens in the other parts.

While preparing this essay, I decided to explore the situation with regard to this *system* and how educational authorities regard it. Thanks to the Internet, I could investigate the public statements of the U.S. Department of Education and statements by many of the fifty states and the territories. Some, like my own state, California, have a book of statutes over a thousand pages long. There were statements in this book about every level of education, as described above. But nowhere in the publications of the California Department of Education, could I find a single statement that regarded these levels as part of a *system*. The different activities are monitored and funded as separate autonomous units, sharing only a competition for the available funds.

The Challenge is to Decide What to Leave Out!

It is clear that we cannot teach *everything* at the early levels. What is taught at one level should be presented with due regard to what will follow. In deciding among possible topics, these criteria may be used:

Love of learning…

If children are to grow up to become responsible managers of their own education and to participate in society as learning adults, they must not encounter experiences that make

[16] Schwartz,*opus. Cit.*

them fear and avoid education at all costs. If we are to produce generations, who have a love of learning, then the way we run our schools must change.

Competency…know-how

Some competencies are essential to all other aspects of education. They include:

Ability to speak	Ability to listen
Ability to read	Ability to write
Ability to reason	Ability to plan
Ability to learn, alone	Ability to learn, in groups
Ability to work and play in groups	Ability to create mental models and to test them against reality

Subject matter…knowledge

Some subjects have a necessary hierarchy. Mathematics, logic, science, technical subjects require that some topics be introduced before others.

Other subjects, such as literature, history, and most of the social sciences do not have such a hierarchy. It does not really matter if you read Mark Twain before or after Shakespeare. You can begin the study of history anywhere.

In the early years, it is important to include only topics that will be essential in the later years, relying on the later stages of education to provide other topics.

Choices about subject matter should be made primarily as they enhance the competencies of the learners and provide joy in learning. (Specific methods for accomplishing these aims will be treated later in this essay)

These criteria cannot be meaningfully applied unless the entire system is treated as a system and the people in the system see how they connect to the rest of the system.

Creating a Love of Learning

There are some who believe that much of learning is, of necessity, boring and unpleasant, but that people have to get used to doing things they do not want to do. "That's life", so they say. Monta Akin, of the Leander Independent School District in Texas, sent me the following list of popular myths that stand in the way of creating a love of learning:

1. *Learning is not enjoyable. If students are enjoying learning, then they must not be learning much.*
2. *Serious learning only occurs with students in isolation from each other, especially when there is competition.*
3. *If more and more students are 'achieving', the standards must be getting lower. Because it is impossible to raise standards **and** have increasing numbers of students achieving those standards.*
4. *Students must be enticed to achieve. Without rewards or consequences, students will set low standards and take the easiest path to completion.*
5. *There is a way a proper school looks. It has teachers teaching and students passively listening.*

When I speak of "Joy in Learning" I refer to that existential pleasure that comes when you discover that you really understand something. For many subjects it requires hard, sustained effort to achieve this joy of accomplishment. Lee Jenkins, Superintendent of Schools of the

Enterprise School District, Redding, California, has developed run charts and statistical studies to monitor the decline in the "Yearning for Learning" in his school district. He demonstrates, with data, what many of us have understood in a qualitative way: Children enter school eager to learn but by the fourth grade this eagerness has been driven out of them[17]. The following photograph, taken at a demonstration session of fifth graders teaching third graders, in Leander, Texas, illustrates what I mean by joy in learning.

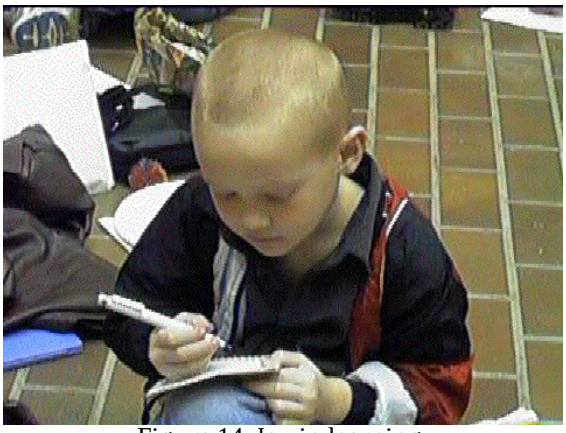

Figure 14. Joy in learning.

Eliminating barriers to Love of Learning

The first and foremost barrier to love of learning is the insidious and almost universal practice of comparing the students, one against another, of 'grading on the curve'. This practice dooms half the class to the status of "below average" and always destroys self-esteem. The quality movement has much to teach us here, for through the principles of quality management we can teach students and teachers, alike, to use standards of excellence as a guide to learning. Instead of comparing students against one another, they should be taught to compare their own performance against agreed upon standards of excellence. David Langford has much to say, based on extensive experience, about how students will always demand more of themselves than teachers are ever able to coax out of them.

A second barrier has been identified in a UNESCO report of over a quarter of a century ago[18]:

> *It is illusory to expect that a bureaucratic system estranged from real life should conceive that the school should be made for the child, and not the child for the school. It is useless to expect of a society based on the authority of a few and the obedience of the rest that it should develop an education of liberty. And how can one imagine a society made up of privileges and discriminations developing a democratic teaching system?*

As we all know, decisions about education are necessarily *political decisions* and as such reflect underlying values. The fact that I selected the above statement tells you something about my values. I believe that one of the most important functions of education is to give every child a good chance to develop his or her faculties to the fullest. This means, among other things, that if a child comes from a background, which lags the rest of society, intellectually, economically or socially, it is the business of education to rectify this; to provide *equity*. Therefore, in the earliest stages of learning, it is essential that the schools not treat everyone the same, but rather the teachers should identify those learners who are lacking in essential cognitive competencies and devote resources to correcting them. Not knowing how to learn is a barrier to joy in learning. It can be overcome by using Feuerstein's system of Instrumental Enrichment.

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[17] Jenkins, Lee Improving Student Learning ASQ Press, 1997

[18] E. Faure et al. *Learning to Be,* Harrap, London (1972)

A third important barrier to creating a love of learning is the use of extrinsic motivators, either rewards or threats of punishment. Alfie Kohn has written so extensively on this topic[19], that I shall not belabor it here.

In my opinion there is too much emphasis on standardized testing as a means of assurance of quality. In industry we learned long ago that testing at the end of the line does not improve quality. It just encourages waste. Vygotsky said it long ago: "The only legitimate excuse for an examination is for the benefit of the learner to decide what to do next."

The most important aspects of education cannot be tested with pencil and paper, or even on a computer. In the end, what matters is what people do in real life situations. The highest ranking scholar at the military college may not be the best leader on the battlefield.

Brain research supports what thoughtful teachers everywhere have long known. There is no such thing as a fixed characteristic called an IQ. What is measured on IQ tests can be improved for anyone. Now that I have spent several years studying Feuerstein's theory of Structural Cognitive Modifiability, I have come to regard IQ tests as one of the cruelest hoaxes ever perpetrated upon helpless children. Its continued use is nothing less than a crime against

Competencies

In 1991 the United States Department of Labor issued the SCANS report[20], defining the competencies industry seeks when it hires personnel. This report defines basic types of skills, which support necessary competencies.

The Basic Skills

Basic Skills--reading, writing, arithmetic and mathematics, speaking, and listening

Thinking Skills--thinking creatively, making decisions, solving problems, seeing things in the mind's eye, knowing how to learn, and reasoning.

self-management and integrity.

The necessary competencies were described as *Workplace Know-How*, or competencies effective workers can productively use.

Competencies

Resources--allocating time, money, materials, space and staff;

Interpersonal Skills--working on teams, teaching others, serving customers, leading, negotiating, and working well with people from culturally diverse backgrounds;

Information--acquiring and evaluating data, organizing and maintaining files, interpreting and communicating and using computers to process information;

Systems--understanding social, organizational, and technological systems, monitoring and correcting performance, and designing or improving systems;

Technology--selecting equipment and tools, applying technology to specific tasks and maintaining and troubleshooting technologies.

Personal Qualities--individual responsibility, self-esteem, sociability,

[19] Kohn, Alfie, Punished by Rewards : The Trouble With Gold Stars, Incentive Plans, A'S, Praise, and Other Bribes Houghton Mifflin Co Paperback Reissue edition (January 1995)

[20] What Work Requires of Schools. A SCANS report for America 2000 The Secretary's Commission on Achieving Necessary Skills, U. S. Department of Labor, June 1991

In an addendum to the original SCANS report[21], the Department of Labor has identified the following changes as desirable for K-12 education:

- Teaching should be offered "in context", that is, students should learn content while solving realistic problems. "Learning in order to know" should not be separated from "Learning in order to do."
- Improving the match between what work requires and what students are taught requires changing how instruction is delivered and how students learn.
- High performance requires a new system of school administration and assessment.
- The entire community must be involved.

When I first heard of the commission my reaction was: "We in education are not in the business of furnishing cannon fodder for industry." But then, as I read the report, I began to realize that, although the requirements may have been framed by people from industry, they represented competencies that are necessary for life, in or out of industry. People who have studied quality methods applied in the classroom, as taught by David Langford, will immediately recognize that the list of competencies defined in the SCANS report will be developed naturally and easily by using quality management methods in the classroom. Since David is speaking at this conference, I do not feel a need to elaborate on his methods of quality learning.

Workplace competencies in the SCANS report do not address the arts, literature, music and drama. For most people they are not essential to earning a living, but they are essential to *making the living worthwhile.*

Curricula

If we are going to travel across a desert, we will take along a good supply of water. Of course, if there are plenty of watering stations along the way, we need take much less. Instead we need only to know how to recognize these stations and how to obtain water from them.

So it is with the children we are educating. Along life's journey, if the educational system is properly designed, they are going to encounter many opportunities for education. It is therefore much less necessary to equip them with a life-long supply of knowledge. Instead we should equip them with the ability to learn and provide such joy in learning that they become learners for life.

To make it easier to manage and describe the process of education, institutions define a *curriculum*. The curriculum defines what the institution intends to teach the students. Curricula seldom refer to the four elements of education*: Knowledge, Know-how, Wisdom and Character*. Curricula generally only refer to the Knowledge they expect to give to pupils. If they refer to *know-how*, they generally refer to things the students will know how to do *in class.*

The existence of curricula raises the question of what to include and what to leave out. This question has spawned countless debates for many years.

On the one hand there exists an organization, called the "Core Knowledge Foundation"[22] This Foundation publishes books with such titles as '"What Your Kindergartner Needs to Know" and "What Your First Grader Needs to Know". The Foundation also publishes reports and analyses of the need for a shared cultural literacy.

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[21] Learning a Living: A Blueprint for High Performance" April 1992, U. S. Department of Labor.
[22] The Core Knowledge Foundation, 801 East High Street, Charlottesville, VA 22902 (e-mail: coreknow@www.comet.chv.va.us)

The presentations by the Core Knowledge Foundation are very persuasive. They represent the view of education subscribed to by most adults. For most parents, education consists of moving ideas from the minds of adults to the minds of children. By exposing children to the best thinking of previous generations, it is believed that the children will thereby have a head start in life; they will be able to stand on the shoulders of those who went before. This belief represents the way most of us were taught. We are comfortable with it. It makes sense. That is, it makes sense until you test it.

The difficulty with this approach to the pre-packaging of things we want our children to know is in the following quotation from a Core Knowledge newsletter.[23]

> "How well I remember reading *Silas Marner* when I was 16 and thinking that it was a bore; but thirty years later, I read it and wept."

In a nutshell, that is the problem. The *product* is fine. Appreciation of *Silas Marner* is a desired outcome. It is the *process* that is at fault. Students often find pre-packaged knowledge a bore.

The Prepackaging and Delivery of Knowledge Does Not Work!

I urge you to look at the research done with the support of the Annenberg Foundation. Researchers at Harvard University and the Smithsonian Institution set out to examine how much, of what they had been taught, students actually understood and could apply outside the classroom. In a three part video series, "Minds of Our Own", they examine the responses of learners at all levels[24]. In the video tapes you will see for yourself that even graduating seniors at MIT had not understood some of the most fundamental things they were taught. The teachers were good. The students were 'good'. What is at fault is the basic philosophy by which they had been taught; the belief that learning follows from teaching.

For example, when given a battery, a piece of wire and the lamp from a flashlight, many of these graduating MIT seniors couldn't figure out how to light the lamp! When shown a piece of wood and asked, "Where did the carbon in this wood come from?" most of them did not know and when told it came from carbon dioxide in the air expressed disbelief. After so much publicity about the greenhouse effect and the consequences of deforestation, you would have thought they would understand photosynthesis. I am confident they had been taught about photosynthesis. They could probably have answered many questions about photosynthesis on a test. But they didn't know how to relate what they had been 'taught' to reality.

You do not have to watch the video to test the assertion that our children are not learning what they are taught, even if they score well on standardized tests. Ask high school students this question, "Where does the Sun go when it sets?"

The Core Knowledge Institute maintains a website at which you can download lesson plans. The few that I have looked at are well done. They are interesting and represent, probably, the best that can be done with that philosophy of education. Certainly these lesson plans, if adopted, will improve most schools. But they are based on the same myths that are discussed in the Harvard-Smithsonian research in the videos, "Minds of Our Own". They are concerned with what and how to teach; not how learning actually occurs.[25]

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[23] Common Knowledge, A Core Knowledge newsletter Vol. 9, No. 1/2, Winter/Spring 1996 reprinting an article by Diane Ravitch.

[24] You may view a ten-minute extract from the video series by going to this website: http://www.learner.org/collections/mathsci/teachers/mooo/moooprice.html

[25] In the one lesson plan devoted to teaching children about learning, the approach treats learning styles as traits, not as changeable states, thus reinforcing views of learning which, at the least, should be presented as tentative and subject to critical analysis. (Go to this website to see what is in this lesson: http://www.coreknowledge.org/CKproto2/resrcs/lessons/398Brain.htm)

Another source of evidence regarding the failure of the existing approach to education comes from the research of my friend, David Hestenes, of Arizona State University. He examined the naïve beliefs about Newtonian physics, held by entering undergraduates. He then tested whether these beliefs had been changed by exposure to conventional, *good* physics instruction. Over 40% of the students had not changed their understanding. He then changed the method of instruction to put the burden of investigation and interpretation on the students. The changes in understanding were dramatic and are described in a report available from the internet.[26]

The strength of the Core Knowledge Foundation's argument lies in their assertion that, as a nation, we need to have a shared culture and a shared understanding of our heritage. The question arises: Who decides on what this shared culture should be? The fact that it was agreed upon by the *elite,* does not necessarily tell us that it is what the country requires.

In an attempt to get around this difficulty, Joel Barker, who is a futurist and whose lectures, books and tapes on paradigm shift are well known, developed the "EFG Curriculum"[27]. (Environment, Future, Global). In this curriculum, the subject matter has been reorganized so that if the students work in the three areas, E, F and G, they will have covered most of the *core* subjects. The learners are expected to engage in *projects* requiring them to study subjects *in context*. For example, if they are working on a problem involving improving the local environment, they will need to study science, and the included mathematics. They will also need to study economics and politics. The objective is to make the subjects *meaningful* to the students. The objective is to build on this principle: *You learn best when you feel the need to know*. To help the students dig out what they need to know, relevant materials from the 'core subjects' are made available on CD roms. One of the purposes in the EFG Curriculum is to develop the students' capacities to frame questions and to seek out answers. This capability is not developed by prepackaging the information. The EFG Curriculum, it seems to me, is a step in the right direction.

Marion Brady[28] proposes a more drastic reaction to the fragmentation caused by the curriculum/subject matter approach. Brady's approach is consistent with what we have learned from brain research. As the little experience with the dot patterns illustrated, you have within you many cognitive structures, which you use, but are not aware that you use them. When you become aware, your ability to use them improves. Brady claims that as soon as children learn to speak, they begin to form basic structures, which permit them to create *relationships.* These relationships are constructed out of their every day experiences, mediated by an adult. Brady's approach, thus, is very much in tune with Feuerstein's concept of Mediated Learning Experience (MLE). Brady argues that the structure which the child first develops, is a universal structure. Although he does not say so, a study of what he does reveals that he is using the same overall framework, illustrated in the following diagram originated by Feuerstein.

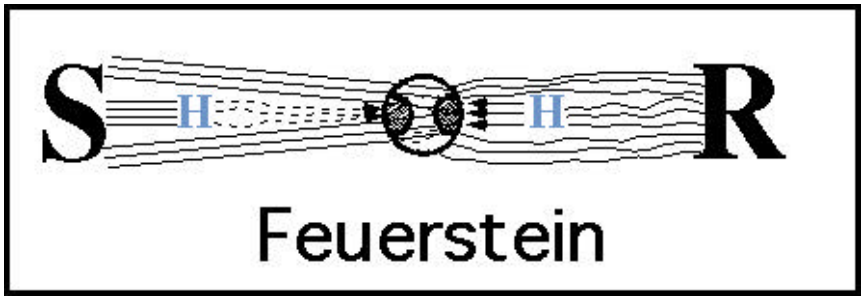

Figure 15

[26] His paper, "Modeling Methodology for Teachers" is available at this website: http://modeling.la.asu.edu/modeling.html

[27] The Learning Collaborative, EFG Curriculum Collaborative, EFG Educational Resources, P.O. Box 14485, Scottsdale, AZ 85267-4485. (http://www.efgedu.org)

[28] http://ddi.digital.net/~mbrady/index.htm His e-mail address is: mbrady@digital.net

Brady uses different words, but the ideas are the same. The learner, pictured in the center, is subjected to stimuli, denoted by the "S". A warm human being, denoted by the "H", inserts himself between the stimuli and the learner and while not shielding the learner from all the stimuli, helps the learner to interpret the stimuli by moderating some of them. The learner attempts to make sense out of the situation and then makes a response (Feuerstein vocabulary) or a *relationship* (Brady vocabulary). The mediator (teacher, mentor) also inserts himself between the learner and the response, reflecting it back to the learner, with some modification, to help the learner understand and appreciate what the learner has done.

This is the process which supports all learning and it provides a framework for the study of any subject.

A difference between Brady and Feuerstein is that whereas Feuerstein concentrates on what is happening inside the learner's head, and creates cognitive maps and other guides to relationships among cognitive structures, Brady analyzes the structure of the stimuli and responses. Brady's analysis is very general and allows the learner to comprehend all areas of the sciences and social sciences in a consistent way, but more importantly, allows the learner to construct his or her *own set of relationships for any situation*[29].

The Brady approach to helping students become aware of the cognitive structures they already have, and strengthening them, involves 'hands on' experiences. They struggle extensively with the task of organizing their own perceptions of immediate, firsthand, here-and-now experience. Immediate experience, he argues, is so rich and varied that not only is the student able to construct from his or her analysis a comprehensive, permanently useful thought model of reality, he or she can find in it illustrations of and introductions to every major concept of every academic discipline.

To give the students a sense and an appreciation for history, for example, they might be asked, first of all to discuss with their parents and relatives, what is known about their own family's history. Where did their ancestors come from? Why did they come? What did they know when they decided to come? What were the circumstances in the place they decided to leave? Are there newspapers and other printed records they can consult to get a feeling of what was really going on? What can they learn from books and novels of the period. If the students tell one another of their family histories they will develop a much richer sense of history than if they are told about it by an adult, with the understanding that they will later be tested to see if they 'got it'.

The challenge of making the implicitly known explicit--"making the familiar strange enough to see" -- is ordinarily more difficult for adults than for the young, so Brady has designed a self-study program for the use of small groups of educators and parents that walks them through the process in a series of 20 weekly meetings.[30]

The approach proposed by Marion Brady, is also consistent with the observations made by Bertrand Schwartz, a quarter of a century ago. In discussing the objectives of adult education, and preparation for the longer period of learning we anticipate for adults in the next century, Bertrand Schwartz had this to say:

> *It would consist of educating the public to look at daily life itself with new eyes, to consider daily life itself as, in a sense, a cultural object. This certainly presupposes teaching people how to look, listen, and observe. But it is also a question of attitudes towards others, taking an interest in their*

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[29] Brady, Marion What's Worth Teaching? Selecting, Organizing, and Integrating Knowledge. SUNY Press, Albany, NY, or Books For Educators, 17051 SE 272nd St., Suite 18, Kent, WA 38042 Phone: 1-888-777-9827 books4@oz.net

[30] Brady, Marion What Should We Teach? A Guide for Community Dialog SUNY Press, Albany, NY, or Books For Educators, 17051 SE 272nd St., Suite 18, Kent, WA 38042 Phone: 1-888-777-9827 books4@oz.net

> *customs or what they do, in their occupational fields or original activities, and, conversely, of finding pleasure in sharing skills, experiences and points of view with others.*
>
> *This would also mean that those places in which people exchange their time for products or services should be opened up to view. And are there not a certain number of lessons to be learnt from a factory, a bank, hospital, and even a prison, just as much as from a museum?*
>
> *The idea of culture would thus no longer be always related to what is past, exotic, rare or costly, nor to completed and catalogued works and, in any case, never to the manufactured thing in isolation from the individuals who made it.*

For me the choice among these three approaches is easy. If we give the highest priority to having students learn how to organize their own knowledge, to create relationships, to test their hypotheses against reality, and if we consider that we are preparing them to be managers of their education for the rest of their lives, then the approaches championed by Brady and Hestenes are best. We should not throw away the good work done by the Core Knowledge Group. In many fields of knowledge they have organized useful teaching materials. Instead of giving these guides to teachers, however, I would make them available to the students, to be used as a helpful hints to organizing what they need to know as they feel a need to know it.

To sum up: People learn best when they feel a need to know. When they are told to learn something because someone else, an adult, thinks they ought to know it, they do not learn well. As the videotapes I discussed earlier have demonstrated, they do not learn much beyond how to pass an examination. The comic strip character Peanuts has observed: "The difference between the F student and the A student is that the F student forgets five minutes before the exam and the A student forgets five minutes after."

Managing the Classroom to Develop Essential "Know-how's", as well as Wisdom and Character

David Langford's presentations at this conference will cover the essential competencies teachers should develop so they can help their students become independent learners. Among these competencies, the "Learning Matrix", which David has developed to a high degree of utility, becomes a central tool. The Learning Matrix makes visible to the teacher, the student and to others, what knowledge and know-how the student has developed. It puts the student squarely in charge of his or her own progress. It makes the student a responsible co-manager of his or her education.

Bertrand Schwartz made the case for this approach when he wrote:[31]

> *The opinion is frequently expressed that if work is boring this is not only unimportant but even essential, and that learning must be difficult and unpleasant. This is to confuse two ideas, that of boredom and that of effort. Of course, it is impossible to learn and educate oneself without making an effort, and demagogy is unacceptable here, but on the other hand boredom is certainly neither necessary nor useful. Means must therefore be found of ensuring that children do not become bored at school and, in order to achieve this, the child must be able to exercise greater freedom and greater responsibility. This is the basis for what we call education founded on freedom of choice.*
>
> *But this freedom of choice must at the same time be based on a "contract". For to allow a child to choose, in no ways means that he is allowed to do nothing, but that having allowed him, for example at secondary level, to choose subjects for specialization, he will be judged as much on his capacities to specialize in his chosen fields as on the personal behaviour and knowledge. In return for his liberty he must show results.*

[31] Schwartz, Bertrand, opus citus Pg. 47-48

> *This education, based on free choice and contract will underlie our plan as a whole and will have innumerable implications for the educational system…*

The concept of a contract, advanced by Schwartz, is realized in the learning matrix and the portfolio, which the student uses to demonstrate, document and defend his or her accomplishment. The details of the 'contract' are contained in the agreed upon levels of competence, how the student will defend, document and demonstrate that the agreed upon levels of competence have been attained.

In this paper, thus far, I have made the case for shifting the emphasis in the early years of education from the acquisition of a well defined body of knowledge to the acquisition of well defined competencies, from *knowledge* to *know-how*. This does not mean that students do not acquire knowledge; what it means is that we cannot be certain that what they *know* is what we thought they ought to know. Instead, what they decide to learn, will be based their own investigations of the lives they now lead, they want to lead and what appeals to them as worth knowing. The teacher, as a guide to this journey, can play a very important role in suggesting areas of interest. For a well educated teacher, this will be as natural as breathing. For a teacher who is not well educated, no amount of pre-packaging of information can create serious learners in the classroom.

The extensive use of *projects* inherent in the approaches promoted by Joel Barker, David Langford, Marion Brady, and David Hestenes, provides the opportunity to develop wisdom and character. *Good judgement comes from bad experience.*

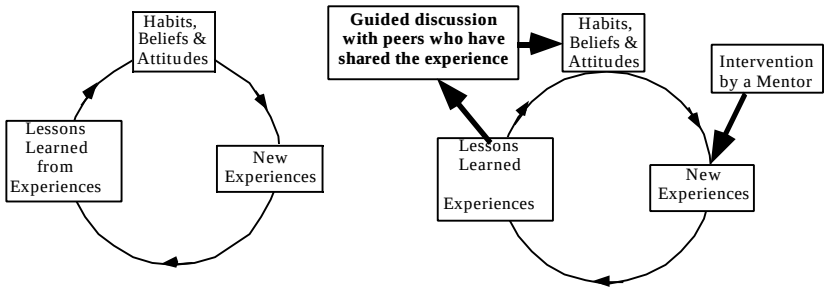

Figure 16. The beliefs and attitudes of learners depends upon a discussion with other learners regarding what transpired during a learning experience. Without this discussion, previous habits, beliefs and attitudes are unlikely to change.

It is essential to give students an environment in which they can "fail forward", that is, fail in such a way that they learn from the experience. The contrast between the left and right figures, below, describes the critical role played by the teacher, acting as a mentor/mediator, not a source of information, not the *sage on the stage.*

Without mediation, students will emerge from experiences without having changed their understanding of reality. Classically run projects are much like teaching people to swim by throwing them off the end of the dock. What you get is a residue of *non-sinkers.*

The guided discussion should include discussions of behavior with some concern for character development. Many helpful aids to these discussions can be obtained from the Josephson Institute, sponsors of the "Character Counts" program of education.[32]

The Southern Poverty Law Center also has a program of instruction which concentrates on teaching tolerance. My study of their program suggests that it also develops character. Workbooks and newsletters are available.[33]

We close this section with a quotation from H. Janne.[34]

> *School education will teach a young person to educate himself by means extraneous to the school and will, itself, lead him to assume independence. The school will no longer have an exclusive monopoly of education, and studies will no longer be confined within a particular place known as 'the school'.*

The Educational System Should Provide Social Equity

In an earlier section I remarked on the role educational systems have in providing *equity*. This has been a troubling problem in societies which have tried to care for their less fortunate members. For a number of years there have been "affirmative action" programs which were specifically aimed at redressing past grievances and at giving special advantages to those where considered to be "disadvantaged". However, these programs have come under attack because they have engendered resentment on the part of those who felt they were denied benefits they would otherwise have had. If there is a limit to the enrollment in a school, and some students are admitted on the basis of affirmative action, then someone in another group will feel discriminated against.

We are all aware that children do not come from homes of equal privilege. Some children come from horrible family situations, involving drugs, abuse, alcoholism, street gangs and much more. To announce that the educational system is "open to all on an equal basis" denies the reality of their existence. On the other hand, to admit them and treat them as though they had no handicap is equally unreal.

We remarked earlier that the current philosophy, born of bureaucratic administration, that the child must adapt to the school instead of the school adapting to the child is at the heart of the difficulty. At the same time, we must admit that most teachers and administrators *do not know how to adapt what they do to the needs of the child*. Only a limited number of "special education" teachers have been so taught. This problem has enormous consequences for the cost of education. Today administrators complain that they do not have the funds required to cater to so many disadvantaged children. Today such children are often found together, in schools which are grossly underfunded to meet even the needs of 'normal' children.

The Cost of Rework

My colleague, Ivan Webb, of Tasmania, has shared with me some of the data he has been collecting on the "cost of rework" in schools. This is the cost to the school system (not to mention society) of children who fall behind and become unable to learn. He has written to say that the top 10% performers in a school do not cost, they pay! In addition he suggests that the bottom

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[32] The Josephson Institute of Ethics provides study guides, for all levels of education, through their program "Character Counts". See their websites: www.JosephsonInstitute.org and www.charachtercounts.org

[33] Teaching Tolerance, 400 Washington Avenue, Montgomery, Alabama, 36104 FAX: 334 264 3121

[34] H. Janne and M. L. Roggemann,*New Trends in Adult Education: Comcepts and Recent Empirical Achievements* UNESCO, 1971 (Schwartz, opus citus, Pg 49)

10% performers consume as much as 80% of the resources of the school and, at the same time, hold back the other students.

The situation in most schools, today, is very much like the situation I encountered in industries about 15 years ago. In industries which have not learned the lessons of quality management the costs of rework were enormous. The costs of poor quality in industry occur as much outside of the factory as inside. For example, when my internet provider failed to design the system so that the signal strength at my computer is adequate, he must pay me for the months of poor service, he must pay for technicians to come to the house and fix things. However, I must also pay for not being able to connect and meet my obligations. As Dr. Deming used to say, some costs are unknown and unmeasurable.

In education the costs of not meeting the needs of the young learners is incalculable and will become even more so in the coming century. I am not just referring to those who are recognized today as having learning difficulties. I am concerned about those who are in the 'bottom half', who do not have any obvious difficulties, but perform at the minimum level. For them school is an experience in frustration. No matter how they try, they are told they are in the bottom half. They cannot wait until they can leave school; indeed, many of them drop out into gangs and lives of crime. Their costs show up on other budgets.

The first thing that can be done, today, is to adopt the practices and procedures advocated by David Langford, and others, and use quality management methods in the system, the school and in the classroom, wherever the opportunity arises or can be created. This approach will lift the performance of almost all teachers and students, right now. The cost of so doing is not very great. In fact, almost immediately resources, that are presently being used for supervision, inspection and rework, will be released. Whatever you have to do will be easier.

I asked Ivan Webb, Principal of Riverside Elementary School in Launceston, Tasmania, for evidence of the benefits of quality. He wrote:

> *As one teacher at Riverside Primary School in Tasmania commented, a year or so after quality was introduced into the school, "We don't' seem to have many of the problems we used to have"*
>
> *Quality principles do not require substantial change. One begins by applying them to improve what is supposed to be happening. Improvement is cheaper than change. Change is costly: it disrupts and competes with what is already happening. Improvement makes it easier for everyone to do well. This is how resources are released.*

UNTIL EVERYTHING IS HAPPENING EXACTLY AS IT SHOULD

RESOURCES ARE NOT THE LIMITING FACTOR*!*

> *It is fair and reasonable that teachers should also be experiencing the benefits of the applications of quality. It would be a travesty of the intent of this paper for the principles of quality to be applied in the classroom, while the traditional management methods, so widely used in schools systems around the world, continued to be used by school administrators. Classical managerial practices at the top will frustrate the teachers efforts to improve student learning.*
>
> *Are there benefits for teachers and the school and the school systems through the application of quality methods? Certainly! Riverside Primary School has rehabilitated three teachers who failed elsewhere and were at the end of their careers. The school, with more than 600 students, applies more than 97% of the school time of its professional staff (including the principal and senior staff)*

in teaching children. This happens despite the school having the highest pupil:teacher ratio in the state system in Tasmania. Stress levels in the school are much lower than in the vast majority of other schools. Quality works for everyone, not just the children.

The implications are:

If you are a teacher, apply quality methods in your classroom

If you are a principal, apply quality methods to the operation of your school

If you are an administrator, apply quality methods to your tasks.[35]

Transforming the System of Education

The transformation of any system so that it operates under a different paradigm than the one that was used to construct it, is difficult at any scale. When we consider the transformation of a system as large as the educational system, and keep in mind how it has been managed for centuries, the challenge appears particularly daunting.

The transformation will not be tidy. It will not occur in a controlled manner. The change will be evolutionary, for it has many of the aspects of the chicken and egg conundrum. For the change to take hold, a generation of adults, educated by the new methods, must form a constituency which will whole-heartedly support the change.

I expect the changes to take place regionally, small regions having the advantage. These regions, as small as a school district, can make the changes without significant increase in funding. The small amount of data accumulated by Ivan Webb, for example, at his school in Launceston, Tasmania, suggests that when implemented the costs will be *less*, not more!

If the changes take place at a local level, it will be because someone in authority decided to become a leader. My definition of a leader is simple:

A leader persuades people to do what they would not otherwise do. The leader takes them to places they would not go by themselves. A leader creates new systems within which people can achieve goals to which they and the leader aspire.

I have written elsewhere on the eleven links which must be present in the chain of transformation and will not elaborate on them here.[36] The most important links in the chain are

- Leadership…without leadership, nothing happens
- Management…by policy, not by command.
- A well articulated aim…so people know what is to be done
- An inspiring vision…so people will want to follow the leadership

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[35] See "The Contributions of W. Edwards Deming to Education" at this website: http://deming.ces.clemson.edu/pub/den/deming_tribus.htm

[36] "Elven Links In the Transformation of An Enterprise to Make Quality the Strategy for Success" may be downloaded, free, from this website: http://deming.ces.clemson.edu/pub/den/deming_tribus.htm

There are other important links, such as education and training, the development of a constituency, communication, consistent rewards, and a strategy for the transformation. There isn't sufficient time or space here to elaborate on these links.

In my opinion, the most important first step is for those who understand what I am talking about and who believe in the vision I have presented, to act on the principle: *It is easier to obtain forgiveness than to obtain permission!* Wherever you are in the educational system, you can learn the things you do not already know and you can apply them wherever you are. People who do not have your sense of initiative and urgency can learn from your experience. The transformation of the system will not be a tidy experience; accept that and go forward.

Secondly, I hope that somewhere, there will emerge leaders who are in positions of authority and who will undertake to study the national or state level system of education, *treating it as a system*, and developing policies which will move the system towards the future. If the people who control budgets will only make these studies, they will be able to create change for the simple reason that *the budget is the policy*.

I urge you to keep in mind the words of Robert Gordon Sproul, President of the University of California, a half century ago, who said: *Youth must be served in its day, or not at all.*

References for Learning More

About the Theory of Structural Cognitive Modifiability

In the USA the principal source of books, tapes and consulting on Instrumental Enrichment (IE), Mediated learning experience (MLE) and the Learning Propensity Assessment Device (LPAD) is an organization called IRI/Skylight (IRI = International Renewal Institute). You can reach them at:

IRI/Skylight Training and Publishing Company, Inc. 2626 S. Clearbrook Drive Arlington Heights, IL 60005 Tel: (800) 348 4474 or (847) 290 6600 FAX: (847) 290 6609

Another resource, in the USA, is

Quality Learning Systems International (QLSI) 4950 W. Dickman Road, Suite B-3 Tel: (800) 379 2322 or (616) 965-6339 FAX: (616) 965-6620 Linda Borsum is the President and can be reached at Lborsum@aol.com

QLSI maintains a homepage on the world wide web which contains information about Feurstein's work. Their web page is at: http://www.qlsi.com

IRI/Skylight also maintains a homepage on the world wide web, with information about Feurstein's work, including, for example, a discussiion with Martin Skuy, from South Africa, who is using IE to help ease racial tensions. Their web page is at: http://www.iriskylight.com

In London, the Binoh Centre, Norwood house, Harmony Way (off Victoria Rd), Hendon, NW4 2BZ, London can be reached at 0181 203 3030. Ask for either Rachel Slacks or Ruth Deutsch.

Negotiations are underway to establish a distribution center in Australia.

IRI and QLSI both also have an extensive catalog of materials on various approaches to improved learning. Among them are:

"On Feuerstein's Instrumental Enrichment", a collection edited by Meir Ben-Hur. ($22.95). In my opinion, this is the best introduction to the method available. I tell beginners to start here.

"Changing Children's Minds" by Howard Sharron ($32.00) Also a good introduction and certainly the second book I would recommend.

"Mediated Learning In and Out of the Classroom" a manual prepared by people from South Africa to help teams who are introducing IE, MLE and LPAD. ($29.95) I have not studied this manual.

"The Mind of a Child" a videotape around the story of Lorna Williams, a Canadian Indian who found in Feuerstein's methods a way to rescue Indian children who were failing in the White Man's system of education. This is a very moving story and has important lessons for those who must work with tribal minorities in any society.

In earlier catalogs from IRI/Skylight, I believe I saw some audio tapes in which Dr. Feuerstein discusses some of his experiences. These were also very moving for me, especially the story of how a young inner city boy tells why, after using cocaine from the age of 12 to 14 he intends to give it up, "Because I have discovered I have a brain."

I have some other books which are not available from IRI and belong in the library of anyone who is going to go beyond the basic introduction. These books are:

"Don't Accept Me as I Am: Helping 'Retarded' People to Excel" by Reuven Feuerstein, Yaacov Rand, John E. Rynders, Plenum Press (1988) This book discusses the philosophy, the science, the methods and the experiences using MLE, IE and LPAD with children who are considered 'learning disabled' and getting them to excel. Most of the methods described in the book are directly applicable to teaching those who are 'temporarily enabled'. (We all become disabled, eventually.)

"Instrumental Enrichment: An intervention Program for Cognitive Modifiability" by Reuven Feuerstein and others. This book is available from Scott, Foresman and Company, 1900 East Lake Avenue, Glenview, IL 60025. It was out of print for some time. AFTER taking a course of instruction from Feuerstein, I could read this book quite easily. Maybe it is my own limitation, but before taking his course I found the book difficult to read.

"Mediated Learning Experience (MLE), Theoretical Psychosocial and Learning Implications" by Reuven Feuerstein, Pnina S. Klein and Abraham J. Tannenbaum. Freund Publishing House, Ltd., Suite 500, Chesham House, 150 Regent Street, London, W1R 5FA. This book is not readily available from sources in the USA. (I have not tried www.Amazon.com. If anyone can get it, they can.) I understand that a revision is contemplated. After you have read some of the other books, this will be found to be a very handy reference.

From time to time the IRI/Skylight sponsors conferences, seminars and training sessions on MLE, IE and LPAD. I can heartily endorse the experience.

Those interested in a personal view of the training in Jerusalem are invited to download two files, Jerusalem Letter 97 and Jerusalem Letters 98 available at this website:
http://deming.ces.clemson.edu/pub/den/deming_tribus.htm