Fulfilling the Proper Aim of Education

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Introduction

When a housefly encounters a barrier, such as a screen, that prevents it from reaching food that it wants,   it lays its eggs through the screen.   In that way, the fly insures that the next generation will have access to what it cannot get for itself.

The future is our screen.   The other side of the screen is where the next generation will live.   I submit that the only legitimate aim of education is:

To prepare our children to live in the future.

What can we say about the future? Peter Scholtes uses this diagram to bring home the fact that changes come ever more rapidly in a lifetime.
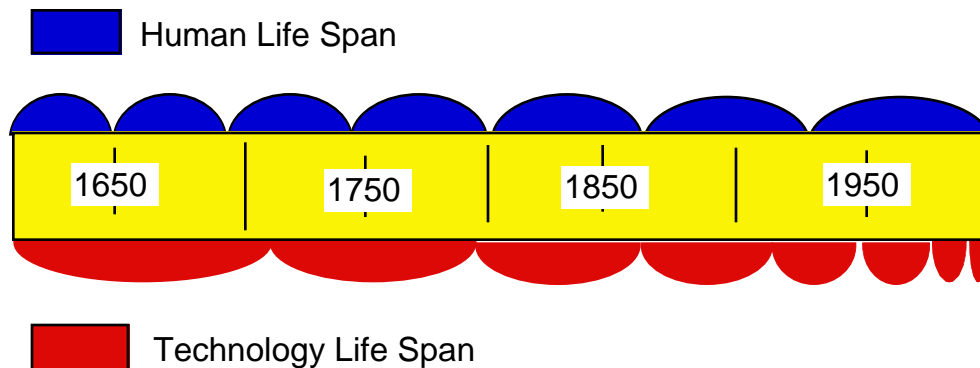
Peter's diagram confirms what we already know.   The future will demand continuous learning and adaptation.

Some people will wish to add another objective to this aim, such as: To preserve our present way of life.

This is not a trivial issue.   There are some who believe that we must teach our children what we have learned and help them to "carry on the tradition". There are others who believe that this will just result in preparing them as badly for the future as we have been prepared.   The resolution of this quandary has been set forth very neatly by Feuerstein and Hoffman[1] who describe it as a conflict between the child's *right to be* and its *right to become.*

By the *right to be* they mean the right to be safe, to be cared for, to fit into the existing scheme of things, safely and securely.   On the other hand, they postulate that a child has a *right to become*, to develop along his or her own lines, to become different from us.   Within all parents there is a conflict

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[1] 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

between a desire to see our children live their own lives and a desire to see them as a continuation of ourselves; or, in the words of Feuerstein and Hoffman, to see in our children our *triumph over death,*.

This conflict reflects itself in different educational philosophies.   The Montessori school goes to great lengths to follow the teachings of Piaget who believed that "in the successive stages of mental growth, the learning occurs through the child's spontaneous interest.   The teacher or 'directress' assists the child only when he or she truly needs help."

The approach based on freeing the child to develop in his or her own way is opposed by a different view, quoting Feuerstein and Hoffman again, "the more traditional one, devoted to the transmission of the accumulation of knowledge, skills, values and beliefs that constitute the society's culture. Traditional education seeks to transmit the skills that are socially and economically useful and to prepare the student for future working life."

Half a century ago Porter Sargent forecast this struggle in his book, "The Coming Battle for the Mind of American Youth".   We see it played out in the contest for control of education, between the secularists and the fundamentalists,   all over the world.

If our aim is **to prepare our children to live in the future,**   then we must do our best to determine what kind of an education prepares children to live in a world we cannot describe. Having decided what needs to be taught, we then come to the question made famous by Dr. W. Edwards Deming,   "*By what method?*"

I propose to answer that question and to show that it is possible to satisfy both philosophies: *the fulfillment of the child's right to be and the child's right to become*.

Asking the Right Questions is as Important as Answering Them

> **An education for the future prepares learners to**
> **encounter new situations, and to cope with them,**
> **by teaching them to formulate and answer, useful**
> **questions**

Note the proactive phrase: "...by teaching them to formulate and answer useful questions." The ability to formulate useful questions is a skill that can be taught. We must do more than put them into situations where they have to figure out what to do, with no training.   Teaching people to swim by throwing them off the end of the dock only produces a residue of non-sinkers.

They need to be taught to assign priorities.   They need to become conscious of constraints imposed by time,   resources and knowledge and be able to take these constraints into account.   Because this ability is not developed in a weekend, or even in a year,   this theme should pervade schooling from kindergarten to college.   Developing these abilities requires experiences, but the learning should be guided, it should not be entirely experiential. It can be done. Some people are already doing it.[2]

If we expect our children to use the knowledge we provide, they will have to see that knowledge as relevant or they will forget it.   In judging whether an education is suitable for the future, it is fair to ask: Do the learners grapple only with the questions we have chosen for them, or do they have a hand in formulating meaningful questions?

Facing new situations requires the ability to figure out what to do when there is no one around to tell you what to do.   That's life.   The fact that life does not provide us with "Given this, find that...." kinds of problems has stimulated interest in education through *action research* and *projects.* Projects require students to solve new problems that are meaningful to them. This is useful experience for the next generation.

Cognitive Research and the Ability to Solve Problems

The ability to solve problems has been the focus of research and study for many generations, starting with Plato's *Republic.*   In reviewing some of this research, I have found the work of Dr. Reuven Feuerstein, of Israel, to be most significant.   Dr. Feuerstein has used the results of psychology, neurology, brain research and his own experiences of over fifty years, to develop a theory and a set of practices which have been demonstrated to yield remarkable results.   The results of his work have been documented in over 1000 research reports and in applications involving,   many thousands of children in over 30 countries.[3]   As part of this personal research I have, myself,   studied with Dr. Feuerstein. I have personally applied some of his techniques with children who were identified as having learning difficulties.

The boy standing to my left in the picture, below is "Alex". Alex suffered from a pre-natal malformation of the neural tube called Sturge Weber syndrome. The initial malformation led to the atrophy of the left brain and intensive epileptic activity. Because of that, the left brain was surgically removed.   Alex, therefore, has had to learn to live with only half a brain.

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[2] See, for example, The Dartmouth Project for Teaching Engineering Problem Solving, 8000 Cummings Hall, Thayer School of Engineering, Dartmouth College, Hanover NH 03755-8000. http://engineering.dartmouth.edu/~teps/   also teps@dartmouth.edu
[3] A diskette for either a Macintosh or PC computer, with the references listed, is available from the author.
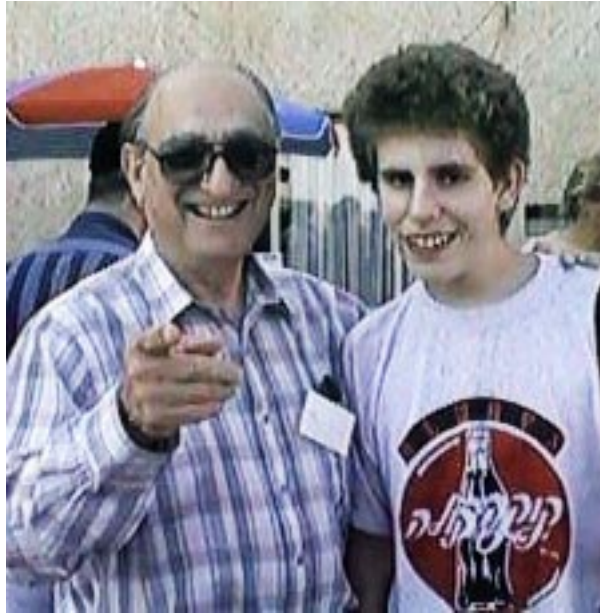
Alex provides a vivid demonstration of Feuerstein's basic thesis: *The human brain is infinitely plastic.* Even if a human brain has not developed normally,   cognitive deficiencies can be overcome through the application of the theory of *Structural Cognitive Modifiability*. (SCM).   Alex's right brain has been taught by Dr. Feuerstein to take over the functions which would normally have been fulfilled by his left brain

 It was predicted that Alex would never learn to speak or to care for himself. Psychologists predicted that if he didn't learn to talk by the age of six, he would never speak.   Alex began to speak at the age of nine, thus confounding existing knowledge of psychology. Then the psychologists said he would never learn to do much more.   His mother refused to give up. She brought him from England to Dr. Feuerstein when he was twelve. When I met Alex he was 14.   We talked, joked, laughed, and exchanged comments.   I could not believe he was functioning on half a brain.   When I saw him again last Summer he was learning to read and write Hebrew.   This dramatic incident was proof to me that Feuerstein's theory of Structural Cognitive Modification was genuine.

Although I have been an educator for over fifty years,   until I began to study with Dr. Feuerstein I had never experienced a teacher-student relation like "Mediated Learning Experience" (MLE), one of the techniques of SCM..   In MLE the mediator (teacher) does not teach a learner *how* to solve specific problems. For example, in the conventional approach, if I were teaching a child long division, I would show the child how to do it in a very specific way and then give the child 'exercises' in doing long division the 'standard way'. Then I would administer tests to convert this "standard way" into a lifelong habit.   That's the way I was taught.   Therefore that is the way I taught others.

In contrast, in MLE the mediator helps the learner to understand his or her own problem solving process, to understand how to improve it and how to "bridge" the improvement to other areas of interest.
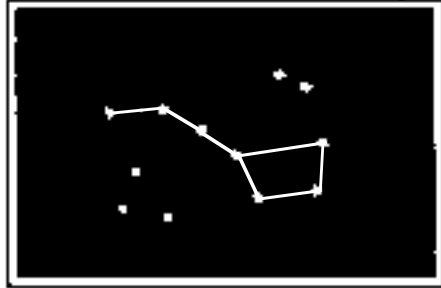
Have you ever looked at the midnight sky and seen the constellation shown in the above figure? Some people call it the "big dipper".

Suppose you were to go out with a friend, one starry night, and say to the friend, "Look, there's the big dipper." Suppose your friend cannot see it. How would you help? Of course, it is easy for you to pick out this constellation. I drew the lines for you! But do you know *how* you do it when it is in the sky and there are no lines? Can you coach someone else?

When you encounter a strange situation, do you understand how you go about imposing your conceptual framework on the incoming stimuli? Do you realize that this is what you are doing? Do you know you are applying a filter to the incoming information? How aware are you that you see the world through your own filter and that others may not have the same filter?

What you see depends upon what you thought before you looked. Filtration is essential if you are to remain sane! It is a universal process. When you see the big dipper, it is because you have taught yourself to impose on a bewildering array of dots a special relationship that isn't there of its own accord[4]. You do the same thing when you pick out the face of a friend in a crowd.

If you do not understand what you are doing with your brain, you will not be able to solve new problems; you can only apply old solutions, the ones you memorized in the past.

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[4] Sometimes when discussing how to help someone else see the "Big Dipper" I remind the audience that they are seeing something that is really not there and are trying to help someone else, who cannot see it. The question is, "Who is it that needs help?"

This alternative approach to learning is at the heart of a different way to present mathematics, called "Cognet"[5]. In Cognet the children invent different ways to do mathematics problems and then compare the speed, ease of learning and economy of thought of their different approaches. I saw a class of nine year olds develop about five different ways to do long division in about half an hour.

Feuerstein replaces the IQ test, and other evaluative methods, with the Learning Propensity Assessment Device (LPAD). I have, myself, had the LPAD administered to me and have administered it to some children. In the first place, unlike all the other evaluative tests I have seen, it is fun! In a conventional approach to evaluation, it is important to administer the test in a standardized way so that the results may be "normed", i.e., compared to the results with other students. Therefore, the person administering the test must remain aloof from the person being evaluated. You are unlikely to feel friendly towards the person administering one of the "standardized" tests or to enjoy its coldly clinical atmosphere. You are on trial and you know it.

In the LPAD process, the learner and evaluator are involved with one another in a very friendly way. The LPAD conforms to the rule first laid down by Vygotski, "The only legitimate purpose of an examination is for the learner and teacher to decide what to do next." Conventional testing is aimed at testing past accomplishments. The LPAD aims at finding a path to future development. During the administration of the LPAD the teacher and learner are discovering the areas of problem formulation, resolution and response in which the learner has deficiencies and is ready to learn to improve. In the LPAD process there are no secrets. Both the evaluator and the subject are aware of the list of cognitive deficiencies developed by Dr. Feuerstein and his staff. They are both aware of the purpose of the test and they share in the interpretation of the results. The LPAD is a form of guided self-improvement, designed to provide a sense of reward and meaningful enrichment to the learner. The LPAD avoids humiliating the learner and yet causes the learner to reveal, to himself or herself, those habits of thought which impede learning.

Feuerstein uses the overall theory, "Theory of Structural Cognitive Modifiability", (SCM), to design methods of intervention. It takes about six weeks of specialized training, usually given in two week blocks of time, interspersed with field work, under supervision, to develop competence as a mediator. This may sound like hard work but actually it great fun. In my limited experience I found that neither I, as the learner, nor the students with whom I was allowed to work, wanted to stop when the test time was up!

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[5] COGNET, University of Tennessee, Dept. of Special Services Education, 445 Claxton Addition, Knoxville, TN 37996-3400   cognet@utkvx.utk.edu

Practical Results from SCM

SCM has helped literally thousands of victims of Down Syndrome.   As you
probably know, Down Syndrome is caused by chromosome damage and
affects the shape of the eyes, the head and makes the tongue too long for the
mouth cavity, interfering with speech.   Because of their appearance and
inability to speak, most people afflicted with this syndrome have been
thought to have damaged brains.   By using the LPAD, Feuerstein knew that
their brains were good, just not developed.   Their development had been
neglected because people did not know how and thought it was impossible.
Dr. Feuerstein arranged for Down Syndrome sufferers to have reconstructive
surgery, so that the shape of their eyes and their head was altered. The tongue
was shortened so they could speak.   Then he used SCM to correct the
cognitive structural damage.   I met some of these people, including some
who were capable enough to serve in the Israeli Defense Forces.   I spoke to
their commanding General. He was generous in their praise.

The picture below is of one of the Down Syndrome soldiers I met at a party
after a tree planting ceremony in their honor

In Jerusalem, in Feuerstein's Center, I have seen children who have been
labeled as having a low IQ or who were said to suffer from attention deficit
syndrome, but with Feuerstein's help, they are completely recovered.

So called "normal" people can profit from SCM. Before the teaching/learning
process was modified to follow Feuerstein's principles,   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 which 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%.[6]

Large Scale Application 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.[7] 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.

The following figures show how the results for Taunton compare to the composite average used by the state.

In 1988 Instrumental Enrichment had just begun on a large scale in Taunton.

The data, up to 1992, were analyzed by Jane Williams and William Kopp and reported to the International Center for the Enhancement of Learning Potential. [8] The data after 1992 were added in a separate analysis.

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

[7] 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 <u>On Feuerstein's Instrumental Enrichment: A Collection</u> (Meir Ben-Hur, editor)   IRI/Skylight Publishing, Inc., Arlington Heights, Illinois (1994)

[8] 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.
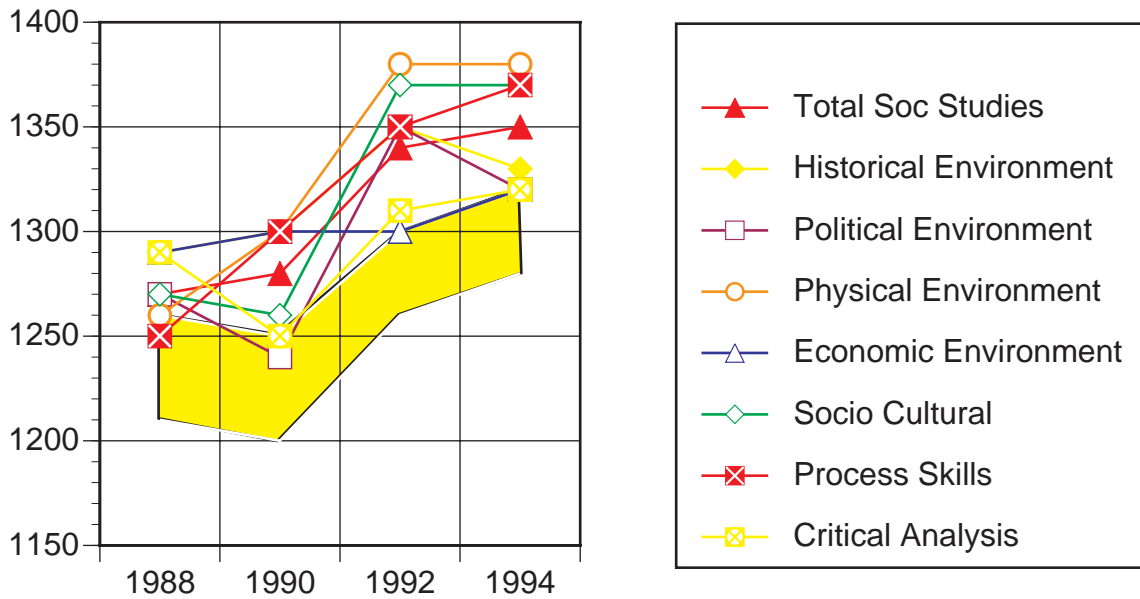
Figure 1. Improvement in social studies scores. The shaded band represents the comparison scores used by the Commonwealth.
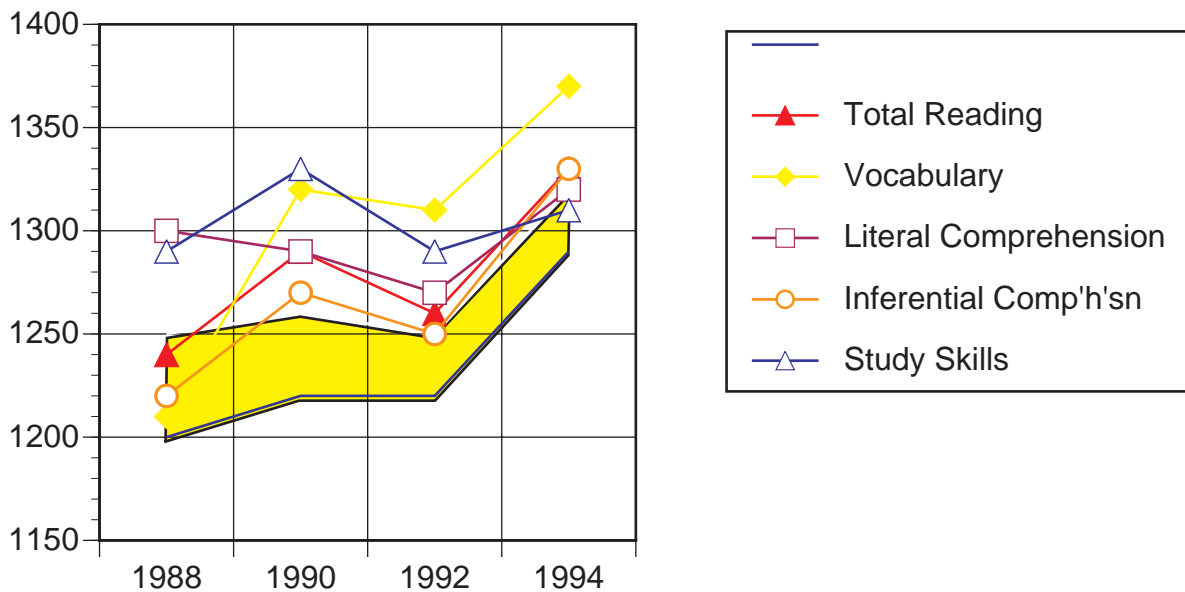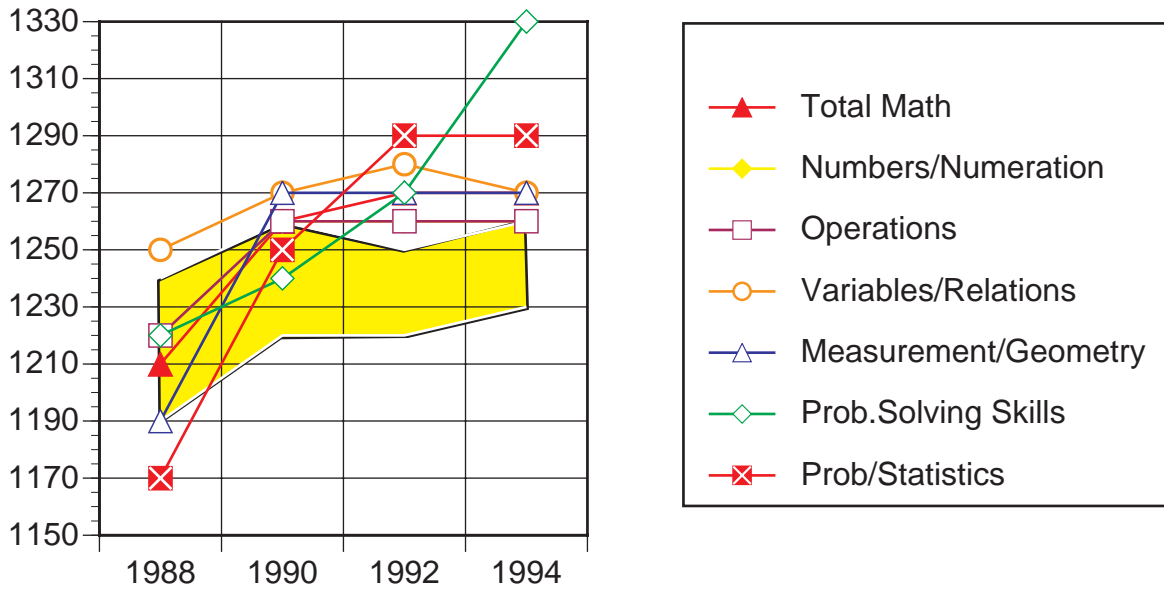

Figure 2. Improvement in reading.

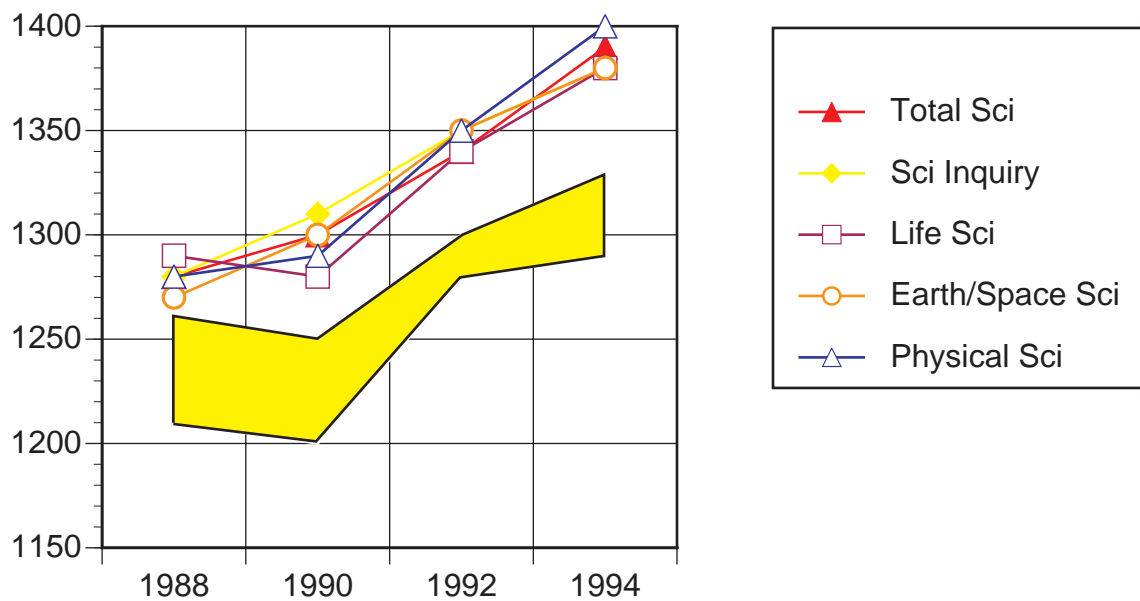Figure 3. Improvement in Mathematics

Figure 4.   Results in Science

Current Assumptions about Learning...All Wrong[9]

Sue Berryman has identified basic assumptions about learning that underlie current educational practices, world-wide. These are:

1. **People Transfer Learning to New Situations**

   They do not transfer what they learn in school to out of school situations, even when the situations correspond to text-book problems, such as figuring costs while shopping in a super-market. Even technicians and engineers fail to transfer theoretical principles, processes or skills to practice. Children who have learned to do arithmetic "on the street" and are very good at it (i.e., selling drugs) cannot do the same problems when given in class. When the problems are 'word problems' they do even more poorly.

2. **Students Transfer Knowledge and Skills Between Disciplines in School**

   At the turn of the century, Thorndike conducted investigations regarding transfer and found it was nil.

3. **The Learner is a Passive Vessel into Which Knowledge is Poured**

   Most educators deny this view, but what goes on in classrooms, in training sessions, in military academies, belies what they say. Quoting Berryman: "Think about a typical schoolroom, or a Congressional hearing, or a corporate training session. The teacher or 'expert' faces the learners, in the role of knowledge source. The learner is the passive receiver of wisdom-- a glass into which water is poured.

4. **Learning is the Strengthening of Bonds Between Stimuli and Correct Responses**

5. **What Matters is Getting the Right Answer**

   Students and teachers focus on the answer, not how it was obtained. By failing to focus on the process whereby the answer was obtained, the teachers are unable to use errors as a source of learning. In general they do not.

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[9] This material is taken from a paper by Sue. E. Berryman, "Cognitive Science: Challenging Schools to Design Effective Learning Environments", Technical Paper No. 23, Institute on Education and the Economy, Teachers College, Columbia University (October 1991)

Using Cognition Research to Provide Unification in Education

The fallacies enumerated by Berryman can, in my opinion,   be eliminated through the use of cognitive science.   The solution is to be sure that the essential aspects of logical thinking are taught as part of every course and taught in such a way that what is learned in one classroom appears relevant to what is happening in another.   In the Feuerstein theory of Structural Cognitive Modification,   the term *bridging* is used to help students relate what they learn about their cognitive processes to topics they encounter 'in the real world'.   Teachers should cooperate with one another to learn the fundamental logical processes they use in the different subject areas and then they should help the students to *bridge* from one subject to another.

Imagine, if you will,   a school in which all of the teachers of physics, of mathematics, of music, of geography, of history and of literature are all aware of the general principles involved in analyzing, comparing, forming classifications, finding relationships, recognizing patterns, considering different frames of reference and doing "what if" kinds of thinking in a fundamental way.   Suppose, when they were discussing a concept, such as beat or rhythm in music the teachers were to ask the students to discuss the development of a concept in physics or chemistry, based on the same basic cognitive process.   If the students were helped to make the connections, their understanding in both physics and music would be enhanced.

 In some places this is already happening.

The Music Research Institute in the UK has assembled a bibliography showing how the study of music has resulted in improved ability in mathematics and reading.[10]

The Richardson Institute of Education through Music has been working for over 30 years at improving the study habits of children through the study of music.[11]   On their web site they discuss the relationship between music and mathematics,   a topic that interested the ancient Greeks, who discovered the relations among the lengths of strings, melody and harmonic ratios.[12]

This method of integration avoids one of the cognitive deficiencies listed by Feuerstein: "An Episodic Grasp of the Universe".   For children who are brought up seeing three 15 second television commercials, back to back, in a 45 second station break, life consists of episodes which occur one after the

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[10]Music Research Institute, Coda Music Centre, Chewton Glen Farm, Highcliffe, Dorset BH423 5QL, England   (100534.476@compuserve.com)
[11]Richards Institute of Education Through Music , 641 Excelsior Ave., San Francisco, CA 94112 Phone: (415) 586-2217 Fax: (415) 239-2737 E-Mail: WingedLion@aol.com

[12]Newman, James R. TheWorld of Mathematics   Simon and Schuster, (1956)

other and bear no logical relationship to one another, or for that matter, to whatever message is being sent.   They should not go to school and study five subjects in one day and come home unable to see any logical connection from one subject to another. That's why integration through cognition fundamentals is so important.

Developing the Ability to Pose Questions...The Quality Approach

The data make it clear that instrumental enrichment,   as defined by Feuerstein,   can improve the problem solving abilities of students.   They perform better on standardized tests.   But the tests are only concerned with students ability to solve problems that have been chosen for them.   Nature does not 'give' us questions.   Students will have to learn how to define them; to be able to formulate problems and then to solve them.   That's where the experiences of students on quality improvement teams,   applied to the improvement of learning, has proven to be most powerful.

Quality management was originally developed for industry. When transferring its concepts to education certain differences should be kept in mind:

1. The *product* is not the student.   We do not manufacture students, nor do we determine most of their characteristics.

2. The *product* is the *education*   of the student.

3. There are many *customers* for this product. In order of priority they are:

    1. The student… who must live with the product for a lifetime.

    2. Parents or close family… who have a vested interest in the student's future.

    3. Potential employers… who will wish to "rent" the education and pay the student for its use and improvement.   Students, in most cases, must become self supporting.

    4. The rest of us… who must live among them and, therefore, hope to be surrounded by decent human beings.

4. The *workers* who produce the product are the students, themselves. This creates a situation quite different from industry.   It is as though the workers at Ford were building cars and then driving away with them, never turning back.

5. The *key process* is *learning.* All other processes of education should be support processes. In this spirit, teaching is not a key process. It is a support process. Ideally, learning would take place without need for teaching. Teaching would be replaced by mentoring.

It is useful to classify all aspects of education under four main headings. These do not form mutually exclusive classifications, nor are they exhaustive. They are useful, however.

1. **Knowledge**… which enables us to understand.
2. **Know**-**how**… which enables us to do.
3. **Wisdom**… which enables us to decide whether to do it.
4. **Character**… which makes us behave like decent human beings.

If we recall the analysis of Feuerstein and Hoffman, discussed at the beginning of this paper, we will recognize that the first two categories above are concerned with the *student's right to be* and that the second two are concerned with the *student's right to become.*

But what should students be expected to know? And how do they turn this knowledge into know-how?

Deciding on Required Competencies

Some people believe that there exists a fundamental core of knowledge which should be mandated for all students. They have a point. If a nation is to have a sense of community, then the citizens should share at least some common background regarding language, history, understanding of government, the economy and how it is supposed to work, environmental issues, the role of the nation in the global economy and trends which are likely to affect their future. The Core Knowledge Foundation is dedicated to organizing this "core knowledge".[13] They publish, for example, the Core Knowledge Series with titles such as "What Your 4th Grader Needs to Know."

Joel Barker has proposed different way to meet this need. He calls it the "EFG" curriculum, in which E stands for environment, F for future and G for global. Under these three themes, he has developed a curriculum which includes all of the basic disciplines, but they do not occur as independent disciplines. They always appear within the context of one of the three basic themes. This approach is still under development and it remains to be seen how well students master fundamental skills in the basic disciplines. The

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[13]The Core Knowledge Foundation, 2012-B Morton Drive, Charlottesville, VA 22903 (800) 238 3233 To see an example of the application, visit the home page at:
http://calvertnet.k12.md.us/instruction/coreknowcalvert.html.

argument in favor of the EFG approach is that it generates student enthusiasm and it puts topics into a meaningful context[14].

There is a third way, which could be overlaid onto either of these approaches without detracting from the objectives of either one.   It is based on cognition research, which I shall discuss in a moment.

Managing the School and Managing the Classroom

The essence of the Deming philosophy may be found in the redefinition of the job of a manager:

<div align="center">

The People Work IN a System
The Job of the Manager is to Work ON the System
To Improve It,   Continually
WITH THEIR HELP

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Alas, too many managers think their job is to issue crisp orders and then when things do not turn out the way they planned,   they fix the blame instead of the system.
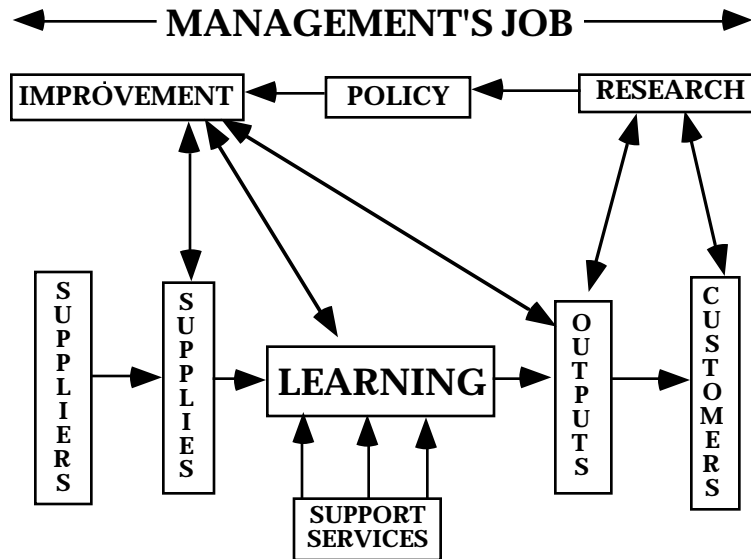
Changes in the basic style of teaching and learning cannot occur if the schools are managed as though they were but a collection of independent school buildings housing teachers working in independent classrooms.   Changes cannot occur if the teachers know, through the reward system, that their pay depends upon the scores children make in standardized tests in their particular subject.

The relationship is reciprocal: It is also not possible to change the way the institution is managed unless changes are made in the classroom.

Dr. W. Edwards Deming proposed to the Japanese in 1950 one way to look at a system for manufacturing.[15]   Elaine Torres has modified the Deming diagram to represent a school as a system. I have adapted her idea in the following diagram.

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[14] EFG Curriculum Collaborative, P.O. Box 9277, Scottsdale, AZ 85252-9277 Ph (602) 905 9469, Fax: (602) 998 9939

[15] Deming, W. Edwards, Out of the Crisis MIT CAES, Cambridge (1982) Fig. 1, pg. 4

MANAGEMENT'S JOB

IMPROVEMENT ← POLICY ← RESEARCH

SUPPLIERS → SUPPLIES → LEARNING → OUTPUTS → CUSTOMERS

SUPPORT SERVICES

The Torres diagram makes it clear that the management has the obligation to study the system by acquiring information on the characteristics of the output of the system and how that output meets the needs of the beneficiaries of the system. The management should then develop policies which direct the system into improvement. The double ended arrows emphasize that the flow of information must be two way. The managers cannot possibly know what is really going on in the system; only the people doing the work know that. On the other hand, the people doing the work are powerless to change the system; only the management can do that. The workers and managers should co-manage the processes.

In an educational institution devoted to educating students for the future, the administration will have learned, and will apply, the philosophy of quality management and will learn how to work cooperatively with the faculty in the continuous improvement of the school processes.

Managing the Classroom

The teacher is the manager of the learning process. Think of it this way:

The Students learn IN a system.
The Teacher's job is to work ON the system,
To improve it, continuously,
With Their Help.

The central process of the system is *learning* The teachers and students should co-manage the learning process. Most teachers have so much difficulty getting students to do what they want them to do that the idea that

students could become responsible co-managers of the learning process will, at first, seem too bizarre for serious study. Just as the managers seldom know what is happening at the shop floor level (or in the classroom), so the teachers seldom really know what is happening when the students are supposed to be learning. Only the students know.

But there are many excellent examples of teachers who have learned to turn their students into co-managers. They come from a variety of places. Franklin Schargel has documented his successes in an inner city high school and says, "If we can do it in New York, it can be done anywhere!"[16] Elaine McClanahan and Carolyn Wicks have developed a teacher's handbook especially aimed at the lower grades.[17]

Excellent newsletters are now available, with helpful examples from schools all across the USA. The newsletter of the American Association of School Administrators appears bi-monthly.[18] Another useful newsletter is "Quality in Action" published in Leander, Texas.[19]

If the students are to become responsible, in the words of Larrae Rocheleau, they first must be taught to be *response-able.* Experience in many schools in many countries has demonstrated that an effective way to teach them to be response-able, is to teach them the tools and techniques of quality management and coach them as they apply these tools to their own life experiences, in and outside the classroom.

Genuine Learning requires Genuine Work

A common misconception among teachers who have not experienced quality in action in the classroom is that if the students are allowed to co-manage their education, they will simply reduce their work load and learn less. If the teacher does not actually use quality management methods in the classroom, this is certainly a possible outcome.

The secret of success in the quality approach lies in having the students undertake to do things which are of benefit to someone else.

Why does this work? Suppose you were offered a job, at twice your current salary, doing essentially the same kind of work you do now with the same number of hours per week. The only difference between your present job and

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[16]Schargel, Franklin P., <u>Transforming Education Through Total Quality Management: A Practitioner's Guide</u> Eye on Education, P.O. Box 388, Princeton Junction, NJ 08550 (1994)
[17]McClanahan, Elaine & Wicks, Carolyn <u>Future Force: Kids That Want to, Can, and Do! Griffin Publishing Co, 544 Colorado Street, Glendale, CA 91204   (1993)</u>
[18] "Quality Network News", Edited by Robert McNiel, Woods Quality Center, Cedar Rapids, Iowa. (800) 603 5306   http://www.aasa.tqm.org/aasa/
[19]"Quality in Action", P.O. Box 1406, Leander, TX 78646   fax: (512) 259 7308

the new one is this: At the end of each working day, whatever you have done will be torn up and thrown away. The result of your daily efforts will be the same as if you did not exist. How many people do you know who would be willing to accept this proposition?[20]

Going to school should not be like that kind of job. It should not be a twelve or sixteen-year experience, never producing anything that someone else thinks valuable and useful.

In the quality approach students are engaged in projects that improve things: For the school, for classmates, for the elderly, for people sick in hospitals, for anyone. They are taught, at the start of any project, to define what it means to do an excellent job *in the eyes of the customer.* They may have to interview people to find out what an excellent outcome would be. The result of such an investigation by a team of students invariably results in a commitment to excellence by the team. When such a commitment occurs, the result seems like magic. The concern for excellence begins to pervade other aspects of the students' lives, including their work in the "disciplines".

Langford's Principles[21]

One of the leaders in promoting the philosophy, tools and techniques of quality in the classroom has been David Langford. David's seminars and conferences have been given in Europe, the UK, Australia, across the USA and in Latin America. Much of what I know about quality in the classroom has been learned from David and his disciples. I have watched his work develop over the last ten years, having visited his classes in Mt. Edgecumbe High School when he was first beginning. Describing these early experiences, David has said:

> *The results were dramatic. Using basic statistical tools, students were able to chart their own learning process. They learned how to evaluate their own work and started taking responsibility for their own learning and work processes. Their efforts were directed toward improving the learning that stood in their way. Most importantly, students realized that school exists to foster lifelong learning.*

Langford's approach is founded on a few simple principles. They are dramatic and effective:

> *Everyone can learn…* students may require Mediated Learning Experience and Instrumental Enrichment, but everyone can learn.

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[20] One man did tell me, "Hell, that's the job I already have!"
[21] http://www.wtp.net/Langford/

Students can take responsibility for their own learning process… they can become *responsible* if they are helped to become *response-able.* They need to be taught tools and techniques of quality improvement and helped to apply them to their own lives.

Students can monitor their own learning process… students are entitled to know the basis for deciding what they know and how well they know it. They are able to chart their own progress, honestly and openly. Students do accept the necessity for knowledge and for know-how.

Students and teachers are colleagues… teachers should become mentors, helping students create their own education. This education is not an unguided process. It is collaborative.

Quality feedback enables the learner to evaluate progress… students need to know the answer to the question, "How am I doing?" and the answer should make sense to them.

There is joy in learning … quality in education is what makes learning a pleasure and a joy. It is the only way to hook a learner on learning for life. Too many teachers confuse *effort* with *work*. Learning requires effort, often sustained effort. However, once a person is interested in what is being learned, the effort will not seem like "work". A boy will practice his basketball hook-shot for hours on end (I know I did) and think of it as play.

Quality is achieved through systems thinking and the application of what W. Edwards Deming has called "Profound Knowledge"… students need to understand the system within which their education is developed and used, they need to understand the role of variation in everyday life, they need to have an introduction to applied psychology and they need to understand the requirement for operational definitions, precision of language and relationships among concepts.

Quality leadership is essential… how teachers and administrators provide leadership in the classroom and in the school building teaches by example, the most important way one generation influences the next.

Quality improvement is the basis for lifelong learning … the tools of quality improvement provide a way to understand how to manage learning for life.

Langford describes this set of concepts under the heading: Total *Quality Learning* . Applying these concepts leads to certain organized ways to approach common problems of education, such as:

> The Self-Managed Classroom... How teachers can organize the classroom so that the students do most of the work and the teacher spends time mentoring.
>
> Just-in-Time Learning... How to make learning meaningful by creating a need to know situation to which the teacher may respond.
>
> Statistical Process Improvement... How teachers and students, together, can use statistical methods to monitor and improve the teaching and the learning.
>
> Team Training... How to train students to work together so that cooperative learning becomes a directed and efficient process. Throwing students together and hoping for cooperative learning does not work.   Students need to be prepared for collaboration.

Details of these techniques are available in a number of articles available at the Mount Edgecumbe High School web site.[22]

Evaluation

Total Quality Learning,   as Langford describes it,   is unique in that it has built into its practices and procedures,   the means whereby the results may be evaluated.

Whenever a changed approach to education is proposed, there are three constituencies which will have to be satisfied that the change is for the good.

First of all,   there are the teachers,   who want to have proof that "it works" before they will invest their time and energies.

If, as is done in the Langford approach,   the grading system is reduced in importance, how will the learners know how they are doing?

Finally, there are the third parties,   the parents, potential employers, politicians and the taxpayers at large,   who need to be satisfied that the investments are not being wasted.   How will they know?

One of the important lessons the Japanese learned from Americans after WWII was that you cannot inspect quality into a product, it has to be built in.

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[22] http://www.mehs.educ.state.ak.us/quality.html

In the 1980's the Japanese were busy teaching this lesson to Americans, who had forgotten it in the intervening 30 years. Inspection at the end of the line just doesn't produce good products; it produces waste and inefficiency.

Just as manufacturers and service providers the world over have learned, the only efficient way to produce a quality outcome is to teach the people doing the work to inspect their own work, never to pass shoddy work on to the next person in line and never to accept shoddy work from someone else.

Self inspection can only work if these criteria are met:

> I.   The worker knows what constitutes excellence.
> II.   The worker knows how to judge excellence.
> III   The worker is motivated to produce excellent work.

Experience has demonstrated that these three criteria can be met provided:

> A. The students participate in defining excellence and are given the chance to prove to themselves, by action research, that achieving this excellence is in their own self interest. Working together, the students and teachers define the specific competencies which are to be attained and the level of competency require.
>
> > 1.   What areas of knowledge are to be mastered?
> > 2.   What kinds of know-how are to be demonstrated?
> > 3.   At what level are these competencies to be achieved?
>
> This activity provides a good opportunity to develop a genuine understanding of an "operational definition".
>
> B. The students, working with the teacher, develop answers to these questions:
>
> > i.   How will I know when I have met the objectives?
> > ii   How will the teacher know?
> > iii   How could we persuade a third party?
> > iv   What is my responsibility in all this?
> > v   What is the teacher's responsibility?
> > vi   What do we do, class and teacher, if someone is not living up to their responsibility?
>
> C The students and teachers, together, develop a method to document, defend or demonstrate that desired competencies have been achieved.

One method, favored by David Langford, is the use of a Competency Matrix. Several examples of these competency matrices are given in the papers at the Mount Edgecumbe High School web site mentioned earlier. Simple examples are given in his book with Barbara Cleary.[23]

I have seen these ideas at work at the level of the second grade. I have reports from across the USA, from Tasmania, from the UK, in which all of the teachers agree: Quality management works magic with students.

Putting it all Together...How Would it Appear?;

To bring about organizational change, requires eleven ingredients. If any one of them is missing, then there will be predictable consequences.:

Eleven Links in a Chain of Transformation

	Link	Without This Link
1	Active Leadership	Nothing happens, things remain as they are.
2	A Good Philosophy	No one will be moved to follow, no one will care
3	A Noble Aim	No sense of direction, people cannot take initiatives
4	An Attractive Vision	No way to measure progress, to see what needs to be done
5	A Plausible Strategy	No credibility, it looks like a nice idea, but there is no way to get there.
6	Adequate Resources	Frustration, all ready to go to work, but no tools, no time.
7	Appropriate Training	Anxiety; fear of being tried and found wanting.
8	Meaningful Rewards	Bitterness at a reward system that pulls the other way.
9	Documented Organization	Peoples' efforts will cancel one another out
10	Two Way Communication	Chaos, discouragement from thinking nothing is happening
11	A Supportive Constituency	Naysayers are always in the wings, waiting to take over

While all eleven links in the chain are essential, the first one is a key ingredient: *leadership.* Without leadership, nothing happens. Leadership can occur at any level. If you are a teacher, then within the classroom you can be the leader. If you are the principal of a school, then within that school you can be the leader. It is all up to you.

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[23] Langford, David P. and Cleary, Dr. Barbara., <u>Orchestrating Learning with Quality</u> ASQ Quality Press, Milwaukee, (1995) (800) 248 1946

The **vision** I hold for a school for the future has these characteristics:

- The school system is managed, top to bottom, school board to classroom, using the philosophy, tools and techniques of quality.
- The administration, working with the teachers, parents, some students, and some future employers, continuously monitors the performance of the alumni, as well as trends in the marketplace, to assure that what is done within the school makes sense to the stakeholders of the educational system.
- All teachers have been taught Instrumental Enrichment, (IE), at least to the elementary level and all teachers are pursuing greater proficiency in IE. They use the principles of IE to provide a coherence to the student's experiences in the different subjects which comprise the curriculum.
- All students receive IE for at least two hours per week starting at the fifth grade. All students are evaluated using the LPAD and their experiences in IE are adjusted to the results of the LPAD.
- All students have been taught the tools and techniques of quality management and use these tools and techniques to participate with their teachers in finding ways to improve their own learning processes and to improve the lives of others.
- All students are engaged in self evaluation of their own progress and work with the teachers to design the learning experiences required for them to achieve mutually established goals.
- In all subjects, the students maintain their own portfolios of accomplishment and maintain a running account of their progress against well understood learning objectives.

The **strategy** for getting from here to there is not so simple to describe, for clearly, one size does not fit all. I have visited communities which are now engaged in a serious transformation. These have all been communities of modest size, generally less than 50,000 population. However, as I contemplate the problems of the Superintendent of Schools in major cities, such as New York, Chicago, San Francisco, Detroit or New Orleans, I admit that I cannot think of how to convert these larger systems as a total system.. Within these large systems, a full scale transformation is virtually impossible in a short time or even in my lifetime.

What can be done in large educational systems is what was done with an equally large industrial system with which I happen to be familiar; the Ford Motor Company. In 1980 the company was threatened with extinction. The CEO, Don Petersen, decided that something had to be done. He did NOT try to transform everything at once. Instead, he picked out one plant and began to experiment with the transformation there. This, incidentally, is the same strategy I encountered 16 years ago when I interviewed Japanese managers

and asked them "How did you change?"   Their answer was "Start small and learn as you go."

The only workable strategy,   in my opinion,   involves starting with a small unit, say a classroom in a school, and then growing to encompass the school. To grow to each level of the system requires the participation of the person who is the manager of the system, so that growing beyond the walls of one classroom, requires leadership from the school principal.   Growing beyond a single school requires participation of the Superintendent of Schools and the support of the School Board.

In larger communities it will probably be necessary to pay close attention to the tenth link in the chain of transformation, the development of a constituency.   The leaders of the transformation process should organize a support group of like minded persons from the private sector, *not under the control of the school board or the superintendent of schools.*   If this group is willing to be proactive and is comprised of people who understand quality, the chances for success are greatly increased. Of course, a supportive constituency is helpful in any size community, but in the larger cities, where the school board is usually involved in heavy politics,   an outside force is essential.

Conclusion

Whoever you are, wherever you are, whatever your position, remember this: *Leadership belongs to those who exert it.*

I have met some of the new leaders.   They are making a difference in the lives of their students.   They all tell the same story.   They learned.   They were inspired to try.   Then they did it.   You can too.   It is up to you.