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Tractatus Pedagogico Peripateticus (the Walk of Future Learning)

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Master Degree Thesis Abstract
Tractatus Pedagogico Peripateticus
The Walk of Future Learning
By D. James MacNeil
May 1999

Our understanding of human learning has been greatly improved by recent research findings from the fields of cognitive science, neurobiology, organizational studies, anthropology, linguistics, and evolutionary psychology. Despite all that is known, however, the majority of formal schools in the world operate much as they did 50 years ago. The pedagogy and the structure of the educational experience still reflect industrial age assumptions that are increasingly anachronistic in the modern knowledge production economy and in the post-modern cultural arena.

Given the paucity of examples, it is difficult to visualize the characteristics of a future learning society - a society that embodies all that we know about human learning. This thesis develops two scenarios that attempt to describe two possible future societies; the first society is where learning flourishes and the other still labors under the industrial age assumptions. The purpose of these scenarios is to describe a utopian and a corresponding dys-utopian state that will serve as target conditions for current efforts at reform.

The thesis presents an extensive literature review of recent research and writings from the above mentioned disciplines. The literature review is divided into three parts: the pupose of education, the way people learn, and lessons from the field. Much of the literature was complied during an internship at the 21st Century Learning Initiative, and educational policy think tank located in Washington DC and on the web at www.21Learn.org

Note to the reader

As we enter the ominous age of global capitalism, redeployment, downsizing, spin-offs, swapping, liquidations, share repurchasing, leveraged buy-outs, growth-oriented asset reallocating and rampant debt restructuring, I feel that it is *apropos* that I submit to my readers the following accountability checklist. I fully appreciate that my modest piece of literature must compete on the free market with many other demands of my prospective readers. This accountability checklist will help the reader make a rapid initial assessment of my work and decide whether further investigation is necessary.

From this thesis, **I** get to:

- Review what I have learned as a master degree student at the Center for International Education from 1997-1999.
- Compile a portfolio of resources, references, and coursework that describe my knowledge-transforming journey (i.e. organize a framework for future knowledge building).
- Assemble an extensive bibliography that will later serve my career.
- Cite liberally my master degree course papers.

From this thesis, **the reader** gets to:

- Become sufficiently engaged in the subject matter to want to take me to task on any and all points (or lack of a point, etc.).
- Extract several rather succinct and nearly self-standing book reviews (designed for the busy graduate student or modern executive).
- Photocopy and claim a rather extensive and career-enhancing "bibliography of the 90's".
- Review and consider several promising doctoral dissertation topics.

This thesis is dedicated to my grandfather,
David James Bushee (1917-1999)
who taught me practical dialectics

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Introduction

In spring 1998, while attending David Kinsey's class on Creativity in Problem-solving, I experienced double serendipity. David had invited Ash Hartwell to speak about recent findings from the "new sciences" that related to education and problem-solving. In this regard he mentioned the 21st Century Learning Initiative (21st CLI), of which he was an active member. I woke up that morning expecting another dull and delirious day in the life of an overworked graduate student. I encountered something quite unexpected - the man and mind of Ash Hartwell and a transnational educational initiative, to boot – and all this before 10 AM. From the moment I approached Ash to find out more details about "emergence", about "downshifting", about "autocatalysis", I knew that my neat course-by-course plan for the master degree would never be the same.

That encounter quickly led me to design an independent study with Ash which we called "Models of Self-organization for Educators". During the course of my study Ash put me directly in touch with the 21st CLI. Later I agreed to take on a summer internship with them. My task, described in detail in the following chapters, was to synthesize much research and literature and develop two scenarios of future societies.

The 21st Century Learning Initiative

The 21st CLI was initially established in the United States by the English non-profit educational think-tank, *Education 2000*. Education 2000 sent one of their senior staff, Mr. John Abbott, to direct the American operation. The 21st CLI is located in Reston, Virginia, where it maintains a small office that functions as a secretariat for the 40-plus researchers and practitioners who are members and regular contributors. Terrence Ryan is the 21st CLI's scholar in residence.

The stated goal of the 21st CLI is to "synthesize the best of research and development into the nature of human learning and to examine its implication for education, work, and the development of communities worldwide". In particular it aims to *facilitate the emergence of new approaches to learning that draw upon a range of insights into the human brain, the functioning of human societies, and learning as a self-organizing activity*. The first major step toward effecting this synthesis was a series of six conferences called the *Wingspread Conferences*. These conferences brought together over 40 world-class researchers, educational innovators, and policymakers from more than ten countries. The purpose of the conferences was to synthesize research findings and field experience from a wide range of disciplines. The conferences culminated in several policy documents, the most recent (1998) being *The Strategic and Policy Implications of a New Model of Learning.*[1]

Scenarios and scenario building

The 21st CLI received their initial inspiration to do scenarios from Betty Sue Flowers, a participant of the Wingspread Conferences and one of the writers of the Shell Corporation's Global Scenarios Project. [2] John Abbott and Terrence Ryan introduced the idea to a group of policymakers in Estonia, who then developed four future scenarios for

their country. These scenarios were presented in the May, 1998 edition of the 21st CLI's *The Journal*.[3]

The aim of John Abbott and Terrence Ryan in hiring me to build scenarios was twofold. First, they wanted to experiment with the scenario building process, i.e., to assess how a reasonably well educated individual would process and synthesize diverse information and build coherent scenarios. Second, they wanted to determine if scenarios would be an effective heuristic means that could bring the message of the wingspread syntheses to a wider audience.[4]

What follows is a report of the scenario building exercise that began in May 1998 and culminated in the current thesis. The content of the scenarios and the opinions contained herein are entirely those of the author. I also take responsibility for everything that is omitted.

Acknowledgements go to all those fine individuals who joined me at various stages along this intellectual journey. Their names are listed in chapter 3 part two. *Special thanks* to John Abbott for reminding me to focus on first-order questions, Terrence Ryan for stimulating and thoughtful feedback, Ash Hartwell for his patient mentoring, Sally Habana-Hafner for helping me to structure this thesis, and to my partner Judy, for teaching me Powerpoint and providing emotional support when this project aggravated my nerves and carpal tunnels.

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[1] For more information see the 21st CLI's extensive and up-to-date website at www.21Learn.org

[2] For a description of Shell's Global Scenario Project see "A Commitment to Sustainable Development" (1998) and a summary of the actual scenarios "Exploring Sustainable Development" (1997). For related explanations see Jaworksi, Joseph *Synchronicity: The Inner Path of Leadership*.

[3] Loogma, Krista, Rein Ruubel,Viive Ruus, Ene-silvia Sarv, and Raivo Vilu (May, 1998) "Estonian Educational Scenarios for 2015" *The Journal*.

[4] This has been the aim of many Utopian writers, from the medieval Thomas More to the present. Edward Bellamy, who depicted a Socialist Utopia in his 1888 *Looking Backward* stated his purpose as, "to assist persons who, while desiring to gain a more definite idea of the social contrasts between the 19th and 20th centuries, are daunted by the formal aspect of the histories which treat the subject" (Bellamy). Scenario building aims to get overcome this "formal aspect" by making the story more familiar and accessible.

- Chapter 1 -
The Problem

The Imperative for Synthesis

During the week of 18 May, 1998, I enjoyed an exhilarating meeting of the minds with John Abbott and Terrence Ryan at the 21st Century Learning Initiative in Reston, Virginia. I had heard that Terrence Ryan was contacted by the Wall Street Journal for expert comment on macroeconomic policy, while John Abbott was publishing articles of the year in prestigious journals of psychology! Who were these extraordinary gentlemen? How could they have the acumen and the audacity to attempt a grand synthesis of emerging knowledge from diverse fields that could one-day bring about a learning society where the topic of 'becoming human' could be discussed and pursued as casually and earnestly as algebra or English grammar? I had to find out more. My only credentials were my capacity and stamina to pack my brain over the brim and my willingness, to risk, in the words of Schrödinger, 'making a fool of myself'!

The format for out meeting was a combination of instruction, independent reading and "cognitive apprenticeship", and perhaps most importantly, "spontaneous discourse" in the hallway, next to the photocopier, at the diner.

My findings for that week, which are summarized below, constitute the problems that I wish to address in this study.

Western civilization is approaching its denouement.
Up until 200 years ago most people in the West learned through apprenticeship-like arrangements, where masters would transfer skills to novices who would advance through the journeyman stage towards achieving mastery in a particular trade.[1] The upper classes learned Greek, Latin and Theology. After 1800, economic changes prompted changes in education in the West. Schools were established to meet the needs to manage and produce a workforce for factories. The objectives of this schooling were to manage the population – 'keep kids off the streets' - as well as to transfer knowledge and skills, thereby improving "human capital" for production. The enactment of the Factory Act just before Education Act in England in the 1870's illustrates poignantly the chain of causality and what the priorities were.

Educational programs were designed to mimic the only educational model available, the classical education of the elite. There were three problems with this undertaking:

1. *The content and instructional pedagogy of this approach was not necessarily suitable.* Implicit was the dubious assumption that skills were transferable between reading the classics, for example, and working as an accountant or a school teacher.

2. *Education developed a narrowly defined skill set.* The focus of classical education was on [what we now call] a single 'intelligence' - the verbal/linguistic intelligence. In some instances a second intelligence, logical/mathematical intelligence, was included. This education thus developed some parts, or faculties, of the brain more than, and possibly at the expense of, others.
3. *Schools became separated from communities.* The locus of education was the school, an institutional arena that would become increasingly formalized into the 20th century. Eventually schools and education would reach the stage, for most governments in the West, where they consumed more public funds than any other service. Learning that occurred in informal settings (family, community, on the streets) was not regarded as education *per se*. Learning meant *being taught*, and teaching occurred in schools. Education, which used to take place informally and in a context-specific, experiential manner, was now de-contextualized and ritualized in an institutional arena that was to a large extent separate from society. In the words of John Abbott, education was turned *inside out* (Abbott, 1997).

Economic forces of the industrial revolution and later the doctrine and methods of Scientific Management (or "Taylorism")[2], developed and perpetuated these lopsided trends. The goal of education during this period was to produce a uniform work force that would be disciplined enough to follow orders and sufficiently skilled to carry out specific tasks on factory production lines. Schools would deliberately select the top 10-15% of students who exhibited potential for brilliance and groom them for management and leadership roles in industry and society.

What we know now

We now know that learning can be learned, that learning is a biopsychological, or brain-based, process. We have discovered that the structure and function of the brain is only partly determined by its genetic composition. Research has demonstrated that the development of the brain is to a large degree dependent on the environment, or the nurturing, of the child in its early years. Education thus depends on social, as well as biopsychological, factors. We also know from research into the brain and learning that emotional states and dispositions also critically affect the quality of learning.

This new knowledge highlights the extent to which our educational systems are *upside down*.[3] Popular interest and investments in education are dramatically skewed in favor of higher education. As one moves along the continuum from primary to tertiary education one detects an increase in funds and teacher qualifications and a decrease in teacher-student ratios.[4] Cognitive science, neurobiology and anthropology tell us that the early years of child development are most formative and critical; yet our educational system paradoxically favors secondary and tertiary education. We are de-skilling ourselves by working "against the grain of the brain"!

Present dilemma

The transition to the post-industrial era requires human beings who are able to think analytically and critically and transfer high-level skills across domains. Economic

necessity will demand what economists euphemistically call "labor market flexibility"; people will need to be flexible, and to some extent, mobile.

Even before the current economic necessity brought about these changes, concerned educators and reformers had begun the search for alternatives to the industrial-age education regimes. They were inspired by diverse concerns, such as safeguarding liberal democracy (Dewey), post-colonial liberation and self-reliance (Ghandi, Nyerere), and the spiritual flowering of individuals (Krishnamurti, Steiner). Many applications of these alternative educational programs (e.g. Summer Hills, Waldorf Schools) proved problematic as they were still awkwardly embedded in a system that was *inside out*. Alternative political/economic systems are needed, not just alternative schools.

The dilemma facing education and other policy professionals stems from the *fragmentation of knowledge amongst disciplines and domains related to education.* It is further exacerbated by our reluctance to embrace the scope of thought and action that is required of true and penetrating educational reform. We need a synthesis of findings from various disciplines that will enable not merely a reform of schooling, but the emergence of new learning arrangements that can self-organize in a dynamically restructuring society.[5] These new learning arrangements will need to achieve the delicate and bountiful balance between content ("knowledge-telling") and experience ("knowledge-transforming").[6]

The difficulty confronting aspiring synthesizers was highlighted in 1944 by Austrian physicist Erwin Schrödinger:

> A scientist is supposed to have a complete and thorough knowledge at first hand, of some subject, and therefore is usually expected not to write on any topic of which he is not master. This is regarded as a matter of *noblesse oblige*. For the present purpose I beg to renounce the *noblesse*, if any, and to be freed of the ensuing obligation. My excuse is as follows.
>
> We have inherited from forefathers the keen longing for unified, all-embracing knowledge. The very name given to institutions of highest learning reminds us that from antiquity and throughout many centuries, the *universal* aspect has been the only one given full credit. But the spread, both in width and depth, of the multifarious branches of knowledge during the last hundred odd years has confronted us with a queer dilemma. We feel clearly that we are only now beginning to acquire reliable material for welding together the sum of all that is known into a whole; but, on the other hand, it has become next to impossible for a single mind fully to command more than a small specialized portion of it.
>
> I can see no other escape from this dilemma (lest our true aim be lost forever) than that some of us should embark on a synthesis of facts and theories, albeit with second-hand and incomplete knowledge of some of them – at the risk of making fools of ourselves.

A specific impediment to realizing a synthesis of knowledge and a transformation of education is the inability to *visualize* the specific features of a new learning society. One

is hard-pressed to locate a society, past or present, that constituted a learning society which practiced the best learning methods (according to what we *now* know) which would ensure the highest possible levels of individual and societal human development. An excerpt from a recent policy presentation "What is Meant by Educational Quality" (Hartwell, et. al. 1998) dramatically highlights this disconnect between what we know and what we practice:

> A description of all the contemporary research on educational quality would fill volumes. Nonetheless, it is a continued point of amazement that so little of what *is* known about how to improve educational quality finds its way into the organization and practice of the vast numbers of schools throughout the world. Indeed it has been remarked that in spite of the considerable advances that have been made in our understanding of cognitive development and human learning, and of the processes of organizational learning that would support true reform, the great majority of schools continue to operate as they did fifty years ago.

We need to creatively visualize an ideal learning society of the future. This future scenario could become a goal of our present efforts at societal and educational reform. It could also bring to the surface the conceptual and philosophical obstacles that clutter the path towards social transformation.

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[1] The evolution away from apprenticeships and guilds has serious implications for economic equity. In these societies, laborers could expect to make about the same amount of total income over the course of their lifetimes. The advent of enterprenurial and corporate capitalism saw the development of a more impermeable hierarchy that permitted substantial disparity of incomes. See Bowles and Gintis, 1976. For more discussion on apprenticeships see chapter 6 and the Postscript of this thesis.

[2] Taylorism, named for its founder, Frederick Winslow Taylor, is an epithet for "scientific management". It is a set of management principles whose main tenet was the concentration of skills and knowledge in the hands of trained managers. Workers would be relieved of responsibility and decision-making duties and would focus on the execution of specific tasks. The purported benefit of Taylorism was increased efficiency. According to Bowles (1976, pers.comm.) , the real effect of Talyorism was increased profits at the expense of worker control, job satisfaction and by some measures even efficiency. Taylorism, applied to schools, had an analogous impact. Schools more efficiently produced skilled workers at the expense of learning and balanced human development. See Spring, 1997; the 21st Century Learning Initiative, 1998.

[3] "Upside down and outside out" are John Abbott's terms and are widely used in 21st Century Learning Initiative discourse.

[4] For further explanation and helpful graphs see the 21st Century Learning Initiative's 1998 *Policy Paper: The Strategic and Resource Implications of a New Model for Learning.*

[5] The 21st CLI's *Policy Paper* claims that the 21st CLI is the only organization attempting to apply a meta-synthesis of knowledge to the field of education. They list many other authors who in the past 5 years have also attempted meta-syntheses in the sciences: E.O. Wilson *Consilience*, Ervin Laszlo *The Whispering Pond*, John Polinghorne *Beyond Science*, Ian Marshal and Danah Zohar *The Quantum Society*, Sally Goerner *Web World and the Turning of the Times*, Stephen J. Gould *Life's Grandeur*, Stuart Kauffman *At Home in the Universe*, William McNeill *History and the Scientific Worldview*. To this list I would add Fritjof Capra *The Web of life*, Francisco Varela et. al. *The Embodied Mind*, Jared Diamond *Germs, Guns and Steel*. Social scientists are equally daring in their meta-synthesizing, David Landes *The Wealth and Poverty of Nations*, Thomas Sowell *Conquest and Culture*, Paul Krugman *The Self-organizing Economy*, and Michael Rothschild *Bionomics: Economy as Ecosystem*.

[6] "Knowledge telling" and "knowledge transforming" are terms borrowed from Scardamalia and Bereiter (1993). See Chapter 4 part two section 7.

- Chapter 2 -
Purpose

Visualizing A Future Learning Society

In the previous section I described the *disconnect* between what we know (from recent field experience and research) and what we are doing (in schooling). Here I discuss one possible first step towards unravelling this disconnect, namely building scenarios of future societies that embody in a complete package, or conversely, totally violate, all that we now know about how human beings learn.

The purpose of this thesis is to assess the usefulness of scenario building as a heuristic and to reflect on its potential to inspire collective action in educational and social transformation. I will report on my experience in sythesizing information and creating scenarios for the 21st Century Learning Initiative. This report will comprise a detailed literature review, for this was a major component of the scenario building exercise. I will then reflect on the product and the process, making recommendations for similar future exercises.

What is scenario building?
The objective of scenario building is to provide a story of the future that encourages and enables people to purposefully create the present. By living towards the scenario a new present unfolds. Scenario building helps users prepare for the future. According to the Shell Global Scenario Project, another purpose of scenario building is to "ensure there is adequate challenge to the users so that relevant learning can take place"(Shell, 1998:5).

A scenario building exercise includes the following general steps:

1. Determining outcomes, or "target condition"
The target condition is the situation or outcome one intends to influence or create through development or a particular intervention. The status of a target condition is determined by the factors that lead to it.

2. Conceptual modelling
A conceptual model describes in diagrammatic form the set of relationships between certain factors considered to impact or lead to a specified *target condition.* Conceptual modelling consists of two general activities:

1. Determine the **factors** that influence a target condition; and
2. Describe the **relationships** that inhere amongst the factors and between each factor and the target condition.

In conceptual modelling, best results are achieved when:
- only relevant factors are included

- information on each factor is accurate
- linkages between factors are shown explicitly
- the modelling results from an iterative, team effort.[1]

3. Building the story

Using the conceptual model as a framework, the scenario-building team "builds" the stories, or scenarios, of two or more future societies. The team must regularly cross-check these stories with the conceptual model and framework in order to ensure that the scenarios are internally coherent and that they are plausible.

Each of the future scenarios must be equally plausible, regardless of how widely they diverge. To ensure facility of comparison, each scenario must include the same factors. Each factor cannot be a mere mirror opposite of its corresponding factor in the other scenario. The different factors in each scenario must cohere with one another for the scenario to be plausible.

Assumptions must be formulated explicitly. Implicit assumptions and vague generalizations undermine the scenario.

The *process* of scenario building is as important as the *product*. According to Betty Sue Flowers, author of the Shell Corporations's report on the Global Scenarios Project and participant of the 21st Century Learning Initiative's Wingspread Conferences, "The process of building the story creates transformation in the team. The process of working with the story creates a *culture of possibility* in the larger unit".[2]

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[1]Adapted from Margoluis and Salafsky, (1998). Measures of Success: Designing, Managing and Monitoring Conservation and Development Projects. Washington, DC : Island Press.

[2] 21st CLI's Wingspread Conference transcripts, 1997.

- Chapter 3 -
On Method

Part One
What I Read

My visits with John Abbott and Terrence Ryan at the 21st Century Learning Initiative were stimulating and challenging. These encounters usually made my head hurt. Upon reaching any horizon I realized that an even more challenging terrain awaited my steps. I clearly understood why people avoid thinking across disciplines and why institutions tend to not undertake interdisciplinary exchange. It makes heads hurt. I am endlessly fascinated with people who *can* at one time manage many disciplines and seem to thrive off it. I think of cross-disciplinary synthesizers such as Vygotsky and Piaget e.g., who were both foundational thinkers in fields in which they received no formal training. This predilection for synthesis is what attracts me to other synthesizers, such as Ash Hartwell and other colleagues at the Center for International Education, and it is also what intrigues me about the 21st Century Learning Initiative.

It is the final year of the millennium. I sit at my desk in Amherst, Massachusetts. About 25 books are lined up in front of me. To my left and right I find ring binders packed with journal articles from economics, education, psychology, organizational studies, and anthropology. On the table next to me I see Lynn Margulis' *Cosmos* and Dewey's *Democracy and Education* and Herman Daly's *For the Common Good.* What, some of my more sober colleagues might ask, do a book on economics, education and microbiology have in common?

In this short chapter on method I would like to present the most important aspect of my methodology - *myself.* All research begins in the constructed, evolving world of the researcher. If that commits me to box on a Cartesian coordinate of paradigms, so be it. I will describe my intellectual history and what I bring to the process of synthesizing and building scenarios. This recounting will help me to assess what progress I have made to date towards meeting Shrödinger's challenge to "synthesize facts and theories...even at the risk of making a fool of myself".

The mind wanders

I entered the University of Massachusetts in 1986 and spent two years as a dedicated accounting major in the School of Management. I spent my third year abroad at the University College Cork, Ireland, studying philosophy, languages and Irish archaeology. I eventually graduated with a BA with a concentration in philosophy and cultural anthropology. To fuse together anthropology and philosophy I used a third interest of mine, linguistics. I focused on 20th century language-oriented philosophers such as Wittgenstein, Cassirer, Austin, and Langer. One of my main outputs of that time was a synthesis of Ernst Cassirer's philosophy of symbolic forms (in *Language and Myth*) with

several prevailing theories from the anthropology of religion (Levi Strauss, Weber, Durkheim and Geertz). I have carried this fascination with "man and his symbols" throughout my work and travels in Southeast Asia (which has occupied 8 of the past 10 years). Last summer I read Terrence Deacon's (1997) *The Symbolic Species*: *The Co-evolution of Language and the Brain* for pleasure, when I realized that it pertains to the 21st CLI's work as well. The acquisition and management of symbols is an endless source of fascination to me. To satisfy this intellectual curiosity, I am a lifelong student of languages, especially Chinese and Chinese characters.

In addition to international development work, I spent a year experimenting with simple living on an organic farm in New York in 1992. The following year I spent with Wes Jackson at the Land Institute in Kansas. I had been impressed with his book *New Roots for Agriculture* as well as his colleague Wendell Berry's *The Unsettling of America.* I recognized these writings as the American analogs to Japanese farmer/philosopher Masanobu Fukuoka's *One Straw Revolution*, which was gaining popularity in Thailand at the time I was there. What recommended these works to me was that their analysis of the problems concerning sustainable agriculture touched on things social, economic, philosophic and religious. According to Wendell Berry, the problems of agri*culture* stem indeed from the problems of *culture*. At the Land Institute, I took part in a ten person learning group called "Considerations for a Sustainable Society". There I gained access some of the paradigm shifting literature such as David Orr's *Ecological Literacy*, William Irwin Thompson's *Pacific Shift,* and Morris Berman's *The Renchantment of the World.* I also had the exhilarating experience of reading Aldo Leopold's *Sand County Almanac* for the first time.

After 8 years in international development work, I returned to study education in my home state of Massachusetts. I had realized that the crisis in human *culture* - from the rise to global markets to the erosion of local communities - is indeed the main problem facing developed and developing countries alike. *Education* is the most fundamental aspect of human development and the key to unpacking and addressing our present cultural crisis. Given my background and skills, education is the likely area to focus my energy. I also saw education as a good place to continue the explorations I had begun in University ten years previous and had carried out on my own in the intervening period. The program at the Center for International Education (CIE) at UMass/Amherst is the ideal place since it is progressive, open-ended, and it is embedded in what I consider to be a fertile intellectual community which consists of one university and four colleges.

What I have read at UMass

During my year at CIE I spent time with the following authors: Illich, Dewey, Ghandi, Nyerere, Freire, Shor, Vygotsky, Howard Gardner, Caine and Caine, de Bono, Perkins, Rosenau (on post-modernism), Patton (an evaluation guru), and others. I wrote a paper comparing Mao Tse Tung's educational philosophy with that of Dewey and Freire. I also conducted a comparative inquiry into the practical philosophies of activists Danilo Dolci and Henry David Thoreau.

During my second year, an independent study with Ash Hartwell opened up new vistas and also led me to the 21st Century Learning Initiative. In that study I synthesized several reports from Thailand on a process called AIC (Appreciation, Influence Control - developed by William Smith). My output for that study was the paper "The AIC Process: Generating Shared Visions for Community Development in Southeast Asia". I also delved into related books and some of the new sciences: Senge, Wheatley, Caine and Caine, Maturana and Varela (*Tree of Knowledge*), Gleick's *Chaos* and Capra's *Web of Life*. I also explored social capital with Putnam's work and Fukuyama's *Trust*.

Other year two courses that were influential included Samuel Bowles course on Theoretical Institutional Economics and Linda Smircich's course on Organizational Theory. Much of literature from these courses appears in my bibliography. My principal output of this period was "Inequality or Cooperation: Multiple Equilibria in Systems of Production and Schooling".

How I synthesize literature

I conducted a semi-structured *eolithic* synthesis that can never be complete. The semi-structure is evidenced by the outline below and also the "outline of variables" in chapter 5. In my *eolithic* approach, I do not aim toward a predetermined destination; rather I set out with a hope for meta-synthesis and a confidence that I will discover nuggets along the way. The art of *eolithic* synthesis is the ability to assess promisingness of a nugget of literature.[1] The literature reviews are open-ended pastiches that will admit many future contributions. My *pastiche* is a hodgepodge, a semi-calculated cutting and pasting, a collage of colors that revel in contrast and confusion.[2]

In visualizing a future learning society I draw inspiration from the following books and articles (the main sources are listed; for full list see the bibliography):

Political economy

Samuel Bowles and Herbert Gintis (1976) *Schooling in Capitalist America*
Herman Daly and John Cobb (1986) *For the Common Good*
Elinor Ostrom (1998) "Coping With Tragedies of the Commons"
Rawls, John (1971) *A Theory of Justice*
Rawls, John (1993) *Political Liberalism*
Archon Fung (1999) *Street Level Democracy: A Theory of Popular Pragmatic Deliberation and its Practice in Chicago School Reform and Community Policing: 1988-1997.*
David C. Korten (1995) *When Corporations Rule the World*
Terrence Ryan (1996) "The Case for a Mindshift: A Review of Popular Economic Arguments and the Future of Capitalism"
Paul Krugman and Mortimer Zuckerman (1998) "American the Beautiful or America the Boastful?"

Learning

John Dewey (1944) *Democracy and Education*

Kieran Egan (1997) *The Educated Mind*
David Perkins (1995) *Smart Schools*
Allan Collins et. al. (1991) "Cognitive Apprenticeship: Making Thinking Visible"
John Abbott (1997) "Why Good Schools Alone Will Never Be Enough"
John Abbott (1999) *The Child is Father of the Man*
Renate Nummela and Geoffrey Caine (1994) *Making Connections: Teaching and the Human Brain*
Howard Gardner (1993) *Multiple Intelligences: The Theory in Practice*

Educational policy
Allan Odden (1998) *Financing Schools for High Performance*
Joel Springer (1997) *The American School*
Lisbeth Schorr (1997) *Common Purpose: Strengthening Families and Neighborhoods to Rebuild America*
Andrea Rugh and Heather Bossert (1998) *Involving Communities: Participation in the Delivery of Education Programs*
Neil Postman (1995) *End of Education*
John Ahier et al.(1996) *Diversity and Change: Education, Policy and Selection*
James Spillane (1997) "Reconstructing Conceptions of Local Capacity: The Local Education Agency's Capacity for Ambitious Instructional Reform"
Amy Gutmann (1987) *Democratic Education*

Neuroscience/Cognitive science
Carl Bereiter and Marlene Scardamalia (1993) *Surpassing Ourselves: An Inquiry into the Nature and Implications of Expertise.*
John Bruer (1993) *Schools for Thought*
Steven Quartz (1997) "The Neural Basis of Cognitive Development: A Constructivist Manifesto"
Francisco J. Varela, et al.(1997) *The Embodied Mind: Cognitive Science and Human Experience*
Henry Daniels (1996) *An Introduction to Vygotsky*
Humberto Maturana and Francisco Varela (1987) *The Tree of Knowledge: The Biological Roots of Human Understanding*

Social science
Wes Jackson (1994) *Becoming Native to this Place*
Peter Berger and Thomas Luckman (1966) *The Social Construction of Reality*
Stephanie Coontz (1997) *The Way We Really Are*
William Vitek and Wes Jackson (1996) *Rooted in the Land*
Manuel Castells (1997) *The Power of Identity*
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Terrence Deacon (1997) *The Symbolic Species: The Co-evolution of Language and the Brain*

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Fritjof Capra (1996) *Web of Life: A New Scientific Understanding of Living Systems*
Ash Hartwell (1997) "Scientific Ideas and Education in the 21st Century"
Margaret Wheately and Myron Kellner Rogers (1996) *A Simpler Way*
Edward Graybill (1995) *Change and Continuity in Cambodia: Contours of a Critical Hermeneutic Discourse for Third World Development*
Alfred North Whitehead (1950) *Science and the Modern World*

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[1] For an explanation of *eolithics* see MacNeil, D. James (1997) "Empathy and Action: An Eolithic Meta-Inquiry into Deep Investigation". Patton, Michael. (1982). *Practical Evaluation* (p. 112-117). Patton defines it as, "The principle of eolithism directs the investigator to consider how ends can flow from the means. One begins by seeing what exists in the natural setting and then attains whatever outcomes one can with the resources at hand." He cites Hawkins (1976) definition of an *eolith* as, "literally a piece of junk remaining from the stone age, often enough rescued from some ancient burial heap...stones, picked up and used by man, and even fashioned a little for his use." (Patton, 1982:113)

[2] Pauline Rosenau gives a wonderful definition of *pastiche* in *Post-Modernism and The Social Sciences* (1992): "a free-floating, crazy-quilt, collage, hodgepodge patchwork of ideas or views. It includes elements of opposites such as old and new. It denies regularity, logic, or symmetry; it glories in contradiction and confusion".

On Method

Part Two
How I Built the Scenarios

This chapter presents the procedure that I carried out from May to December 1998. This scenario building project was partly a deliverable for an internship with the 21st Century Learning Initiative and partly an outcome of an independent study at the Center for International Education (CIE). I also wove in several strands of information and ideas from other courses. This thesis is a veritable portfolio of my knowledge-transforming experience at CIE.

The scenario building exercise began with a visit to the offices of the 21st Century Learning Initiative in Reston, Virginia. For 5 days I was exposed to the thoughts and ideas of John Abbott and Terrence Ryan as well as volumes of books and articles. I left with a huge reading list (see bibliography) and an assignment to develop two scenarios for two "mythical" countries in Eastern Europe:

- Scenario 1: a well functioning and just society whose education and social practices had adopted and integrated all our present knowledge about human learning;
- Scenario 2: a conflict-ridden, disorderly society whose education and social practices run counter to what we know about human learning.

I named the country of the first scenario *Collabrolova*, the country of collaboration and love. In Collabrolova human *inter*action builds community spirit and fosters collective action. The second country was *Pretioska*, the country where everything has its price (from the Latin *pretium* "price"). In Pretioska human *trans*action builds economic relationships and fosters fair business practices. For a full description of the attributes of the two scenarios see chapter 5.

In general, building the scenario was a *thought exercise*. I imagined a new country into existence. I carried out the following specific steps to develop the two scenarios (for an explanation of the purpose of each step see chapter 2):

1. Develop conceptual model and variables for the scenarios (see chapter 5). I incorporated feedback from John Abbott, Terrence Ryan and Ash Hartwell into the draft conceptual model. After finishing the scenarios I made a final revision.

2. Research the literature in the fields of cognitive science, neurobiology, anthropology, economics, education finance, community development, and curriculum and pedagogy studies.

3. Consult professionals and colleagues working in various fields (in addition to John Abbott and Terrence Ryan):
    - Ash Hartwell (Center for International Education) Educational Planner and Policy Specialist with focus on Africa.
    - Peter Tamas (CIE) - Canadian Ed.D candidate studying applications of systems theory to educational planning.
    - Fritz Affolter (CIE) - German Ed.D candidate studying moral education.
    - Charles Kirkwood - businessman and independent researcher investigating changes in American family structure.
    - Archon Fung (Political Science, MIT) – Phd Candidate researching several "deliberative democracy" experiments in Chicago.
    - Kieran Egan (Simon Fraser College) - author of *The Educated Mind.*
    - Jenny Moylan - coordinator of school-museum education programs at a science museum in Chapel Hill, North Carolina.
    - Samuel Bowles (Economics, UMass/Amherst) - author of *Schooling in Capitalist America.*
    - Ekkehard Ernst (University of Paris) German Phd candidate in economics working on institutional complementarities in European economic institutions.
    - Laura Dresser - coordinator of the Wisconsin Regional Training Partnership.

4. Develop preliminary scenarios, August, 1998

5. Submit "Outline of Thinking" to John Abbott, August, 1998

6. Present scenarios to colleagues at colloquium at CIE, September, 1998

7. Write book review of Kieran Egan's *The Educated Mind* for the 21st Century Learning Initiative, September, 1998

8. Further refine scenarios and submit to peer review, October, 1998

9. Incorporate feedback and reflect on the exercise, November, 1998

10. Write "Inequality or Cooperation: Multiple Equilibria in Systems of Production and Schooling" for a seminar on Theoretical Institutional Economics, December, 1998

11. Form an informal study group exploring various alternative schooling practices in Massachusetts. Make several visits to Waldorf schools and the Greenfield Center School's responsive classroom, Spring, 1999

12. Attend debate at Mt. Holyoke College on "Economics of School Choice", March, 1999

13. Make final revisions to scenarios, literature review, and write conclusion, April, 1999

- Chapter 4 -
Literature

Part One
Why Learn? Why Teach?

Nietzsche said, "He who has a *why* to live can bear with almost any *how*." This could apply to education as well as to life in general (Postman, 1995). The first and most important question for scenario building is "what is the purpose of education?" This question has been as hotly contested through the eons as the questions of the nature and purpose of human life. Indeed the two issues are flip sides of a coin. Whether the purpose of education is to make efficient workers or renaissance persons, one's view of the purpose of human life will shape the design of educational programs.

1. Big Questions

A survey of past debates is helpful in tackling the present problem of addressing the questions concerning the purpose of education and the values that shape educational systems. This brief survey covers thinkers and philosophies of Europe and the United States. This is done because the scenarios were designed for a future European country, and I assume that ideas and research from Europe and the US would be most relevant. These ancient questions and debates still frame the ongoing discourse.

- What is human nature?
- What are the values that underpin the educational activities of a group of people?
- What is the purpose of education and who determines this purpose?

Plato (427 - 347 BC)

In the West, all debates on matters philosophic begin with Plato. Plato held that the purpose of education was to provide students access to recognized forms (or canons) of knowledge and reasoning skills that would give them a privileged, rational view of the world. Such a rational view would enable students to contemplate higher ideas and transcend stereotypes and illusions of the phenomenal world. To a large degree, this ability was innate but required being drawn out and cultivated.[1] Basic skills were only of secondary importance as a means to access this rational faculty and these forms of knowledge. Plato's views, to a large degree, provide a framework for the following debates on the purpose of education.

The state of nature

Jean Jacques Rousseau (1712-1778) held that *nature* is the guide. In the state of nature people are good, society taints them. The famous first line of the *Social Contract* states his point of departure most succinctly, *L'homme est né libre, et partout il est dans les fers* (Rousseau, 1992).[2] Education is a matter of protecting children, at critical developmental

stages, from the corrupting influences of society. The most important area of educational study is the nature of student's individual (internal) development, learning and motivation. The development of the individual is the goal of education. Thomas Hobbes (1588-1679), the owner of the famous statement, *bellum omnium contra omnes*[3], believed that a sovereign is required to prevent disorder in a society. In the state of nature people are generally nasty and unable to govern themselves. Without active intervention and management individual development would not occur.

John Locke (1632-1704) maintained that the human being was a *tabula rasa* that could be shaped by environmental conditions. Locke claimed that the motivation for learning was extrinsic. The idea that children can be completely molded by environmental conditions set the stage for the field of behavioral psychology and 'environmental determinism'. Strict adherence to environmental determinism would not only influence researchers and scholars, such as Skinner and William James, but it would also shape mass movements in the 20th century such as the Lenin/Stalin program.

The purpose of education: extend social control or build human capital?
In the United States, there have been various stages of debates concerning the purpose of education. In the early colonies, the purpose of school was to promote the authority of the church and to instill popular obedience of the government. The purpose of learning to read and write was to enable citizens to read the Bible, become better workers and to better understand and follow the rule of law.

The idea of common school, as promoted by the illustrious reformer, Horace Mann (1796-1859), was that human nature can be formed and given direction by training within formally organized institutions. It was believed that by offering a basic school education to all, the government could create a 'perfect' society.[4] The common school was designed to accommodate all children and teach a common political and social ideology (Spring, 1993).

Values: "natural aristocracy" or young republicans?
Thomas Jefferson (1743-1826) believed that children should learn not values or ideologies, but rather basic tools (skills) such as reading and writing and analytical thinking. These tools would enable children to exercise their own reason and to read books and newspapers in order to form their own opinions. In a famous quip Jefferson said he would prefer to have newspapers with no government than government with no newspapers. In contrast, Noah Webster (1758-1843) was a champion of republicanism and nation building. He believed that in addition to the 'basics', children should learn to be patriotic and responsible American citizens. His 1787 reader begins with the words, "Begin with the infant in the cradle; let the first words he lisps be 'Washington'" (Spring, 1993).

How is learning: child-centered or efficiency-driven?
John Dewey (1859-1952) held that ideas, values and social institutions originate in the material circumstances of life. These circumstances during his time were increased

urbanization, the rise of corporations and the increasing complexity of society. To prepare children for that reality he advocated that schools should be social, as well as, educational centers, where children learned not only the basics but also how to function in society. In a word, school was society.[5] Dewey believed that "the only true education comes through the stimulation of a child's powers by the demands of the social situations in which he finds himself" and that "education is the process of living and not a preparation for future living" (Dewey in Dworkin, 1959). Accordingly, Dewey was an advocate of child-centered, experiential learning.

In contrast, Edward Thorndike (1874-1949) was the father of *connectionism*, where the ideal social organization is one which people are selected for their social roles through testing. Connectionism refers to the connection between stimulus and response. All changes in the human intellect are a result of certain fundamental laws that affect these connections. Thorndike's goal was efficiency through social sorting. The implementation of Thorndike's social efficiency ideas in the schools was facilitated by the scientific management approaches of Frederick Taylor. In the early 20th century schools began to adopt Tayloristic hierarchical organization, with a new class of administrators directing the actions of teachers.

The most influential inheritor of Thorndike's tradition was B.F. Skinner (1904-1990), the most famous champion of behaviorism.[6] Like Skinner, William James (1842-1910) also advocated stimulus-response explanations for psychological phenomena. Skinner held that there is no science of mind, only observable environmental stimuli. For Skinner, these stimuli and how they affect behavior were the proper units of psychological analysis.

Democracy and education - a critical perspective

The classic work of Bowles and Gintis, *Schooling in Capitalist America* (1976), takes a critical look at the economic realities underlying the United States' hierarchical educational system. They begin by recapping Dewey's three goals of education. These goals are the *integrative* - children are socialized to become participants in the society; *egalitarian* - each individual gets the opportunity to improve themselves and advance from the social group in which they were born; *developmental* - education provides the means for individual growth and also creates a desire in each individual to grow. Because of Dewey's optimism and faith in democracy, he believed that these could be mutually supporting goals.

Bowles and Gintis claim that Dewey's vision could only be realized if democracy was extended thoroughly to all aspects of life, both political *and* economic. The United States has a political democracy, but its economy is too hierarchical, non-inclusive, and inegalitarian to be democratic. The capitalist mode of production is primarily a matter, not of efficiency, but of the generation of profits that accrue to the capitalist class. Class relations undergird the spheres of education as well as production. An economic system that has divided its labor in vertical structures that are subject to bureaucratic authority has a systemic requirement to support a repressive education. A repressive education will

reinforce the technocratic perspective, provide human capital for economic production and produce responsible employees who will be accustomed to norms of subordination and domination.

Repressive education and an hierarchical division of labor are thus mutually supporting. This mutually supporting relationship is due to a gradual co-evolution. Bowles and Gintis recommend that some sort of revolution will be necessary to transform these structures and install true political and economic democracy. MacNeil (1998) proposed as an alternative that institutional forces might also undo this co-evolved relationship. As schools become more egalitarian firms may become egalitarian in their management and benefits distribution. This would encourage schools to produce more graduates equipped for egalitarian institutions, and so on. For an account of this theory see MacNeil (1998), "Inequality or Cooperation: Multiple Equilibria in Systems of Production and Schooling".

2. Persistent Issues

Efficiency vs. effectiveness: the sorting of learners

A critical shift occurred between the time of the common school ideal up to the implementation of Thorndike's program. The common school *ideal* was an equal opportunity for all to get an education. However, social and economic opportunity in the "marketplace" upon graduation depended on access to jobs and institutions that was not equally distributed in society. Under the influence of Thorndike and the emphasis on scientific management and efficiency, schools in the 20th century began sorting children onto career tracks based on their proclivities and abilities, which were measured by standardized tests. In doing this, schools replaced the marketplace as the "sorter" of children.

The underlying justification for sorting is *efficiency*. Education produces workers of diverse interests, skills and levels of competence that will fill positions along the hierarchies of capitalist systems of production. Sorting purports to do this efficiently. This notion is beset with at least three problems. Firstly, the meaning of efficiency depends on the goal of the educational and economic system that happens to be prevalent. Secondly, what is efficient depends on who is defining efficiency for what purposes. In Bowles and Gintiss' analysis the champions of capitalist production and hierarchical education claim efficiency as their guiding principle. Bowles and Gintis (1976) present a wealth of theoretical and empirical evidence that show that capitalism is driven by the capitalist class' quest for *profits* rather than efficiency of production. Michael Apple's *Official Knowledge* (1993) also illustrates how powerful interests define the purpose and content of education.

The third problem is that those practices, which are efficient, are not necessarily *effective*. This is especially true with human learning. There is a wealth of evidence (much of it compiled by the 21st Century Learning Initiative) that shows that many current teaching practices are not effective. Current brain research shows how much teaching and learning

actually works against the grain of the brain (see chapter 4, part 2). If the current goal of education is effective learning, then it appears to be failing in the name of efficiency.

Conflicting messages in the classroom

The persistence of the above debates has given rise to competing and conflicting approaches *and* messages in classrooms and schools. While Thorndike's testing has predominated, the influence of the ideals and philosophy of Dewey is undeniable. Schools struggle to reconcile child-centered, experiential approaches with mandates for efficiency and scientific authoritativeness. According to Kieran Egan (1997) there are three principal 'incompatibilites' in schools today:

- The idea of socialization (that school's function is to socialize);
- The idea of the quest for Platonic Truth (that education is about learning forms of knowledge that will impart a privileged, rational view of reality);
- The idea of nature as the guide to development (Rousseau).

Egan maintains that schools are unable to concentrate on any one of the three, and the incompatible mixture generates a confused curriculum and pedagogy. Bowles and Gintis, and many others, have also noted the incompatibility of ideas in the American classroom (see discussion above).

New values or the end of education?

In *The End of Education* (1995), Neil Postman presents a provocative inquiry into the purpose of education. In particular he is concerned with public education in contemporary America. He suggests that public schools do not simply *serve* the public, they actually *create* it. The quality of a society depends on that society's "shared narrative" (or 'myth to live by') and the capacity of that narrative to provide inspired reasons for schooling. In the past educators were conscious of and inspired by the *reasons* for education, but in contemporary education, teachers merely focus on *methods* of teaching. There are no longer explicit narratives or deliberate dialogue about the purpose of education.

In the absence of explicit narratives, we labor under narratives that pervade our practices implicitly, or by default. Postman refers to these narratives as "gods". They are the *god of economic utility*, which posits America not as a culture but as an economy. Under this god an individual's worth and meaning is equal to their profession and pay. The purpose of education is to 'get a job'. The *god of consumership* preaches the hedonistic creed that pleasure is the greatest good and that pleasure comes from material acquisition. Related to this god is the *god of technology* that holds that technology and technological advancement is an unquestioned and proper goal for society. The *god of multiculturalism*, which is in contrast to "cultural pluralism" (which Postman applauds), calls for an exclusive preoccupation with cultural diversity. "Multiculturalism" of the brand Postman disputes calls not for reconciliation with the traditionally dominant Eurocentric world, but the calculated and thorough discarding of it.

In Postman's view the cause of the end of education are that these gods are false gods and they should no longer serve. Some of the emerging symptoms of the end of education include privatization of schools, the direct management of schools by business, and the subordination of schooling and classrooms to technology.

Postman's recommendation is that we need to create (and one assumes, believe in) new narratives. He proposes a few narratives to initiate the discussion. One he calls *spaceship earth* - an ecological ethic that puts all humanity together on the same living planet with a responsibility to protect and love it. Another narrative is the *American experiment* - the great American arguments about what America is and also the culturally and politically pluralistic experiment that has formed a nation over the past 350 years. The narrative of the *law of diversity* borrows from cultural and biological sources. It maintains that systems are more stable and beautiful when they are more diverse.[7]

The specific narratives that Postman proposes can and should be discussed, modified and in some cases refuted. The point he makes is that without a *why* for education, any permutation of possible *hows* will never restore life and vigor to education in America. In the absence of a narrative - a *purpose* - education as we know it should end.

Where's the theory? – whither education in modern democratic states?

Lenin observed that if one wants a revolution then one needs a *theory* of revolution.[8] I suggest that this requirement of theory also apply to social transformation and everyday acts of reform. Even more fundamental than Postman's gods, or narratives, are the social and political theories, or meta-narratives that guide a society. Theory provides a principled plan that guides action towards desirable outcomes. In the absence of an articulated theory citizens cannot assess the merits or implications of particular policies or programs.

In her classic book, *Democratic Education* (1987), Amy Gutmann explores this issue and affirms the necessity of theory in creating a democratic society and education. Her book addresses the questions of who should have the authority to influence how democratic citizens are educated and what the moral boundaries of that authority should be. She argues that democratic education and democratic politics are mutually supporting, and that we need both if we want either. In a democratic society *collective deliberation* is the required, and also the most effective, means to decide on issues of education. Collective deliberation, or put more crudely, 'public debate', should not be avoided, but should rather be embraced as a "democratic virtue". We should not leave education questions to the enlightened experts and bureaucrats. We should consider public debate as a means to increase public understanding of education.

Governments often make policy as broad as possible in order to quickly and painlessly achieve public consensus. For example, advocating the reduction of schools' role to "teaching the basics" is a way to avoid political controversy. It hardly advances the goal of democratic education, and it cuts public debate off at the bud. The "back to basics" movement, for example, can be seen as an "apolitical functionalist" measure toward

educational improvement. Gutmann not only eschews functionalism, she also criticizes the polarized liberal and conservative stances on education. The conservative approach calls for increasingly solving educational problems (such as sex education or social studies) in their proper realm - the private. Ultimately the conservatives would welcome complete privatization of schools both as a way to increase efficiency and also to gain more private control over school content.

The liberal perspective is captured in Dewey's famous suggestion, "what the best and wisest parent wants for his own child, that must the community want for all of its children". This turns out to be not a *political* ideal, but a *moral* ideal. Gutmann points out that, in a democratic society, moral ideals do not translate directly into political ideals. It could well be that not all community members want their children to be educated like the wisest and best parent's children. Who will determine the wisest and best? What if the wisest parents do not want their children to learn arc welding or taxidermy - should this preclude others from pursuing it? Gutmann does not want to install an enlightened philosopher king to set the 'best' educational policy. Even if that king agreed with all of Gutmann's moral ideals, this system would not pass her political ideals of deliberative democracy. For Gutmann is proposing a democratic theory that "faces up to the fact of differences between our moral ideals of education". She argues for a "democratic deliberation, not only as a means to reconciling these differences, but also as an important part of democratic education". We may even, "find ourselves modifying our moral ideals of education in the process of participating in democratic debates and of publicly reconciling our differences (p.12)".

Gutmann is calling for a "conscious social reproduction" where communities deliberately make educational policy. The only constraints that she places on the deliberative process are that it be non-repressive and non-discriminatory to its participants. A community that makes educational policy, moderated by these two constraints, realizes democratic education.

The search for first principles

Gutmann espouses democratic deliberation as the means to achieve democratic education. What would be a set of principles or ground rules that could underpin and regulate such deliberation? In *Theory of Justice* (1971), John Rawls proposes a method of deriving such principles, which he calls "first principles of justice". These principles and methods appear consonant with Gutmann's *modus operandi*. As his theory of "distributive justice" has been so influential and it promises to help guide public debates about setting educational goals, it is worth briefly outlining.

To Rawls the subject of justice is the basic structure of society, the way that social institutions distribute rights and duties as well as determine the division of benefits. The "just" society will be the society that individuals would choose if they chose from what Rawls calls the "original position". The original position is a hypothetical position where all members of a society enjoy equal liberty. They do not know what position or status they or others occupy, or will occupy, in society. Thus they are choosing a society from

behind a "veil of ignorance". A society of individuals will cooperatively choose, in one joint act, the *principles* which will assign basic rights and duties and determine the division of social benefits. Rawls claims that the society they choose will have two fundamental characteristics[9]:

1. Equality for all members in their assignment of basic rights and duties. They will enjoy the maximum amount of freedom compatible with the freedom of others;
2. Any social and economic inequalities are just *only* if:
   - They are derived from positions that are open to free competition; and
   - They operate to everyone's advantage. This requires that *the least well off in society be made as well off as possible.*

These are the "first principles of justice" that "regulate all subsequent criticisms and reform of institutions" (Rawls 1971:13).

Rawls' theory of justice is a "rational choice" theory. Individuals who choose their first principles are doing so from a rational position. They are not considering others' interests or even their own vested interests. All agreements reached in an original position will be *fair*. Rawls' conception of justice can thus be called "justice as fairness".

This theory of justice is called a distributive theory because the *distribution* of 'primary goods' (rights, freedoms, opportunities, wealth, income) matters. In Utilitarianism, by contrast, it is the greatest *net* balance of goods that matters. In a utilitarian society the least well off might be much worse off than would be the case in a Rawlsian 'distributive justice' society. A distributive justice society, on the other hand, might end up with a net balance of satisfaction that pales against a utilitarian society. Rawls' basic intuition is that:

> Since everyone's well being depends upon a scheme of cooperation without which no one could have a satisfactory life, the division of advantages should be such as to draw forth the willing cooperation of everyone taking part in it, including the less well situated (p.7).[10]

Rawls methods in deriving a theory of justice as fairness require an understanding of the difference between "political conceptions" and "moral conceptions". An argument for justice as fairness begins from a political conception and can only become a moral conception if it later acquires its own intrinsic moral ideal. When arguing for justice as fairness one does not take a moral stance, but rather one refers to an agreed upon political conception. Justice as fairness is not a teleological position. It does not purport to maximize some ontologically determined highest "good" (like Utilitarianism does). It merely provides the space for people in society to cooperate and arrange institutions in a just manner and for the right reasons.

This idea appears consonant with Gutmann's discussion above where she separates moral from political ideals. This idea is critical for regulating public debates on education goals.

Rawls follow-up treatise *Political Liberalism* takes justice as fairness a step further. The central problem in that book is to apply the political conception of justice to an actual constitutional democratic state that is composed of a plurality of reasonable doctrines. How can people who espouse such a plurality of doctrines (some of which are mutually irreconcilable) come to freely endorse and live by the same political conceptions and thereby maintain a well ordered society? Rather than present an overview of this work, it will be more instructive to look at one current attempt to apply politically liberal concepts in the field - Archon Fung's account of "Street Level Democracy". To preface this, it is important to emphasize that Rawls and Fung's liberalism is not the liberal perspective of the classic liberals like Dewey. Theirs is the liberalism that upholds the ideals of deliberative democracy that Gutmann would also endorse.

Making institutional guesses

In his forthcoming book, *Street Level Democracy: A Theory of Popular Pragmatic Deliberation and its Practice in Chicago School Reform and Community Policing: 1988-1997*, Archon Fung claims that "Democracy can be its own best school". His general question concerns how we can make political institutions more democratic. His book describes one possible answer to that question – "Street Level Democracy". SLD is a scheme in which parts of public sector services – in this case policing and schooling – are "broken down along dimensions of territory and function"(p. 29). In SLD a deliberative democratic and decision-making process takes place at the smallest operational unit of governance, say the school committee or a police beat.[11] The smallest operational units are democratic but not completely autonomous. They are embedded in a larger system and still depend on the assistance and review of a central authority, or "administrative center".[12] The function of the administrative center is not to control or command, but rather to "assure that the microscopic operational units perform their function well, in part by assuring that each of them is indeed governed by deliberative processes internally, and in part by spreading the successful techniques – the revealed best practices – of similarly situated units in other parts of its large jurisdiction"(p.29).

SLD is an institutional means to achieving 'radical democracy', *radical* in the sense that true deliberation and decision-making takes place at local units. SLD is *practical* in the sense in that it provides opportunities for "political participation and influence that advances each of the core democratic values beyond the level achieved by, say, institutions that allow citizens to vote for political officials who then direct insular, hierarchical agencies" (p.29).

Fung is searching for institutions that advance democratic values. What then are these core democratic values and what are the constraints that impede their realization?

Fung proposes **five core democratic values**:

Production of desirable outcomes
This is the instrumental ground for advocating democracy. Popular participation in designing and implementing policy increases the likelihood of beneficial outcomes for the people and decreases the likelihood of manipulation by capricious despots.

Individual autonomy
While individuals in democracy construct an authority to rule over collective bodies and activities, they intend that these authorities preserve and protect the rights of individuals. Autonomy for the individual means that they act as they choose and set their own rules. The function of a democratic community, then, is to reconcile individual freedom with dependence of the individual on the collective.[13]

Equal consideration
This value assumes the equal intrinsic worth of individuals. The ideal of "one person, one vote" has its basis in this value. One common objection to this abstract value is that it defies the more complex reality. Equality can be *formal*, in the sense of equal political rights (to vote e.g.), or it can be *substantive*, meaning that influence of one individual may be disproportionate due to other inequalities, such as wealth, status and education (p.6).

Individual development
Democratic government not only benefits a society of citizens, it also provides the space for the personal development of individual citizens. One indicator that theorists and politicians have emphasized is 'competence in public affairs'. Democratic processes require and generate this competence, which in turn further develops democracy. "Democracy is the feedback loop between individuals as citizens (makers of laws and policy) and as subjects – the values, interests, wisdom, and capacities of citizens are aggregated through the machinery of democratic government into public decisions and public action"(p.7).

Deliberation
Democracy is government by dialogue and discussion. This value serves as a *process* that relates to and underwrites the other four values. By recognizing the value of individual opinions, a deliberative process respects individual autonomy. Deliberation requires a certain facility for dialogue and discussion that citizens must develop and hone throughout their democratic careers. Deliberation also produces desirable outcomes because it takes in more information and provides space for reflection.

Having outlined five core democratic values, Fung then turns to **four practical constraints** that impede the realization of these values:

Performance
Quite simply stated - democracy does not work. The deliberative process is cumbersome and hinders rapid and effective deployment of social programs, campaigns, etc. Division of labor in government – in the name of efficiency - also gives rise to dispersed and specialized control over different functions. The final outcome of this process is an 'oligarchy' where a minority of directors governs on behalf of the people.[14]

Complexity
The average democratic citizen is increasingly unable to grapple with the technological and social complexity of modern societies. Hired specialists manage more aspects of our lives. Technocrats dominate decision-making arenas as ordinary citizens become more vulnerable to policies whose provenance they cannot trace or understand.[15]
In the area of education it amounts to this:

> Complexity means that, even when ordinary people know what they want in particular – like better education for their children – they don't necessarily know which public policies will best get it – whether the best course involves charter schools, total privatization, progressive education, national standards, and/or higher teacher salaries (p.19).

Scale
Political theorists have often maintained that democracy works for small groups of citizens but that true self-governance is impossible when number of citizens or the geographical areas grows too large. Simply calculated, the larger the number of citizens the lesser the stake in outcomes each individual will have. These concerns were voiced most famously by Montesquieu[16] and Rousseau. Madison's federalist program of government by representation is the one well-known solution (p.23).[17]

Inequality
The issue of inequality of status and material wealth amongst citizens is a major constraint – especially in the present United States context - to realizing democratic values. Rousseau[18] pointed this out most succinctly, "no citizen should be so rich as to be capable of buying another citizen, and none so poor that he is forced to sell himself" (*The Social Contract* quoted in Fung p. 25). Fung concedes that much could be done to level the social and class field in the United States, and that this would have a beneficial impact on advancing democratic values. In his current project, however, he is seeking institutions that could advance democracy even in the current context of relative inequality.

Fung's **methodology** is pragmatic and objective-oriented. He is seeking institutions that advance five core democratic values. Whether or not these values are flawlessly conceived or exhaustive of all values need not hinder his search. This is not a philosophical argument to validate these values. Invoking "what diverse people find attractive about democracy"(p.9), he merely suggests that any society that advances toward these values will become *more* democratic. Concerning the practical constraints, he says, "whether these factual constraints are just, my suggestion is that democratic

proposals attentive to them will be more fruitful than those that ignore or attempt to overcome them"(p.4). His method of identifying institutions is to make educated 'institutional guesses'. He is making what mathematicians call a "numerical approximation", where guesses are made in succession until one reaches an answer *close enough* to the one required (p.2). The institutional guess for his investigation is Street Level Democracy. True to the Rawlsian tradition of political liberalism, Fung is not promoting a 'comprehensive doctrine' but rather an institutional guess and a framework for benchmarking democratic theories.

3. Conclusion

Who controls education controls the destiny of society. This statement may admit of some historical exceptions. Education may not always be the must culpable cause for social degeneration, and it may not be the panacea for all of a society's ills. Nevertheless, education has been viewed as such, especially in the United States. No revolution is consummated until educational systems are overhauled. This task typically begins early in the morning the day following the victory parade of the revolutionaries. Education will always be a highly contested arena in both revolutionary and conservative societies.

We saw in section one that educational debates are tempered by ancient questions on the nature of human life and society. Philosophers, educators, politicians and lay persons still debate the key issues within the framework that has been laid down by preceding generations of thinkers. I presented the issues as dichotomies – social control vs. human capital, efficiency vs. effectiveness, natural aristocracy vs. republicanism. The use of dichotomies serves a heuristic purpose. Indeed, actual debates tend to polarize towards these extremes especially to the extent that the contestants are uninformed or have ulterior vested interests. A well functioning educational program will typically be one that results from informed debates, where values are explicitly discussed, where outcomes are negotiated in an atmosphere of fairness to its members.

Many of the debates appear insoluble, especially in highly heterogeneous societies that espouse what Rawls calls conflicting "reasonable comprehensive doctrines". This chapter has tried to outline possible guidelines and methods that can facilitate agreement and action in the highly contested arena of education. Gutmann, Rawls and Fung provide useful philosophical and political solutions. In the next section we will explore how the sciences of mind, brain and learning further contribute to solving these most insoluble of problems.

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[1] In the *Republic*, Socrates presents the "Allegory of the Cave", where people have been chained in the dark and cannot move their heads to see the light at the cave entrance. He explains to Glaucon, "Whereas our argument shows that the power and capacity for learning exists in the soul already; and that just as if it were not possible to turn the eye from darkness to light without the whole body, so too the instrument of knowledge can only by the movement of the whole soul be turned from the world of *becoming* to that of *being*, and learn by degrees, or in other words, of the good....and must there not be some art which will show how the conversion can be effected in the easiest and quickest manner; an art which will not implant

the faculty of sight, for that exists already, but will set it straight when it has been turned in the wrong direction, and is looking away from the truth."(Price, 1962:65) Glaucon, having been "set straight" by Socrates oratory, concurs. *Becoming* refers to the world of transient phenomena and illusion. *Being* is the world of ideas and perfect forms.

[2] "Man is born free but everywhere he is in chains".

[3] As it is probably the most quoted sentence in all of Western Philosophy why resist here? From chapter 13 of *Leviathan*: "Hereby it is manifest that during the time men live without a common power to keep them all in awe, they are in a condition which is called war; and such a war is of every man against every man....in such a condition there is no place for industry...no knowledge of the face of the earth, no account of time, no arts, no letters, no society and which is worst of all, continual fear, and danger of violent death; and the life of man solitary, poor, nasty, brutish and short."

[4] Compare with Confucius who also believed that all human beings had the potential to become "superior individuals.

[5] Contrast "school is society" with Mao Tse Tung's dictum that "society is school". During the Cultural Revolution, Mao called for a partial de-schooling of society where university students returned to the countryside to learn hands-on essential lessons of production and living. Dewey's lectures in China about his educational theories were influential on a generation of Chinese Theorists. For his purposes, Mao turned it around. He believed that the most important learning takes place in society not in schools and that schools should be integrated into society as much as possible. Mao claimed that "Everybody in society will be a school graduate; yet school will be a preparing ground for the large school which is society as a whole. Such will be the final product of a thousand years of reform and progress" (Di, Xu. *A Comparison of the Educational Ideas and Practices of John Dewey and Mao Zedong in China: Is School Society or Society School?*. San Francisco: Melle Research University Press, 1992: p.71). For a cogent summary of Mao's educational philosophy see MacNeil (1998 unpublished) "The Educational Philosophy of Mao Tse Tung and Implications for Non-formal Education".

[6] In his brilliant overview of Evolutionary Psychology, *Evolution in Mind*, Henry Plotkin points out that, despite his immense popularity, there were never many adherents to Skinner's position. The reason for his popularity was that, "...he articulated in a powerful way so provocative a viewpoint that his heuristic value was immense. One might want to think that had he never existed, someone would have had to invent him in order that the extreme behaviorist position be represented. It is fair to say that his greatest achievement as an outspoken representative of extreme behaviorism was to demonstrate quite conclusively the intellectually bankrupt nature of this school of thought." (Plotkin, 1998:144).

[7] Caine and Caine (1997) refer to a narrative used by educator Susan Campbell (1995) that fosters a "shared sense of belonging". It is exemplified by four essential principles, which she calls Community Ownership, Meaningful Work, Ecological Sustainability, and Respect for Differences. At base these are probably similar to Postman's narratives. His use of the word 'narrative', however, implies that it is an unfolding story that members of society can modify. Campbell's 'essential principles' smacks of rigidity and dogma. What is most important (and challenging) for my purposes is that communities or societies have a means to develop their own narratives.

[8] Lenin wrote that "the role of the vanguard can be fulfilled only by a party that is guided by an advanced theory". This sentiment is true to Marx, writing to German party leaders, "If you must combine, then enter into agreements to satisfy the practical aims of the movement, but do not haggle over principles, do not make concessions in theory" (quotes in Gouldner, 1980:5). This agrees with Confucius' famous dictum, "Firm in principle, flexible in practice". One set of critiques claimed that adherence to Marxist principles ended with Lenin, and subsequent decades saw political and social catastrophes. Stalin or Mao had perhaps overextended or even flipped the exhortation of Marx and Confucius. The resulting inflexibility in practice and steady erosion of credibility of the founding principles caused social chaos that that Mao and Stalin subdued by force. The challenge for the theorist is to develop a theory that is sufficiently fundamental and broad enough to inspire consensus of its principles and popular approval of its unwavering application. This is what theorists like Gutmann and Rawls attempt to do.

[9] Rawls' approach reminds the political philosopher of the social contract philosophies of Kant and Rousseau. To the teacher or trainer, he follows a similar procedure to the trainees' "setting norms" at the outset of a training course.

[10] Imagine a group of managers who sought to design a just society where the least well off were made as well off as possible. It is doubtful that they would even be able to know *how* the least well off were doing and *why*. This reminds me of Hegel's familiar discussion of the slave and the master. The master sets up institutions and mores that prevent him/her from being able to understand not only how slaves live and think, but also how the masters' own society functions. This dilemma has spawned various "standpoint theories" that call for starting all social/political investigations from the perspective of the most oppressed and disenfranchised members of society. For a succinct presentation of standpoint theory and its variations see Sandra Harding's (1993) "Rethinking Standpoint Epistemology: What is Strong Objectivity?" in *Feminist Epistemologies*. Alcoff, Linda and Elizabeth Potter, eds. New York:Routledge.

[11] See Odden et al. in section 5c for similar arguments in the area of school finance reform

[12] See Elinor Ostrom's discussion of polycentric governance systems in "Coping With Tragedies of the Commons" Indiana: Workshop in Political Theory and Policy Analysis 1998. Ostrom proposes the concept of polycentric governance systems as an alternative to vertical, top-down or bottom-up systems. She explains thus, "By polycentric I mean a system where citizens are able to organize not just one but multiple governing authorities at different scales. Each unit may exercise considerable independence to make and enforce rules within a circumscribed scope of authority for a specified geographical area. In a polycentric system, some units are general-purpose governments while others may be highly specialized. Self-organized resource governance systems, in such as system, may be special districts, private associations, or parts of local governments. These are nested in several levels of general-purpose governments that also provide civil, equity, as well as, criminal courts." Like Fung, Ostrom's system has a role for local, self-governing units as well as larger, centralized authorities. Local units are more responsive and expedient, but often benefit from technical backstopping of a larger authority. And when local units occasionally fail, the centralized authority can take over.

[13] The value of individual freedom was the sole justification for democracy of Rousseau. From freedom all other values follow. In the *Social Contract* he says, "To give up freedom is to give up one's human quality: to remove freedom from one's will is to remove all morality from one's actions". Rousseau's point of departure in *Social Contract* and *Emile* is that humans are born free, and this remains his central preoccupation.

[14] See Robert Michel's "Iron Law of Oligarchy" in *Political Parties: A Sociological Study of the Oligarchical Tendencies of Modern Democracy* (New York: Free Press 1962).

[15] Robert Dahl in *Democracy and its Critics* says on page 234-5. "I am inclined to think that the long run prospects for democracy are more seriously endangered by inequalities in resources, strategic positions, and bargaining strength that are derived not from economic position but from special knowledge." (quoted in Fung p. 19). A similar sentiment is expressed by Wendell Berry in various essays in *Standing by Words* (1983), *Home Economics* (1987) San Francisco: North Point Press. See also Carl Bereiter and Marlene Scardamalia's (1993) systematic account of the cognitive and social contrasts between *experts* and *specialists* in *Surpassing Ourselves: An Inquiry into the Nature and Implications of Expertise.* Chicago, IL: Open Court. A discussion of this work is presented in chapter 4 part 2 of this thesis.

[16] Montesquieu wrote that "These sorts of institutions (popular government) can have place only in a small state, where one can educate the general populace and raise it a whole people like a family" (*The Spirit of the Laws* quoted in Fung p. 23).

[17] Madison's federalist solution was representative government, which would "refine and enlarge the public views, by passing them through a medium of a chosen body of citizens, whose wisdom may best discern the true interest of their country, and whose patriotism and love of justice, will be lease likely to sacrifice it to temporary or partial considerations. Under such a regulation, it may well happen that the public voice pronounced by the representatives of the people, will be more consonant to the public good, than if pronounced by the people themselves." Tenth *Federalist Paper* (quoted in Fung p. 23).

[18] Rousseau begins chapter 11 of book 2 saying, "Si l'on recherche en quoi consiste précisément le plus grand bien de tous, qui doit être la fin de tout système de législation, on trouvera qu'il se réduit à ces deux objets principaux, la *liberté* et l'*égalité*. La liberté, parce que toute dépendance particulière est autant de force ôtée au corps de l'état; l'égalité, parce que la liberté ne peut subsister sans elle." Rouseau *Du Contrat Social* Paris: GF Flammarion.

Literature
Part Two

What Do We Know About How People Learn?

1. Introduction: The What, How and When of Human Learning

What we know about how we learn starts with Plato's observation, "The beginning, as you know, is always the most important part." Rousseau concurred that the earliest education was the most important. Nearly every major educational thinker since Plato, and presumably thinkers from other cultural traditions, has emphasized the importance of education in the early years of child development (Egan, 1997: 68). What do we know now? Recent research in neurobiology, cognitive science, linguistics, and anthropology have corroborated the rational speculations of these philosophers as well as the observations of parents and educators the world over. Perhaps our knowledge has increased more in volume than in substance. The new research does support, with scientific evidence, what educators and parents 'know' about the crucial importance of early childhood development, about the social nature of learning, about the emotional and other intelligences in education. Many of the findings of the new sciences can also constructively reframe and complement the philosophical and political debates addressed in the previous part of this chapter.

The 21st Century Learning Initiative Synthesis of the Wingspread Conferences
Between November 1995- November 1997 the 21st Century Learning Initiative convened six conferences at Wingspread, Wisconsin. Each of these conferences attracted the participation of a multidisciplinary assembly of 40-60 leading researchers, policy makers, and educational innovators from more than ten countries. These findings were eventually incorporated into the 21st CLI's 1998 policy paper *The Strategic and Resource Implications of a New Model of Learning*. A preliminary *Synthesis* of the findings of these conferences was compiled in December 1996.

The *Synthesis* summarizes the findings as follows:

1. *Creative learning*: Societies increasingly depend on their citizens' thinking creatively and mastering a variety of skills. A key goal of formal schooling should be to give every child the "confidence and ability to manage their own learning as an ongoing activity".
2. *Learning communities*: A proper appreciation of human learning will reshape communities, families and schools. This will enhance the emergence (or resurgence) of "learning communities", which "use all their resources - physical and intellectual; formal and informal; in school and outside of school, within an agenda that recognizes every individual's potential to grow and be involved with others."

3. *Self-directed learning*: In order to nurture a learning community schools should, "start a dynamic process through which pupils are progressively weaned from their dependence on teachers and institutions, and given the confidence to manage their own learning, collaborating with colleagues as appropriate, and using a range of resources and learning situations."
4. *Relocating learning and reallocating resources*: The formal school system and its current use of resources should be turned "upside down and inside out". Early childhood education is the most critical for learning and development. "Upside down" means that more resources should be allocated to early education where the child is "learning to learn". "Inside out" means that education has removed learning from communities and shifted emphasis to formal schooling. In a future learning society, institutionalized learning in schools should be *integrated* with informal learning in communities.
5. *New technology*: Digital networks, multi-media, etc., should enhance learning by moving it away from teacher-centered instruction to spontaneous, collaborative, child-centered learning.

Assumptions and principles about learning

There are several sets of principles of human learning and education. All these principles are useful and tend to be mutually complementary and overlapping. They include Caine and Caine's 12 principles of brain-based learning, the 14 Learner-Centered Psychological Principles of the American Psychological Association, the 5 Essential Components of Human Learning of the 21st Century Learning Initiative, the 12 Principles of Adult Learning of Kurt Lewin, the 7 Principles of the Institute for Research on Learning (see Appendix 3 for IRL's Principles).

The ***five key issues*** outlined in John Abbott's (1999) forthcoming book *The Child is The Father of the Man* will suffice for this discussion:

1. *Biological processes are an important component of learning.*
   - The first three years of the life of the child is a critical window of opportunity for the development of a healthy human being. At this stage much of the brain's neural circuitry is actually forming.
   - Extraordinary physical and emotional transformations take place in adolescents.
   - The brain is supple; we make the brain as we use it (see section 2).
2. *The development of transferable skills will enable people to think across boundaries.* Transferable skills are those skills that can be transferred across domains of knowledge. There is an important distinction between "expertise" and "specialization". Specialists know their subject area top to bottom, operate following formulas, and avoid extending themselves beyond routine procedure. Experts tackle problems that increase their expertise, take on new challenges and progressive problem solving. Experts are expert learners. Specialists are routine-bound problem solvers (see section 8).
3. *Technology has a significant impact on learning, on the way we understand ideas, process information and create knowledge.*

4. *Life is more than work.*
   Education, accordingly, should be for more than work. The acquisition of "higher-order" skills - that should be the purpose of education - should enable people to not only get good jobs, but also raise healthy families and participate in political and social activity.
5. *Education takes place not only in schools but also in communities and informally in multi-generational interactions.*
   Many educational experiences take place informally beyond the institutional confines of the school. Education is about more than schooling (see chapter 4 part 3).

2. The Triune Brain and Brain-based Instruction

Perhaps none of Abbott's five core issues receives more attention or is more compelling than the biological basis of learning. In this section I will discuss the views of one of the field's most eloquent and influential packagers and promoters of brain-based learning, Renate and Geoffrey Caine (the latter participated in the Wingspread Conferences). In their books *Making Connections: Teaching and the Human Brain* (1991) and *Education on the Edge of Possibility* (1997) they have popularized an approach called "brain-based instruction". *Education on the Edge of Possibility* relates their experience introducing brain-based instruction into two schools in California (see chapter 4 part 3).

Making Connections describes the functioning of the triune brain and implications for education. Every brain is a uniquely organized, social brain that has an innate drive to search for and make meaning. The search for meaning occurs through the finding of patterns, and the emotions are critical for patterning. Learning happens through the brain; it involves conscious and unconscious processes, focused attention and peripheral perception. Learning is developmental, and it is enhanced by challenge and inhibited by threat (Caine and Caine, 1997:19).

The "Triune Brain Theory" is the popular name for a theory of the brain promoted in 1978 by Paul MacLean, the former director of the Laboratory of the Brain and Behavior at the US National Institute of Mental Health (Caine and Caine,1991:57). The name "triune" refers to the notion that the brain is actually 'three brains in one'. *The Reptilian complex* (R-complex) is our ancestral brain, which consists of the brain stem. The R-complex is preoccupied with survival functions and behaviors, such as territoriality, ritualistic displays, maintaining social hierarchies, mating, flocking, as well as execution of digestion, circulation, and breathing. *The Limbic System* is our emotional brain, the second brain to evolve. It includes the *amygdala*, which regulates the association of events with emotions, and the *hippocampus*, which deals with locale memory and contextual memory. *The Neocortex,* our most recently acquired brain, constitutes 5/6 of our total brain size. The Neocortex processes most sensory data as well as symbolic representations that make language possible. Logical and operational thinking occur here. The combination of these features enables human beings to think on virtual planes as well as plan for the future.

The three brains are separated only in terms of primary responsibilities for brain functioning and also roughly by physical location. In all other respects, the three brains overlap and interconnect. The three brains influence, interpenetrate and shape each other. This point is key to educators for it shows that components of the educational experience – such as emotions and logical operations, ritualistic behavior and language, etc. – cannot be treated separately.[1]

A brain under threat retreats to its routinized, instinctual behaviors that are localized in the reptilian complex at the base of the brain. This phenomenon is called "downshifting". Downshifting prevails in classrooms where children are pressured to participate in an inappropriate manner or forced to perform on high-stakes tests. When a learner downshifts they cannot think or act creatively or deliberately. Only when a learner is in a *relaxed* state can the brain maximize the use of the emotional faculties of the limbic system. Only when the brain is *alert* can the learner maximize the use of their creative faculties localized[2] in the prefrontal cortex, or "frontal lobes". The optimal state for learning is the state of "relaxed alertness". To bring about this optimal state, the Caine's propose "orchestrated immersion" where students are immersed in "compelling experiences". The thrust of orchestrated immersion is to "take information off the page and the chalkboard and bring it to life in the minds of students" (Caine and Caine, 1991:115). The program for a brain-based education is thus outlined as:

1. Designing and orchestrating lifelike, enriching and appropriate experiences for learners;
2. Ensuring students process experience in such a way as to increase the extraction of meaning (Caine and Caine, 1991:8).

Neural constructivism

Brain-based instruction is supported by a wealth of recent research in neurobiology and cognitive science. It is beyond the scope of this paper to present a survey of this exciting research. It is worth mentioning, however, Quartz and Sejnowski's (1997) work on "neural constructivism" since it has influenced the thinking of the 21st Century Learning Initiative. According to neural constructivism, *learning guides the development of the brain.* The theory emphasizes the constructive nature of the interaction between the developing system (child's brain) and the environment in which it is embedded. In this sense it agrees with Piaget, from whom the term "constructivism" is borrowed.

The brain is a "representational device". Representation is the "neural encoding of environmentally derived information and transformations resulting from the application of mental operations"(p.539). Representational structures (that enable neural encodings in the brain) are progressively added during early childhood development. The child is not born with a fully formed brain (unlike the eyeball, e.g.). The cortex develops in a *constructive interaction* with the environment and is influenced by the "problem domains" which confront it. Quartz and Sejnowski point out that the extent of human cortical development has been widely underestimated, most researchers limiting it to the

first two years. They suggest that development on the cortex is actually more extensive, prolonged and progressive.

Limitations in applying neuroscience to education

The Association for Supervision and Curriculum Development has devoted a recent edition of their *Educational Leadership* to the issue of brain-based learning ("How the Brain Learns" Vol. 56, No. 3, November, 1998). The articles in this volume affirm the importance of recent neurobiological research findings as well as the immense *potential* of brain-based approaches in the classroom. The main findings outlined are succinct and comprehensible – namely, that the brain changes physiologically as a result of experience (brain plasticity), that intelligence is not fixed at birth, that some abilities are more easily acquired during certain critical periods ("windows of opportunity"), and that learning is influenced by emotions (Brandt and Wolfe, 1998:8-13).

A few caveats are in order regarding the use of neuroscientific research results. First of all, the specific mission of neuroscientists is to understand how the brain functions. The neuroscientist, in general, is not concerned with applications of research findings to the classroom (Brandt and Wolfe, 1998; Bruer, 1998). While research findings are compelling, educators must assess them carefully. John Bruer, in his article "Brain Science, Brain Fiction" (1998), offers several examples to illustrate the potential misapplication of poorly understood, complex ideas about the brain into the classroom.

The first brain fiction starts with the idea that synaptic density is an indicator of brain capacity or intelligence. There are popular reports that complex learning situations may increase neural branching and offset neural "pruning" that occurs as a child matures. Neural branching increases the density of synapses in the brain.[3] Normally, synaptic density in a growing person increases rapidly at the age of 2 months, peaks at 8 to 10 months and declines to adult levels by the age of 10 years (Bruer, 1998:15). Educators would be mistaken to simply conclude that children of 10 years are at the peak learning stage. First, there are many different types of learning and intelligences. Second, synaptic densities stabilize at adult levels in different parts of the brain at different stages (e.g. age 16 for the prefrontal cortex). One must conclude that there is no simple, direct relationship between synaptic densities and intelligence or brain capacity (Bruer, 1998:15).

Beliefs about critical periods for development are another area susceptible to 'brain fiction'. The basic idea is that humans (and other animals) require certain kinds of experiences at certain stages of their development in order to develop normal motor, sensory and language skills. This idea has been translated to mean that certain amounts of stimulation (say, exposure to spoken language) are required at certain critical periods, or windows of opportunities. Hundreds of experiments have shown, however, that the amount of stimulation is not as critical as the quality, balance and timing of the stimulation (Bruer, 1998). There is also no *one* critical period for brain development. Indeed, as the research of Quartz and Sejnowski has shown, cortical development continues in different ways beyond the first few years.

Different types of cortical development at different stages of a person's life successively open up new windows of learning opportunity. According to Bruer these windows open and then slam shut. I would suggest a more moderate view of learning windows. The brain does appear to shut windows in order to economize its functioning. When and with how much force a window shuts depends to some degree on the learner. A determined learner may keep certain windows open longer – say, an individual who learns a completely foreign language at age 30. To the extent that *native* fluency (speaking without a detectable accent) of a new language learned after a certain age is impossible, one can say that the window is shut tightly. But any individual who has achieved *functional* fluency in a new language knows that they were able to hold the window open just enough to let the breeze in, so to speak (personal experience, 1994).

Bruer's in-depth discussion of this brain fiction offers powerful insight towards a better understanding of the evolutionary mechanism that has shaped our brains. According to Darwinian theory, critical periods exist because they have adaptive value. The process of evolution has produced highly sensitive neural systems - our brains – that have come to depend on environmental stimuli for their fine-tuning. This process ensures that the neural circuitry will be much more finely tuned than if it was genetically hard wired from birth. It seems that the evolving mechanism would be taking a high risk had they been relying on the presence of certain stimuli during fleeting critical periods (especially for functions necessary for survival, such as vision or sense of smell). The reason why it is not risky, according to Bruer is that

> the kinds of stimuli needed during critical periods – patterned visual input, the ability to move and manipulate objects, noises, the presence of speech sounds – are ubiquitously and abundantly present in any normal human environment. Nature has made a bet that the stimuli will be present, but nature has placed its money on an almost sure thing (p.16).

Bruer then applies similar reasoning to the popular notion of the beneficial effects of an enriched environment. Findings from many tests on laboratory rats suggest that the development benefits of enriching environments are marginal at best. For the same evolutionary reason as above, the environments where children learn are nearly always sufficiently complex to enable normal development. Bruer maintains that "despite what we read, the specifics of home or preschool environments matter little, if at all, to how children's sensory and motor systems develop"(p.17).[4]

In a relatively short and readable article Bruer makes strong claims that the lay person may not feel qualified to dispute or endorse. It would seem that lay persons are generally vulnerable to the often convoluted reasoning and jargon-laden conclusions of the researchers of this most arcane of sciences. It is especially important for lay people to demand of scientists (and writers of popular science) that they clarify the parameters of the applicability of their research findings. In this regard, the caveats contained in several recent articles (Bruer, 1998; Brandt and Wolfe, 1998) are especially appropriate.

Educators and parents are highly qualified to take all scientists to task for their findings, especially concerning learning and development, the areas where educators and parents are expert. Most of the neurobiological findings that have received broad acceptance concern areas and issues that parents and educators know from their extensive "field studies". Let me repeat the major findings as outlined above:

- The brain changes physiologically as a result of experience;
- Intelligence is not fixed at birth;
- Some abilities are more easily acquired during certain 'windows of opportunity';
- Learning is influenced by emotions.

It may turn out that neuroscience will provide "credible" scientific evidence that will corroborate and "validate" the field observations and intuitions of parents and educators the world over. If it serves only this function, it will have served well. This analysis certainly does not intend to downplay the importance of this fascinating area of scientific inquiry. It also does not trivialize the valuable work of practitioners and promoters of brain-based approaches, like the Caines, John Abbott, Marion Diamond, and others. These writers and thinkers have served the essential function of convincing policy makers with "hard evidence" and supporting teachers and parents with comprehensible principles and guidelines for action.

The above discussion demonstrates the difficulty and the risks in applying neurobiological findings directly to classroom teaching. It also highlights the limitations of a single domain of science, operating in isolation, to produce *useable* research findings. For neuroscience to be useable to teachers, we must synthesize its findings with other domains of inquiry, such as cognitive science, to which we now turn.

3. The Science of Mind

In the West, the sciences of mind trace their roots in philosophy to the principal pantheon of epistemologists Plato, Kant, Descartes, Locke and Hume.[5] Their modern inheritors (and detractors) include Wittgenstein, Husserl, Fodder, Dennet, Goodman, Searle, and Maturana. In the 20th century the study of mind has branched out into myriad areas, even creating entirely new disciplines, such as the psychoanalysis and psychology of Freud and Jung. Noam Chomsky outlined a new theory of mind with his Universal Grammar in the area of linguistics.[6] Von Neumann, Weiner and others developed the field of cybernetics that sought to discover, and express mathematically, the neural mechanisms underlying mental phenomena. Building on the theoretical insights of information theory and von Bertalanffy's general systems theory, the cybernetic movement synthesized findings from a wide range of disciplines.[7] Cybernetic theory gave rise to cognitivism and artificial intelligence.[8] The 20th century has witnessed an explosion of thinking about the mind, cognition and intelligence. The range of problems covered by the sciences of the mind are vast and beyond the scope of this thesis to outline. For the purpose of building

learning scenarios, the present work focuses on *cognitive science*, whose foundational thinkers include Vygotsky and Piaget (see sections 4 and 6 below).

Cognitive science is the science of mind – the study of how we think, remember and learn. Like neuroscience, cognitive science does not offer explicit prescriptions for educational practice. It offers learning theories that can form the basis for the applied sciences of learning. In the same way that biology guides medicine, cognitive science guides educational practices (Bruer, 1993). Learning can be many things to many people. For the cognitive scientists Bruer[9], Scardamalia and Bereiter (see section 8 below), *learning is the process by which novices become experts in a particular domain.* What distinguishes a novice from an expert is what rules the learner applies to problem-solving and also the capacity of the problem solver to "chunk", that is, to see meaningful patterns and configurations in a particular problem set. The goal, then, for a student is to become an expert learner.

To become an expert learner requires three main qualities (Bruer, 1993):

- Knowledge of specific subject matters (or domains);
- General thinking and learning skills;
- The ability to monitor and control one's own cognitive processes.

The first two qualities appear straightforward. Cognitive scientists refer to the third quality as "meta-cognition". Meta-cognition is the ability to monitor the content as well as the quality of one's own thinking. By combining learning of domain-specific subject matter with general thinking skills it is possible to teach subjects as higher order cognitive skills. The third essential ingredient, meta-cognition, makes this possible.

One method of teaching that advances this concept is the "cognitive apprenticeship". The cognitive apprenticeship builds on the Vygotskian notion of an expert learner providing "scaffolding", or learning support at critical junctures, to the learner (see section 5). The traditional apprenticeship consisted of three stages:

Modelling - the apprentice observes the master demonstrate.
Scaffolding- the master provides support to apprentice as they attempt to carry out the task.
Fading - the master slowly withdraws support while the apprentice steadily assumes more responsibility.

Coaching is the fourth and most critical aspect of the apprenticeship. By coaching, the master monitors the entire learning process through the three stages. Coaching is the art of challenging and reinforcing the apprentice, diagnosing learning bottlenecks, and giving constructive feedback.

A fascinating article by Allan Collins et. al. (1991) *Cognitive Apprenticeship: Making Thinking Visible* describes an application of the traditional apprenticeship to the modern

English and math classroom. The teacher takes on learners as apprentices. The apprenticeship consists of learning how to teach math and English, and the apprenticeship is carried out 'on-site', as it were, in the classroom. The teaching strategy is to begin to scaffold, at an early stage, the apprentice's attempts at formulating the problems and teaching themselves and others. It is essential that the teacher be able to make their *own thinking visible* in the process of demonstrating their craft to the apprentice. The apprentice's thinking must also be made visible to the master. This process can be highly effective at transferring knowledge and skills as well as developing metacognition.[10]

Meta-cognition is the most recent addition to the evolution of thinking about intelligence. Classical education entailed the mastery of formal disciplines such as Latin and Logic. By the 1950's the emphasis had shifted to general skills and reasoning ability. Thinkers and teachers in the 1970's considered expertise to be domain specific and extensive experience in a domain was required to develop expertise. What these three stages share is their preoccupation with the *what* of education. By the 1980's, the *how* of education entered the picture. Howard Gardner's Theory of Multiple Intelligences (first published in *Frames of Mind* in 1983) is an important milestone in this movement. What mattered was not so much the content of instruction or the developmental value of learning. The movement launched by Gardner focussed on the *way* people learn, remember, and process and communicate information and ideas. Meta-cognition is the essential feature in the education of now and future generations of higher-order thinkers. It is important to keep in mind that metacognition does not stand on its own. It incorporates the ingredients of previous generations. The new synthesis, then, combines learning of domain-specific subject matter, the learning of general thinking skills, and metacognition (Perkins, 1992; Bruer, 1993; Bruner, 1996).

In his book, *The Educated Mind: How Cognitive Tools Shape Our Understanding* (1997), Kieran Egan advances a remarkable developmental theory of learning that also focuses on the *how* of learning. According to Egan, individuals grow through progressive stages of development where different 'types of understanding' are operative. These stages of an individual's development can be regarded as loosely recapitulating the evolution of the human species.[11] These stages (see section 5 below) are not discrete like the stages of Piaget, but they are overlapping and cumulative. What is recapitulated can be understood in terms of "mediating intellectual tools" (see section 4) and the *kinds of understanding* they generate. Egan follows Vygotsky's notion that human beings make sense of the world by using mediating intellectual tools that in turn affect the kind of sense they make. Like Vygotsky, Egan maintains that these mediating intellectual tools are the proper unit of analysis for examining human development and education.

4. Vygotsky and Piaget

L.S. Vygotsky (1896-1934) is a pivotal figure in 20th century cognitive science, in a field of inquiry in which, like Piaget (1896-1980), he was not formally educated. The application of such a free ranging and powerful mind to a field of study in which he was free of the burdens of tradition produced a rich and creative body of theory about human

learning and development. Like Piaget, his theories have been subject to much criticism. This criticism, which is mixed with considerable acclaim and creative modifications, shows that he (as well as Piaget) was asking the *right* questions.

General Genetic Law of Cultural Development

It is worth reviewing some key aspects of Vygotsky's conceptual system, for they have informed many innovative practices that appear to be brain-based and expertise-generating. The "General Genetic Law of Cultural Development", which underpins his entire scheme, states that any function of an individual's cultural (in the broadest sense, including language) development appears on two levels: the social plane and the psychological plane. What is learned on the social level (interpsychological) is internalized to the psychological (intrapsychological) level. The process of internalization transforms its own structures and functions in an ongoing dialectical manner.

Psychological tools or 'mediators' mediate the social and psychological worlds. These mediators direct the mind and the behavior of the individual. Vygotsky claimed three types of mediators: signs and symbols, individual activities, and interpersonal relations. It is not the tools, or mediators, themselves which are important for human development, but the *meanings* that are encoded in them (Daniels, 1996). The mediators (such as speech or a relation with a parent) function as psychological tools in the construction of an individual's consciousness. Human beings, then, are not constructed from the inside out, but rather they come into their own from the "outside" through symbolic, cultural systems (Daniels, 1996). In summary, for Vygotsky all higher mental functioning in the individual has its origin in social life, and an adequate account of this functioning starts with an analysis of the tools and signs that mediate it (Wertsch in Daniels, 1996).

Zone of Proximal Development

Vygotsky's second principle concept is the "Zone of Proximal Development" (ZPD). The ZPD provides the vehicle in which the social and the psychological are brought together. Vygotsky defines the ZPD as the distance between, "a child's *actual* development level as determined by independent problem solving" and the higher level of "*potential* development as determined through problem solving" under guidance of a more experienced person or in collaboration with peers (Vygotsky in Daniels, 1996). Thus two children of the same age who test at the same age-level equivalent of ability, may actually perform at different age-level equivalents if they are under guidance or working in a group. This suggests the need for a dynamic assessment of performance that assesses a learner's *progress* rather than a static evaluation of their aptitude (which often at least partially assesses the student's ability to take tests).

There are at least four interpretations of the ZPD (Lave and Wenger in Daniels, 1996). The ZPD as "scaffolding" has the most immediate relevance to learning and teaching. The term "scaffolding" is borrowed from traditional apprenticeships. It is the guiding support that a master gives an apprentice tries to carry out a task on his or her own. A skilful master gradually withdraws this support at just the right pace to ensure effective

acquisition and eventual mastery of the skills and knowledge needed to perform the task (see section 3 above).

Dialectical participation in the theories of Piaget and Vygotsky

Vygotsky, like Piaget, takes an anti-reductionist, dialectical approach to explaining how human beings develop in relation to their environment. Vygotsky's claim is overtly dialectical - the social (interpsychological) shapes the personal (intrapsychological) which in turn shapes the social, and so on. In Vygotsky scholar Bidell's words, the social and the personal have "shared existences as differing tendencies united within real developing systems"(Daniels, 1996).

The unit of analysis of Piaget's *stage* theory (see below) is the individual who appears to stand apart from and interact with their environment. In this respect this theory appears reductionistic and perhaps inconsistent with his own *constructivist* theory (Daniels, 1996). According to constructivism, living things are in a constant state of interaction with their environment. The environment shapes the organism, which shapes its immediate environment, and so on, in dialectical fashion. Survival and development of the organism depends on its ability to achieve equilibrium with its environment. Piaget referred to this process as *autoregulation* (Plotkin, 1997). Piaget's approach thus invokes the Vygotskian notion of *participation*. Rather than a reductionistic interaction with its social and physical environment, an organism and its environment are mutually participative.

Corroboration from other disciplines

As outlined above (section 5) constructivist theories in neuroscience provide support for Vygotsky's general genetic law and Piaget's constructivism. These notions also gain support from theoretical and empirical work in the fields of sociology, linguistics, biology and philosophy.

In sociology, theoretical corroboration comes from Berger and Luckman's influential sociological treatise *The Social Construction of Reality: A Treatise in the Sociology of Knowledge* (1966). They argue that so-called 'objective' social reality is a human product, and that human beings are social products. The social world is created through a process of externalization and objectivation. At the same moment, an individual human is molded by internalizing the social world. They emphasize that the "relationship between man, the producer, and the social world, his product, is and remains a dialectical one" (Berger and Luckman, 1966:61).[12]

In his synthesis of linguistics and neurobiology, *The Symbolic Species: The Co-evolution of Language and the Brain* (1997), Terrence Deacon, shows how symbolic language and consciousness emerge along with the evolving physical brain. In his view, "Languages have adapted to human brains and human brains have adapted to language (p.122)". In other words, brain and language are *co-evolving* phenomena. According to Deacon, languages are socially and culturally constructed entities that in many ways resemble living organisms. In its evolution language has had to be responsive to the same

Darwinian selection pressures as the human brain. "The most basic principle guiding their [languages] design is not communicative utility but reproduction – theirs and ours (p.110)". His views on the mechanism of the development and acquisition of symbolic language also appear consonant with Vygotsky's general law of genetic development. Language evolves on the social, or interpsychological, level and occupies the brain that can support and aid its further development. To illustrate this mechanism, Deacon invokes the metaphor of language as an "independent life form that colonizes and parasitizes human brains, using them to reproduce" (p. 111).[13]

Ludwig Wittgenstein, working in the fields of philosophy and mathematics, also devised an argument that seems sympathetic toward the constructivist position and the general genetic law of development. In his now famous "private language argument" Wittgenstein argued that a language that consists of symbols must be developed among a community of language users. This is because a single individual working in isolation could not possibly understand the meaning of novel symbols. If each symbol had to follow a rule, he reasoned, in order to maintain coherency, how could we know that we are following the rule? "To think one is obeying a rule is not to obey a rule. Hence it is not possible to obey a rule privately: otherwise thinking one was obeying a rule would be the same thing as obeying it" (Wittgenstein, 1958:81). Wittgenstein also held that the word meanings were socially constructed phenomena. A word has no essence or corresponding Platonic form, but rather it acquires its meaning by the 'language games' that are ongoing in a community of language users.[14]

5. The Stages of Learning

Many authors and theorists have proposed stage schemes of human development. Rudolf Steiner is one of the earlier theorists whose stage theory is still operative today in Walfdorf schools. Piaget is the foundational thinker of the stage development theory that has gained acceptance in academic circles. Results from neurobiological research are also spawning various stage notions, which are popularly known as the 'windows of opportunity'. The biology of brain development affords windows of opportunity where different types of learning (popular examples are math, music, and languages) are optimal.[15] Kieran Egan (1997) has developed a stage theory that introduces various "types of understanding" that operate at each stage. Howard Gardner has not promoted a specific stage theory, though he, like most good educators, recommends "sensitivity to what makes pedagogical sense at different stages or levels of development" (Gardner 1993:193).

Piaget claimed that children develop systematically through distinct stages. He proposed four major stages of intellectual development:

1. *Sensory motor stage* - the infant comes to know the world through sensory and motor systems;
2. *Semiotic (symbolic stage) and the pre-operational child* - at age 2-5 years the child is capable of representational thought;

3. *Concrete operations* - around age 6-7 years children are capable of operational thinking - they can perform mental operations in their head and undo them again. They are no longer tied to physical and simple representational (symbolic) operations, and can now consider implications of actions without having to carry them out;
4. *Formal operations* - around age of secondary school children can think hypothetically about a world made up of ideas and concepts.

Responding to decades of criticism, subsequent generations of Neo-Piagetians have modified Piaget's pathbreaking ideas. In general they recognize that the Piagetian stages are not so rigid or discrete. A child may be simultaneously at one developmental stage with material that is familiar and at a lower stage with unfamiliar materials or contexts.[16]

Like the neo-Piagetians, Kieran Egan's stages of development are not discrete, rather they are smoother and overlap. In each of Egan's stages, different 'types of understanding' are operative and dominant (see section 4 above). These stages recapitulate the development (evolution) of the human species. What is recapitulated can be understood in terms of mediating intellectual tools and the kinds of understanding they generate (see discussion of Vygotsky in section 4). For a full account of Egan's scheme see Appendix 1.

Ages	*Type of understanding*
0-2 1/2	Somatic understanding
3-8	Mythic understanding
8-15	Romantic understanding
16-early 20's	Philosophic understanding
above 20's	Ironic understanding

Howard Gardner does not explicitly lay out a particular scheme of stages, but the following rough scheme can be distilled from his diverse writings:

Ages	*Primary learning focus*
Preschool	Children experiment with boundaries, fantasy;
8-9	Children want to master rules (including notational systems) and vocations of their culture;
10-14	Adolescents should focus their enormous energy on specializing in a few topics;
14-21	Mature learners should gain comprehensive knowledge of liberal arts and science. They should "sample widely" and make diverse connections (Gardner,1993).

6. Multiple Intelligences, Learning Styles, Geniuses, and Temperaments

Since Howard Gardner published his theory of multiple intelligences in 1983, the theory has taken hold in educational institutions across the country.[17] A thousand flowers have bloomed under the banner of this theory and innumerable books both theoretical and practical have been published. The fact that it spread so quickly might be an indicator that there was a groundswell already, i.e. it was a "theory" that many educators had already

internalized but had not yet articulated.[18] In short, the theory says that in order to be effective, curriculum design and teaching methods should take into account different learning styles, or proclivities, called multiple intelligences (Gardner, 1993, Sternberg).

The personality types of C.G. Jung have been tested and modified and reused (most recently in the Myers-Briggs personality indicator tests) countless times since he published them in 1923. The Center for International Education (1998), under David Kinsey's tutelage, had begun attempts to overlay Jung's types with Gardner's Multiple Intelligences. This could be a promising area of inquiry. David Kolb's well-known Experiential Learning Cycle and Learning Styles Inventory also trace their roots to the work of Jung as well as Kurt Lewin.

Waldorf schools design learning experiences following on an elaborate scheme based on individual "temperaments". Waldorf schools begin with Rudolf Steiner's intuition about the spiritual nature of human life. He held that the essence of an individual's existence is the spirit, which existed before birth and persists after death. During the human incarnation the spirit is carried in a physical body, constrained by the genetically determined constitution of that body. The symbiotic tension between the nature of the spirit and the constraints of the body give rise to temperaments. Temperaments arise from the interface between the body and soul (or in Steiner's terms the "physical" and the "etheric"). Steiner used medieval terms – melancholic, phlegmatic, sanguine, and choleric - to describe the four temperaments. A single individual embodies all four temperaments at a given time, though one or more may be more dominant. Different temperaments may also dominate at different stages in an individual's life.

Steiner's temperament scheme shares a common concern with Gardner's multiple intelligences program. Educators should pay attention to different individual temperaments and not dismiss or contradict a child's temperament. Some aspects of a temperament of a child may be disruptive to learning, for example, a choleric child might boss his mates around or become enraged when they do not follow his instructions. The teaching strategy would be not to contradict this choleric tendency but to try to bring out its positive aspects. This is accomplished by grouping like temperaments together. As a choleric works with cholerics, he may become frustrated that the other cholerics are giving orders but not taking action. He sees a mirror of his own temperament, adjusts his behavior and becomes transformed and redeemed in the process.

Educator Thomas Armstrong has proposed yet another interesting scheme based on multiple geniuses. He identifies 12 different kinds of genius in children. Borrowing from the original Greek, he defines *genius* as "giving birth to one's joy". *Every* student is a genius in this scheme. The 12 kinds of genius are curiosity, playfulness, imagination, creativity, wonder, wisdom, inventiveness, vitality, sensitivity, flexibility, humor and joy (Armstrong, 1998).

7. Expertise vs. Specialization

I save Scardamalia and Bereiter's systematic inquiry into expertise until the end of this section, because their analysis and recommendations form a bridge between this chapter and the next chapter on 'what is working'. The work of these two Canadian psychologists, particularly their book *Surpassing Ourselves: An Inquiry into the Nature and Implications of Expertise*, has strongly influenced the thinking of the 21st Century Learning Initiative, as well as my scenario building exercise.

The aim of their inquiry is to understand the nature of expertise and how it is generated. They argue that people in a learning society must "become experts at becoming experts" (Scardamalia and Bereiter, 1993:2). They avoid offering a compact definition of "expertise", but rather present examples and describe the characteristics of experts. They begin with the observation that human beings are good at those skills and abilities that we need to know in order to survive (build shelters, use language, etc.). We are also able to acquire a seemingly unlimited range of abilities (swim under water, fly jet planes, navigate by the stars, etc.) which evolution would have had no reason to *specifically* prepare us for. "It is these effortfully acquired abilities, abilities that carry us beyond what nature has specifically prepared us to do, that we properly refer to as *expertise*"(p. 3). The key word is "effortfully". Expertise does not happen naturally. It takes sustained and systematic effort in order to 'surpass' oneself.

They propose a conception of expertise that may differ from popular stereotypes. To illustrate this conception they contrast the expert with the 'specialist'. Specialists, like experts, may be well trained, credentialed and experienced. In solving specific problems and in developing their careers, however, they tend to "gradually constrict the field of work so that it more closely conforms to the routines that the [specialist] is prepared to execute (p.11)". The career of the expert, on the other hand, progressively advances, tackling and growing into the problems which constitute a field of work. "The difference between experts and nonexperts", the authors note, "is not that one does things well and the other does things badly. Rather, the expert addresses problems whereas the nonexpert carries out routines (p.11)."

An individual's level and quality of creativity determines how much expertise they have. Scardamalia and Bereiter's hypothesis of creative expertise combines two ideas: knowledge of *promisingness* and the *step-size* in analysis. An expert has a high level of knowledge of promisingness. S/he is swift and methodical in making judgements about the degree to which a new idea or problem contains *promise*. The first type of promise is that of the possibility of leading to new discoveries, generating general laws, and conjuring more interesting quandaries. The second type concerns whether the problem provides a match to a specific goal or long-term strategy. The third type of promise concerns whether the problem matches the problem solvers' capability to effectively take on the problem and capitalize on the first two promises.

Step-size also distinguishes experts from nonexperts. Step size refers to "...how far successive steps in progressive problem solving venture beyond what the person already has the knowledge to accomplish" (p.143). When these two ideas are combined the resulting hypothesis suggests that

> by taking larger, riskier steps, one is forced to make greater use of judgements of promisingness. From the resulting successes and failures, one acquires a greater fund of informal knowledge with which to judgements of promisingness. This makes it possible to take still larger steps with confidence, resulting in more extensive knowledge, and so on in an ascending spiral of creative expertise (p.144).

One may have surmised by now that the conventional formal schooling does not equip students with high levels of creative expertise. Scardamalia and Bereiter refer to schools as examples of 'nonexpert societies'. Most interesting of their critiques of schooling is that the teachers, not the students, are the ones who acquire expertise.[19] Schooling also deals with the "visible parts of knowledge" or formal knowledge and demonstrable skills. Informal knowledge – the kind that students have developed elsewhere and that they will need to become experts – is generally ignored in the pursuit of transferring and testing for demonstrable skills and knowledge (p.187).

What Scardamalia and Bereiter seek are institutions that provide a "process of progressive problem solving and advancement beyond the present limits of competence" of its members (p.199). They offer *knowledge-building communities*, which are loosely modeled after university research *centers* (as opposed to more stagnant university *departments*) whose inquiry is systematic and progressive. Their intuition is that by the time children reach schooling age, the most effective way for individuals to make sense of their own world is engage in collective efforts to do so. Knowledge-building communities take into account the social dimension of learning, and go beyond the endless polarized debates between didactic and child-centered approaches.

To illustrate the concept of a knowledge-building community, the authors invoke the process of the production and dissemination of learned journals. Researchers submit articles to journals because they want to make a contribution to a meaningful discourse. They also want recognition for accomplishment in their field. They also expect peer feedback that will improve their own thinking as well as enrich the discourse in the field. There is much meaningful discourse in all fields and in schools that goes unnoticed and leads to nothing. A community of participants is needed in order to carry meaningful discourse to fruition. A knowledge-building community, then, resembles the community of participants in a learned journal. Focussed curiosity and informed conversation are not sufficient. A knowledge-building community requires an institution, formal and/or informal, that provides a, "stable way of organizing behavior, so that the discourse satisfies a sufficient range of human motives that it will be sustained, that people will keep putting energy into its advancement" (p.208).

Scardamalia and Bereiter propose new approaches to schooling modeled on the knowledge-building community. These new schools will include some of the following characteristics:

1. Topics are studied in depth and the study is sustained over a long period.
2. The focus of study is on 'problems' rather than on categories of knowledge.
3. Inquiry is driven by students' questions. Teachers help formulate better questions and reformulate them as the inquiry proceeds to higher levels.
4. Students produce their own theories and critique each others' theories.
5. The focus of learning is progress toward collective goals of understanding and judgement rather than on individual performance.
6. Students typically work in groups and each group explores a different topic and has different task.
7. Students are encouraged to give and receive feedback. Teachers train students in the skills and attitudes required to do this effectively.
8. Teachers contribute their knowledge to the discourse, but in such a way that it does not upset the learning process.
9. The teacher remains the leader, but their role shifts from guiding the process from the front of the room to participating in the learning activities. *The teachers lead by virtue of being more expert learners* (p.211).

This summary sketch is quite rough and could possibly expose the knowledge building concept to crippling scrutiny. I list the attributes of a knowledge-building society, not to demonstrate the validity of each or all attributes, but rather to illustrate the concept. The knowledge-building community idea may ring familiar to contributors to academic journals, members of research centers or progressive learning societies (like the Center for International Education), members of book clubs or writer's workshops, or to those who maintain interactive websites or list-serves.

I cannot definitively answer the question of whether schools can function as knowledge-building communities. I can only illustrate how it can happen by examining a few examples of schools where it has tested true. This discussion waits until the next chapter. This concept profoundly informs the scenarios. A future society will comprise overlapping and mutually supporting knowledge-building communities only when the preconditions are in place that will give rise to them. The aggregate of such preconditions will constitute a knowledge-building society. Focusing on the training of individual experts is necessary but insufficient. What is needed above all is a "social reorganization of the pursuit of knowledge" (p.246).

8. Conclusion

In part two of our literature review we have made steady progress towards realizing a rich synthesis of issues political and philosophical with research findings and theory from the sciences of learning, neurobiology, cognitive science and developmental psychology. The work of Vygotsky, Egan, and Gardner as well as the metacognitive revolution has helped to reframe and partially resolve several of the debates in part one. The additional focuses

on types of understanding, multiple intelligences and the development of expertise help to diffuse the intensity of the debates over curriculum content versus individual development. Deacon's co-evolution, as well as Quartz and Sejnowski and Piaget's constructivism, contribute towards resolving the nature/nurture debate. In effect, we have seen that 'nurture' has itself evolved and that nature has nurture.[20]

The results of the Wingspread Conferences and the findings reviewed in this section point to an education that teaches to temperaments and different intelligences, is sensitive to development and learning stages, employs pedagogy that goes "with the grain of the brain", makes learning visible to the learner, teaches students to become expert learners and fosters the formation of knowledge-building communities. Is there an educational system or a society of learners that currently integrates and exhibits these features in a complete package? It is more likely that we will find geographically – dispersed micropractices that exhibit one or more of these practices. Once we gain an understanding of how these practices are applied and how their development or adoption occurred, we can begin to construct scenarios of a future learning society.

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[1] For a more in depth presentation of these brain functions see Caine and Caine's (1991) *Making Connections: Teaching and the Human Brain.* Terrence Deacon's (1997) *The Symbolic Species The Co-evolution of Language and the Brain* presents a more technical description of the brain and its functions. He clearly explains the difficult to grasp concept of the interconnectivity of the regions of the brain. See also Steven Mithen's (1997) *The Prehistory of the Mind* for a lucid discussion of brain modularity.

[2] I use the term "localized" loosely. Brain functions are neither discrete nor neatly localizable. Localized here means that, for example, the proper functioning of the prefrontal cortex is a *prerequisite* to many types of human creativity. This does not mean that the creative impulse is strictly localized in the prefrontal cortex, but simply that without the prefrontal cortex creativity would not occur. The prefrontal cortex "projects" its neuronal impulses into other regions of the brain, upon which it depends for its functioning. Language provides an instructive example. The prefrontal cortex governs symbolic representation functions, but in order to make intelligent conversation it needs to recall vocabulary from the cerebellum, which is located near the base of the brain. See Terrence Deacon *The Symbolic Species: The Co-evolution of Language and the Brain* (1997) for a detailed analysis of how the brain organizes itself.

[3] The brain contains about 100 billion nerve cells (or neurons). Each of these neurons connects with many other neurons by transmitting neural impulses from their axons to the dendrite of another neuron. The neural connection point between one cell's axon and anther cell's dendrite is called the synapse. The connecting activities of 100 billion neurons generate upwards of 1,000 trillion synapses. (Jensen, E. (1998) *Teaching with the Brain in Mind* (p. 8). Alexandria, VA: ASCD.)

[4] Except of course in cases of severe deprivation of sustained emotional and physical abuse at young ages.

[5] "Epistemology" is the study of knowledge and knowing. It answers the question, "how do we know what we know?". There are two broad traditions in western philosophy. The rationalists (Plato, Descartes) hold that reason and rationality are the source of true knowledge (think of geometry e.g.). The empiricists (Aristotle, Locke, Hume, and Berkeley) hold that knowledge comes from experience. The extreme expression of the empiricist position belongs to Locke, who maintained that the mind is blank slate at birth, and knowledge is acquired only through the senses. The grand synthesizer of these two schools is Kant. His writings are formidable, but the reading of them will be a transformational experience, I assure you.

[6] For a handy outline of these various fields and their key players see Varela, et al. *The Embodied mind: Cognitive Science and the Human Experience* (1997:7).

[7] For a concise explanation and history of systems theory, information theory and cybernetics, see Fritjof Capra's the *Web of Life: A New Scientific Understanding of Living Systems* (1996: Chapter 3 and 4).

[8] Cognitivism, the idea that underlies artificial intelligence, maintains that intelligence so resembles the computation of computers that cognition can be regarded as a process of computing symbolic representations (Varela, 1997:41).

[9] Bruer, John (1993) *Schools for Thought: A Science of Learning in the Classroom* provides an excellent overview of cognitive science.

[10] For details of the methodology see Collins, Allan et al. "Cognitive Apprenticeship: Making Thinking Visible", *American Educator* (Winter 1991) and Abbott, John and Terrence Ryan. "The Strategic and Resource Implications of a New Model of Learning". Reston, VA: 21st Century Learning Initiative (1998: 17-18). See also my footnote below. I made a note on my copy of the Collins et al. Cognitive Apprenticeship piece that the root word for "learn" the Old English *leornian* is akin to the Old English *laeran* which meant "to teach". This act of creative etymology suggests that ancient Germanic tribes, who certainly taught and learned much differently from the modern tribes, appreciated that teaching and learning were procedurally analogous.

[11] The theory that "ontogeny (the development of an individual) recapitulates phylogeny (the evolution of the species)" originates with Haekel in the 19th century. It also shaped the conceptual system of Herbert Spencer, who like other 19th century theorists was eager to apply Darwin's theory to all aspects of human life. The roots of the idea can be traced back to Aristotle (Mithen, 1996). Gould has pointed out that this idea has been abused to justify racist theories and policies. Despite the dangers of misusing recapitulation, Mithen (1996) notes, it would almost be academically irresponsible to disregard it out of hand.

[12] Berger and Luckman's use of highly-specific, sociological terms make the book a formidable read. The important point here is that in their developing a sociology of knowledge they devise a theoretical system that resembles that of cognitive scientists such as Piaget and Vygotsky. Their claim that objective reality is socially constructed has further implications for knowledge generation and education. The 'real world' has no ontological status apart from its circumstantial construction. It is an ongoing human production. Since the real world includes human society and individual human beings, it follows that there is no 'human nature'. "Social order is not biologically given or derived from any biological data in its empirical manifestations. Social order part not part of the "nature of things", and it cannot be derived from "natural laws" (Berger and Luckman, 1966:52).

[13] It is impossible to summarize the rich content of his argument here. His multidisciplinary synthesis is a sobering and lucid complement to the freewheeling writings of the illustrious neo-Chomskian Steven Pinker. According to Plotkin (1997), Deacon's approach is the "most plausible middle way yet" that can reconcile Chomsky's innate language predispositions (nature) with the socially dynamic milieu in which language emerges (nurture). For further corroboration of Deacon's co-evolutionary approach read about *structural coupling* in footnote twelve of the Postscript of this thesis.

[14] This Wittgensteinian interlude is not meant to explain or defend the private language argument. I intend merely to show that a major multi-disciplinary thinker made similar discoveries as Piaget and Vygotsky. As far as I know, he worked independently of them and was unfamiliar with their work. Although Wittgenstein's impact on the history of Western Philosophy is monumental, he is not cited in most of the literature in my bibliography. For further details on the private language argument, see Wittgenstein, Ludwig. (1958). *Philosophical Investigations*. New York: MacMillan., and Kripke, Saul. (1982). *Wittgenstein on Rules and Private Language*. Cambridge, MA: Harvard University Press.

[15] There are many accounts popular and academic. Start with Begley, Sharon "Your Child's Brain" and Hancock, Lynell "Why Do Schools Flunk Biology" in *Newsweek's* spring/summer issue 1997 that devoted the entire issue to findings from biology that inform child rearing and education. See also The November 1998 issue of *Educational Leadership* (ASCD vol. 56 no. 3) focuses on "How the Brain Learns".

[16] (For a concise account of Neo-Piagetian thought, see Gardner, Howard (1996) *Intelligence: Multiple Perspectives*. New York: Harcourt Brace.)

[17] According to Steven Mithen, 1983 was a big year for the science of mind. In addition to Gardner's theory, Jerry Fodor published *Modularity of Mind* in 1983. For a comparison of Gardner and Fodor's Theories of mind and intelligence see Mithen, Steve. (1996). *The Prehistory of the Mind: The Cognitive Origins of Art, Religion and Science*. In this book Mithen undertakes a reconstruction of the architecture of the mind using theoretical and empirical sources as well as a survey of the Hominid fossil record. This account shows that the origins of multiple intelligences can be seen in the evolution of the Human species.

[18] I may be stumbling upon an interest theory of knowledge evolution and diffusion. I am sure others have written eloquently about this idea, though I am not familiar with the literature.

[19] I learned in my graduate studies that copious reading and classroom discussion, and even passively receiving the occasional lecture, were effective means of *learning*, in the sense of acquiring new knowledge and perhaps insights. The experience of *teaching*, on the other hand, was an effective means for gaining mastery, or expertise, in a domain. Designing a syllabus, for example, requires visualizing the learning goal and the connections between the steps that bring the learners toward that goal. The instructor must also develop judgements of promisingness about various topics and authors. Facilitators of discussions must also develop a facility for judging the promisingness of questions and problems that emerge in the classroom.

[20] See Plotkin (1997) for a history and lucid discussion of the nature/nurture debate.

Literature
Part Three

Where Does Learning Occur? What Is Working?

1. Introduction: Education has to be About More Than Schooling

The present incarnation of schools *qua* institutions was explicitly designed to educate children *in loca parentis*. The implication was that parents were no longer suited to teach children the things they would need to know to navigate through the complex, post-agrarian world that was unfolding. The economic imperative was clear - parents were relieved from their child rearing duties in order to become wage laborers. Before laws had mandated schooling and prohibited child labor, parents had to choose between placing their children in formal schools or in the factories. One of the significant contributions of the 21st Century Learning Initiative is their promotion of the idea that *learning has to be about more than just schooling* (Abbott, 1998). Formal schooling should constitute only part of the learning of well-educated people. Formal schools should be integrated with and complement informal learning experiences and non-formal learning activities.[1]

While the modern school grew out of the ferment of 19th century industrial revolution, learning in a formal, institutionalized setting is not a modern phenomenon; and non-formal alternatives are as old as formal schools. The ancient Greek educational institution was the *Academy*, which was the proper name for Plato's school. It took one of Plato's star pupils, Aristotle, to conjure up an informal alternative to this stuffy academy. Aristotle's informal educational sector was the *Lyceum*, which gets its name from the grove that Aristotle taught in.[2] The Lyceum was also a New England practice established in the 19th century to aid the diffusion of knowledge to adults in non-formal settings. Its popularity eventually waned, leaving the academy as the sole "house of knowledge".[3]

Previous writers have made more radical proposals than the 21st Century Learning Initiative. Ivan Illich (1970) called for a total de-schooling of society. He categorized the formal school as a 'manipulative institution'. It is the "repository of society's myths", where the perpetuation of status quo power arrangements is enacted. Only as a result of false consciousness or direct coercion do people 'choose' to participate in these institutions. 'Convivial institutions', on the other hand, are institutions responsive to people's expressed needs, and people freely choose to participate in them. Convivial institutions include informal places and networks such as parks, subway lines, telephone linkups, mail routes and public markets. Illich calls for a dismantling of the foremost manipulative institution, the formal school. It its place he proposes various convivial institutions, some of which were already in place. With uncanny prescience (two decades before the internet) he envisioned a future society where learning occurred primarily through de-centered, informal networks, or *webs*, where information, knowledge, skills

and services were negotiated and exchanged. Illich has attracted severe and compelling criticism for his explicit proposal to de-school society.[4] Nevertheless, he provides a benchmark for the radical position, and his affirmative agenda to create informal learning networks remains a worthy notion.

Education is about more than schooling. Quality learning requires a comprehensive learning program that integrates formal and non-formal elements, as well as the informal learning that happens "along the way" - in playgrounds, in the woods, in communities. The question remains: is this happening anywhere?

2. What Works?

I will not attempt to review the massive literature on school reform. In this section I will review a few recent works that offer novel ideas and approaches. I choose ideas that are helpful to the scenario-building exercise. I also focus on literature that describes, in a hopeful light, what is currently working. As any graduate student who has slogged through the doomsday literature on our crumbling education systems knows, my focus on positive cases limits the literature review considerably. I do not intend to belittle the importance of the critical reviews of our crumbling systems. I assume that most of *my* readers are already acquainted with the downside of education and society. Like myself they probably thirst after hopeful refreshments.

Systematic change to rebuild America

The title of the first chapter of Lisbeth Schorr's (1997) *Common Purpose: Strengthening Families and Neighborhoods to Rebuild America* reads "What works and why we have so little of it". This title suggests that something *is* working. Indeed there are many exemplary pioneering efforts and programs currently reforming education and communities all over the country. But replication of these efforts is fraught with difficulty. Schorr refers to those things that are working as 'hopeful signs'. In her book she explores how these hopeful signs emerge and how they may spread and combine to rebuild American communities.

The first question she addresses is why don't we hear more about these positive movements and change pioneers? First of all, the press prefers to polarize debates in order to avoid the gray areas - where hopeful signs usually emerge - and simplify the issues for the mass consumption of a population with a short attention span. The second problem is that most observers fail to see how these seemingly isolated signs of hope combine to portend a more hopeful future. Ideologues and politicians, claims Schorr, "happy to accommodate the media's inclination toward polarization, obscure the hopeful signs with sterile debates about public versus private, entitlement versus charity, top-down versus bottom-up, and market versus bureaucratization"(p.xv).

The solution that Schorr observes everywhere is 'systematic social reform'. She admits that doubts about social reform have prevailed since the French Revolution and have recently intensified. She seeks to advocate strategies that "would actually change lives

and counter the skepticism about their collective ability to do so"(p. xxvi). Skeptics tend to point out that pioneering social reform efforts are usually isolated, idiosyncratic, small-scale, and can only be initiated and run by local, dedicated people. Often times their success is attributed to 'miracle workers' who sustain extraordinary efforts *despite* 'the system'.[5] The skeptics believe that there will never be enough miracle workers, and at any rate, that the public sector can do little to create or support miracle workers. Schorr disagrees and suggests a different tack, "...we must learn from the breakthroughs these local heroes have made to *establish the conditions* in which well-trained, committed, persevering, but otherwise, ordinary people can achieve the ends it once took a miracle worker to reach (p. xxvii, my emphasis)".[6]

Schorr also disagrees with the skeptics that "relationships of trust and mutual respect (which are requisites for reform to occur) are only possible in nongovernmental settings, financed by charitable donations, or governed by market forces (p. xxvi)". She advocates that these market driven and private agencies collaborate with strong and effective public institutions, which we can *and* should create. She spends much of her book describing these public institutions and how they can create the conditions for systematic social reform to unfold.

She begins her exploration with the "Seven Attributes of Highly Effective Programs' (which were originally laid out in her *Within Our Reach: Breaking the Cycle of the Disadvantaged* (1989)):

1. Successful programs are comprehensive, flexible, responsive, and persevering
2. Successful programs see children in context of their families;
3. Successful programs deal with families as parts of neighborhoods and communities;
4. Successful programs have a long-term, preventive orientation, a clear mission, and continue to evolve over time;
5. Successful programs are well managed by competent and committed individuals with clearly identifiable skills;
6. Staffs of successful programs are trained and supported to provide high-quality, responsive services;
7. Successful programs operate in settings that encourage practitioners to build strong relationships based on mutual trust and respect.

These attributes are intuitive and should not surprise any field practitioner. The more interesting point is *why* have these attributes have been so scarce in programs. Schorr answers, "It is now absolutely clear that the attributes of effective programs are undermined by their system's surroundings, especially when they attempt to expand to reach large numbers" (p.18). In other words there is a mismatch between these attributes of effectiveness and the "systems and institutions on which they depend for legitimation and support" (p.19). The biggest impediment to systematic change is that this mismatch has gone largely unnoticed. Effective programs can only flourish under special public protection and funding, which tend to be ephemeral. Beyond these conditions, programs

languish and efforts to 'scale up' falter. We need new approaches to replication, to bureaucracy, accountability and evaluation. We need to install systems and institutions that will sustain the *conditions* needed for reform to occur and persevere.

In chapter 8, "Educating America's Children", Schorr explores the new systems and institutions needed for systematic educational reform. For starters she suggests that success in schools depends on high quality early childhood care. Children must be prepared to begin formal school education. She recommends a national level framework to assure this quality care. This framework rests on three 'foundation stones'(p.242):

1. High quality preschool experience for 3 and 4 year olds;
2. Support to families with toddlers to ensure best start on life and learning;
3. Quality healthcare for all children during their early years.

Schorr then recounts several successful preschool and school programs that are currently operating in the United States.[7] From the experiences of these alternative programs, as well as successful mainstream school reform efforts, she draws out 4 characteristics of successful schools (p. 251-259)[8]:

1. *Successful schools focus on academic learning*
Academic learning is the central purpose of schooling. The schools focus on academic achievement and assure that students are engaged in challenging academic work. Schools are *not* multi-purpose institutions. Content is important. Rote learning is decreased in favor of brain-based, engaged pedagogy. Learning tends to be both individualized and group oriented.

2. *Successful schools provide teachers with ambitious professional development activities*
Teacher training is ongoing and it occurs in settings that allow staffs to function as a strong, professional, collaborative community. Teachers participate in planning, in their own assessment, and have ample time to develop and reflect.

3. *Successful schools have enough autonomy to support their mission*
Schools need more freedom from external constraints. Schools should have the space to develop their own shared visions and missions; they should have the authority to hire staff and teachers who can carry out this mission; and they need effective leaders to guide this process.[9] Schools should have authority and flexibility to devise their own budgets, plans, schedules, curricula and pedagogical methods. While schools should be free to pursue their own mission, they must also be accountable to higher authorities, such as government and donors.

Some experiences suggest that schools must be small enough for teachers to know their students well. Schorr cites Deborah Meier's recommendation that schools should be small enough "to allow faculty to sit around a table and to permit everyone who will be affected by a decision to be consulted"(p.257).

4. *Many successful schools are intentional communities*
Schools are more than bureaucratized institutions that confer skills and knowledge. They are purposeful organizations that convey values as well as prepare students for productive, meaningful lives. Social contracts between administrators, teachers and students ensure mutual trust and respect. Schools in inner cities serve as "bridging institutions" that "mediate the gulf between the intimacy of the family and the impersonalism of the world of work" (p.259). Coursework is academically rigorous.

Schools are large systems that function against the backdrop of the local environment in which they are embedded. The four *internal* features of schools are thus insufficient to maintain success unless the following *external* conditions are met (p. 260-277):

1. Accountability must be based on standards of student achievement.
2. Parents, teachers and students exercise enough choice for schools to become intentional communities.
3. Schools must get help in selecting and implementing proven interventions.
4. Many reforms must be aligned with one another.

Equity, accountability and control
Whether and how the internal features of a school intersect with the external conditions in society depends on a well-calibrated distribution of accountability channels and implementation control mechanisms. Most states and nations are also concerned to match this distribution of control over implementation with some reasonable distribution of resources for education. For educational policy makers and politicians, perhaps no issue is as crucial as equity – the distribution of resources across different places and groups of people.

Since the enactment of 1993 Educational Reform Law the Massachusetts Department of Education has focussed on improving academic achievement and enhancing the equity of distribution of resources across the commonwealth's 247 school districts. The law calls for increased state aid aimed at the leveling of educational spending amongst all districts, with special attention paid to "property-poor" areas (since the bulk of local revenues for education come from property taxes). The state uses a formula to set a "foundation" funding level that is required for a district to perform adequately along various indicators, such as instruction, maintenance, materials, extra-curricular activities, special education, etc. By increasing and targeting financial assistance and setting a minimum local effort, the state promises to bring the poorer districts up to at least the foundation level by the year 2000. To date the legislature has increased education aid by $200 million a year for four straight years (*Education Week*, 1999:132).[10]

Nearly every day one encounters newspaper and journal articles debating the issues around charter schools[11], voucher programs, curriculum frameworks, teacher examinations and the new Massachusetts Comprehensive Assessment Tests (MCAS). This litany of programs is generating hope and expectation, as well as confusion and outrage. On the one hand, university departments and academic experts (and part 2 of my

literature review!) ask teachers to scaffold the learning of students as they teach to multiple intelligences in a brain-based, child centered, experiential manner. On the other hand, the Department of Education's standardized achievement tests (some argue) require teachers to abandon their progressive pedagogy to "teach to the test". Education remains as hotly contested as in the days of Horace Mann and Noah Webster. As in the past, the current debates appear the surface to be about standards, quality and funding. The underlying tensions that fuel the debate, however, are about *accountability* and *control*, issues that strike to the heart of the meaning of democracy.

Accountability in education means that schools and community are responsible for their own results. It means that communities and their schools demonstrate to funding agencies that they have achieved agreed-upon standards.[12] It means that communities and their schools assure government regulatory agencies and politicians that their educational programs meet basic health, safety and humanitarian standards. For accountability to work, the locus of *control* must be properly situated at the right levels of governance and programmatic execution. Control means power. Power means more than autonomy in program implementation. Power comes from the ability to define *purpose* and to make decisions about programs (see discussion in postscript). The proper measure of control at the each level entails the right amount of participation and responsibility for outcomes. Responsibility requires and welcomes accountability.

As we saw in part one of this chapter, Archon Fung's Street Level Democracy in Chicago provides some insights into how this sort of power can be vested in the appropriate levels. The school district of Chicago, recognizing the insolubility of debates over educational goals and curriculum design, decided to delegate this function to the lowest level in the vertical education bureaucracy – the school. The school set up local education committees - including participation from local community members - to construct their own educational goals, design curricula, and prepare budgets. The Chicago school district continues to provide funding but does not impose curricula and programs from above and does not micro-manage school and community affairs. Fung claims that the function of the local education committee is to make informed "institutional guesses". Through a process of action, reflection and revision, the committees' aims are to reform schools so that they are responsive to community needs. The effectiveness of this current program remains to be assessed. The important point is that Chicago was willing to take a chance with "micro- democracies" at the school level. This decision creates the conditions for the local education committees to conduct a program as a policy experiment, with implications for city and national policy as well as local action.[13]

Financing for High Performance

The Chicago example highlights the importance of control over funds for increased equity and improved effectiveness. In their recent book *Financing Schools for High Performance: Strategies for Improving the Use of Educational Resources* (1998), Allan Odden and Carolyn Busch provide guidelines for putting educational dollars where it matters the most – the school. Citing a wealth of research and examples, they claim that *school-based funding* (rather than district, county or state-based) is the most effective

strategy to improve the productivity of educational systems and increase student achievement.[14] School-based funding means that schools receive their budget in a lump sum, and they determine how to best spend the money to meet their goals. They argue that schools need more autonomy and managerial flexibility in order to meet the standards targets that are being set by school reform programs and laws throughout the country. They call for a new management approach that would be

> a performance-based, decentralized system in which schools would be granted substantial authority and autonomy to accomplish results within a context in which the state and districts set goals, standards, and directions and administer a true accountability system. From research in both education and other settings, we have shown that providing budget authority to the site responsible for producing results – schools in the case of education- is a key element of this new management strategy (p.204).

This managerial autonomy and approach to decentralization is consonant with that of Fung's Street Level Democracy as well as Schorr's 3rd characteristic of successful schools. The key issue is not the principles that underpin decentralization, but rather *what* precisely is decentralized and *how*. Odden and Busch recommend decentralizing authority for financial decision-making to the school. The district and the state still set and monitor the standards, and provide technical assistance to schools. Fung describes Street Level Democracy as an "autonomous, participatory, small-unit democracy". But his approach departs from the participatory, decentralized democratic tradition in that a "muscular central authority" retains an important function. Ostrom's concept of "polycentric governance systems" also retains an important role for central authority in decentralized systems (see footnote 12 in chapter 4 part one).

The details of Odden and Busch's scheme no doubt will attract much discussion in educational policy circles. Their focus on effectiveness as measured by student achievement resonates with much of the discourse today. Other recommendations include a strong curriculum, effective accountability systems, and effective teaching. They refer to a recent in-depth study of five restructured schools by Karen Hawley Miles and Linda Darling-Hammond (1997) for the Consortium for Policy and Research in Education. Each of these schools had adopted or created a new school design, which required a substantial reallocation of resources (Odden and Busch, 1998:164). These five schools increased the effectiveness of teaching by pursuing the following resource allocation strategies to varying degrees:

- Increase the number of classroom teachers adding new staff and by converting specialists and administrative staff to teachers;
- Vary class sizes depending on the subject;
- Group different aged students in the same classroom;[15]
- Increase teacher planning time and provide space for teachers to plan together;[16]
- Increase classroom time in order to reduce daily student/teacher contact numbers;
- Improve opportunities for teacher development.

These specific reallocation strategies may not apply to all contexts. For instance, increasing class time would not be effective for learning foreign languages, especially if it means reducing the number of weekly meetings. Foreign language learning requires more frequent meetings to be effective (pers. comm.1999). Converting specialists to regular classroom teachers may also be difficult in practice. They cited an example of a school that mainstreamed all special education students. To do this the school trained all regular teachers on methods of instruction that would foster a more inclusive environment. It is surely the case that some teachers cannot make the conversion and that some children cannot be mainstreamed.

These reservations notwithstanding, their school-based funding proposal merits attention. It has proven successful in England and parts of Australia. If Chicago's street level democracy is a harbinger of things to come, then school-based funding may be also applicable to the United States. Educational policy makers seem to speak the same "school-wide reform" language of Odden and Busch. But school-wide reform will only be realized when the right things are decentralized to the right levels – in this case lump sums of dollars to schools.

4. Alternative Educational Approaches In and Out of the Classroom

The typical education enthusiast need not travel far to find examples of innovative learning and teaching in classrooms and communities. Within a 15 miles radius of my home in western Massachusetts I cannot find the time to survey the wealth of ongoing innovation and creative solutions to educational problems. I am, admittedly, situated in a particularly innovative region that is home to several well established charter schools, a Waldorf School, a laboratory school of the University of Massachusetts, and the nationally known Northeast Foundation for Children which is located at the Greenfield Center School. Several of the area's public schools also have innovative multicultural programs, alternative modes of assessment, community integration, not to mention outstanding classroom instruction. My observations tell me that something is working. My experience tells me that when something works, you should work with it.

Managing classrooms, building communities

Can a school be run like an intentional community? The Greenfield Center School (GCS), in Greenfield, Massachusetts, may offer an answer. This school, which was founded by six former public school teachers in 1981, serves as a laboratory school for the Northeast Foundation for Children. The NEFC is a nonprofit educational organization that works to improve the quality of the country's elementary schools. NEFC's educational approach, called *the responsive classroom*, integrates the teaching of social skills with the teaching of academic skills. The GCS spends the first six weeks of the academic year focussing on the "social curriculum". Teachers inculcate social skills and build a sense of community amongst the students. Much like an adult training course, teachers and students work together to establish routines and behavioral norms that will ensure an effective and enjoyable learning environment for subsequent months.

The academic curriculum is developmentally appropriate and emphasizes meaningful experiential learning, especially in the lower grades. Classroom size is 18-22 students who are attended by a full time teacher and a full time assistant. With the exception of 2d grade, two grade levels are grouped in each classroom. The school also employs 8th graders as administrative staff and classroom attendants and tutors for lower grades. These students are paid $10 a week for their efforts.[17]

The inspiration for this approach is summarized by Ruth Sidney Charney in her book, *Teaching Children to Care: Management in the Responsive Classroom* (1992), "The most important thing I have learned is that discipline is a subject that can be taught, just as reading and arithmetic is taught. It is taught year after year without apology. It is taught with the conviction and the affirmation of the teacher"(p. 5). The basic goal of the responsive approach is to, "teach children in a such way that they gain affection for ethical behavior (p.8)". The meaning of "discipline" here is akin to its Latin root, *disciplina*, which means training that fosters self control and personal development. It goes far beyond its more familiar meaning of punishing offenders for misbehavior. Charney points out that traditional classroom teachers spend much time *reacting* to behavior problems at the expense of academic learning. The responsive teacher, on the other hand, invests considerable time up front establishing, with the participation and consent of the students, behavioral norms and guiding ground rules. By doing this, the teacher and students "establish an ongoing curriculum in self-control, social participation and human development"(p.9).

The establishment of an intentional learning community requires discipline and commitment to sustaining efforts over the long term. Learners and teachers develop norms of behavior that define classroom boundaries. Learners take responsibility for their own learning, and also for the learning of their peers on whom they depend for support.

Changing mental models

Intentional learning communities require learners to actively participate in shaping their own social reproduction. Our current society may be unable to support on a wide scale intentional learning communities like the Greenfield Center School. This is because preconditions have not yet reached the critical mass needed to initiate an *institutional shift*. Institutional shifts receive impetus from mindshifts[18], or new ways of thinking. Mindshifts are a consequence of the transformation of *mental models*, or the ways educators and learners look at the world and their place in it.[19] One attempt to introduce such a mindshift to schools has been carried out and documented by Caine and Caine in their book *Education of the Edge of Possibility* (1997).

The Caines' goal was to assist in restructuring two K-6 public schools in California by applying the theory of brain-based learning. Their first objective was to introduce a change in mental models amongst teachers and staff. This would contribute to their second objective of creating an environment safe and supportive for learning and reflection. Their assumption is that the actions and decisions of educators are driven by mental models. Their process included a serious of workshops, retreats, and "mindshift"

study group meetings. Teachers were also invited to read the Caine's book *Making Connections: Teaching and the Human Brain* (1994). The restructuring results in the two schools were mixed and the impact on individual teachers ranged from transformative to disgruntling.

They concluded from their experience that "whole school change" does not necessarily happen regardless of how promising the new learning organization appears. Theories and process can introduce a shift in some mental models, but the eventual outcomes on the whole system are not predictable. Borrowing from the language of complexity theory, they called the immediate result of their intervention *disequilibrium*, where they "perturbed the system" by introducing uncertainty and ambiguity. Disequilibrium in a school system, they concluded results in one of three outcomes – a reversion to traditional practices, an evolution of the school system, or, in extreme cases, a disintegration of the school (p.244).

They end their book with a proposed set of guidelines for facilitating what they call "self organization". They maintain that change through self-organization occurs under the right disequilibrium conditions; when the environment is supportive of challenging assumptions about learning; when community self-reflects and grows in the process; and when management and school leaders need to be included in each step of the process. Their book is a wonderfully lucid exposition of an application of complexity theory to school reform. It also shows clearly the difficulty in transforming a system that (like many other organizations) has become set in certain ways, perhaps not for the best reasons, but for reasons that can never be thoroughly comprehended by an outside facilitator.

Schools and communities: shall the twain meet?

My intention in this review is not to describe and critique in detail each alternative school that holds promise for reforming education and society. Schools appear to be like people. Each of them has much to offer. None of them is perfect. Like people, the concept of perfection does not apply anyway. For the purpose of building scenarios, the teaching methods, organizational approaches, and other lessons from each of these alternative schools can be gathered and combined into an ideal school of the future. Over the past two years I have visited and observed many of these schools as well as kept abreast with the literature in journals and the popular press. I have found that most writers and researchers focus on the *school* as the point of intervention for educational reform. This explains an apparent incongruity that the reader may have noticed. I began this review by claiming that "education is more than schooling". Yet I have mainly discussed schools.

In *Multiple Intelligences: The Theory in Practice* (1993) Howard Gardner gives a few examples of how schools can crossover into communities. I was intrigued by his idea of student apprenticeships at local museums, and I incorporated this into the Collabrolova scenario. Other recent articles, such as C. Cryss Brunner's (1998) "The Legacy of Disconnection Between the Public Schools and Their Communities" describe the

historical development of the disconnection and outline the concept but do not provide case studies.

Case studies of school community collaboration often go undocumented. One example is the Jackson St. Elementary School in Northampton, MA. Like other Northampton schools Jackson St. has seen a rapid ethnic diversification. Teachers who began teaching to predominantly white students 10 years ago now find themselves in front of classrooms that are 50% other ethnic groups. To make the most of this learning opportunity for both students and teachers, the principal introduced a monthly "cultural night", where parents from different ethnic groups come to the schools and share their cultures with teachers, students and other community members (pers. comm, 1998).

Although community service learning is a part of some school programs, school-community integration typically means the community comes to the school to use the facilities for educational and cultural purposes. Another example comes from Framingham schools where an ambitious after school nonformal education program is currently underway. Local experts and citizens use the school facilities to teach a variety of nonformal subjects such as martial arts, crafts, and other practical skills (pers. comm.1999). Examples such as these are becoming more commonplace. They are valuable and should be documented and shared.

One area of school that has traditionally attracted substantial community participation in the United States is *sports*. Parents coaching their children after school and cheering from the stands; local businesses sponsoring trophies, uniforms, and refreshments; newspapers covering the big games; athletes selling chocolate bars door to door to raise money for equipment. School sports may be outside the academic curriculum, but it is unlikely that any other school program attracts so much community involvement. This demonstrates the existence of a potential energy in communities to become more involved in other areas as well. Perhaps a study of how communities and schools interface in the sports arena could inform efforts at integration in other arenas, such as academics and school governance.[20]

Knowledge building communities

However promising the above examples may be, they do not appear to live up to the sophisticated theory of "knowledge-building communities" that was presented in part two of this chapter. To illustrate what such a community might look like, I describe the case of an elementary school in Shutesbury, Massachusetts. This case shows how innovative pedagogy and community collaboration may be mutually reinforcing:

> The 4th grade children in the small rural town of Shutesbury go to a school that looks like any other in this part of the state. It had functioned comfortably like most schools until the introduction of *portfolio assessment* about five years ago. The ripple effects of this seemingly minor innovation eventually reorganized learning throughout the school's classrooms. Students formerly accustomed to learn by drill instruction in short, discrete units began to learn by trial and revision towards steady development of products over several weeks time. Students learned Geometry, for example, by designing the blueprints of their "dream homes". The initial drafts

were subject to peer review and then revised by the owner. Teachers trained students to give and receive feedback, which helped them conduct peer review, and was also an educational end in itself. After a few drafts, the teacher invited an architect from the community to come to the school for a few hours per week to provide professional review of the students' drafts. After several weeks of revisions students proudly displayed their products – or their *portfolio.*[21] In another project students learned biology and environmental science by testing water quality of the town's wells. Local experts assisted the students by teaching them how to use the testing equipment. This learning was highly effective for it was real life – the town had never tested their drinking water sources. The children developed their biology class portfolios and presented their results to town officials and concerned citizens.

4. Innovative Solutions from Overseas

Experience from overseas can enrich educational systems and other social institutions that are weary from stagnation. Successful school-based funding programs in England and Australia inspired Busch and Odden, for example.[22] Other writers gather innovative teaching practices from classrooms around the world. Not surprisingly, many researchers have focused on countries, such as Japan and Germany, that are perceived to be competitors of the United States. Developing countries also have much to offer. The "low resource" contexts they operate in require innovative solutions that can also be applied to high resource situations. Community involvement, for example, is often one of these requirements. Resource rich contexts could also benefit from more community involvement.

Quality learning

Everyone knows that Japanese and Korean students test higher in math and science than their American counterparts. This realization has inspired American educational policymakers to concentrate efforts and resources in increasing standards of student achievement. What these policymakers may not have studied carefully is *why* East Asian students score better. Stevenson and Sigler's cross national studies of China, Japan, Taiwan, Korea and the United States in the 1980's provide the benchmark for investigation (Perkins, 1992; Hartwell, 1998). According to Perkins, one of the "entrenched myths of education" that is challenged by these studies is the direct relationship of class size to student learning. While East Asian students' math scores are consistently higher than their American counterparts, their average class sizes are actually larger than those in the U.S. (Perkins, 1992:225). Merciless drilling and rote memorization are not responsible (as is commonly believed) for these higher standards. Children are actually motivated to learn, and teachers know how to teach them. Teachers also have ample time to think and plan and share with their colleagues – something that is sorely lacking in American schools (Sizer, 1984; Perkins, 1992; Adelman and Walking-Eagle, 1997). Drawing from Stevenson and Sigler's study Hartwell. et al. (1998) summarize the main characteristics of the East Asian educational experience as follows:

- High expectations for children's performance.
- The belief that effort, not inherited aptitude, is the key to achievement.
- Learning is interesting and school is fun.
- Teachers relate subjects to children's everyday lives.

- Social activities and games occupy considerable time each day.
- Teaching methods are diverse and complemented by hands-on activity.
- Feedback and diagnostics are frequently used.
- Students are guided by teachers to construct their own ways of representing what they learn.

A recent article in *American Educator* (winter, 1998), "Teaching is a Cultural Activity" James Stigler and James Hiebert describe in detail the findings of their cross-cultural study. Stigler and Hiebert videotaped 231 eighth-grade math classrooms in Germany the United States and Japan. They discovered that even the teaching of math was more of a cultural activity than was previously understood. They claim that teachers follow "cultural scripts" that govern their performance in ways they are not aware of (p. 6). The development of cultural scripts begins at an early age. Perhaps the most important initiation into the culture of teaching is to have been a student in that culture. Indeed, it appears that most teachers probably teach roughly the way that they were taught. Stigler and Hiebert illustrate their arguments by comparing math instruction in Japan and the US.

American math teachers teach as if learning math entails mastering a set of procedures for solving problems. Since the emphasis is on acquiring *skills* the teacher regulates the learning to ensure that children gain the skills. Students start with simple procedures and proceed incrementally to more complex ones. Japanese math teachers, on the other hand, teach as if math consists of a set of relationships between concepts, facts and procedures. Since the emphasis is on fostering thinking, teachers usually begin a lesson by letting students struggle with problem sets. This is followed by a discussion in which students share their methods and solutions under the teacher's facilitation (p.8).[23] This explains why American teachers use overheads – to regulate the flow of the lesson, and why Japanese teachers prefer the blackboard – to display the cumulative progress toward understanding mathematical relationships.

Sigler and Hiebert's article demonstrates how cross-cultural sharing and comparing can contribute to our understanding of teaching and learning. The main point of the article, however, is that teaching is a cultural activity. We will only be able to constructively change teaching and learning activities once we appreciate the cultural scripts they follow.

Involving communities in low resource contexts

Community involvement in educational delivery in developing countries is the focus of a recent publication by USAID's Advancing Basic Education and Literacy Project. *Involving Communities: Participation in the Delivery of Education Programs* (1998) by Andrea Rugh and Heather Bossert presents the nature of community involvement in six case studies: IMPACT Project in the Philippines, The Harambee Secondary School Movement in Kenya, Bangladesh Rural Advancement Committee (BRAC) in Bangladesh, the Community Support Project (CSP) in Balochistan, Pakistan, Escuela Nueva in Colombia, and Fe y Alegría, in Bolivia and Venezuela. Community participation was a core strategy in each of these programs. Among the stated objectives

of community participation was to increase resources available for education, to increase enrollment of marginalized groups such as girls, and to improve school operation and make it more accountable to communities.

From these case studies the report drew out three models of community involvement in educational delivery (p. xviii):

- *Accountability Model: Issue focussed community participation*
  Community participation is mobilized to address specific educational issues. staff and teachers are more accountable to communities for these issues. Lack of accountability was a weakness in each case studied.
- *Partnership Model: High community involvement*
  High levels of participation may be needed in situations where enrollments are very low and government services lacking. Parental involvement increases enrollments and fills in the resource gaps that the government cannot provide. The Community Support Project (CSP) and Fe y Alegría were cases of high community involvement.
- *Demand Model: Communities request appropriate services*
  Communities request specific services they need and also cover part of the costs for it. Fe y Alegría and Harambee were examples of this model.

The report concludes that community involvement often enriches educational programs and even improves 'civil society' as an indirect benefit. Community participation is not a panacea. In successful cases community participation was only one element in a multifaceted program, and it cannot be proven that community involvement was the decisive factor in any of the cases. It appears that community involvement is most effective in areas where demand for educational are high but which are situated beyond the reach of government services (p. xiv).

5. Conclusion

Expanding educational services and programs beyond the confines of formal institutions will be an exciting frontier for educators in the 21st century. Invoking the slogan "education is more than schooling" a new generation of practitioners and policymakers will embark on dispersed missions to *deformalize* learning – to integrate community and school into a necessary unity. This movement will unfold hand-in-hand with the deformalization of other political and economic institutions. Resource poor contexts have already undertaken this program. Motivated by necessity they have devised elegant semi-formal solutions to specific local problems.

These solutions cannot be directly scaled-up to a higher levels. Future educational development agencies will no longer attempt to strictly replicate elegant local solutions. As Schorr suggests the focus will be on cultivating the messy preconditions that enable change to emerge. These preconditions cannot be orchestrated but can only evolve organically through the systematic achievement of knowledge-building communities. The

Chapter Five

Outline of the Variables Comprising the Two Scenarios

whole school approaches. Odden and Busch (1998:167) cite list the following networks and references: New American Schools (Stringfield, Ross, and Smith, 1996), Core Knowledge Schools (Hirsch, 1996), Accelerated Schools (Finnan, St. John, McArthy, and Slovak, 1996), the Coalition of Essential Schools (Sizer, 1996), the School Development Program (Comer, Haynes, Joyner and Ben-Avie, 1996), and the Edison Project (1994).

[15] The Greenfield Center School teaches to 2 grades at a time (K-8), with the exception of grade 2.

[16] For a detailed discussion see Adelman, Nancy E., and Karen Panton Walking-Eagle (1997). "Teachers, Time and School Reform". (1997). *Rethinking Educational Change With Heart and Mind.* Alexandria, VA: ASCD.

[17] This approach appears in the scenarios. Enlisting 8th graders to tutor lower levels makes learning real (because they are paid for the work), rewards them for their successful studies, and is a highly effective way to learn higher order skills. They are "scaffolded" by teachers and learn how to teach through this cognitive apprenticeship. See chapter 4, part 2, section 3.

[18] As usual it also requires a new word, "mindshift"!

[19] Caine and Caine claim that mental models are based on the "fundamental ways that people look at things and interpret their world" (Caine and Caine, 1997:24). David Bohm's description of 'mental models' (though he does not use the term) is "...our assumptions about the way society works, about what sort of person we are supposed to be, about what relationships, institutions and so on". To Bohm, "thought is the problem" (Bohm, 1996:11).

[20] My interest in sports is shared with other big names in the thinking business. Habermas quipped somewhere that professional sports are the modern day opiate of the masses. Chomsky observes that the typical American man devotes enormous time and energy to watching and critiquing sports; he packs his long-term memory with statistics and events; he demonstrates sophisticated analytical skills and confidently takes to task – in newspapers and on radios - powerful professional coaches, athletes and team owners. Would that a democratic society could harness such involvement in the political arena.

[21] Portfolio assessment is a *dynamic* assessment based on the premise that the most important assessment of a student's progress is the student's own assessment. Students want to perform well and gain approbation. To this end they are constantly assessing their own progress. Unfortunately traditional classrooms did not take advantage of this natural, dynamic assessment. It is dynamic because it measures the learning process – progress towards mastery. Examinations measure skills and knowledge at a given point in time. They also measure to some degree the "test-taking" ability of the student.

[22] Although the authors do not refer to it, "Sector Investment Programs" (SIPs) in the field of international development assistance follows a similar managerial imperative as school-based funding. In SIPs donor agencies deliver funds directly to a central ministry budget. The ministry has autonomy to disburse these funds as per its overall strategy. The donor's grants are for *sector* programs, and not earmarked for specific projects as in the past. Accountability is ensured through the use of conditionalities, or broad stipulations of what outcomes the donor may expect. Many donor agencies are also invited to participate in regular tripartite review meetings.

[23] The former resembles "banking education"; the latter resembles sound andragogy.

[24] "Managing the boundaries" is a concept that comes from management science. It traces its intellectual roots to the work of Kurt Lewin (1935). Weisbord describes it as "managers and supervisors do best guarding the goals and values – the input. Workers control the output. Where more self-control is needed *inside* the system, the leaders must stay *outside*, working on it, not in it (Weisbord, 1987:164)". For a full account of the concept and a history of its development see Weisbord, Marvin. (1987). *Productive Workplaces: Organizing and Managing for Dignity, Meaning, and Community* San Francisco, CA: Jossey-Bass.

transformation of society. "For schools are so important to the reproduction of capitalist society that they are unlikely to crumble under any but the most massive political onslaughts".

[5] Systematic, or systemic, school reform has become part of the mainstream discourse. See Sashkin, Marshall and John Egermeier. (1993). *School Change Models and Processes : A Review and Synthesis of Research and Practice.* Washington DC: US Department of Education.

[6] We can either train cadres of miracle workers or establish the conditions for ordinary people to *emerge* and undertake the tasks that were previously only the forté of miracle workers. This powerful conceptual notion is consonant with the concept of emergence that is coming out of the new physics. Kauffman refers to the popular saying that 'the whole is greater than the some of its parts'. He says that "life itself is an emergent phenomenon arising as the molecular diversity of a prebiotic chemical system increases beyond a threshold of complexity...life is not located in the property of any single molecule – in the details – but is a collective property of systems of interacting molecules" (Kauffman, 1995: 23-25). Similarly, social and educational reform will result not from fixing "the details" – improving technology or strategically placing miracle workers (though these would certainly help) – but from systemic transformation that enables the *emergence* of new institutions and forms of interaction. This concept is fundamental to visualizing a new learning society.

[7] Examples include Avance, a community-based early childhood program in San Antonio, Texas; Schools of the 21st Century, a childcare program that operates out of public schools in 14 locations on the east coast; HIPPY, Parents as Teachers, Early Head Start, and Healthy Families America which provide home visits, family support and early education services (Schorr, 1997:238-243).

[8] These four characteristics, combined with Bereiter and Scardamalia's (1993: 210-211) characteristics of knowledge building communities, were instrumental in visualizing the role of schooling in the Collabrolova scenario.

[9] For an account of the importance of effective leadership see Spillane, James P. and Charles L. Thompson. (1997). "Reconstructing Conceptions of Local Capacity: the Local Education Agency's Capacity for Ambitious Instructional Reform".

[10] It is too early to assess the success of these efforts. Some detractors point out that Massachusetts would have to increase aid by at least the current amounts just to bring poor districts up to the levels of the pre-economic downturn of the 1980's (that resulted in decreased spending on education. According to *Education Week* (1999), Massachusetts saw a change in inflation-adjusted spending per student of 13% for the period 1987-1997. Compared to the other 50 states Massachusetts ranks 28th (the highest Kentucky at 42% and the lowest Alaska at –18%). One can guess that some of the top 27 states increasing spending at higher rates than Massachusetts have less ambitious Education Reform Laws than Massachusetts. One can also conjecture, however, that Massachusetts would rank much higher if the study focussed on the years 1993-1997. A recent equity analysis by Kato, Demoranville, and MacNeil (1999) of 12 districts and four services showed high levels of equity in per pupil expenditure and teacher/pupil ratio. The dropout rate and computers per student suggested, however, a more inequitable situation. It is probable that analyses on some other services would show significant inequity as well.

[11] 300,000 of the nation's 50 million school age children are in charter schools in 35 states. By the fall of 2000 Massachusetts will have over 10,000 students in 43 charter schools. Massachusetts is ranked 9th nationwide, considerably trailing frontrunner Arizona, which has 271 charter schools. Palmer, Thomas (March, 1999) "Charting the Alternative Impulse". *Boston Globe.* Palmer begins his article with a paragraph that reads (in its entirety) "Vouchers and charters. Charters and vouchers", indicating that this movement is all the rage in the press.

[12] Recall from part 1 that Gutmann suggested the basic standards of nondiscrimination and nonrepression. The job of the philosopher is to suggest these standards to the community and the state. The community and the state consider these recommendations in their negotiation over standards.

[13] For an explanation of the concept and practice of conducting projects as policy experiments see Rondinelli, Dennis A. (1983). *Development Projects as Policy Experiments: an Adaptive Approach to Development Administration.* New York: Metheun.

[14] Efforts to redesign, restructure, reallocate, rethink schools have proliferated widely during the 1990's. Their goal: higher performance schools. There are several school reform networks that design so-called

learning organizations that promote and support these knowledge-building communities will themselves follow the same principles as the communities they aim to support.

The common thread that runs through the work of Schorr, Odden, Fung and Ostrom is the focus on setting up processes for calibrating institutional arrangements towards specific agreed-upon goals. These cases call for a new style of development that sets "managerial boundaries" - to ensure accountability and preserve social order – and then allows learning organizations to emerge and develop.[24] The responsive classroom provides a learning analog to institutional boundary management. The social curriculum – norms of behavior and relationships - sets the boundaries in order that academic learning may flourish.

As this brief survey shows, the seeds of the social and educational movement to deformalize are already scattered widely. A future learning society will be one that has deformalized its learning, organically generates living knowledge, enjoys managerial flexibility in its institutions, and above all, is purposive about the purpose of education. A future anti-learning society will be one that tightens the reins on formal learning, buys and consumes prefabricated knowledge, reinstalls impermeable, hierarchical structures, and embeds unexamined goals of education in whatever learning process is most efficient for business.

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[1] For a discussion of the characteristics of and distinctions between informal and nonformal education see Evans, David R. (1981) "The Planning of Non-formal Education". Paris: UNESCO: International Institute for Educational Planning.

[2] "Academy" derives from the demigod *Akademos* who presided over Plato's grove. "Lyceum" comes from *Lukeios* an epithet for Apollo, whose temple abutted Aristotle's grove. From *Lukeion* we get the word "gymnasium". Aristotle's method of facilitation while walking in and amongst students was called *peripatein* (literally "to walk up and down"). From this we get the English word "peripatetic" which refers to the followers of Aristotle's philosophy. The second, broader meaning is a person who walks or travels about, working, teaching and learning amongst diverse people in different institutions.

[3] The Lyceum, established by Josiah Holbrook in the 1820's, provide a forum for some of America's great writers and thinkers to develop and spread their ideas. The list includes people who might have achieved only marginal followings if not for the lyceum – Thoreau, Alcott, and Fuller, even the great Emerson himself. Richardson says, in his path-breaking intellectual biography of Emerson *The Mind on Fire*, that, "Emerson did not in general give talks at colleges and universities. He never spoke at Yale; after the "Divinity School Address" he was not welcome – not even invited – to speak at Harvard until after the Civil War. It is ironic that the American Plato had his greatest impact not through the academy - named in honor of Plato's place of instruction – but through the institution named for the walk where the practical Aristotle taught, the Lyceum," (Richardson, 1995: 419)

[4] Bowles and Gintiss (1976) offer several serious criticisms (pg. 256-262). In short, the structure of schooling is a reflection of the economy that shapes it and that it serves. Capitalist society is as manipulative as the schools it maintains. Deschooling would release people into a power infected and merciless society where they would be perhaps even more vulnerable to manipulation. "...the elimination of schools without the transformation in economic life would inevitably lead to a situation of social chaos, but probably not to a viable mass movement toward constructive social change." Bowles and Gintiss also question the relevance of Illich's argument that de-schooling is a sufficient measure for bringing about the

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FIELD	PRETIOSKA	COLLABROLOVA
Attributes	Market driven Autocratic/homogenizing Yielding individual benefits Competitive Market-based Efficient, rational, consumptive	Community led Democratic/pluralistic Forming social capital Collaborative Community-based Effective, fulfilling, self-sustaining
Environment	• Homogenized for efficiency • Unsustainable use of resources • Environment as economic resource	• Managed for diversity • Sustainable use of renewables • Ecological ethic
Community	• Fragmented, nihilistic • Community based on *trans*actions • Increased human capital and reduced social capital • Regulated institutional arrangements • Deplaced knowledge • Hegemony of specialists	• Connected, grounded in purpose • Community based on *inter*actions • Build human and social capital • Mosaic of civic associations • Knowledge-building communities • Collaboration of experts
Family	• Family as unit of consumption • Contradiction between nuclear and non-traditional families • Family as competitive agent • Comprehensive value systems in conflict	• Family as part of community • Nuclear and non-traditional forms • Clusters of cooperating families • Overlapping consensus[1] of value systems
Governance	• Politics of resentment[2] • Policy by specialists and the tyranny of legislators[3] • Antagonism between autonomous communities (self-determination) and central authority[4] (Vertical command and control)	• Renewed social compact • Deliberative process • Polycentric governance systems[5]
Economy	• Class fragmentation • Widening income disparity • 'Winner-takes-all' global capitalism • Hegemony of economic blocs	• Principle of economic justice • Extension of democracy to economic relations • Nested economies[6] • Reclaiming and protecting the local
Education	• Homogenizes student body • Institutionalized • Knowledge telling • Encourages specialization[7] • Competitive and selective	• Tailored to multiple learning styles • Integrated into community life (deformalized) • Knowledge transforming • Nurtures expertise • Cooperative and fulfilling

[1] "Overlapping consensus" is a term coined by philosopher John Rawls (1993) in *Political Liberalism*. People belong to an overlapping consensus when they affirm the same public conception of justice. As I apply the term to value systems it means that people share a consensus of what and how the state should regulate values and practices at the level of family and community. It is a political conception of the

parameters for discourse and debate on family and community values. Overlapping consensus is not merely an average of all family value systems in a society (see chapter 4 part one of this thesis).

[2] "Politics of Resentment" is a term used by Robert Reich (lecture on the "Social Compact" at University of Massachusetts, 1997) to refer to the imminent political situation in the United States that will result from the widening income gap. Various disempowered groups will form reactionary factions and focus their disgruntled sentiments towards each other as well as central authorities whom they perceive as unresponsive and self-serving.

[3] The tyranny of legislators is a current feature of the American political landscape. The Starr investigation, the attack on tobacco corporations, the regulation of the gun industry, are all instances of lawyers and legislators making public policy. In the case of the Starr investigation it may be a case of the legislative branch trying to supplant the executive function of the government.

[4] See Manuel Castell's (1997) discussion of social movements against the global order for an illustration of how this antagonism arises when the central authority in peoples' lives becomes a de-centered global order.

[5] "Polycentric governance" is Elinor Ostrom's (1998) term (see chapter 4 part one of this thesis)

[6] "Nested economies" is a scheme from James Robertson's *Future Wealth: A New Economics for the 21st Century* (London: Cassell Publishers, 1989). For and summary of this scheme see Korten (1996) *When Corporations Rule the World* pgs. 261-276.

[7] I use the terms "specialization" and "expertise" in the specific sense of Scardamalia and Bereiter (1993) (see chapter 4 part 2 section 7).

Variables that Shape Quality of Learning

Key Questions
1. How do each of the components contribute to quality learning?
2. How do the components influence each other?

Chapter Six

The Scenario of Pretioska

Pretioska is a small southeastern European country with a short coastline on the Mediterranean Sea. The country has an export-oriented industrial economy and a GNP about half as much as the lowest of the G-7 nations. The society of Pretioska is pluralistic but divisive along ethnic and class lines. Although once a model of liberal democracy, it has become increasingly segregated as disparities in educational and professional opportunities have become more pronounced. Children are taught in schools the virtues of democracy and civic-mindedness, but these values are becoming anachronisms. In the past 3 decades the income gap has widened to the point where 1% of the population owns 50% of the wealth. Tension among the poorer 50% has given rise to many social problems, especially in the inner cities where most of the poor live.

The socio-economy and role of the state

Citizens of Pretioska are patriotic and their sense of identity is defined by their national heritage. Nostalgia for Pretioska's golden age of great philosophers, scientists and industrialists is particularly strong in these days of economic stagnation. Conscription into the military is mandatory. Border disputes with neighboring countries are frequent and the military is also occasionally dispatched to quell 'ethnic unrest' in remote parts of the country.

The country's 12 million inhabitants occupy 7 million acres, 3/4 of which is mountainous, non-arable land. Less than 1% of the population is responsible for the country's food production - which covers about 50% of its consumption needs. Food and raw materials production depends heavily on petro-chemicals and gasoline, much of which has to be imported. Sixty percent of the population lives in two large cities which until recently were bustling industrial centers. In the aftermath of the government's recent signing of several international trade agreements much of local industry is currently relocating to neighboring countries to the south where labor is cheaper and the political situation is perceived as more stable. Company directors defend themselves against accusations that they are non-patriotic by claiming that they must move to remain competitive in the world market. Some have said that they would have located to the east of the country (where labor is cheaper) but infrastructure is poor and ethnic unrest presents a high risk. In addition to companies losing their patriotic fervor, people have lost loyalty to their companies. Many communities that used to be formed around the local firm are now left with not only economic depression, but a lack of community spirit.

To counter these social and economic trends, the government holds tight reins over economic activity. Through manipulation of taxes, interest rates and subsidies for private mortgages, corporate relocation, and countless civil projects, the government has taken active command of the economic destiny of the country. People are cynical about the government's efficacy, due in part to the mixed messages they receive. While espousing communitarian values and free market principles, politicians are building up a government that has achieved an unprecedented level of scope, command and size.

The economy of Petrioska is a highly developed industrial economy transitioning to what the government and corporations are calling a "knowledge production economy", which will be dominated by information technology. While the media and politicians promote the new world of knowledge production, the growing number of lower-middle class and blue collar workers are disgruntled as they do not see the relevance of this new world to their lives. On the other hand, parents have the utmost faith that their children's knowledge of information technology will ensure upward mobility in society. The amount of money school district's spend on computers reflect this faith. Indeed, even public schools have more computers than they can effectively use. One of the reasons for lack of effectiveness is that teachers are not skilled in using them. In the politically and ethnically divided society of Petrioska, the value of technology is one of the few things that everyone agrees on.

Petrioska is divided administratively into 5 states each with a population between 1-3 million. Two of the states are nearly completely urbanized. States are responsible for health care, education, industrial and agricultural policy, infrastructure maintenance and governance. Each state is made up of 10 counties, which oversee police, municipal affairs, public works and prisons. Towns vary in size and tend to be ethnically homogeneous. There is considerable mobility in society, especially as people relocate to suburbs to escape urban decay. The labor market also demands flexibility of jobs and locations. As capital has become highly mobile, labor has been forced to move with it, often displacing entire portions of a community at a time.

Politicians and parents agree that education is the panacea for most economic and social malaise. Much of the political discourse revolves around education policy and often ends up in heated debates between the incompatible views of liberals and conservatives. Policy is stipulated at the national level in consultation with state boards of education. Education policy discourse focuses on areas such as citizen values, core knowledge and skills and child development. There is little consensus in government and in society, and policy shifts are often dramatic. One reason for these sudden shifts in policy is that the policy makers in the Department of Education are appointed by whoever is in power at the time.

The **community** in Pretioska is an administrative unit that serves the purposes of consolidating a tax base and carrying out governance. With the exception of small, remote farming communities, most communities are inhabited by people who work outside the community. The majority of professional people commute between 1-2 hours each way to work in cities or industrial parks. Since people spend so much time in cars, they equip their cars with office equipment so that they don't spend idle time on the freeways. All **families** have two income earners. For raising children most parents place their children in private day care centers. For those who cannot afford private day care centers, the state provides day care, but the quality is widely perceived to be inadequate. Some companies provide day care services for employees, but this not an appealing option since people work so far from their homes. In some families, parents of young children have tried to arrange their work schedules so someone is always home. This has been viable in some cases but not without introducing considerable strain to marriages.

While the income gap has been widening in recent years, the increase in workloads and hours on the job has been relatively uniform. Managers and executives of firms work on average 55 hours a week while manual laborers work about 52 hours.

School Programs

Schools are bureaucratically organized institutions that are managed by a well-trained cadre of educational and administrative specialists. Schools are required to transfer math and reading skills as well as impart a corpus of knowledge that is standardized at the national Department of Education. The mandate for schools claims that they are value-neutral institutions. In practice, however, they effectively confer values on children. A recent survey of middle school students found that students from the age of ten are already worrying about their careers and how much money they will make when they get their first job. Popular commentary by educators that children are worrying about jobs before they even acquire 'higher-order' skills has caused considerable alarm among parents. This has caused increasingly widespread criticism about the educational system. While the Department of Education claims that schools are academically rigorous and value-neutral, children seem to be worrying about jobs, money and acquiring material goods than they do about learning. Some educators blame the parents for these values. Many parents and interest groups are either indifferent or maintain that such values are good because they motivate kids to learn.

The prevailing rule-of-thumb in these days of uncertainty, is to enroll your children in a good school. All children in Pretioska go to school and about 85% complete secondary school. About 40% of secondary school graduates go to university. Schools are either private or semi-public. Private schools are funded by tuition of students. The current annual tuition and fees per student - 25,000 dollars - effectively excludes participation of 95% of the population. The families whose income ranks in the lower 40% of the country make less than 25,000 per year.

Semi-public schools get half their funds from the government. Between 25-75% of these funds come from local property taxes (depending on the amount of local wealth). Because aggregate property values diverge widely across communities, the national government provides a supplemental amount to level the public funds available to each school. The other half of school money comes from fees from families and from corporate donations.

Most local and national government moneys are earmarked for specific uses - staffing, facilities, technology, etc. Most of the funds are spent on staffing. Staff consist of teachers, professional administrators, and a range of specialists that cater to specific needs - health professionals, counselors, psychologists, special needs educators, and sports coaches. The government holds schools accountable by administering periodic standardized testing of students and teachers. The government is also highly responsive to parent complaints about school quality, often dispatching inspectors for school visits if the case seems serious or potentially volatile. Corporate moneys are also given for predetermined uses, depending on the commercial interests of the corporation. Chemical companies, for example, provide money for chemistry classes provided that the school

purchase its chemicals and educational materials. Companies tend to measure effectiveness by how many educational posters, notebook (which bear the company's logo) are distributed and how much of other materials are used (such as chemicals). Most corporate sponsorship is in the areas of chemistry, physics, computer technology, and sports. School infirmaries often receive corporate support from pharmaceuticals and health education materials.

Education programs

The primary function of schools is to transfer knowledge, information and skills to students. In recent years computers and the internet have risen to prominence in the schools. According to a recent study, children spend nearly as much time in front of a computer screen as they do interacting with their teachers. The same study showed that many children are confused by the disconnect between the rote learning in school and the far more stimulating learning available on the internet and on videos. The conclusion of this study was startling: teachers cannot compete with computers in transferring information to students. Consequently parents have little faith in the school system. A growing number have turned to home schooling that uses state-of-the-art interactive software.

Some utopian communes have also shunned the school systems and home school their children. Home schooling tends to use cooperative methods and hardly prepare children for the real world. Children from these communities have difficulty building successful careers in the competitive, hierarchical market place. Most mainstream families brush off home-schooling as a romantic fancy or as anti-pretioskan behavior. Most families are pushed by economic necessity to have two incomes and would not be able to home-school anyway.

The new global economy and the emphasis on knowledge production have increased pressure to produce (what the Department of Labor calls) a workforce of "flexible and adaptable lifelong learners" who are highly organized and intrinsically motivated to perform. Teacher's inability to compete with computers in the classroom is one example of the evidence often cited that adult professionals are intellectually stagnant and ill-equipped to learn and use new technology. In response, the Department of Education, the Department of Labor and representatives from major corporations have assembled a task force to explore ways to extend vocational training to students and the general population. Schools are increasingly required to emphasize "practical vocational skills" above all else. A recent comment from the President of Petrioska captures the essence of this movement, "Workers of the future knowledge production economy need high-level and hands-on skills that the rapidly evolving marketplace demands. Accordingly, our schools should emphasize practical vocational skills beginning at the earliest possible ages." One way this policy has manifested is in the widespread teaching of computer languages, starting in the 8th grade. In over half of the country's high schools, students are able to waive their foreign language requirement if they have achieved literacy in a computer language. Corporate sponsors of education have been instrumental in formulating this policy as well as supporting school programs with software and in some cases, technical advisors.

The Semi-public Schools are divided into primary (grades 1-5) and secondary (grades 6-12). About one-third of all secondary schools are vocational schools. The schools emphasize the basic skills of reading, writing, mathematics, and the hard sciences. In addition to learning in classrooms, students engage in school government, sports and various extracurricular interest groups. Most teachers are required to lead an extracurricular activity in addition to carrying a full teaching load. Teachers at the primary level are in the classroom 5 hours a day. This increases to 5.5 hours a day at the secondary level. The national average class size in primary school is 34 students. The average in inner cities is much higher at 40. At the secondary level the class size falls to 28 and 35 respectively. The National Assembly of Petrioska recently approved funds to add 10,000 more teachers to the educational system with the aim of reducing class size. Polls show that voters are pleased with this move because they understand that class size has been identified as *the* determining factor in educational quality in the classroom. About 1/3 of the funds for this new initiative come from the private sector. The allocation of funds are mostly to the secondary schools where most of the practical vocational training occurs. It is hoped that average class size will reduce to 32 at the primary level and 22 at the secondary level.

Learning and pedagogy

With the exception of occasional field trips to museums, aquariums, and libraries, most educational activities take place in the school. Children learn by drill instruction in specific subjects. Children attend and average of 5 classes per day; each class period lasts about 40 minutes. Teachers administer examinations on a regular basis to test progress and a standardized final examination is administered each year to assess whether each learner has met the requirements to advance to the next grade. These examination results are tabulated at certified national testing centers (some are government agencies and some are privately owned) to assess the quality of instruction of the teachers. Teachers' tenure and raises depend on these test scores so many teachers feel compelled to "teach to the test".

Much of the learning in primary schools is drill and rote. Teachers find that rote learning is the quickest, most efficient way to inculcate basic skills in children. Not only are the teachers teaching to tests, but they also have to manage the pressure placed on them by parents, who want to see results in their children, say in reading and writing, at the earliest possible age.

Secondary school learning is also school-based, but it tends to be more hands-on, especially the learning of hard sciences. In the final years of secondary school students spend about a one-half of each day in vocational training. The amount and type of vocational training depends on the aptitude and competency levels of the students. These levels are tracked carefully starting in the 6th grade. Hands-on vocational training will give students enough specialization to get jobs right out of secondary school.

Chapter Seven

The Scenario of Collabrolova

Collabrolova is a landlocked country in the mountainous region of Eastern Europe. The country has an ancient history and many world-renowned authors and artists who have made lasting contributions to the shaping of modern European culture. The society of Collabrolova comprises ethnically and religiously pluralistic communities who share basic democratic values. The Collabrolovans are a tolerant people who have welcomed large numbers of Russian, Polish and Latvian immigrants over the centuries. These immigrant populations have retained their language and culture while adapting to the Collabrolovan cultural context and speaking Collabrolovese.

People with a strong sense of place maintain local political and social institutions. The **community** is the crucible within which local knowledge and a sense of place and identity are developed. Community values are implicitly and explicitly conveyed by localized, responsive organizations, such as **community learning centers** (CLCs), local churches, mosques and other civic associations. Children are raised to think, learn and act locally as well as think, and learn globally. All children acquire local ecological expertise as well as a global consciousness. Most children also develop some level of transnational competence - learning languages, information access and cross-cultural sensitivity. Most learning centers have bilingual programs, where Collabrolovese and another language are the medium of instruction.

A community learning center is a public space that provides opportunities for education and development for people of all ages. CLCs are created and run as 'intentional communities' - created by local initiative and defined by popular deliberation. The values that inform CLCs are deliberated explicitly by the communities during the formation of the CLC. While communities are pluralistic in their views and cultures, consensus is achieved through dialogue. The CLCs are flexible institutions embedded in the community, with formal and informal connections with **community** associations, other learning centers (such as **museums** and **libraries**) and **businesses**.

Community Education Councils (CECs) design and articulate the values, goals and curricula of the community learning centers. This is done in frequent community dialogues, where representatives of various groups come together. Learning takes place in the community as well as at the CLCs. Community learning opportunities are available to learners of all ages in civic associations, local businesses, and other learning centers such as museums and libraries, who train apprentices on a continuos basis. Other community learning occurs in **family home schooling**, many of whom form **family clusters** for common home schooling and child care. Local volunteer midwifes and community health workers provide expertise to new parents about child rearing and early childhood education. These volunteers often conduct workshops for groups of parents at maternity wards. Health volunteers receive training from local health centers and colleges free of charge with the condition that they pledge to volunteer for two years after

certification. After this time they are supported by the families they advise and they also receive a modest stipend from the CLC.

Families make up communities. Clusters of extended families form to establish cooperative housing arrangements as well as to share in home schooling and childcare. Families and clusters of families form partnerships with and share their expertise with the community learning centers. Families can take on apprentices from the CLCs and in return receive continuing education credits, certificates or vouchers for the education of their children in the CLC of their choice. Much of language instruction takes place in the homes of Russian, German and Polish speaking families who provide total immersion language and cultural experiences to students. Experts from the CLCs provide guidelines for families to orchestrate these immersions. Families and family clusters regularly host exchange students from different countries in Europe and overseas.

Socio-economy and the role of the state

The country of Collabrolova is administratively divided into 12 provinces, each with a population between 1-2 million. Each province is divided into 5 and 7 districts of around 200,000 people. Districts are composed of numerous **community development zones** (CDZ), each home to an average of 2,000 people. The population of Collabrolova is relatively evenly dispersed. The political and cultural capital of the country is also the largest city with about 500,000 people.

Collabrolova has a free market economy that is regulated at each administrative level by local government agencies. With the exception of a few large electronics and motor vehicle manufacturing companies, most productive assets are owned and controlled at the local levels. National and district governments provide technical and regulatory assistance that enables community development zones to carry out their self-defined social and economic goals. Economic activity is organized to first meet local needs before engaging in trade with other CDZs, other districts, and internationally. About 40% of Collabrolova's citizens engage in some food production and management of raw materials (fuel, building materials). Most families have home gardens that provide the bulk of their fresh fruit and vegetable needs. While few individual families are wholly self-sufficient in food and other raw materials, the level of self-sufficiency increases as one moves from the family to the CDZ to the district. Most families are also engaged in other major economic sectors such as high technology, microelectronics, tourism, entertainment and commerce. Collabrolova's main exports are microelectronics, high value food products, and woolen clothing. The people of Collabrolova do not place different value on manual and mental labor. This is reflected in the level of equity in the work force. Above all flexible specialization of workers is needed to perform and grow in integrated workplaces. Many firms are collectively owned by workers who must be specialized in all aspects of production as well as marketing and management.

Collabrolova has a national currency that it uses for inter-provincial and international commerce. Roughly one-third of the value of local transactions are carried out in local currencies. The local free market, regulated by district chambers of commerce determines the local currency value of goods and services. People prefer local currencies

because the currencies embody the value of real goods and services that they themselves can create and provide. The chamber of commerce promotes local currencies as the best way to keep wealth local and to protect the local economy from external shocks from the unstable global economy.

Each employee in Collabrolova spends on the average 30 hours a week at the workplace. For those in managerial and administrative positions, an additional 5-10 hours is required, but this work can usually be done at home. Most families have one off home and one at-home breadwinner. The at-home breadwinner is responsible for food production and preservation, maintenance of home and garden, and involvement in civic affairs of the CDZ. The off-home income earner also shares much of this work in the evenings and weekends. At-home breadwinners often have small businesses that they run out of their homes, such as technical writing, translation services, counseling and therapy, crafts and pottery, and so on. Child-rearing and home schooling are usually carried out in clusters with nearby families.

Educational programs

CLCs and family schooling clusters are formed with the CDZ and are partly administered and financed by the CDZ elected government. The State of Collabrolova provides technical assistance to the districts and CLCs as well as provides some legal and regulatory protection to safeguard the civil rights and basic health and safety of citizens. Learning activities at the CLCs are financed by several sources: 1/ local CDZ taxes, 2/ business and civic association contributions (mostly in kind such as providing stipends for apprenticeships), 3/ fees from learners' families, and 4/ allocations from the District Department of Human Resources.

The budget from the district comprises about 33% of the total budget for each CLC. The district moneys are allocated to each CLC in lump sum. The CLC uses these funds at its discretion. The total amount granted to each CLC depends on the relative wealth of the CDZ. In other words, the district funds are intended to ensure fiscal equity among CLCs. The district's continued contributions are conditioned on the achievement of certain standards, which are measured each year by a combination of standardized tests and in-depth qualitative assessment (during which, district experts are available to help identify areas of need and provide technical assistance). The criteria for these assessments is set by a joint commission of the District Department of Human Resources, CECs, CLC staff and other stakeholders from the community. The tests are designed to assess progress of learners rather than raw achievement.

Much of the budget for the CLCs is for staffing of educators. All the staff is active educators. Administration of the CLCs is carried out by a group of educators who share the responsibility. Two of the educators also serve as **community education liaisons** to organize learning activities between the CLC and other community organizations. They also coordinate and facilitate CEC meetings and community dialogues (where curricula and assessment criteria are developed).

Families choose which CLC they would like to attend and at what stage of learning they want their children to attend. Nearly 100% of children spend some of their learning years at a CLC. About 95% receive a Basic Expert Learner Certification that is conferred by the CDZ government and the CECs. About 45% of students go on to acquire 2-year college degrees before entering the workforce as managers, administrators, technicians and skilled laborers. 20% of all students study at four or more year university programs that prepare them for academic and research jobs. University education is paid for by the students through work study and community service learning programs.

University programs are run as apprenticeships. For liberal arts students, this entails cognitive apprenticeships whereby students design and teach courses to each other under the guidance of a mentor. Vocational students become apprentices in a collaborative guild that is formed between the local businesses and the university. This university training prepares professionals for their future trades as well as for future apprenticeships that they will mentor. The economic system is set up so that benefits increase to each professional artisan and worker as they progress through their careers. Benefits also depend on how well and how often they guide new apprentices. Accumulated benefits over the lifetimes of each artisan, administrator and worker differ between 50-100% from person to person.

Learning and pedagogy

Curricula at the CLC is generated by educators, students and community members over time through an iterative process of educator-orchestrated immersion of learners in real-life experiences and in classrooms. The curricula is periodically reviewed and revised by the CECs with the approval of the district and community stakeholders. Education programs at Collabrolova's CLCs are academically rigorous. The pedagogy aims at developing basic reading and arithmetical skills as well as transferable skills and higher order thinking (teaching children how to learn and become expert learners). Full development of each type of understanding at each developmental stage of the learner is the goal. Specific content (history, literature, and cultural studies) is determined by local CECs. Content tends to consist of national, regional and local topics, literature and current events.

The only explicit requirement from the CDZs and District Department is that learners achieve "locally literacy" in matters ecological, political, social, historical as well are conversant in the local literature and art. Academic rigor takes priority over the needs of socialization of students, the latter of which takes place mostly in the communities and family clusters, as well in extracurricular activities at the CLC. Through cooperative learning methods, educators and students are constantly modeling cooperative Behavior and norms. These methods enable students to learn better and prepare them for successful integration into working environments where cooperation and mutual respect are the norm.

At the heart of pedagogy is the cognitive apprenticeship whereby teachers guide learners' acquisition of basic skills (Arithmetic, reading, etc.) by making thinking and organizing knowledge visible to the learner and the teacher. As early as possible teachers coach

learners in teaching themselves and each other. By the time they reach their secondary learning years, learners are able to tutor younger learners.

Learning in the early years (pre-kindergarten to ages 6- 8) occurs between the homes, family clusters and in Primary CLCs. The largest percentage of district and CDZ resources (40%) are invested in this area. Highly skilled and sensitive teachers provide the educat'ional activities. Regular workshops with parents are incorporated into programs to inform parents of up-to-date findings from the fields of cognitive science, anthropology and neurobiology that inform the pedagogy and curriculum of these CLCs.

Class size is an important factor during the early learning years. Family schooling clusters generally educate around 10 children at a time. In the CLCs classes tend to be somewhat larger, but never exceed 20.

At the middle level (ages 8-14) Learning occurs partly in apprenticeships in the community and partly in the Middle CLCs. The CLCs are gathering places for qualified community members to provide educational opportunities to youth and adults. Curriculum and pedagogy for younger students are 'negotiated' by educators and parents. CLCs operate like "learning fairs" - where educators inform parents and students about the uses and benefits of particular subjects. Parents and children make 'informed choices' about how to invest their time and energy. In many cases parents form partnerships with educators to become tutors to a group of students (for speakers of different languages this might include organizing homestays for immersion of the students in language and culture). Parents who take on tutoring are not paid directly but receive vouchers that enable them to purchase additional materials or opportunities for their children, or they may get a rebate on the taxes that they pay to support CLCs.

Partnerships

Collaboration with parents and business community is a key feature of this learning society, especially during the middle learning years. Part of a business's learning organization consists of teaching apprenticeships - this would require educators to train employees in methods that they could use to impart not only technical skills but social skills for working in groups, making presentations, organization and management skills. The process of organizing and carrying out learning experiences for interns would be a learning experience for the business staff, as business managers have come to realize that the best way for adult employees to learn is actually to teach. Some business leaders regularly hold workshops around the theme that "expertise consist in becoming an expert learner"..etc. Employees experience increased job satisfaction as the act of teaching and learning is intrinsically meaningful to them.

Students begin to acquire expertise in specific areas during this time. Part of the student's learning time is spent in 'practical apprenticeships' in the community (museums, businesses, government agencies, etc.). Based on negotiation between educators, parents and students, they focus on subject areas that they have interest in and for which they have some proclivity (music, history, physics, horticulture, etc.). During this time, not only do students begin to gain mastery over a subject area; they begin to

learn the value and meaning of expertise that will be essential in later educational and vocational undertakings. While some students may be slower at gaining mastery, and others will later choose to shift their domain of expertise, they all will gain indispensable experience in how to develop a competency area and in how to monitor that process. This approach assumes that learning how to learn, or becoming expert learners, is important for future self-directed learning opportunities. The learning in CLCs is individual-centered, in that methods are tailored to cater to diverse intelligences of the learners. Much of the actual learning, however, occurs in groups of learners.

Practical Apprenticeships

During practical apprenticeships with businesses and public agencies, learners acquire hands-on training towards the eventual goal of flexible specialization (i.e. becoming "expert learners"). In order to become expert learners, students reconvene weekly for one day at the CLC to share on their respective experiences and reflect as a group about the economic, social, and moral significance of what they are undertaking. Professional educators facilitate these sessions with a metacurriculum in mind to ensure that students are acquiring higher-order knowledge and critical thinking skills. Artful and empathetic facilitation will ensure cross-fertilization that will enable students to make connections between different fields and to understand the functioning of complex systems - such as the economy or society. When they eventually take on careers in their fields they will continue to build upon the networks that they have developed throughout this experience at the CLCs. They will also be flexible in their own careers, as they will have had exposure with various fields during their education. What is key is that youth are thinking broadly at this stage and are willing to risk inter-disciplinary thinking. Exploration and maximum exposure to disciplines is essential, but done in such a way that learners are able to draw connections between discipline knowledge and extra-scholastic concerns in their communities.

Technology

Educators use a wide array of media with learners of all levels. Through experiential learning, students also become adept at creating and using media such as photo-novellas, transparencies, slide shows, videos. The computer and internet also play a prominent role in creating and disseminating knowledge. Each CLC has its own web page and intranet service to learners and educators and parents. Each class contributes the findings from its explorations to the intranet and this is circulated among other classes at nearby CLCs. The knowledge generated by each class is saved and handed down to subsequent classes that analyze, critique and add to it. Especially for subjects such as current events, history, and local ecological issues, learners are able to contribute to an evolving corpus of community knowledge.

Learners at the secondary level (ages 15-18) continue their apprenticeships but increasingly learn at the CLC and in the local environment. Reflection on middle CLC experiences occurs at this time. Learners explore general fields of knowledge and learn connective principles that integrate diverse fields. Archaeology, astronomy, the story of the emergence of the human family and intellectual history of humanity are explored in-depth, using pedagogical methods that employ various intelligences. Philosophical and scientific understanding is developed during this time. Environmental sciences are learned by taking on conservation projects in the local environment. In the process,

learners develop a concern for the local environment and also their natural understanding faculties are enhanced. These maturating learners are encouraged to attend the local lyceum to participate in adult discussions of matters of the day. There are also opportunities for learners to present papers at the lyceum for feedback from members.

- Chapter 8 -

Reflections, Recommendations, Significance

1. Reflections on content

Human "Nature"

Throughout the scenarios there are hidden assumptions about *human nature*. I call for a government that regulates the economic and political arena, because I am assume that human societies at the *local* levels are not always capable of self-regulating for *equitable* outcomes. This is necessary for the unit of analysis I am dealing with - namely, bureaucratically organized, post-industrial nation states.

For other scenarios, I could look at "modern", self-sufficient, (perhaps post-bureaucratic) localized economies, or even a hunter-gatherer society. In these cases I would modify my view of human nature. The hidden assumption would then become some brand of ethical anarchism where self-organization for equitable outcomes would prevail (this does seem to be the case with some hunter-gatherer societies). In all cases I refer to human nature with a small "n", meaning the way prevailing norms of *behavior* in societies. This human nature is modifiable and it evolves (sometimes quickly) over time. My assumptions about human "nature" - or the way humans behave - are different for a bureaucratically organized society vs. a hunter-gatherer society.

In the course of writing the scenarios I encountered Elinor Ostrom's polycentric governance systems – where citizens organize multiple governing systems at different levels. Each level has some degree of independence in its own circle of influence. But when it occasionally fails the organization occupying the level (or circle) above it takes over. It is not clear whether Ostrom's polycentric system could apply to pre-bureaucratic societies.[1]

Small is beautiful yet problematic

One of the problems with a localized, self-sufficient political-economy is how to generate economies of sufficient scale so that one can build trains and computer chips, etc. In Collabrolova I emphasized the use of computer technology in education. Since I also wanted a self-sufficient economy, I dreamed up a society where 40% of the population grows a lot of its food and is still capable of producing microelectronics! Some self-reliance in food production is essential, because dependence of industrial food products is central to the alienation of the modern person from the land and from their own culture. I am inspired here by the writings of Schumacher, William Irwin Thompson (*Pacific Shift*), Wendell Berry (*The Unsettling of America*), Bill Mollison (*Permaculture*), Francis Moore Lappe (*Diet for a Small Planet*) and recent post-modern writings such as Esteva

and Prakesh (*Grassroots Postmodernism*). With the exception of Shumacher, none of these writers are economists.

Macro-economists might scoff at the idea that a partially agrarian society (I would call it a horticultural-technological, or *hortitechnical* society) could ever achieve the economies of scale needed to produce modern medicines, high-technology, etc. It does appear impossible given present modes of production. The only way to make an argument would be to claim (as I do) that our current mode of production is *inefficient*. A global capitalist economy driven by large corporate enterprises, characterized by hierarchically organized social relations of production and substantial disparities in the distribution of benefits and power, makes inefficient use of resources. In some respects it does maximize its use of human capital, but invariably at the expense of social capital. In a post-corporate world workers will be *intrinsically* motivated to work and will no longer be alienated from the sources of production. An enormous amount of creative energy would be available to produce and create far more than what currently seems possible. By 'produce' and 'create', I refer to all human endeavor, including arts, leisure and recreation.

It was my explicit aim to avoid the pitfall of creating a local/global dichotomy and entrusting the essentialized local community to provide all the answers. To do this I relied on the concept of "nested economies" as spelled out in David Korten's *When Corporations Rule the World*. Elinor Ostrom's model of polycentric governance system was helpful in visualizing a partly vertically organized society that would benefit from the oversight of a central authority.

Cognitive and practical apprenticeships in a hierarchical economy?

I maintain that cognitive and practical apprenticeships are pedagogically sound. It is a curious notion that this medieval practice somehow serves as a model for modern human learning. The reason that it makes pedagogical sense is that the apprenticeship is a *task-continuous* process. Each level of advancement from apprentice to journeyman to master requires more experience and knowledge and bestows incrementally more responsibility and control over the means of production. Task-continuity ensures a continuous progression of learning and responsibility. One of the hallmarks of the evolution from feudalism to capitalism is that this continuous progression was broken and tasks in the economy became *discontinuous*. In other words workers (apprentices) cold no longer advance to become managers (masters).[2] The question for the scenarios is whether children who learn in apprenticeships could adapt to work in a task-discontinuous economy. Or will the proliferation of apprenticeships as a way of learning need to precipitate a transformation in economic modes of organization?[3]

Value-based or value-neutral education?

Whether and what values to teach - this big question requires more deliberation. Initially I made Collabrolova *value-based* and Pretioska *value-neutral*. I decided to modify this for two reasons. First, Pretioska cannot be value-neutral. It is just as important to teach values in a bad society as a good one. Postman elucidated this point in the *End of Education*, where he claims that American schools reify and worship the

"gods" of technology, consumerism, and materialism. I would posit similar gods for Pretioska. Second, values are both taught explicitly and modeled by educators and by the structure of the educational experience. Teaching explicit and specific values is problematic in a pluralistic society like Collabrolova since agreement on values would be nearly impossible. Structuring the educational experience and modeling ways of relating is a more sensible approach.[4] Certain values that everyone agrees on - like the value of cooperation - could be modeled and practiced in classrooms. Cooperative learning is also pedagogically sound from the perspective of brain-based learning.

The philosophical method of Rawls and Gutmann help to illuminate a path through these political conundrums. Schools and their communities should be able to achieve consensus on political conceptions and ideals, and not confuse them with moral ideals. Any community with even a modicum of diversity will not achieve consensus about moral ideals. For more explanation see chapter 4 part one.

Equity

Some measure of equity is an indispensable feature of a learning society and also the variable that most clearly separates the two scenarios. In my original outline of the scenarios I included a variable I called "political economy". I mentioned in the market-driven scenario that the middle class would be squeezed in a 'winner takes all' capitalist order. In the community-led scenario, I thought of a new "social compact", à la Reich, and suggested the emergence of new forms of wealth generation (influenced by the metaphor of a complex adaptive system). Indeed, I had not considered fundamental *economic restructuring*. My naïve assumption was that social capital formation and new forms of wealth generation would ensure equitable distribution of educational opportunities and equal access to the fruits of labor. Perhaps I allowed myself to be swayed by the highly palatable idea that social capital formation leads to more net wealth (Putnam, 1993; Fukuyama, 1995). Even if this were true, I am not sure why or how a more equitable distribution of wealth would result.

I mentioned that the community-led scenario would be democratic and pluralistic. Here I was referring to democracy in the political arena. In the scenarios I expand this to the economic arena as well. A future learning society will see the rise of worker-owned and controlled capital and a steady reduction in the scope and size of corporate enterprise. In Pretioska, the division of labor is highly hierarchical and completely controlled by the ruling capitalist class. In this case, the structure of schools will mirror this hierarchical organization and teaching will aim at unequalizing outcomes in order to fill jobs in the economic and political hierarchy. In Collabrolova, the underlying social relations of production, which are more egalitarian, require and shape an educational system that equalizes outcomes and inculcates the value of cooperation. Joel Spring's (*The American School*) and Sam Bowles' (*Schooling in Capitalist America*) give insightful historical overviews showing how the economic systems have shaped the educational systems in America. See also MacNeil "Inequality or Cooperation: Multiple Equilibria in Systems of Production and Schooling" (1998) where I develop a model that explains how

inegalitarian schools and hierarchical economic systems co-evolved and how their mutual unraveling may occur.

2. Recommendations on Process

Use the Metaphor as a Heuristic

The exercise was useful since it forced me to confront the complexity of the educational problematic. Judging from peer feedback and from my own assessment of my scenarios as well as other scenarios[5], I conclude that the exercise is more valuable for the scenario builders to build visions and strategize than it is as an heuristic to an outside reader. The most durable message an outside reader takes away is the *metaphor*, rather than the details of how the society works. I feel that the metaphors of the "Land of Collaboration and Love" (Collabrolova) and the "Land where Everything has it Price" (Pretioska) can create vivid and lasting impressions in a similar way that the "new frontier" and "barricade" metaphors (in the Shell corporation's project) register and resonate in the reader.[6] Metaphors can be constructive, such as Orwell's "big brother" which keeps us ever vigilant. The name "Orwell" (i.e. *Orwellian*) has also become a powerful metaphor to describe manipulative totalitarian practices. Metaphors can also lead to destructive ends, such as the "domino effect", which was a veritable rallying slogan for the American military build-up in Vietnam.

Conduct a group exercise for collective action

Conceptual modeling and scenario building could be a powerful tool for a group of academics or a community to develop common visions for collective action. The process is just as crucial as the outcomes. The role of a facilitator would be an important factor determining the usefulness of the exercise. Especially in the case of the community, considerable warm-up would be required. This might consist of a community-based workshop that explored the history of education and current trends in that community, various principles of quality learning, brain-based learning made simple, open dialogue on values and directions, etc. It would be crucial that the community developed and defined the variables that would be used to construct the scenarios and that they could provide rationale for choosing those variables.

Imagine a "Day in the Life" scenario

To make the scenario more readable and perhaps more useful as a heuristic, the scenario could be presented as a "day in the life" of a typical *individual* in a given society. A educational biography of a typical individual would also be powerful (the *Education of Little Tree* genre) but would require a lot more writing. Another approach would be a day in the life, or a profile of, a typical *community* in a society. A comparison of two very different communities located near each other in the same country could be a very powerful heuristic. For example, Takoma Park , MD and Reston, VA, whose citizens are probably similar in ethnic and class terms, but their education and social institutions are quite different (most likely due to special historical circumstances).

Develop a simulation

The scenarios could be used to develop a simulation exercise that could introduce many people, in a short time, to life in a quality learning society. The message of the simulation is powerful when it is distinct, clear and relevant. One potential message, e.g., could be the connection between social relations of production in the economy and social relations and pedagogy in the schools. A group of individuals could simulate a society that was hierarchical or egalitarian in the economy and consequently either competitive or cooperative in the classroom. Many similar simulations could be imagined.

3. Significance

This small thought experiment has made no discernible impact on any world but my own. The most significant outcome is that I am again reminded of my ignorance and also my ability to learn. I gain enhanced empathy for people and professionals who regularly make important decisions based on incomplete information, colored by particular perspectives, emanating from diverse fields of knowledge with which they have only superficial acquaintance.

My scenarios are mere outlines of potential stories that are waiting to be told. Who comes to tell the story in a compelling way – by writing a "day in the life", developing a scenario, or writing a novel - will gain the ears and sway the hearts of thinking people far and wide. The potential impact of a well-written novel is immense. Consider the harmonious social order on the new world imaginary island in the Thomas More's *Utopia*. He conceived this short story in 1516, and his book and the word he coined still form part of our cultural lexicon. The upheavals and nihilism of the 20th century have spawned a generation of dys-utopias. The most famous, Orwell's *1984* and Huxley's *Brave New World*, have literally become household words.

Edward Bellamy's romantic utopian novel, *Looking Backward* (1888), describes Boston in the year 2000 as an harmonious, leisure-filled society free of want. The book, which was written as a period romance, enjoyed instant popularity. Although he never used the word "socialism", his utopia is basically a socialist society. To the degree that a socialist utopia has never occurred (on a large scale) in Boston, one can conclude that Bellamy's book made little impact. On the other hand, Erich Fromm, in his introduction to the 1960 edition, calls it "one of the most remarkable books ever published in America". It inspired 46 other utopian novels that were written between 1888-1900 in the United States and Europe. John Dewey, Charles Beard (the founder of Boy Scouts of America), and Edward Weeks ranked *Looking Backward* the second most influential book, after Marx's *Das Kapital*, written since 1885. In addition to influencing the thought of intellectuals, it inspired mass political movements – 165 "Bellamy clubs" formed between the years 1890-1891. Their goals were to discuss and propagate Bellamy's ideas with the eventual aim of creating the utopia that he envisioned (Erich Fromm, 1960).

To sum, my work has little significance to the world beyond my desk and mind. The *potential* impact of my next novel, on the other hand, is immense.

[1] For an account of the evolution of bureaucratic institutions see Talcott Parsons, "Evolutionary Universals in Society" American Sociology Review 29:3 (June, 1964) reprinted in *Sociological Theory and Modern Society* p. 490-520.

[2] See Mary Jo Hatch "Conflict and Contradiction in Organizations" (1997) for a summary of these concepts. For a more in-depth study see Braverman, Harry. (1974). *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century*. See Bowles, Samuel and Herbert Gintis. (1976). *Schooling in Capitalist America: Educational Reform and the Contradictions of Economic Life.*

[3] This is essentially the theory that I propose in MacNeil, D. James. (1999). "Inequality or Cooperation: Multiple Equilibria in Systems of Production and Schooling". The idea is simply that the characteristics of school structure and educational delivery shape and perpetuate the structure of production and property relations which perpetuates the school structure and so on. When the educational delivery *shifts* towards a new mode of operation (such as widespread use of apprenticeships) the economic modes of production may *flip* into a new mode altogether.

[4] There are doctoral students at Harvard's Divinity School that are using this approach to teach *basic* religious values in public schools in the Boston area. The idea is not to inculcate values from a specific religion, but to structure classroom experiences so that children come to their own common understanding of why groups of people create religions and codes of conduct, etc. In other words, children practice creating their own religions. The "social curriculum" of the Greenfield Center School (see chapter 4 part three) makes similar assumptions and follows a comparable approach.

[5] The "Estonian Educational Scenarios for 2015" in the 21st Century Learning Initiative's *The Journal*, June 1998;

[6] The World Business Council for Sustainable Development *Global Scenarios 2000-2050* by Ged Davis of the Shell Corporation.

- Postscript –
How Do We Get Where?

Our life is an apprenticeship to the truth, that around every circle another can be drawn; that there is no end in nature, but every end is a beginning. Emerson

What fascinates me about this thesis is all that has been omitted and everything that remains to be seen and said. My method has been a semi-structured *eolithic* synthesis that can never be complete.[1] The scenarios are merely outlines for stories that me or preferably someone else may some day construct. The literature reviews are open-ended pastiches that will admit many future contributions. This thesis clears a swath for my ongoing folly.

The following concluding remarks are also merely garnishes on the *hoche pot.*[2] One day they may form the stock of a yet richer stew.

1. The big lacuna – where's the theory of change?

21st Century Learning initiative's 1996 *Synthesis* paper harbors a hope that a "proper appreciation of human learning (i.e. what we now know about learning) will reshape the nature of family life and schools, and will revitalize community (p.4)". This sentiment also appears in the 1998 Policy paper "*The Strategic and Resource Implications of a New Model of Learning*". This well argued and carefully documented policy paper does not naïvely assume that knowledge alone is sufficient to catalyze change. On the other hand, it also does not explicitly state *how* change will occur. The policy paper claims that the evidence of Western education, considered in light of the needs of the "knowledge production" economy of the 21st century, is plainly "upside-down and inside out". How it will flip right-side up remains to be seen. The *Policy Paper* merely points out that "an alternative model is now available to those countries willing to take current findings and open-up space for radical innovation" (21st CLI, p.2). The assumption is that if countries have the *will* to change, then change *can* occur. Indeed, the change will require 'radical innovation'. Hartwell's observation at the end of chapter 2 (p. 3) casts doubt on these assumptions. Despite the mountain of knowledge we have amassed about human learning (much of it in the past decade or two), schools around the world plod along much like they did 50 years ago.

Pointing out the lack of a theory of social change is not a devastating critique of the *Policy Paper*. Neither is the absence of theory a shortcoming of the scenarios. The scenarios describe a *target condition*. They are not required to say how those societies achieved those target conditions. Scenarios build a culture of possibility that generates its own movements. The *Policy Paper* critiques the present conditions and lays out the evidence. It ends with the question: "what are we waiting for?". One answer to this question came out of a group critique of the policy paper in November 1998 at the Center

for International Education. On my colleague Karen Campbell-Nelson's densely edited version of the policy paper I noticed the scribbled words following this question: "A theory of radical economic restructuring".

The current capitalist modes of production and property relations may well be anathema to knowledge building communities. Marxist theory maintains that the transition of feudalism into capitalism brought with it the severing of the continuous progression of *knowledge production* in guilds. Tasks in the economy became discontinuous, and managerial hierarchies were installed. It was no longer possible for apprentices to become journeyman and eventually masters of their trades. Managers could now enter into the workforce at the managerial level, and workers took dead end jobs. To complete this economic transition owners and managers had to take control of the knowledge of production away from the workers.

A true knowledge building society will require, as well as precipitate, new modes of production and property relations. This will occur when a critical mass of dispersed knowledge building activity is sustained for a long enough period to *shift* the dominant modes of capitalist production towards more egalitarian arrangements. This theory is elaborated in my "Inequality or Cooperation: Multiple Equilibria in Systems of Production and Schooling"(see also chapter 8). If any of my kind readers have another proposal please send me a pamphlet.

2. The Postmodern Condition – How we pastiche the road as we walk it.

I am neither qualified nor concerned to present an overview of the family of ideas and phenomena called postmodernism. I would simply like to draw out a few points as they relate to my topic.[3]

Post-modernism is flavored by the cynicism that was bred by the misplaced aggrandizement and mishaps of the Enlightenment project. The result is an enduring skepticism of any truth claims and suspicion of all oligopolies of knowledge production. Postmodernism is the death knell for institutional knowledge. If we are truly entering the era of "knowledge production" – and not merely the era of consolidating control over knowledge – then postmodern knowledge generation will become de-centered and de-institutionalized. The hegemony of specialists will finally bow to the dispersed experiments of experts.

The communities of the future will be knowledge building communities. Knowledge-building communities will not form spontaneously. They require inspiration and careful nurturing. They require leaders and practitioners who have the discipline and resources to sustain a network of enterprises over time. They require legitimation and purpose. Postmodern knowledge generation will be a return to medieval *Bildung*, where the process of knowledge acquisition is necessarily associated with the training of specific individuals and minds. Ironically, the most ominous threat to knowledge building communities is the very thing that is *supposed* to legitimate it - the knowledge production economy itself.

If Lyotard's premonitions are correct, then we are witnessing the exteriorization of knowledge with respect to the knower. The relationship of knowledge to its suppliers and users will increasingly resemble the relationship of a commodity to its producers and consumers (Lyotard, 1984:4). This commodification of knowledge has serious consequences for knowledge building communities, not to mention civilization itself:

> Knowledge in the form of an international commodity indispensable to productive power is already, and will continue to be, a major – perhaps *the* major – stake in worldwide competition for power. It is conceivable that nation-states will one-day fight for control of information, just as they battled in the past for control of access to and exploitation of raw materials and cheap labor (p.5).[4]

This consolidation of power through control over exteriorized knowledge threatens to permanently undermine knowledge building communities as envisioned by Scardamalia and Bereiter and described in my scenarios. On the other hand, *knowledge building communities are a viable antidote to this threat.* This may seem like a vague notion. Where are knowledge building communities situated? Will they be locally specific, virtually networked, or both? At the level of the community I have argued for deformalized learning centers. At the international level, knowledge building communities may form and function in the same way as social movements. The actions of social movements, according to Escobar (1995), provide the possibility of redefining development. Social movements thus provide a way out of the strictures of post enlightenment modernity. Social movements, like knowledge building communities, are "self-producing, self-referential systems, even if their effects disseminate across large areas of economic, social and cultural life (p.226)". Social movements serve as "symbols of resistance to dominant politics of knowledge and organization in the world (p.227)". They carry the kernel of creative resistance against the homogenizing onslaught of the global knowledge production economy.

Re-empowering the local is an essential step towards cultural reclamation and autonomy in knowledge production. It is doubtful, however, that essentializing the local and granting it complete autonomy, will further the cause of reclamation. Many social movements, such as the Zapatistas and the Chipko movement, gain vitality from links to higher levels of political power and knowledge production (Esteva and Pradesh, 1998; Castells, 1997).

Beyond post-modernism – what is to be done?

Assuming that modern problems still require solutions it is time to go beyond dualism. Post modernism was created and eclipsed by Nietzsche. He exposed the floundering program of Western civilization and called for an end to dualism. The once precious essentialized categories of good and evil, truth and falsity, right and wrong have never recovered from Nietzsche's painstaking deconstructions. It has taken the great minds of the West nearly a century to process Nietzsche's challenge.[5] During this time we have seen the rise of structuralism, existentialism, post-structuralism, critical theories, renovated idealisms and positivisms, deconstructions, genealogies, phenomenologies, hermeneutics, postmodernism. We still cannot give up dualism. Western philosophy is

now divided along Continental and Anglo-American lines. The constant intellectual battles and incessant generation of new "isms" testifies to the West's difficulty in thinking through a world where the omnipotent God has been supplanted by a cacophony of competing truth claims and anti-truth crusades. The West has never been able to truly fathom that duality arises from the principle of uniqueness and that mind and matter form a necessary unity.[6]

If the postmodern condition drives home a single point, it is this: human enterprise has blossomed into a well-documented patchwork of unanswerable quandaries and cultural gaming. At the end of the day, we are left to muddle through. Development projects will no longer be development solutions - cookie-cutter, elegant or otherwise. They will be policy (local, national and global) experiments. Curriculum development and school reform will no longer be administered across the board – be it liberal, conservative, content-focused or child-centered. It will be a series of institutional guesses, numerical approximations towards realizing certain values and outcomes. Students will not be tested for static knowledge or their ability to take tests. They will be assessed for their ability to construct and improve knowledge. They will be rewarded for their ability to formulate questions, not answers.

Words no longer own their meanings. Meanings are socially constructed by communities of users through endless language games (Wittgenstein, 1958, Lyotard, 1984, Berger and Luckman, 1966). This essential insight provides the method for the postmodern human reconstruction. It is important to remember, however, that without rules there can be no language games (Wittgenstein, 1958; Lyotard, 1984) and thus no meaning for our cherished symbols. Following the same logical imperative, institutional guesswork for school reform requires the benchmark of outcomes to which it is held accountable (Odden 1998, Fung, 1999). Responsive classrooms require discipline for learning to flourish (Charney, 1992). Democratic society requires some agreed-upon political conceptions for open-ended deliberative process to occur (Rawls, 1971, Gutmann, 1986). The future learning society of the postmodernist will not be a relativistic, value neutral, crazy-quilt of incoherent rages against chaos. It will be a semi-structured and nurtured pastiche of ways of knowing, ways of organizing and ways of being in the world.

3. Saving the Enlightenment. Reclaiming Rationality

Despite the depredations of postmodernism, scientists carry out their positivist programs unhindered. Just as scientists no longer deign to metaphysicians for their guiding principles, they are hardly perturbed by the deliberations of educational theorists and literature professors. Science has much to offer the fields of education, organization, and management. The continuing relevance of scientific findings in everyday life vindicates the rational worldview that many do not yet feel ready to abandon.

Evolutionary psychology

There has been a recent proliferation of popular articles and books that apply the principles of evolutionary psychology to nearly every aspect of human behavior (Mitchell, 1999). They promise to explain human behavior by accounting for their

Darwinian adaptive value. In its crudest forms (Fukuyama, 1998; Nicholson, 1998), it amounts to arguing that what happened in the Pleistocene (when most of our modern faculties developed) is strongly predictive of how we behave now. Sociobiology and evolutionary psychology are rich areas of research and ideas. Many good books present the ideas and argue persuasively in a way that I cannot possibly carry out here.[7]

The ideas I would like to sow at this stage are that Darwinian evolution is not the only type of evolution (even Darwin explicitly conceded this); and Darwinian evolution helps to explain how the mind works, but human behavior is more than a bunch of minds operating *ex situ*. Once we see the human mind as embodied, as it were, in a living human being, the explanatory power of Darwinian mechanisms begins to wane.[8] Cultural behavior is much larger than the behavior of the sum of its minds.[9] Evolution works in myriad ways –Darwinian (random mutations), recombination, symbiogenesis.[10] Some aspects of cultural evolution are also Lamarkian.[11]

For the purpose of visualizing a future human society I prefer the notion of Baldwinian selection as it is outlined in Deacon's *The Symbolic Species* (1997). This idea, advanced by American Psychologist James Baldwin, is complementary to Darwinian theory. Deacon summarizes Baldwin's suggestion as, "learning and behavioral flexibility can play a role in amplifying and biasing natural selection because these abilities enable individuals to *modify the context of natural selection* that affects their future kin"(p.322, my emphasis). Evolving human behaviors actually shape the course of evolution.[12] The development of symbolic language, for example, has affected the evolution of the human brain ever since. Even as I write.

The constantly co-evolving symbolic language/brain complex is generating newer forms of thought and consciousness at a rate faster than a simple Darwinian reading of brain evolution would suggest. The potential danger of misreading evolutionary psychology is precisely this: assuming that our Pleistocene behavior is a strong predictor of contemporary behavior leads us to severely underestimate how rapid and dynamic human evolution can be. Our learning organizations and knowledge building communities should not, then, base themselves on Pleistocene norms, but rather on the expectation of boundless co-evolution. Deacon emphasizes that the key adaptation was human flexibility to learn:

> Of all the forms of adaptation, the flexibility to learn new behavioral responses during one's lifetime can produce the most rapid and radical evolutionary consequences. Indeed, the ability to learn and thus inherit acquired behaviors may be one of the most powerful sources of evolutionary change. It provides an organism with access to a repertoire of potential adaptations, and so amplifies and extends the range of behavioral predispositions that can be sampled by natural selection (p.326).

There is no human nature precisely because nature has nurture. Nurture is also natured. The two form the one. The one gives birth to myriads. As Emerson observed of the human being, "There is no outside, no inclosing wall, no circumference to us".

Autopoiesis and Self-organization

The new sciences of complexity and chaos are having a steady influence on the way we organize and think about organization (Wheately, 1992, 1996; Senge, 1991). These ideas are also seeping into educational discourse and practice (Caine and Caine, 1997; Hartwell, 1998; Abbott, 1999). One of the most powerful notions to emerge is the concept of *self organization* (Capra, 1997),[13] which is expressed in biological terms as *autopoiesis* (Maturana and Varela, 1992). Autopoiesis is a pattern of organization that is common to all living beings. Living beings are self-producing; they are constantly making themselves. The organization that defines this process of self-production is autopoietic organization. This notion has been applied to management (Wheately, 1992), education (Hartwell, 1998) and the anthropology of social movements (Escobar, 1995).[14]

The challenge for future learning organizations, knowledge-building communities and social movements will be to find the balance between actively managing learning and fostering the emergence of new forms of self-organization.

Communicatively achieved understanding

The problem with the human world is the incoherence of individual thought and the resulting distorted and incomplete communication amongst people. In the past half-century (no doubt partly as a reaction to the appalling horrors of the first half) many powerful thinkers have developed various affirmative agendas to improve human thought and communication (Gadamer, 1960, 1997; Rawls, 1971; Habermas, 1984; Buber, 1992; Bohm, 1996). The goal of their programs can be summarized, borrowing Habermas's term, as *communicatively achieved understanding*. Their methods have been various and not unrelated: suspending assumptions in dialogue (Bohm); hermeneutically fusing horizons (Gadamer); undistorting communication in ideal speech situations (Habermas)[15]; achieving overlapping consensus through deliberative process (Rawls). Their goal and their methods are evidence of their faith that reason and empathy will triumph over distortion and elimination. For Habermas, undistorted communication represents the highest form of rationality (Habermas, 1984; Alvesson and Deetz, 1999):

> This concept of communicative rationality carries with it connotations based ultimately on the central experience of the unconstrained, unifying, consensus bringing force of argumentative speech, in which different participants overcome their merely subjective views and, owing to the mutuality of rationally motivated conviction, assure themselves of both the unity of the objective world and the intersubjectivity of their lifeworld (Habermas, 1984: 10).

Critiques abound of Habermas and all of the above, and it is not my duty to summarize them here. Let me simply dangle the question – how can "unconstrained, unifying consensus bringing force" occur in a world of power-laden, ego-driven, interpersonal encounters? Habermas dreams of ideal speech situations where there is a symmetrical distribution of opportunities to choose and apply 'speech acts'. This is only possible when we step aside from the power struggles and ego standoffs and check problematic claims, all the while 'suspending our assumptions' (Bohm's method) about what another person is saying. Can we step aside? Can we ever achieve Bohm's suspension or Rawls'

'reflective equilibrium', where we are consciously aware from which perspective our judgements are derived? Can we will our judgements to coincide with our principles?[16] Is there hope for Aristotle's social animal?

AIC – the search for three part harmony

What is needed is a process of dialogue that builds on the principles of communicative rationality and also attends to power relationships.[17] One promising process on the horizon is the AIC process, which was developed by William Smith of Overseas Development: an International Institute. AIC - or Appreciation, Influence, Control - is a process philosophy whose main concern is how purposeful systems self-organize themselves. The philosophy states that *purpose* - not control, strength or wealth - is the source of power. The dynamic relationship of purpose and power is the central concern of the process. AIC gets its name from what Smith calls the three "fundamental and universal relationships involved in the design of any purposeful system - the relationship to the whole (appreciation), the relationship between the parts of the whole system (influence), and the relationship of the individual parts to themselves (control)" (ODII Website, 1998).

The first step to carrying out AIC as an *organizing* process is to identify the purpose to be served by a particular intervention. The second, and most important step, is to frame the *power field* around this purpose. The power field consists of those participants who have control, influence and appreciation relative to the purpose.[18] The remaining steps resemble a future search conference, although a variety of methods can be used.

Power is made available to the extent that appreciation, influence and control can be aligned. Power resides in expanding the "field of appreciation", not in increasing and sharing control. A field of appreciation results when, for example, the employees of a company appreciate more fully the relationship of themselves to each other *and* to the whole.

In the last section of the last chapter of this thesis it is not my intention to outline the whole of AIC. I would rather focus on two features, that purpose is the source of power and the notion that appreciation, influence, and control are fundamental and universal relationships involved in the design of any purposeful system. These ideas can be applied toward answering some of the most intractable issues surrounding education, many of which I have wrestled with throughout this thesis.

The fundamental relationships of three parts that form the whole has received corroboration from Maturana and Varela's work in biology. Living systems consist of the interactive self-reproducing activities of three levels of matter – the molecular, the unicellular and the metacellular. The molecule relates to itself, to other molecules and to the whole – the alignment of this dynamic interaction gives rise to unicellular creatures, which mirror this process at a higher level to form metacellulars, and so on. What characterizes living things is that they are self-producing, that their cause and effect are inseparable. It is the power that is generated in this *appreciative field*, so to speak, that brings forth life.[19]

More central to our discussion are the three normative theories about human nature that have been formulated to set the parameters of educational authority. These three theories, as articulated by Gutmann (1986), are drawn from interpretations of Plato, Locke and Mill. Gutmann refers to them as the *family state*, the *state of families*, and the *state of individuals* (p.22). Each of these theories delimits the authority for education at a different societal level.

- The *family state* (Plato) holds that state authority over education is needed to establish a harmonious balance between individual virtue and social justice. By means of its enlightened control over education the state regulates the relationship between individual and common good.
- The *state of families* (Locke) places authority over education in the hands of parents. Parents should be permitted to inculcate their children with ways of living that are consistent with familial heritage.
- The *state of individuals* (Mill) claims that states and families should not be able to monopolize education and bias the minds of impressionable children. Children should have freedom to learn and opportunities to choose among different conceptions of the good life.

These competing theories of human nature frame ongoing educational debates. Which of the three theories is most suited for a democracy? According to Gutmann, none of the three standing on its own is adequate. In a democracy, the three parties – the state, the parents, and the children – must share educational authority. This broad distribution of educational authority can only occur when the three parties can find a "more inclusive ground" for deliberation about the purpose and particulars of education. They may continue to disagree about the particulars as long as they share a common political commitment to what Gutmann calls "conscious social reproduction". In other words they may disagree at the outset, but at least they are *committed to agreeing on something.*

Applying AIC, we see that the source of democratic power does not reside in any particular theory or the relative efficacy of any interest group. The source of power is the *inclusive ground* (the appreciative field), in this case, the commitment to conscious social reproduction. The more inclusive this commitment the more powerful the polity. What is good for children in this democracy, then, is "not just freedom of choice, but also *identification* with and *participation* in the good of their family and the politics of their society (p.42, my emphasis)". Children relate to themselves (freedom of choice), to others (family member, fellow citizens), and to the whole (commitment to conscious social reproduction) which they gradually come to appreciate more fully as they mature.

Ruth Sidney Charney (1992) of the Greenfield Center School, summed it up most eloquently:

> The aim of every [classroom management] technique is the creation of self-controls and community, which I define as the capacity to care about *oneself, others* and the *world.* A single, basic goal is to teach children in such a way that they gain affection for ethical behavior (p.8 my emphasis).

What distinguishes Charney's approach from conventional practices is a single word, "the world". The world becomes her students' appreciative field. Therein lies the power.

Is education over?

In this hodgepodged exploration of learning we have traversed provocative recent literature from several domains of life sciences. We have pursued promising directions from philosophy, political science, and sociology. We have considered the instructive experiences of teachers, administrators, politicians and miracle workers in the United States and abroad. We have seen the best of what the inheritors of the Enlightenment can conjure. We have confronted Nietzsche's challenge of building a world bereft of its familiar foundations. With our concluding examination of a process philosophy called AIC, we have come full circle to our original question, *Why learn*? When all the particulars of research are defended and all the budget negotiations are said and done, the only thing that will save education is a *narrative*, a new appreciative field, a more inclusive ground of being- together-in-the-world.

> The question is, What kind of public does [schooling] create? A conglomerate of self-indulgent consumers? Angry, soulless, directionless masses? Indifferent, confused citizens? Or a public imbued with confidence, a sense of purpose, a respect for learning, and tolerance? The answer to this question has nothing whatever to do with computers, with testing, with teacher accountability, with class size, and with the other details of managing schools. The right answer depends on two things, and two things alone: the existence of a shared narrative and the capacity of such narratives to provide an inspired reason for schooling (Postman, 1995:18).

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[1] For an explanation of *eolithics* see MacNeil, D. James (1997) ""Empathy and Action: An Eolithic Meta-Inquiry into Deep Investigation". Patton, Michael. (1982). *Practical Evaluation* (p. 112-117). See chapter three part one.

[2] *Hoche pot* is the French stew from which we get the word "hodgepodge". The dictionary definition of pastiche includes "hodgepodge", which is a "jumbled mixture". While the contents of *Hoche pot* may be jumbled and disorderly, their outcome, a well-blended stew, is purposeful. I have to thank Paul Rabinow for pointing out the origin of "hodgepodge" ("Representations are Social Facts: Modernity and Post-Modernity in Anthropology" in *Writing Culture: The Poetics and Politics of Ethnography* (1986) edited by James Clifford and George Marcus.

[3] "Simplifying to the extreme", Lyotard (1984) defines postmodern as, "...incredulity toward metanarratives (p. xxiv)." It is a curious point that despite, or due to, this seeming incredulity towards metanarratives, innumerable scholars have written metasyntheses in the past decade. See footnote no. 5 in chapter 1 for a list of metasyntheses.

[4] I cannot recall the sources, but I have read in several places, that Biotechnology (including genetic engineering) – the consummate knowledge commodity – is the fastest growing industry in recorded history. The drive to control this technology and govern its markets is led by corporations from Japan, Germany, and the United States.

[5] Foucault conceded that his mission was to fulfill a "Nietzschean quest".

[6] See Bateson's *Mind and Nature: A Necessary Unity*. The "Principle of Uniqueness" is articulated in the Tao Te Ching.

[7] See Henry Plotkin's (1998) *Evolution in Mind* for the finest overview of evolutionary psychology. Also see Melanie Mitchell's (1999) article in *Complexity* "Can Evolution Explain how the Mind Works? A Review of the Evolutionary Psychology Debates?". Also Steven Mithen's (1996) *The Prehistory of the Mind: The Cognitive Origins of Art, Religion and Science.*

[8] Another must read is Varela et al. *The Embodied Mind* where they develop this idea in considerable, pleasurable to read, detail.

[9] Compare the claim of the 21st CLI's *Policy Paper* (1998), "The human brain is the most complex organism in the known universe (p.3)" with Poltkin's *Evolution in Mind* (1997) that suggests, "It is often said that the human brain is the most complicated thing in the universe. Not so, say I. The most complicated thing in the universe is the collective of human brains and their psychological processes that make up human culture, which is defined here as shared knowledge and beliefs (p.222)". The difference is more than rhetorical. It reflects an assumption about the proper vehicle of human development and evolution.

[10] For a concise overview of evolutionary models, including a description of symbiogensis, see Capra's *Web of Life* p. 222-263. If you crave original sources, see Lynn Margulis and Dorion Sagan (1986) *Microcosmos: Four Billion Years of Microbial Evolution.*

[11] See Boyd, Robert and Peter J. Richerson. (1994). "The Evolution of Norms: An Anthropological View". *Journal of Institutional and Theoretical Economics*. Vol. 150, No. 1.

[12] This resonates with Maturana and Varela's concept of *structural coupling*. They suggest in *The Tree of Knowledge* (1992) that we need to free ourselves of the popular view of "evolution as a process in which there is an environmental world to which livings beings adapt progressively, optimizing their use of it. What we propose here is that evolution occurs as a phenomenon of structural drift under ongoing phylogenic selection. In that phenomenon there is no progress or optimization of the use of the environment, but only conservation of adaptation and autopoiesis. It is a process of in which organism and environment remain in a continuous structural coupling (p. 115)".

[13] Capra (1996) gives a concise definition, "Self-organization is the spontaneous emergence of new structures and new forms of behavior in open systems far from equilibrium, characterized by internal feedback loops and described mathematically by non-linear equations (p.85) " If you find that definition sufficiently baffling and beckoning, read the *Web of Life*.

[14] I must give due homage to the great Kant (as did Capra). The modern idea of self-organization was presaged in the *Critique of Practical Reason* (p.252-253), "nature organizes itself, and it does so within each species of its organized products...organization of nature has nothing analogous to any causality known to us...a thing exists as a natural purpose if it is both cause and effect of itself."

[15] For a coherent account of the main ideas of Gadamer and Habermas, and a novel fusion of the two see Edward Graybill's (1995) *Change and Continuity in Cambodia: Contours of a Critical Hermeneutic Discourse for Third World Development* (an unpublished dissertation of the Center for International Education).

[16] According to Rawls (1971), "The best account of a person's sense of justice is the one which matches his judgements in reflective equilibrium." Reflective equilibrium is reached "after an individual has weighed various proposed conceptions and he has either revised his judgements to accord with one of them or held fast to his initial convictions (p.48)".

[17] Edward Graybill's dissertation (1995, unpublished) *Change and Continuity in Cambodia: Contours of a Critical Hermeneutic Discourse for Third World Development* outlines a synthesis of Gadamer's Hermeneutics and Habermas' communicatively achieved understanding. It could be that Graybill's synthesis, or perhaps even Habermas himself, proposes a program that is designed to achieve the same ends as my current proposal.

[18] The AIC history and methodology are outlined in Appendix 2. See also the appendix to *The Worldbank Participation Sourcebook* (1997), or visit www.odii.com

[19] "The ontogeny of a metacellular system is determined by the domain of interactions that it specifies as a total unity, and not by the individual interactions of component cells (p.80)" Maturana and Varela *The Tree of Knowledge*.

- Appendix One -

How Cognitive Tools Shape Our Understanding

Kieran Egan's recent book, *The Educated Mind: How Cognitive Tools Shape Our Understanding*, reframes the debates concerning the problems of education and proposes a provocative antidote: increase our understanding of understanding.

Egan's point of departure is that, "The problem is not so much with the school, but with the way we conceive what the school is supposed to do". Schools in the West currently operate under the strain of three incompatible ideas. Egan describes these ideas as 1/Rousseau's emphasis on individual human development, 2/ Plato's idea that reason and knowledge can provide a privileged access to the world, and 3/ the idea of socialization of children into their societies' and nations' values and beliefs. Rousseau maintains that the internal processes of a child and the environment drive human development. Plato maintains that knowledge drives human development. The aim of socialization is not with development at all, but rather with homogenizing children and preparing them for responsible membership in society. Due to historical circumstances and ideological pressures, the present educational program in much of the West attempts to integrate all three of these incompatible ideas. In the process, it has failed to effectively achieve any one of the three.

As a first step to unpack this confusion, Egan suggests that we reframe the debate. Rather than debating back and forth between the Platonic program (the "great books", e.g.) and the "intertwined means and ends" approach of the child-centered, experiential program (a la Rousseau and Dewey), Egan offers a way out - a revamped theory of recapitulation blended with insights of the Russian psychologist Lev Vygotsky. In this way, as we shall see below, recapitulation provides a useful framework for rethinking the goals and methods of education and human development. "Education", proposes Egan, "...can best be understood as a process in which the individual recapitulates the kinds of understanding developed in the culture's history (p.73)."

In the wake of Darwin's Theory of Evolution through Natural Selection in the 19th century, "Recapitulation" became an explanatory framework for all kinds of social and natural phenomena. Its application to education was articulated by the 19th century philosopher Herbert Spencer, "If there be an order in which the human race has mastered its various kinds of knowledge, there will arise in every child an aptitude to acquire these kinds of knowledge in the same order.... Education is a repetition of civilization in little" (quoted in Egan p.27).

The simple idea of recapitulation is that the development of an *individual* human being proceeds through stages that roughly follow, or recapitulate, the gradual trajectory of

evolution of the human *species*. To identify what exactly is recapitulated in the developing individual, Egan turns to Vygotsky. Vygotsky's notion is that human beings make sense of the world by using "mediating intellectual tools" (such as symbolic language) that in turn affect the kind of sense we make of the world. The units that get recapitulated, according to Egan, are the *types of understanding* that are generated by different "mediating intellectual tools". We can identify what is recapitulated in the development of an individual, then, *not* in terms of knowledge or psychological processes but in terms of mediating intellectual tools and the types of understanding they generate.

The types of understanding are called Somatic understanding, Mythic understanding, Romantic understanding, Philosophic understanding and Ironic understanding. Every child is born with some Somatic understanding, that is, a pre-linguistic, physical-based sensibility that grasps the concrete world. Somatic understanding results from an "infant's mind discovering its body" (p.242). Somatic understanding recapitulates the adaptive evolution of the early hominids.

Mythic understanding comes with the acquisition of language. Mythic understanding is a pre-literate understanding that uses the power of language to make sense of the human universe. It is readily observable in the spontaneous discourse of children who are gaining command over a spoken language. The primary 'tool of sense-making' at this stage is the forming of "binary oppositions" (p.37), which all children seem adept at executing. Egan observes that such binary structuring - the forming of dualistic characterizations - is one of the earliest cognitive developments in children, and for good reason. "Organizing one's conceptual grasp on the physical world by initially forming binary structures - hot/cold, big/little, soft/hard, crooked/straight, sweet/sour - allows an initial orientation over a range of otherwise bewildering phenomena (p.40)". Children also make sense of the complex world of human emotions and values by dividing phenomena into opposites, such as good/bad, happy/sad, love/hate. Many popular fairy tales are laid out along a binary structure, such as *Hansel and Gretel*, which uses a well-known security/fear structure (p.40).

The Mythic of understanding of young children enables them to dwell comfortably in a land of myth and fantasy, and their orally-based 'mediating tools' allow them access to a community of magical beings, including ghosts and goblins, tooth fairies, the Easter bunny and Santa Claus and so on. During this stage children make sense of the world by dividing it into black and white. As they develop through subsequent stages they will fill the gray areas in between and round out their comprehension of a complex world. Mythic understanding is prevalent from the time grammatical language is formed until the ages of 6-8. This understanding recapitulates the historical development of oral societies and traditions.

Romantic understanding comes with literacy (including numeracy) and rational thinking - recapitulating the evolution of written language systems. As children enter the early Romantic understanding stage, around ages 6-8, they begin to learn 'abstract systems of reference' (such as the degrees on a thermometer) and thus supplement their perception-

based knowledge of the world (such as "hot" or "cold"). Children thus begin to learn the use of abstract, symbolic language, which human societies have codified in writing systems. The young learner moves from Mythic understanding, which uses the symbol system of oral language, to the Romantic understanding, which uses the symbol system of written language (numbers and letters). In doing this they gain the ability to think abstractly and use decontextualized language. It is during this stage that the child develops a sense of and autonomous self and of an autonomous real world.

During the stage of Romantic understanding, children are commonly obsessed with the extremes of human achievement and qualities, such as the largest, tallest and oldest human being, e.g. - the kind of facts that have been popularized in *Guinness Books of World Records* as well as other books of lists (p.85). While children are trying to master notational systems of alphabets and numbers, they are also becoming avid collectors, sorters, and rankers of things. According to Egan they are trying to gain a grasp on the limits of various systems in order to assure themselves that the world is 'knowable' (p.87). They are also preoccupied with heroes and heroic achievements. Egan refers to these objects of obsession as "human qualities of transcendent degree" (p.90). These are the stuff of a Romantic understanding of the world. The Romantic understanding might be called the 'initial wonder' of a romantic rational inquiry (such as Darwin's amazement of the diversity of finches in the Galapagos) that leads to systematic and theoretical inquiry (such as Darwin's developing the theory of evolution based on natural selection). Egan suggests that the failure to recognize Romantic understanding as a prerequisite to theoretic thinking may be part of the explanation for widespread failure of math and science instruction (p.97).

Mythic understanding and romantic understanding require oral language and written language respectively. The next type of understanding, Philosophic understanding, also requires the development of a certain set of communication tools. The tool of Philosophic understanding is 'systematic theoretical thinking'. Scientific thinking, for example, is included under the heading of Philosophic understanding. The full development of Philosophic understanding also requires a belief that truth can be uncovered and expressed in the language of reason and logic. Furthermore, according to Egan, Philosophic understanding requires the support of certain communities or institutions, such as those that existed in Greece at the time of Plato and Aristotle (p.104). The development of Philosophic understanding occurs from about the age of 15 onwards. The participation of the learner in supportive institutions, such as colleges and universities, increases the chances that Philosophic understanding in the individual will bear fruits and lead to the next type of understanding, namely Ironic understanding.

When Socrates declared "All that I know is that I know nothing", he was displaying an advanced degree of Philosophic understanding that recognizes the inadequacy of our conceptual schemes and our lack of mental flexibility in trying to make sense of the world. Ironic understanding is not more than the pervasive irony of the post-modern theorist. It is a "more inclusive ironic understanding" that "gains the theoretic generalizing capacity of Philosophic understanding while keeping ironically in check the

easy belief that truth resides in general schemes (p.157)." In other words, in Ironic understanding, learners use philosophic tools and capacities with greater flexibility and to better effect. They are able to progress intellectually by comparing, contrasting and combining competing truth claims and systems.

Some criticisms of the Theory

Egan clearly and entertainingly describes each of the types of understanding in great detail in his book. He also points out how the different stages interrelate, and he foresees several potential criticisms. First of all, although the stages are described as somewhat *distinct*, they are not *discrete* stages a' la Piaget. Each stage incorporates and builds on the previous stage. Once we have acquired a type of understanding, we continue to use it and hone it throughout our lives. The Romantic understanding, for example, deals with reality in a newly developed rational manner, but according to Egan, "it does so with persistent mythic interests." (p.86) Just like the cultural and psychological evolution of the human species, the individual must gradually and deliberately progress and add each type of understanding to their toolkit. By the same token these supplementary and over-lapping types of understanding can undermine each other if teaching and learning are not mindful of the types of understanding. If literacy, numeracy and rationality (Romantic understanding) are imparted to children to early or in an overly 'decontextualized' way that does not accommodate their ever-evolving intellectual dispositions, then there is a danger of undermining Mythic understanding. This would be akin to a pre-literate society irretrievably abandoning their oral tradition with the introduction of literacy and book learning. There is another potentially more damaging scenario, observed by Egan, where Mythic understanding can be lost, only to be replaced by a poorly introduced and inadequately grasped Romantic understanding. In this case the learner languishes with a debilitated imagination and impoverished writing and thinking skills. "Herein lies the roots of alienation"(p.102). An analogous predicament with a preliterate society in transition is easy to imagine.

Despite its attractive simplicity, the original 19th century recapitulation theories were discredited because the theories could not demonstrate why and how children should in fact acquire knowledge and skills in the sequence that the species developed. Stephen Jay Gould also warned in his *The Mismeasure of Man* that recapitulation provided a convenient criterion for ranking human beings into lower and higher groups. Egan uses the theory carefully and explicitly addresses questions regarding the dangers of ranking. By invoking Vygotsky Egan he appears to circumvent many of the criticisms of recapitulation. Egan's scheme is not as susceptible to the abuses that Gould warned about. The rankers of human beings were assessing human intelligence based on knowledge, psychological processes, hard-wired functions of the brain, and even brain capacity (during the heyday of phrenology). Egan is suggesting a recapitulation of types of understanding. The development of the types of understanding do pass through several *somewhat distinct* stages. However, it is inaccurate to consider different stages as more primitive or more advanced. Indeed, the five types of understanding, as we shall see below, can be acquired by all human beings under the right conditions. Egan claims that

"all types of understanding are embryonic in all minds because of the presence of symbolic language".

The criticisms of recapitulation could equally apply to any theory (including those of Piaget, Vygotsky or even Gould) which is applied dogmatically. At any rate, in the words of Steven Mithen, "it would seem a missed opportunity bordering on academic negligence if [one] were to ignore the idea of recapitulation" (p.63 The Prehistory of the Mind: The Cognitive Origins of Art, Religion and Science). Egan recognizes that his framework is a work in progress. He explicitly encourages feedback about his thesis. He even includes his website address and email address in the book (p. 173).

Implications for teaching and curriculum

Egan's theory of the types of understanding suggest that curricula and pedagogy should form to fit the type of understanding that learners' minds are engaged in, and not vice versa. A particular pedagogical approach or content matter is not prescribed. Specific course content and pedagogy will be determined according to local and historical conditions. What matters is that the teaching and learning reflect careful consideration and understanding of the types of intellectual tools that learners are deploying at different stages of their development.

For example, when the student is in the stage of Romantic understanding, all topic matter can be taught in an engaging and comprehensible way if the teacher is able to invoke some human qualities of transcendent degree to which students will be able to associate (p.91). This is reminiscent of William James' exhortation to teachers to teach everything as a humanity, including math and science. For example, when teaching geometry talk about the Greek philosophers who shaped it, their struggles, successes, fears, etc., and how geometry assumed for them a quasi-spiritual significance. Another familiar example would be teaching about the discovery of electricity by relating the personal stories and struggles of Benjamin Franklin, Thomas Edison, and others.

One of the many provocative examples Egan presents is a criticism of the experience-based method of teaching that starts with what is familiar to the learner and gradually expands to broaden understanding. Egan claims that this method may be inappropriate when applied to learners who are entering the Romantic understanding stage. Learners at this stage are actually very little concerned with what is most near to them. Indeed, they are preoccupied with the *extremes* of human experience, such as the Great Wall and the Pyramids, the tallest man or the longest fingernails in the world, etc. (p.85) Teachers should, in a sense, start with what is far from the child learner and work back to what is familiar!

Egan spends two chapters of his book discussing the practical implications for teaching and curriculum. His sensitivity to the complexities of teaching and the challenges facing teachers bespeak extensive experience as an instructor. He offers assurance that a teacher need not be 'superhuman' to navigate through all these types of understanding, knowing when and where to move on to the next stage, and so on. Indeed, what is required above

all else is an appreciation of the different types of understanding and sensitivity to where the learners are situated intellectually. Teachers can actually draw on one or more types of understanding at a time, for learners are commonly employing more than one type at a time. Teachers themselves also use several types of understandings. Once acquired, the types of understanding provide a set of tools that can be utilized, often complementarily, throughout our lives.

Egan is calling for an academically rigorous program that has a "clearer task of stimulating and developing the different kinds of understanding". Socialization, Plato's privileged knowledge and Rousseau's developmentalism are no longer part of the program (p187). While Egan does remove Plato's ideals from the program, he does recognize that much particular knowledge is indeed required to develop each type of understanding. In keeping with his overall aim, he recommends that such knowledge be "knowledge about the world that stimulates, bit by bit, wonder and awe at being alive in this world at this time" (p219).

Relevance to the work of the 21st Century Learning Initiative

In his book, Kieran Egan provides insights into the nature of learning and understanding that can inform the 21st Century Learning Initiative's efforts at encouraging new approaches to learning.

Without mentioning biology explicitly, Egan recognizes that learning to some extent is a brain-based activity and thus is in accord with many of the research that the Initiative has synthesized to date. To Egan all knowledge is *living in human minds*. Knowledge is not the inert information that lines the pages of encyclopaedias. Teaching is a process of bringing knowledge to life in the minds of learners. In teaching history, for example, teachers should look for dramatic narratives that engage the emotions of the learners. An engaged and happy brain learns better.

Egan makes recommendations for curriculum that intimate a restructuring of school learning. For example, knowledge of all disciplines can be "humanized knowledge", that is, taught as a humanity. To accomplish this students may need to conduct "in-depth projects" on diverse natural or social topics or particular human biographies that would last several years – projects that they would grow into as they progressed through the stages of the types of understanding. These types of activities, and the emphasis on enhancing the types of understanding, suggest that Egan shares John Abbott's interest in supporting the development of "transferable skills". "Transferable skills" are those skills that can be transferred across new domains of knowledge and disciplines. To Abbott, these types of skills will be essential for an educated population entering the next century (Abbott, 1999).

Like the Initiative Egan holds that our current educational programs are often unable to fully bring out our human potential. Egan's book is a theoretical and practical guidebook to helping teachers and learners to "subvert the natural constraints on our intellectual flexibility." With a grasp and command on our types of understandings and the ability to

apply suitable learning experiences to fully develop each types of understanding, teachers and students will be able to more fully realize human potential. An educational program that understood Egan's types of understanding and emphasized transferable skills could 'evolve' a society where we would be poised to "surpass ourselves", borrowing the phrase of Bereiter and Scardamalia (whose work has been influential in the Initiative). A well-rounded, life-long learner who can deploy all five types of understanding and transfer their skills across domains could be the "polymath" that John Abbott refers to (Pers. Comm.).

In the end, Egan calls for an approach to learning that will develop a new type of person who will be equipped to thrive in a complex and uncertain world of the 21st century. In his words, "We have to adapt our undifferentiated learning capacity to deal with much more complex and flexible learning than it has been evolutionarily shaped to handle" (p. 278).

- Appendix Two -

Participation and the AIC Process: a Brief Overview

Participatory Development

"Participation" is arguably the most commonly mentioned term in the field of international development today. It has become a concept, a mode of operation, an objective, an output of projects, and even an ideology with its own orthodox principles and groups of adherents worldwide. The concept was first defined in United Nations resolutions in the early 1970's, which suggests that its antecedents arose many years earlier. Progressive British colonial administrators were advocating participatory techniques in the 1920's and 30's to tackle widespread health problems in India. After the revolution in 1949, the Chinese government launched a nationwide campaign calling for popular participation to eradicate schistosomiasis and other diseases (Midgley, 1986).

In the field of business management, "participative management" arose out of the work of Kurt Lewin and his colleagues in the 1940's. One of Lewin's seminal principles from this period rings true in current community development programming throughout the world, namely that people are likely to modify their own behavior when they *participate* in problem analysis and working out solutions. Furthermore, people are likely to carry out decisions that they themselves have made (Weisbord, 1987, Johnson and Johnson, 1982).

By the early 1980's participation was already recognized as the issue most written about in the field of rural development (Chaufan in Dudley, 1983). In 1981, a group of experts appointed by the UN to discuss community level action in popular participation defined it as:

> The creation of opportunities to enable all members of a community and the larger society to actively contribute to and influence the development process and to share equitably in the fruits of development (UN, 1981. P. 5).

A recent formulation in the World Bank Participation Sourcebook states that "Participation is a process through which stakeholders influence and share control over development initiatives and the decisions and resources which affect them." According to the sourcebook,

> The key characteristic of a participatory approach is the collaborative stance that project sponsors and designers (mostly governments in the Bank's case) take in carrying out these steps so that the stakeholders influence and share control over the decisions that are made (World Bank, 1997).

The Sourcebook emphasizes the contrast between *popular* participation and *stakeholder* participation. Earlier formulations of the participation concept tended to call for popular or 'broad-based' community participation – i.e. participation of all members of a given

community, with special provisions for disadvantaged and voiceless members such as the poor or women. Many of these formulations failed to recognize the complexity of communities, with their internal webs of power relationships, and their connections with external institutions, such as the state and private sector services. When the participation concept was applied in projects, development practitioners soon discovered that this formulation was inadequate to address the complexities of real communities with their complicated composition and situatedness in a greater context. Indeed, popular participation turned out to be an ideal, with some pronouncements concerning participation conveying a Utopian message. An unfortunate consequence of the attempt to apply this ideal of popular participation is that the detractors have been able to gain credibility in their dismissals of participatory approaches.

The shift in thinking to stakeholder participation began with the recognition that the participation of all groups, or representatives of these groups, from inside *and* outside the community, is of equal importance as each individual member of a community. Since stakeholders are those individuals or groups that are actually or potentially involved in or concerned with the outcome of a particular initiative, their participation is project design and implementation have become an essential feature of development projects.

Recognizing the complexity of communities and the role of various stakeholders inside and outside the community, the concept and practice of stakeholder participation has gradually replaced popular participation. The antecedents of the stakeholder approach can be also seen in early community development theory. Ross (1955), for example, did not use the term 'stakeholder' or 'participation', but he did call for the "*involvement* of the *major subgroups* of the community through the accepted leaders of these groups"(pg.22, my italics). He also emphasized "process objectives" in addition to mere focus on "content". To meet process objectives, the focus was not on content but on the

> initiation and nourishment of a process in which all people of a community are involved, through their representatives, in identifying and taking action in respect to their own problems. The emphasis is on cooperative and collaborative work among the various groups in the community (be it functional or geographic) to the end that they may develop capacity to work together in dealing with problems which arise in their community (Ross, 1955, pg. 22).

Despite the shift to stakeholder participation, problems with participatory approaches may still arise when project holders and stakeholders are not in agreement as to whether participation is a *means* or an *end.* There is potential for one project partner to understand people's participation as a cost-effective and equitable means to meet project goals, while the donor agency might have as another agenda the promotion of participation, on principle, as an empowering end in itself. Some have argued that participation can function neither solely as a means or an end (Dudley, 1993). A more constructive approach would be to get beyond participation as a *principle* and look at the *practicalities* of how participation fits into overall development programming. The concept of "participation" is also beset with controversy that could be avoided if other terms had been used instead. What was once called "collaborative management" or the "villagers' contribution" is construed by some critics as an abuse of the principles of participation by

the state, or a "manipulative" mode of participation (Midgley, 1986; Dudley, 1993). In his assessment of applications of Participatory Rural Appraisal (PRA) in Vietnam, Theis (1994) suggests that it may be more instructive and productive to avoid the term "participation" altogether and to look at PRA as a process of *negotiation* between stakeholders.

Misunderstandings of community participation can also stem from misconceptions or unchecked assumptions concerning the agent or unit of participation - the individual, the people or the community. In the literature, development proposals as well as policy statements 'communities' are typically presented as self-contained wholes, or virtually closed systems. Mentions of community participation usually refer to the "the lowest level of aggregation", or a rural village, as the unit of participation. For many international development agencies this rural, archetypal village looks like the traditional African village, the semi-feudal Asian village or the Latin American peasant settlement (Midgley, 1986, pers.comm.). In emphasizing communities' independent, self-contained aspects, development theorists and planners have overlooked an essential feature of communities - that they are *open* systems. While communities appear to maintain their stability through internal structuring, they are also embedded in a greater context, of which they comprise a part and upon which they depend.

The widespread conception of communities as closed systems reflects the Newtonian worldview that posits fundamental laws of material reality and a universe of isolated, interchangeable parts. Although the Newtonian worldview was originally articulated in the field of physics and formalized in mathematics, its mechanistic metaphor has shaped thought and practice in community development, as well as education and the social sciences in general. Despite serious challenges to Newtonian physics in the 20th century by Quantum Theory and the Theory of Relativity, the Newtonian metaphor continues to dominate in these other fields. In the area of education, Hartwell (1997) has suggested that it takes about 100 years for scientific theories and ideas to affect the content, processes and structure of schooling. The structure and content area of community development similarly appears to lag behind the emergence of new scientific paradigms.

Systems Thinking

Systems thinking offers a new metaphor and a new way of thinking for community development planners. Systems theory, as developed by Ludwig von Bertalanffy and other biologists in the middle of this century, is a theory of wholeness that sees living systems as integrated wholes whose properties cannot be reduced to those of the smaller parts (Capra, 1996). Systems thinking is a conceptual framework for seeing the patterns that inhere and the structures that emerge in the natural operation of living organisms and organizations.

According to Bertalanffy, a living organism is an open system because it needs to feed on the influx of matter and energy from outside itself to survive. "The organism is not a static system closed to the outside and always containing the identical components; it is an open system in a quasi-steady state...in which material continually enters from and

leaves into, the outside environment" (Bertalanffy in Capra, 1996, pg. 48). This steady state is characterized by continuous flow and change and has an innate capacity to self-regulate, or self-organize. Later, scientists in several fields would elaborate on models of "self-organization". Self-organization is the process through which a living system, such as a community, organizes and regulates itself through networking and feedback (Capra, 1996). What is relevant to community development is that these theories claimed that self-organization requires a content flow of energy and matter through the system. By analogy a community can effectively self-organize when it is an open system, i.e. it is able to take in information and resources from the outside and integrate them into its own structure. Another key feature of self-organizing systems is that new structures emerge and new behaviors form when the system is far from equilibrium (Capra, 1996). The analog for community organizing and education to this state of disequilibrium might be called "creative tension".

In his enormously popular exposition of systems thinking, *The Fifth Discipline*, Senge (1991) refers to the 'creative tension' that emerges within a community when members try to manage the gap between their present realities and their shared visions (Senge, 1991, pg. 150). *AIC* - Appreciation, Influence, Control - is one model of self-organization that looks at communities as open systems and also seeks to optimize this creative tension. As will be seen in the cases below, if this creative tension is brought out and maintained in a constructive manner, then new capacities for action will form.

AIC history and philosophy

AIC - Appreciation, Influence and Control - is a *self-organizing process* and an approach to collective planning and action that recognizes the complexity of communities and importance of power relationships. AIC is a philosophy and a process that was translated into a model for organizing development work in the late 1970's and early 1980's by Dr. William Smith, who currently directs the Overseas Development: an International Institute (ODII).

The main concern of AIC is the process of how "purposeful systems" (i.e. groups, villages, teams, communities, nations) self - organize themselves. The AIC philosophy maintains that power relationships are central to this process of self-organization. The philosophy states that *purpose*, rather than other common indicators such as wealth, prestige, knowledge, is the source of power. What concerns AIC, then, is the *relationship between purpose and power*. (Smith, website) AIC gets its name from what Smith (1998) calls the three "fundamental and universal relationships involved in the design of any purposeful system - the relationship to the whole (appreciation), the relationship between the parts of the whole system (influence), and the relationship of the individual parts to themselves (control)."

As an organizing process, AIC consists of:

A. Identifying the purpose to be served;
B. Framing the power field around that purpose - those who have control, influence and appreciation relative to that purpose;

C. Selecting those with the most influence relative to the purpose (stakeholders) from the three framed groups and designing a process of interaction between them; and
D. Facilitating a *self-organizing* process which ensures that the stakeholders:

    1. Step back from the current problems to fully appreciate the realities and possibilities inherent in the *whole system*;
    2. Examine the logical and strategic options as well as the subjective feelings and values involved in selecting strategies; and
    3. Allow for free and informed choice of action by those responsible for implementing decisions (AIC Natural Systems Website, pg. 2, my italics).

In Appendix I of the World Bank's *Participation Sourcebook* , AIC is described simply as a workshop-based process where diverse stakeholders are enabled to appreciate (A) each others' views by *listening*, influence (I) feelings, values and ideas through *dialogue*, and control (C) taking responsibility for and committing to action (World Bank, 1997).

AIC is not a specific tool, nor is it attached to a particular methodology. It is a framework that guides the efforts of organizers and planners to design methodologies and tools that are specific and appropriate to local conditions and each phase of a planning or organizing cycle of a particular program. (AIC Natural Systems, website).

The philosophical roots of the AIC approach are in the work of such pioneers as Kurt Lewin in the social sciences and Fred Emery and Eric Trist in the field of management. Lewin's vast and lasting contributions to social science, management and education, include the idea that groups are more productive than individuals, and that learning is most productive when it is done in groups whose members can interact and then reflect on their mutual experiences (Johnson and Johnson, 1991). He was also one of the early proponents of 'participative management', which recognized that people are more likely to act on decisions that they themselves take part in making.

Following Lewin's intellectual inroads, Trist, Emery and others, redefined the workplace by applying systems thinking to the field of management. These thinkers ushered in a new management paradigm that replaced scientific management (where people were considered as extensions of machines and technical systems were of primary importance) with an approach that aimed to optimize a blend of technical *and* social systems. The new management paradigm called for a participatory approach that was cooperative rather than competitive. While the scientific management paradigm emphasized the organization's or company's purposes only, the new paradigm included individual and social purposes, as well (Weisbord, 1987).

The working philosophy of AIC was discovered by a student of Trist's, William Smith, while he was working as a consultant for the British Overseas Airways Corporation's Italian branch. Smith was enlisted by BOAC to determine the source of poor performance of this branch, and then to design and carry out measures to improve operations. Smith had little managerial control and was thus unable to use incentives to reward or disincentives to punish. But with a minimal intervention he was able to transform this branch of BOAC into the top-performing airport of the network (Smith, 1998). Smith

initially applied industrial engineering concepts but could find no particular weak points in the system. All departments and employees had the capacity to run an efficient operation. Interpersonal and interdepartmental relations appeared to be smooth and traditional means were sufficient to work out differences. Abandoning the industrial engineering approach, Smith began to explore the principle of a sociologist, James D. Thompson, who claimed that organizations run not on norms of rationality but on norms of *purpose* (Smith, 1998).

What individuals and departments lacked was a sense of purpose. They could not see how their daily worked mattered. The simple intervention that Smith carried out was to gather examples of good performances in the company and circulate an account of them in a periodic newsletter. In the process of interviewing people about their good performances and in providing a newsletter to all employees, Smith was creating what he came to call an "appreciative field". People began to see their relationship of themselves to each other and to the whole, and this had a profound impact on employee initiative and productivity (Smith, 1998). It turned out that an increased appreciation for the work of others and for one's own relationship to the whole had increased employees' sense of purpose. This enhanced sense of purpose was empowering in that it increased the self-efficacy of each individual.

Since then, AIC has been developed into a comprehensive philosophy and approach to development. It has been modified into innumerable variations and applied in over ten countries. In some countries, it has taken on a life of its own and continues to develop and spawn new approaches and methods.

-Appendix Three-

Seven Principles of Learning
Of the Institute of Research on Learning

Introduction: challenging fundamental assumptions
In the outmoded view of learning that dominates our institutions, knowledge is regarded as a substance that can be deposited directly into people's minds. Learning is seen as the process by which knowledge is transferred into the learner's mind, and teaching is seen as the packaging of knowledge for efficient transfer. Our research at IRL leads us to offer a new view, in which learning is inseparable from engagement in the world, and intellect is inseparable from experience. This view is summed up in seven basic principles:

1. Learning is fundamentally social
Schools and workplaces commonly require participants to choose between learning and social fulfillment. This is a choice that should never arise. An important part of what makes adult professionals successful and productive is their ability to integrate their work with their social lives. They forge their identities and connections around their work, their knowledge and their contributions to the community in which they work. Yet most students and workers in our society are currently expected to live differently-to maintain distance between work and social activity.

2. Knowledge is integrated in the life of communities
Knowledge, activity and social relations are closely intertwined, whether in families, scientific communities, jump rope groups, jazz bands or design teams. United by a common enterprise, people come to develop and share ways of doing things, ways of talking, beliefs, values - in short, practices- as a function of their joint involvement in mutual activity. We call such informal aggregations communities of practice, because they are defined not only by their membership, but by shared ways of doing things. Every individual belongs to, and seeks membership in, many communities of practice. In communities of practice, social relations form around activities, activities take shape through relationships, and particular kinds of knowledge and expertise become part of individuals' identities and places in the community. Because shared knowledge underlies this activity, learning is the means by which people gain membership, and participate in community activity.

3. Learning is an act of membership
Learning is not just the activity of a sole individual, but the primary vehicle for engagement with others. It is what enables people to enter and participate in new communities of practice, and it is what enables them to continually modify their places in

and contribution to the community. Every act of learning brings a change in one's relation to the community-a change in one's identity. The key to enhancement and motivation in learning lies in the intimate connection between the desire for participation and the role of new knowledge in enabling that participation.

4. Knowing depends on engagement in practice

Only in the classroom is knowledge presented in the abstract, and only in the classroom are people expected to demonstrate knowledge through abstract performances. Knowledge does not lie around in the world in some pure form; nor is there any reason to believe that it is stored in the human mind in such a form. Rather, people glean knowledge from observations of, and participation in, myriad situations and activities. A productive lifelong learner - a person who can adapt and learn swiftly in new situations - is a person who can transform all situations into learning situations. Learners must be able to learn as they engage in new activity, and as they move into new settings. This entails figuring out what the characteristics of the situation are, what its relation is to situations that they already know, what there is to learn, and what new knowledge they need in order to be able to participate productively in the situation.

5. Engagement is inseparable from empowerment

Individuals perceive their identities in terms of their ability to contribute - and in terms of their contributions - to a community. Meaningful participation in a community involves the power to affect the life of that community. Settings and situations that provide the greatest potential for learning, therefore, will be those in which participants have meaningful and active roles - in which they are engaged in real action that has consequences not only for them but for their community as a whole.

6. "Failure" to learn is a common result of exclusion from participation

Learning requires access and opportunity. People have difficulty learning when they are only accorded marginal or tentative membership. Limited privileges of participation do not entail rights to contribute and make meaning, hence do not provide opportunities for engaged learning. This deeper perspective requires a more textured understanding of the means and implications of discrimination and exclusion.

7. We already have a society of lifelong learners

People are learning all the time, but what they are learning is not necessarily in their best interests or in the best interests of society. People learn what enables them to participate in communities of practice - not just any communities of practice, but those that appear to them to be real, to be available, and to hold possibility for meaningful participation. It is this need for meaningful participation that motivates both the gang member and the honor student, the scientist and the soloist, the public servant and the entrepreneur.

Adapted from www.irl.org

-Appendix Four-

Understanding the Disconnects

Understanding "the disconnects" that explain why good schools alone will never be good enough to meet the needs of the 21st Century

By the 21st Century Learning Initiative

As policy makers responsible for education, at least four disconnects have to be considered. They are all interconnected in their implications.

Industrial Age Assumptions	*Versus*	Today's Reality
In the Industrial Age most work was organized hierarchically. Only relatively few people at the top needed to be creative, imaginative and enterprising. Most workers had to be good only at performing highly precise, structured and repetitious tasks necessitating a high degree of discipline but little personal initiative. Understanding of the total business process was unnecessary and discouraged.	**The Economy**	Today's successful businesses tend to be highly decentralized and rely on continuous innovation at all levels. Almost all workers have now to be able to think for themselves, take personal responsibility, identify new opportunities and training needs, and understand the relationship of their business to that of others. Workers must be able to adapt rapidly without waiting for external direction.
Learning was assumed to be largely an individual activity and a consequence of formal instruction. Differences in individual levels of intelligence were regarded as hereditary and immutable. Superior intellects were relatively few. Learning tasks were strictly gradated, because it was assumed that only a few youngsters as they got older were capable of "real, meaningful learning." This tiny minority itself had to be "tutored by professionals." Real learning occurred only in schools, so children were removed from the "negative influences" of the community.	**Learning**	Learning is a collaborative problem-solving activity that involves far more than instruction alone. It occurs through progressive construction of individual knowledge, not simply through information transfer. Intelligence is at least partially learn-able. Learning is multi-tasked and involves the use of multiple forms of intelligences. Adolescents thrive when they were given the skills in primary education that enable them progressively to take responsibility for their own learning. Individual learning is driven by the need "to make sense," and by the strength of intrinsic motivation.

Because so little was known at a technical level about the structure and operation of the brain, philosophers assumed that it was "an empty vessel waiting to be filled." The early experiences of very young children were seen to be of little significance; learning began at school. In the late 1960's the metaphor shifted to that of a linear computer waiting to be programmed, and so external inputs not motivation were seen to drive learning. Emotions were extraneous to formal education.	**The Brain**	Brain research now describes "predispositions" inherited from our evolutionary past which are best described as a collection of "successful adaptation skills." Critical to the brain's healthy development are prenatal health, a challenging, stimulating and reassuring environment in the first four or five years of life followed by plenty of opportunity to develop practical involvement in the growth years, and personal responsibility during adolescence.
Valid learning was dependent on close association with an expert who utilized "chalk and talk" to convey information. Learning depended upon verbal assimilation and memorization, checked by tests, all at a specific time, in a specific place, and in a stepped relationship to other learning.	**Learning Technologies**	New information communication technologies expand enormously opportunities for individual and group learning. They offer multi-sensory, reflective, and collaborative learning environments unconstrained by time, place and formal structures. These encourage exploration and discovery thus supporting students in the construction of new understandings.

When these four disconnects are considered together it becomes apparent that, by having the largest classes when children are young, and the fullest teacher support as they get older, we are actually "going against the grain of the brain," and the developmental process of weaning. If we continue to operate under Industrial Age assumptions about learning children will increasingly be more, not less, dependent. Only when it is recognized that the community, and the school have new (and combined) roles in the promotion of learning, and that technologies must become central to the delivery of learning opportunities, will we be able significantly increase the rate of return on our current educational investments by, literally, reversing our "upside down and inside out" assumptions, and their implications.

"New wine never did fit into old wineskins; it simply blew them apart." (after Matthew IX V17)

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