

Educating for Ecological Intelligence: Practices and Challenges

By

C. A. Bowers

2009

Contents:

Chapter 1 Introduction

Chapter 2 Educational Reforms that Foster Ecological Intelligence

Chapter 3 Educating Students About the Political Economy of the Cultural Commons and the Nature of Sustainable Wealth

Chapter 4 The Misuse of Academic Freedom in an Era of Global Warming

Chapter 5 How Computers Contribute to the Enclosure of the Cultural Commons

Chapter 6 The Leadership Role of Deans in Colleges of Education

Chapter 1 Introduction

Humans have been sustained by the cultural and environmental commons from the time of their first appearance on the vast savannas of what we now call Africa. The “environmental commons” provided the source of food and fiber, wood for fire and shelter, and water. From the earliest times, there were norms that governed the nature of the family unit, the roles of men and women in performing various activities and ceremonies, what actions would be punished, status systems that regulated group decision-making, how the success of the hunt and later the harvest would be shared, how the dead were to be dealt with, and how young were mentored in the performance of various tasks. The cultural beliefs and norms that governed behavior and even led to various expressions of aesthetic judgment and performance were the “cultural commons” of that era and bioregion. It is now important that we make these two phrases a central part of our thinking. These first humans survived because of their ability to exercise an ecological form of intelligence—which we now need to understand in our modern context if we and future generations are to survive in an environment that is undergoing rapid change.

Another tradition that began during these earliest times is the tradition of “enclosure” of the cultural and environmental commons. Basically, enclosure involved the different ways members were excluded from sharing in what was part of the local cultural and environmental commons--- or allowed access only on a monetized basis. The main focus in following essays will be on the ecological and community importance of the cultural commons—and how they are being enclosed today. Enclosure in earlier cultures was based on gender distinctions, family lineage, prejudices toward the outsider, clans and societies that had special responsibilities, and the emergence of politically based hierarchies. As these early cultures moved from the hunter and gather stage of development to dependence upon agriculture and the establishment of cities with specialized trades and a money economy, the forms of enclosure multiplied. Military conquest, and an increased reliance upon a money economy became powerful new forms of enclosure. In more recent times, ideologies (including messianic religions), the industrial system of production and consumption, as well as the prejudices and silences

perpetuated in institutionalized approaches to education, added to the list of the many ways in which the local cultural commons are enclosed.

This current trend is now being challenged in Third World cultures, and in local communities in industrially developed cultures where there is an increased awareness of how the global economic systems are undermining the traditions of community self-sufficiency and are forcing more people into poverty and a state of hopelessness. Across North America, there is a revival of participation in the various aspects of the cultural commons—from traditions of relying upon local markets and currencies, to the creative arts, and to political decision-making that challenges the forms of enclosure promoted by outside economic and political forces. In effect the movement that is revitalizing the local community should also be understood as a movement away from reliance upon the industrial system of production and consumption. The growing evidence that the industrial/consumer dependent lifestyle may be on the verge of collapse is forcing people to turn to the traditions of self-sufficiency and mutual support that are part of the local cultural commons.

Unfortunately, the revitalization of the local cultural commons is taking place on the margins of a culture still dominated by the widely shared mentality that equates exploiting the environment with progress. The vast majority of people still victimized by this mentality continue to ignore that scientists are providing evidence that the Earth's natural systems are being degraded to the point where western technologies will no longer be able to reverse the trend, and that global warming and the accompanying changes in the chemistry of the world's oceans are already beginning to adversely influence the lives of hundreds of millions of people.

Unfortunately, faculty in the non-scientific disciplines have not made the cultural commons a focus of attention. Indeed, a case can be made that they continue, with minor exceptions, to promote the same deep cultural assumptions that underlie the industrial/consumer-oriented culture. Most of these faculty are in the social justice tradition of liberalism, while the promoters of furthering the enclosure of the world's cultural and environmental commons are in the economic or market tradition of liberal thought that can be traced back to Adam Smith and the classical liberal thinkers of his era. The irony is that while social justice-oriented faculty criticize the proponents of

globalizing the ideology of market liberalism, they fail to recognize the cultural assumptions they share with the market liberals.. Because of these shared assumptions they fail to engage students in a study of the ecological importance of the local as well as the diversity of the world's cultural commons.

The essays in this collection challenge three misconceptions that are widely promoted in universities and in most public schools. The first essay challenges the assumption that intelligence is an attribute of an autonomous individual, and it goes beyond what I have written elsewhere by suggesting that if we are to slow the rate of environmental degradation by learning to live within environmental limits it will be necessary for our educational institutions to foster an ecological form of intelligence. I realize that many readers will claim that relying upon public schools and universities to promote this fundamental change in how intelligence is understood is fundamentally flawed.

While a case can be made that ecological intelligence is already being fostered in many of the intergenerationally informed activities within the local cultural commons, universities and public schools are promoting an even more extreme individualistic view of human intelligence. The increased emphasis on understanding intelligence as a function of the electro-chemical processes occurring in the brain, as well as the increased reliance on computer-mediated learning and communication, further marginalize awareness of the constant interplay of consciousness, embodied experience within different cultural and environmental contexts, collective memory, and biographically-informed expressions of intentionality. The essay suggests how public schools and universities can foster ecological intelligence in ways that go beyond the obvious recommendation that students should not be reinforced in the belief that their ideas originate from their own thought processes. However, there are obstacles that need to be overcome. These include the boundary lines that separate such fields of study as cultural linguistics, the sociology of knowledge, phenomenology, political economy, ecologically-oriented cultures, community development, intellectual and economic history—all of which have something to contribute to understanding both the nature of ecological intelligence and why it has not been valued by educated elites.

The essay on the political economy of the cultural commons challenges the dominant way in which wealth is now understood as achieving success in the money economy. As the world economic crisis reminds us, associating wealth with money can lead to dire consequences for hundreds of millions of people. That is, it can disappear entirely, and the response on the part of corporations is likely to lead to more disappointments as they seek to replace workers with more automated technologies. Associating genuine and lasting wealth with the participating in the traditions within the diverse cultural commons of the world that enable people to live less money, and thus less consumer dependent lives, leads to a number of benefits—to improving the quality of life that comes from participating in the activities and mutual support systems in the community, to discovering talents and skills that are not available in most work environments, and to having a smaller adverse impact on the natural systems that are now being rapidly degraded. Proposals for actually engaging students in different aspects of the local cultural commons are suggested.

The essay on the misuse of academic freedom challenges some of the most taken-for-granted assumptions within the academic sub-culture. The title of the chapter, “The Misuse of Academic Freedom in an Era of Global Warming”, was deliberately chosen to emphasize that academic freedom is not the problem. Rather, the problem is in how it has been misused in the past—and misused today to justify scholarly pursuits that are of personal interest to faculty but totally irrelevant to understanding the cultural roots of the ecological crises. One of the points made in this chapter is that as long as faculty claim that their academic freedom allows them to ignore the cultural issues related to overshooting what scientists are warning about as a “tipping point” where cultural changes will no longer slow the rate of global warming, universities will continue to be part of the problem rather than part of the solution.

The essay on computers challenges the third misconception, which is that computer mediated learning should be more widely adopted—from the primary grades through graduate level classes, and in different parts of the world. There are many misconceptions surrounding the educational uses of computers. Addressing these misconceptions is not the same as arguing that they should be eliminated from the educational process. Part of the problem is that most public school teachers and

university professors continue to think of computers, like other technologies, as culturally neutral tools. However, the problem goes deeper than this historically rooted misconception about technology in general. That is, there is also a widespread bias that privileges print-mediated knowledge and images over oral and embodied traditions of learning—which are essential to the intergenerational renewal of the cultural commons. These misunderstandings become more than academically significant as much of the world’s population depends upon what remains of the intergenerational knowledge of how to live in ways that are largely independent upon a money economy. As much of this knowledge is intergenerationally renewed through face-to-face communication, where context and embodied experience are vital to what is being learned, it cannot be digitized without undergoing fundamental changes that support the industrial form of consciousness which is part of the problem.

It is also pointed out in this chapter that students in Third World cultures will be socialized through their reliance on computers to equate significant knowledge with the decontextualized knowledge they encounter from the computer software programs. They will also learn to view the intergenerational knowledge that sustains their community as a source of backwardness and thus as an obstruction to their joining the modern, consumer-dependent lifestyle. The same alienation occurs in western cultures where computer mediated learning undermines the intergenerational traditions within the family and local community. Like the misuse of academic freedom, the solution is not to do away with computers. Rather, the challenge is for teachers and professors to understand the culturally mediating characteristics of computers—which include being aware of the forms of knowledge and relationships that contribute to a lifestyle that has a smaller ecological footprint. It is essential for students to recognize when the uses of computers make a genuine contribution, and when they reinforce the industrial consciousness and consumer-oriented traditions that undermine the cultural commons.

The last chapter addresses other problems that contribute to what I have referred to in an earlier book as the “cultural of denial”. The chapter on the leadership role of deans in colleges of education focuses on the need for the kind of leadership that few administrators, whether in colleges of education or in other divisions, have traditionally exercised. As scientists are continually reminding us these are not normal times. Thus,

there is a need for deans to step outside their traditional role of focusing on administrative tasks. In the past it was thought that if the dean exercised intellectual leadership the faculty's traditional prerogatives in the areas of curriculum and scholarship would be infringed upon. Unfortunately, when it comes to faculty in colleges of education taking seriously the ecological crises, the long-held idea that curricular reforms should be initiated by faculty has been thwarted by the widely held assumption that courses were already based on progressive ideas. Few recognized, however, that these progressive ideas were also based on the cultural assumptions that are contributing to the degradation of the environment and to the further undermining of the local cultural commons.

The argument in this essay is that deans and other administrators continually need to remind faculty what the major challenges of today are. Holding faculty accountable for addressing both the causes and possible solutions to the ecological crises is not, as I argue, the same as dictating what should be taught in courses and published. Rather, it is a matter of signaling that just as sexism would not be overlooked and even rewarded, the old ways of thinking that reproduce the silences about cultural and ecological sustainability issues would no longer be overlooked—or even rewarded.

When taken together, the essays provide practical suggestions for dealing with the problem of faculty who exhibit the tendency of reframing issues in ways peculiar to their taken-for-granted interpretative paradigms. When faculty are encouraged to discuss issues that are outside their normal fields of discourse, the discussion too often goes off in many directions. The result is that the exchanges lack depth and even understanding of what other participants are contributing. This problem is magnified many times over when faculty are not fully informed about the changes occurring in the Earth's ecosystems. Too often faculty leave the sessions feeling satisfied that they have had their say. Unfortunately, the diversity of views provides little in the way of consensus about the changes that should be introduced in their courses—and how to take interdisciplinary approaches to curriculum reform.

In addition to sustaining faculty interest in what may appear to them as having little relevance to their teaching, as well as to their own lives, there is an even more critical problem. The need to start with the most fundamental issues is too often diverted by a combination of factors that range from a lack of genuine concern and in-depth

understanding, feelings of not having enough time to meet other obligations, and the awareness of how past faculty discussions have failed to bring about substantive changes. Too often solutions are proposed before there is an understanding of the cultural patterns that are major contributors to the ecological crises, and that have been ignored in the past. For example, any in-depth discussion of curricular changes that enable students to understand the history of different forms of enclosure will be dependent upon having a basic understanding of the language issues that have led to the tradition of equating different forms of enclosure with progress. Faculty focused on the history of different cultural traditions such as economic thought, philosophy, science, technology, creative arts, and so forth, may be reluctant even to consider how their field of inquiry could be re-oriented in ways that help clarify the origins of the different forms of enclosure that transformed what was part of the cultural commons into a commodity and thus part of the market-oriented culture.

All of the chapters provide suggestions for how the leader of a faculty discussion needs to frame the issues in ways where a conceptual framework is systematically built up to where it is possible to recognize the curricular changes within different disciplines that are not based on the old ecologically problematic taken-for-granted assumptions. That is, there has to be a process of unlearning some of the old ways of thinking in order for faculty to learn about the interconnections between ecological intelligence and revitalizing both the cultural and environmental commons. This requires a willingness to make explicit the silences that have led so many faculty to assume that their fields of inquiry and teaching are unrelated to what has now become a major concern of governments and social groups outside of the university.

Chapter 2 Educational Reforms that Foster Ecological Intelligence

Scientists are documenting a rate of change in the Earth's ecosystems that far exceeds the rate in which the West is able to introduce fundamental changes in its core guiding assumptions. Changes in the chemistry of the oceans that are affecting the viability of fisheries, as well as changes in the glaciers that are the source of water that hundreds of millions of people depend upon, are now being measured in mere decades.

The additional five billion people added to the Earth's population since the beginning of the twentieth century is further accelerating the rate of environmental degradation. Changes in the consumer/technological sectors of western cultures, which are now being globalized, create the illusion that cultural changes are keeping pace with the rate of environmental changes. This illusion is based on the failure to recognize that the cultural changes we associate with progress are based on the conceptual foundations that can be traced, in terms of western cultures, back to Biblical times.—and to the beginning of the scientific revolution and the privileging of print-based abstract thinking. Similarly, cultures rooted in other ancient religious traditions that are resisting the West's continuing colonization efforts are also unprepared to meet the challenges resulting from the rate and scale of environmental change.

The paramount challenge we face in the West is how to change the core assumptions that underlie how we think. This is necessary as the changes we falsely associate with progress have not slowed the rate of decline in the self-renewing capacity of the Earth's natural system. This is important as the core assumptions underlying the West's approach to progress are being promoted through the spread of western technologies and the myth that the American consumer lifestyle should be the model for the rest of the world. One of the reasons that the core assumptions and values in the West are so resistant to change, even in light of the growing awareness that changes in the Earth's ecosystems are threatening the lifestyle that so many Americans and others now take for granted, is that key words in today's vocabulary carry forward the misconceptions and silences of earlier thinkers who were responding to the social issues of their era. The misconceptions and silences carried forward the taken for granted patterns of thinking and values of even earlier times, which in turn influenced the analogs settled upon in the writings of philosophers and social theorists who are still considered essential to a liberal education. These analogs framed the meaning of words that are, in many instances, the basis of thinking and values in the West. Even though such important people as Albert Einstein, Gregory Bateson, and Jared Diamond, among others, urged that a change in thinking is the only way of addressing the rate of environmental changes now threatening life on this planet, our educational systems continue to ignore the critical role that language plays in perpetuating the ideas that were formed before

there was an awareness of environmental limits. That is, what the vast majority of Americans, as well as citizens in other western countries, fail to recognize is that words have a history. If the history of words is ignored, the analogs chosen in response to a different set of social circumstances will continue to frame how we understand today's problems. This history also influences the silences that are clearly present when people claim that they are concerned about changes in the environment, but have few ideas beyond embracing the technological solutions being promoted by experts who share similar silences about the deep cultural changes that must be undertaken.

The word "ecology" has become a prominent part of today's vocabulary, especially among environmental writers, scientists, and even some educational reformers. One of the purposes of this paper is to examine how the history of this word carries forward the silences and misconceptions of the scientists who borrowed this word from the ancient Greeks. Another purpose is to rectify over a century of reductionist thinking by explaining how the ancient Greek understanding of "oikos" can lead to challenging current ways of thinking about the nature of intelligence. Regardless of whether it is a constructivist, cognitive science, or behaviorist explanation of intelligence, none address the language issues and thus the core cultural assumptions that have put western cultures on the pathway of overshooting environmental limits. As I will argue in this paper, only as we develop the capacity for relying upon ecological intelligence will we be able to understand how we are nested in cultural ecologies, and how cultures are nested in and thus totally dependent upon the self-renewing capacity of natural ecologies.

Misinterpreting the Metaphors of Other Cultures

As the word "ecology" has become associated primarily with the vocabulary and thus epistemology of post-mechanistic science, its use as a descriptor of a form of intelligence may seem unwarranted. What may appear as even more questionable is the suggestion that educational reforms should foster ecological intelligence. Before

explaining the characteristics of ecological intelligence, and how it differs from the dominant form of intelligence now reinforced in public schools and universities, it is necessary to recognize that the ancient Greek word “oikos” referred to a profoundly different set of relationships than what Ernst Haeckel intended when he translated the Greek word and introduced it as “Oecologie” to a scientific audience in 1866. Haeckel reduced the meaning of oikos to the management of household relationships (which was partly correct), but shifted the focus to the scientific study of how living organisms function as a single interdependent economic unit. According to Donald Worster, the modern spelling of “ecology” was introduced in 1893, and from then on scientists began, through their study of different forms of dependencies and bioregions, to give ecology multiple meanings (1990, p.192). This linguistic elaboration represented shifts in the study of ecosystems, and included “climax formations”, “ecological succession”, “biotic communities”, “energy flows”, “ecosystems”, and so forth. The important point is that over the last hundred years scientists have largely claimed to be stewards of which analogs can be associated with the word ecology.

The traditional scientific disregard of the nature of culture led to the reductionist thinking that equated management of the household relationships and activities with managing the household of nature. For the ancient Greeks oikos encompassed all aspects of the social life centered in the household but also extending to community affairs that ranged from who could perform certain economic activities, the succession of property rights and inheritance, to the roles that were dictated by gender. In short, oikos referred to a wide range of cultural practices, just as the more widely recognized Greek word “polis” referred to the physical site as well as individual participation in governance (1999, Nevett, pp10-20). What has been ignored by the scientific transformation of ecology into an increasingly powerful paradigm that opened new understandings of natural processes is that oikos referred to the complex culture of family life and its connections with the culture that extended outward beyond the household. Learning to live within the norms prescribed by the culture of oikos as well as the polis involved developing what can be referred to as ecological intelligence. Yet there was a profound difference from what ecological intelligence should mean today. That is, the ancient Greeks lacked an awareness of the interdependencies between human behaviors and the

natural systems that some indigenous cultures have so clearly understood—and that modern ecologists have increasingly focused attention on as they collect evidence on the rate of environmental degradation.

It needs to be kept in mind that while *oikos* referred to a complex range of cultural practices and taken for granted values and ways of thinking of relationships, it did not include the degree of awareness we now associate with ecologically sustainable daily practices. That is, in foregrounding the cultural dimensions of the Greek understanding of *oikos*, it is not being suggested here that we should emulate their ancient traditions. Rather, what needs to be understood is that the modern translation of *oikos*, that is, ecology, is as relevant to understanding culture as it is to understanding natural systems. At the same time, it should not be assumed that the elaborated ecologically oriented vocabulary of the scientific community can be used to understand culture as an ecology of ideas, behaviors, and practices.

There are aspects of culture that are profoundly different from the characteristics of natural systems. For example, the elaborated ecological vocabulary that now frames different areas of scientific research is not adequate for understanding why ecological intelligence is expressed differently in cultures—especially in indigenous cultures. Nor is it adequate for understanding the challenges that confront efforts to introduce educational reforms that lead to ecological intelligence becoming a taken for granted pattern of thinking in Western cultures. As scientists study the energy flows, the processes of plant succession, the disruptions in food chains, the chemical/information exchanges within complex systems, the changes humans introduce in the evolution of plants and animals, and so forth, they have learned to exercise a limited form of ecological intelligence. But limited in the sense that their focus on natural systems has not included a similar level of understanding of cultural systems. Indeed, when it comes to how the majority of scientists understand cultural processes, it would not be inaccurate to claim that they take for granted many of the same cultural assumptions that are responsible for overshooting the sustaining capacity of natural systems.

The way in which ecologically oriented scientists have learned to think provides an important contrast to the taken for granted patterns of thinking now being reinforced in the media, through the use of computers, and in classrooms at all levels of the educational

process. Core scientific understandings include the following: that all life forming and sustaining processes are part of a hierarchy of communities where the waste at one level becomes the source of food at another level—that is, each level of community affects the energy flow and structural coupling of what Humberto Maturana referred to as the life producing autopoietic systems, that interdependent relationships and constant information exchanges at the chemical level and, for humans, at the cognitive and emotive level, are the norm. Gregory Bateson argued that the idea of individual autonomy is an abstract cultural construction by noting the basic unit of information that undergoes transformation as it circulates and sustains the ecosystem is a “difference which makes a difference” –and that what we take to be an individual is always a participant in these larger cultural and natural ecologies of information exchanges (1972, p.315). Another core understanding is that living systems are intergenerationally connected, and that some adaptations may not meet the test of Darwinian fitness and thus become extinct.

This iron rule of natural selection applies both to the biological and, for humans, to symbolic adaptations—with the problem for humans being the failure of the symbolic adaptations to take account of the characteristics of the bioregion that are the source of fiber, protein, water, and shelter. Jared Diamond documents this process of culture/ecosystem collapse in his study of the failure of a number of cultures to adapt to the changes in the ecosystems they were dependent upon (2005). Bateson makes the same point more directly when he writes in Steps to an Ecology of Mind that “the unit of survival is not the breeding organism, or the family line, or the society....The unit of survival is a flexible organism-in-its-environment” (1972, p. 451). His following warning is a direct challenge to a number of cultural assumptions that underlie what in the West have become the basis of the high status knowledge still being promoted in public schools and universities:

The environment will seem to be yours to exploit. Your survival unit will be you and your folks or conspecifics against the environment of other social units, other races and the brutes and vegetables. If this is your estimate of your relation to nature and you have an advanced technology, your likelihood of survival will be that of a snowball in hell. You will die either of the toxic by-products of your own hate, or, simply, of overpopulation and overgrazing. The raw materials of the world are finite”.

“The most important task today”, he concludes, “is, perhaps, to learn to think in a new way”. (p. 462)

Key Cultural Characteristics of Ecological Intelligence

This short overview of the living systems of which humans are a part makes it possible to begin identifying differences between a culturally grounded ecological intelligence and the high status patterns of thinking that can be traced to Enlightenment thinkers who were unaware of environmental limits, and who were still under the influence of a theology that represented the environment as both a threat and a source to be exploited. The intention here is not to prescribe another conceptual reform agenda that is to be adopted by other cultures. However, in the event that other cultures are basing their approach to development on the following characteristics of the West’s high-status knowledge, the following discussion may serve as a guide to what needs to be avoided—especially when the margin of error in terms of feeding an expanding population in an increasingly degraded environment may be greater than what exists in western countries that rely upon technology to mask the degraded state of the Earth’s natural systems.

Danger of privileging abstract ideas and theories. One of the most prominent characteristics of the scientists’ approach to studying ecosystems is that they avoid relying upon abstract theories to dictate the outcome of their research. When ecology serves as the interpretative framework, observation of the patterns and processes occurring in the natural systems become the source of knowledge. Scientists cross over into the realm of ideology when they attempt to extrapolate their empirical findings into general statements about cultural change—such as when scientists claim that computers represent the emerging post-biological phase of evolution, and when they assume that the technologies emerging from scientific discoveries are examples of a linear form of progress. Their focus on the behavior of natural systems does not mean that they are uninfluenced by many of the same cultural assumptions that are responsible for the ecological crises they are studying. The toxins in the human body, as well as in the world’s oceans, are evidence of how scientists are too often unaware of the cultural assumptions they take-for-granted—assumptions about the progressive nature of change and the ability of rational thought to bring nature under human control. In spite of these

lapses, the thinking of ecologically oriented scientists adheres more closely to what the ecological paradigm brings into focus. Thus, their ecological thinking stands in sharp contrast to such areas as philosophy, social and political theory, educational reforms, and business practices, where the abstract representations of reality formulated in past centuries still exert a major influence,

The abstract theories about the nature of knowledge, universal values, the ownership of property, the nature of individualism, as well as the silences about other cultural ways of knowing—including the failure to understand how the fate of humans is dependent upon the sustaining characteristics of their local ecosystem--have been the dominant feature of Western philosophy from the time of Plato to the present. Even the so-called empiricist philosophers approached the question of the experience/knowledge relationship not by observing cultural patterns, but by starting with another set of abstractly based assumptions. From Adam Smith to the Chicago School of Economics, the idea of free markets has been regarded as beyond questioning —except when they fail as they have today. Yet many market liberals (wrongly referred to as conservatives) continue, in the face of spreading poverty, to hold onto this abstract idea. However, as Karl Polanyi points out in The Great Transformation (2001 edition), the idea of free markets as self regulating processes that transcend cultural differences was not derived from a study of different cultural contexts, but was and still is represented, in Platonic fashion, as a universal truth. Similarly, the theories that explain the purpose of educational reform as emancipating students from all traditions that limit the achievement of greater individual autonomy are also derived from abstract theories that misrepresent the most basic characteristics of the consciousness shaping influence of being born into a language community. The key point about privileging abstract theories over the culturally mediated embodied experiences in everyday life, regardless of the discipline or professional field, is that they have not led to an awareness of how humans and their symbolic worlds are contributing to the degradation of the ecosystems that their long-term survival depends upon. These abstract theories not only marginalize the importance of cultural contexts, but lack the vocabulary necessary for overcoming the silences perpetuated by the theories.

When Rachel Carson observed the dead birds near the fields that had been sprayed with DDT, her questioning of what other scientists assumed to be yet another achievement of western science took on a new urgency. A similar change of consciousness occurred for Aldo Leopold when he looked into the eyes of a dying wolf and began to realize that the wolf was not just the enemy of the hunters wanting to kill deer, but played an important role in protecting the mountain from being destroyed by an out-of-control deer population. The irony is that the culturally mediated embodied experiences of market liberals and western philosophers, to cite just two examples, involve cultural patterns that are marginalized by the abstract theories they promote as universals. Knowledge framed by abstract theories and explanations lead to a bifurcated state of consciousness where what is taken to be real is often totally divorced from the cultural and natural systems that are unconsciously relied upon on a daily basis. As I have explained elsewhere (Bowers, 2008, pp. 57-74), language carries forward the analogs that made sense in earlier times, but the analogs too often have no relationship to the present. Unfortunately, they too often become part of the abstract representations that people assume to be more accurate than what could be learned if they were to give attention to their culturally mediated embodied experiences.

Importance of context to exercising ecological intelligence. If the reader interprets this reference to the importance of knowledge being derived from the individual's encounters in local contexts as further justification that students should be encouraged to construct their own knowledge, as many educational reformers and linguist/philosophers such as George Lakoff and Mark Johnson now advocate (1999), they are being influenced by a cultural assumption that is one of the chief contributors to the ecological crises that now confront us. As will be explained later, the idea of the autonomous individual is itself an abstraction that does not make sense when we begin to understand the structural couplings between everyday patterns and identities that constitute the cultural ecologies we are embedded in, and how these cultural ecologies are interdependent with natural ecologies

The digital phase of the industrial revolution we have now entered continues to marginalize awareness of the importance of cultural and environmental contexts. For

example, the increasing reliance on cell phones, text-messaging, and video games marginalize the importance of face-to-face interactions as well as awareness of the behaviors of natural systems—the sounds of birds, changes in flora and fauna that accompany changes in seasons. As computers reinforce a sense of temporality where the individual is the center of the universe there is a loss of cultural memory of species that were part of people's experience in earlier times, such as the changes in the quality of water in streams and rivers, changes in weather patterns, and so forth. Reliance upon computers also contributes to the cultural amnesia that occurs when the narratives that are part of face to face relationships become replaced with reading the printed word on the computer screen or observing the out-of-context computer mediated performances of others. Instead of observing the information exchanges circulating through natural systems, as well as the culturally coded messages that make daily behaviors and values predictable and viable at the taken-for-granted level of experience, the experience of abstract thinking contributes to the idea that local contexts are unimportant.

Ecological intelligence does not mistake the parts for the whole. While scientists gain a greater understanding of the various processes of information exchange between the living organisms that make up the web of life, the major approaches to education in American society—ranging from public schools and universities to print and electronic media—continue to reinforce the long-held idea that society is made up of self-directing individuals. The reality is that individuals act and think in ways that reflect, with only minor variations, the traditions of their culture. But this has not led to questioning the dominant cultural idea that individuals think their *own* thoughts, choose their *own* values, possess legal and property rights as individuals, and become ill and die as individuals. Copyright laws are based on the idea of individual origination, just as our legal systems hold the individual accountable even though the social environment largely influences the individual's self-concept, sense of hopefulness or helplessness, provides models for behaving and thinking, and so forth. The widely shared idea that change is part of the progressive force that animates life at all levels, from natural to cultural systems, contributes to the sense of individualism where responsibility is primarily focused on self-interest—and, at the most, may extend to one's grandchildren.

This culturally mediated experience of self has also been influenced by the misconceptions of well-intended Enlightenment thinkers whose limited understanding of “tradition” was influenced by the politics of their era. Their major focus was on the privileges and forms of exploitation taken-for-granted by the aristocracy, the church, as well as the seemingly unyielding cultural traditions that limited peoples’ prospects to that of their parents’ social standing in a hierarchically ordered world. The analogs they associated with tradition did not include the highly developed traditions of craft knowledge, the systems of mutual support, and the knowledge of local ecosystems so essential to their survival. Just as in natural systems, where the process of generational succession of species must meet the test of Darwinian fitness, the process of carrying forward the symbolic traditions that represent genuine gains in the areas of social justice, systems of mutual support, and wisdom in how to live lightly on the land requires a radical revision in the way the individual is now understood as the basic self directing unit of society. To recall Bateson’s warning, the fate of individuals cannot be separated from the fate of the ecosystems of which they are a part—and upon which they are absolutely dependent. Bateson is not alone in situating the individual within the larger interactive life-shaping systems being referred to here as ecologies.

The following propositions represent how many people in the field of human development are already relying upon Uri Bronfenbrenner’s ecological paradigm.

1. The individual functions and develops as a total integrated organism.
Development does not take place in single aspects, taken out of context.
2. The individual functions and develops in a continuously ongoing, reciprocal process of interaction with her or his environment.
- 3a. At each specific moment, individual functioning is determined in a process of continuous, reciprocal interaction between mental factors, biographical factors, and behavior—on the individual side—and situation factors.
- 3b The individual develops in a process of continuous reciprocal interactions among psychological, biological, and environmental actors. (Moen, Elder, Luscher, 1995, pp. 24-29)

If Bronfenbrenner’s key idea can be summed up with some degree of accuracy, it would be that his model for understanding the interactive relationships that influence the

individual's development must take account of the network of environments--ranging from family, peers, school, parent's workplace to the larger cultural context of politics, economics, and environmental events and transitions over the individual's lifespan. There is no such thing as an autonomous, self-creating individual in his ecological model for understanding human development. Nor, according to Bronfenbrenner, should a single event or idea be seen as the determining or causal factor.

Thinking of the influence of interactive and reciprocal relationships provides a powerful mode of analysis, just as the thinking of reformers who are addressing social justice issues involves understanding the interacting networks that privilege some while marginalizing others. This more holistic way of thinking is now found in many approaches to inquiry—ranging from the social sciences to the humanities. But it represents only a partial approach to the exercise of ecological intelligence. For example, Bronfenbrenner and his many followers do not address how to promote ecological intelligence through the various cultural approaches to education. Nor does their ecological paradigm take account of the central problem of understanding cultural patterns and behaviors that are further degrading the ecosystems. The recommendations of his followers, like those of most reformers, fail to frame proposal for social change in ways that address how to renew intergenerationally the non-monetized traditions of different cultural groups that will become increasingly important as the current industrial/consumer-oriented culture comes under more pressure from failed economic policies and degraded environments. Yet another omission in their thinking is how to promote ecological intelligence through the formal educational process where there is an opportunity to reinforce patterns of thinking that may be absent in the home, church, media, peer group, and so forth.

While social justice groups rely upon a limited approach to thinking within an ecological paradigm, they often are unaware of the ecologically destructive cultural assumptions that guide their thinking about what constitutes social justice for different social groups. Achieving greater equality in the political process is an important goal for all. But is achieving equality as a consumer in the industrial/consumer-oriented culture the right goal when this culture is a major contributor to global warming and to the other life altering environmental trends? Both John Dewey and Paulo Freire, for instance, were

dedicated to achieving social justice for marginalized groups that lacked political efficacy. However, both were also Social Darwinian thinkers who wrote about the “savages” and indigenous cultures locked into a condition of “semi-intransitivity of consciousness”. In effect, their taken for granted cultural assumptions not only supported one of the long-standing sources of prejudice in the West, but they also assumed that education should enable each generation to recognize that the traditions of previous generations were the source of their own oppression. The assumption that change is inherently progressive in nature led to the failure of these educational reformers to ask about what needs to be conserved, such as the non-monetized and social justice traditions of previous generations that have a smaller ecological footprint and that protect people’s civil liberties from various totalitarian forces. A fully developed ecological intelligence has to be free of the otherwise taken-for-granted assumptions that represent change as inherently progressive, humans as in control of the natural environment, and the West as the teacher of the world.

The role of critical thinking in ecological intelligence. Bateson’s reference to an ecology of bad ideas that puts the community on the pathway to self-destruction, while causing needless human suffering, brings into focus the question of what the role of critical thinking should be in the exercise of ecological intelligence. To find concrete examples of an ecology of bad ideas, we need look no further than the policies of George W. Bush’s presidency. These policies undermined the long-held traditions of separation of powers and civil liberties that protected people from unlawful surveillance and imprisonment, that advanced the interests of corporations at the expense of the well-being of the general public, that engaged in secrecy and deception in promoting the invasion of Iraq, that undermined the existing environmental policies, and that gave billions to Wall Street without an adequate system for holding accountable the perpetrators of greed and the smoke and mirror practices of Wall Street culture. Yes, critical thinking is an essential part of ecological intelligence. But it needs to be recognized that critical thinking is not a panacea in itself and that its use does not always lead to more progress.

Critical thinking is not just relied upon by individuals and groups working to achieve greater social justice. It is also used by different groups attempting to work out a

strategy for achieving their own political agenda, which often involves seeking economic and political advantage over others. For some religious groups, it is used to develop strategies that will force politicians to enact legislation and policies they want imposed on the rest of the country. Corporations rely on critical thinking in deciding which technologies and products to develop, in promoting a demand for new products, in identifying a campaign for exploiting new markets that have a global reach, and in masking the unequal distribution of corporate profits, and so forth. Critical thinking, as Dewey tells us, is really the basis of problem solving that does not rely upon repeating already established approaches. Thus, the carpenter engages in critical thinking when the designer of the building introduces changes that have not been encountered before, just as the airline pilot and others engage in problem solving situations. The reformers who have made critical thinking their main approach to achieving social justice tend to equate critical with being a progressive force in society. That is, they interpret the word “critical” to mean exposing unjust social practices--thereby improving the lives of others. Their approach is to examine historical and current prejudices, as well as the consequences experienced by marginalized social groups. Other uses of critical inquiry are more oriented to solving problems that exist for individuals and social groups—many of which have economic and ideological agendas that perpetuate various forms of injustice.

Both social justice and non-social justice practitioners of critical thinking share a common characteristic that has its roots in the reductionist way Enlightenment thinkers understood the nature of tradition, as well as the assumption about the nature of progress that took hold during this same period. Along with the growing reliance on empirically-based problem solving in the sciences, critical rationality became associated with overturning traditions that stood in the way of progress. As I have pointed out in other writings, equating the overturning of traditions with progress has served as one of the sources of conceptual and moral legitimation for the rise and spread of the industrial culture that has exploited humans and the environment for the sake of profits. What the promoters of the industrial culture, and its scientific/technological support systems, overlooked in the past as well as in the present are the traditions of mutual support and non-monetized practices within different cultures that are being overturned in the name of

progress. It has only been in the last few years that the various groups traditionally supportive of the industrial/consumer-oriented cultural approach to progress have turned their attention to how this culture is changing the world's ecosystems in ways that expose the myth of progress. But this has not altered their goal of turning more aspects of daily life into new market opportunities—which is the main agenda of economic globalization.

Making the analogy between the role of DNA and RNA and the role of the symbolic traditions of human cultures carries with it the risk of misinterpretation. What they share in common is that the former carries forward from the past the life-forming chemical information that influences the survival potential of succeeding generations, while the symbolic traditions of human culture carry forward both the genuine achievements as well as the prejudices and other misconceptions of earlier generations. Given that there is always variation in what is passed on to succeeding generations, it would be wrong to interpret this analogy as suggesting some form of biological or cultural determinism. How symbolic traditions rooted in the distant past are still part of people's taken-for-granted patterns of thinking will be explained in the later discussion of linguistic issues relating to ecological intelligence. What is important here is to reiterate that the networks of interdependent relationships that are the sources of information and energy exchanges that now bind together the fate of both cultural and natural ecologies need to be considered when assessing the role of critical thinking.

As Bateson points out, the autonomous individual we mistakenly assume to be the agent of reflection is actually part of the larger system of information exchanges within the natural and cultural ecologies. Bateson sums up this point by noting that “ecology, in the widest sense, turns out to be the study of the interaction and survival of ideas and programs (i.e., differences, complexes of differences, etc.) in circuits” (1972, p.483). Critical thinking is what separates the role of DNA and RNA in natural systems from the role of traditions in cultural systems. The nature and role of critical thinking is misrepresented when the individual is assumed to be uninfluenced by the traditions of the past. When this happens the individually-centered interpretation of critical thinking reproduces the same errors found in how critical thinking is used by groups who take-for-granted the deep cultural assumptions that underlie the industrial form of consciousness that is putting our collective futures at risk. These shared cultural assumptions include

the idea of the autonomous individual, the progressive nature of change, an ethnocentric understanding of critical thinking, a Social Darwinian view of non-Western cultures, and a secular messianic drive to convert others to a Western way of thinking and lifestyle.

Many scientists and technologists are now focusing on what needs to be conserved, with some corporations now beginning to recognize that improving their profits requires “greening” their products and including the word “sustainable” in their marketing campaigns. Unfortunately, social justice advocates are still reluctant to include the words “tradition” and “conserving” as a legitimate part of their emancipatory vocabulary. Thus, the long tradition continues of socializing students in public schools and universities to the idea that an individually-centered form of progress is the ultimate purpose in life. Unfortunately, public school teachers and university professors continue their silence about the need to adopt an approach to critical thinking that takes account not only of what needs to be changed, but also what traditions need to be intergenerationally renewed. Evidence of this failure can be seen in the widespread indifference on the part of the general public to how the Constitution and the tradition of civil rights have been undermined in recent years by the government. The increasingly widespread use of surveillance technologies also has been met with indifference by a large segment of the general public who still appear mesmerized by the myth that change, including changes in surveillance technologies, is always progressive in nature.

One of the tasks of classroom teachers and university professors is to model how to exercise critical thinking in ways that take account of how to conserve the life-supporting networks of interactive and interdependent relationships within the local cultural ecologies and that exist between the cultural and natural ecologies they depend upon. Only this more balanced and less ideologically driven approach to critical thinking is consistent with the exercise of ecological intelligence. Making the individual who is ignorant of past achievements the primary agent of critical thinking violates what should be understood as the ecological contract that humans have with their heritage and with their responsibility for limiting their impact on the life-sustaining larger ecosystems upon which they and future generations will be dependent. This may be a contract that has been so violated that any human effort to restore it will be overwhelmed by the rate and scale of environmental changes now underway. Unfortunately, the high-status accorded

to abstract thinking, which is being further reinforced by the increased reliance upon computer mediated communication and thinking, may be too ingrained as part of people's natural attitude for them to make the necessary fundamental changes.

Ecological intelligence can only be intergenerationally renewed when the meanings of words are framed by analogs informed by a deep understanding of cultural and environmental processes that contribute to a sustainable future. As I have written extensively about the myth of the conduit view of language, and how words carry forward the insights and misconceptions of earlier thinkers, I will only summarize the changes that need to be made by public school teachers and university professors if we are to begin using a vocabulary that does not undermine the exercise of ecological intelligence (Bowers, 2008, pp. 33-48, 74-154). Michael Reddy was one of the first linguists to identify what most public school teachers and university professors take-for-granted: namely: reinforcing the idea of language as a conduit in a sender/receiver process of communication (1979, pp.284-323). It was only later that Gregory Bateson explained another misconception about the nature of language that enables us to recognize how past and current mistaken ideas about language undermines the possibility of achieving a form of intelligence that takes account of the characteristics of the cultural and natural ecologies we participate in on a daily basis. Bateson referred to this as double bind thinking (1972, pp. 206-212).

Double bind thinking can most easily be understood as the colonization of the present by the past. This process of colonization can also be understood as the linguistic colonization of other cultures. Both forms of colonization result when today's meanings of words were framed by the choice of analogs by earlier thinkers who were unaware of environmental limits. Widely accepted analogs for such words as "individual", "tradition", "technology", "progress", "data", "development", "illiterate", "property", "wealth", and so forth, continue to reproduce the prejudices and taken-for-granted culturally specific assumptions of the era in which the analogs were established. That is, double bind thinking perpetuates the pattern of thinking that has contributed to the ecological crises that we are now beginning to recognize. Unfortunately, the ecologically and culturally informed analogs that are necessary for a vocabulary that makes it possible

to thinking ecologically have not yet become accepted by educators, media pundits, and other agents of mass socialization. The linguistic colonization of other cultures occurs when the analogs are derived from another culture, such as when Third World cultures accept the West's analogs for understanding "development", "illiteracy", "individualism", "progress", and so forth.

The conduit view of language, like so many aspects of culture that are part of taken-for-granted daily experience, may appear as too difficult to recognize and change. Nevertheless, it needs to be understood that both educators and the educational role played by the media not under the control of reactionary political groups have participated in the process of popularizing new analogs for words such as "woman", "wilderness", and "environment". Today, the word woman now is associated among certain segments of the population in the West with a wide range of possibilities. The new analogs include scientist, engineer, doctor, artist, and so forth. Wilderness, until recently in the West was associated with wildness and thus a source of danger that had to be brought under human control. Within environmental and conservation circles wilderness is now associated with healthy ecosystems and what needs to be conserved. The metaphor, "environment", while still being associated with what needs to be economically exploited, is increasingly being associated with what sustains life—which leads to clarifying the differences between healthy and degraded environments.

The key point is that if educational reforms are to foster greater reliance on ecological intelligence on the part of today's citizens, it will be necessary to give greater attention to the many ways in which language continues to reproduce the earlier forms of intelligence that took-for-granted the cultural assumptions that can be traced back to earlier thinkers such as Plato's emphasis on abstract ideas, John Locke's analogs for establishing how to understand individual ownership of property, Rene Descartes' understanding of intelligence and human/nature relationships, Adam Smith's misinterpreted idea of free markets, Herbert Spencer's analogs for the linear ordering of the development of cultures from primitive to civilized, and the reliance by some scientists upon mechanistic analogs for understanding ecological systems. The list of historical sources of today's silences and misconceptions can be extended, and when the impact of the linguistic colonization of other cultures is taken into account, the need to do

an archeology of linguistic colonization will become more evident. A good place to start in clarifying the nature of the linguistic colonization of other cultures can be found in the essays in Wolfgang Sachs' edited book, The Development Dictionary: A Guide to Knowledge as Power (1992) and in Peter Muhlhausler's Linguistic Ecology: Language Change and Linguistic Imperialism in the Pacific Region (1996).

How to become aware of the cultural and natural ecologies we participate in on a daily basis. Learning to think ecologically will require, as stated above, relying upon a vocabulary that has been informed by analogs derived from current understandings of the different forms of information exchange that sustain the cultural and natural systems—or to use Bateson's phrase, becoming aware of the “patterns that connect”. But the grip of the past is difficult to shake off. The legacy of Western philosophers and political theorists can still be seen in how the idea that we are autonomous observers of and thinkers about an external world is still taken-for-granted by most university graduates. The idea that change is inherently progressive can be seen in the current expectation that as soon as the economic downturn is reversed, everyone—including corporations—will get back to achieving more progress for themselves. Which will mean more progress in consumerism and the accumulation of personal wealth.

One of the characteristics of being born into a language community that makes explicit only a limited range of its taken-for-granted patterns and ways of thinking is that what others take-for-granted often becomes part of one's natural attitude. And the ongoing languaging processes continue to reinforce the stock of knowledge (including prejudices and silences) that others take-for-granted. This process of socialization goes on in every classroom, even in graduate level classes. Contrary to what some educational reformers want to believe, not all of what the student is socialized to accept at the taken-for-granted level of awareness is oppressive. Indeed, this judgment cannot be made until the taken-for-granted cultural patterns are made explicit and examined in terms of whether they strengthen community mutual support systems, traditions of moral reciprocity, and contribute to lifestyles that have a smaller ecological footprint. Unfortunately, ideology as well as the limitations in the classroom teachers' and university professors' own knowledge of the patterns and interdependencies of the local

cultural and natural systems too often lead to the idea that socialization should be done away with—as if this were a possibility. Even the educational goal of emancipating students from the influence of their culture, and thus from history itself, is based on western Enlightenment assumptions.

This double bind remains a problem that needs to be recognized at all levels of the educational process, including classrooms, talk around the dinner table, through the media and video games, in churches. As long as learning from the different forms of information exchange within the local cultural and natural systems is marginalized by the old beliefs about the primacy of the individual's ways of seeing and knowing, the idea that progress is inevitable, and that abstract knowledge and ways of communicating (cell phones, text messaging, email, books) are the only sources of individual empowerment and social progress, we will be unlikely to make the transition to a culture that is based on ecological intelligence. As some readers may jump to the conclusion that I am saying we must abandon the idea of individualism, progress, and the use of print and other forms of de-contextualized communication and learning, I must emphasize that this is not what is being suggested. Rather, we need to recognize how these long-held cultural assumptions need to be made explicit and modified in ways that take account of how we are participants in cultural and natural systems where the former is dependent on the self-renewing capacity of the latter. We also need to recognize what can be called the cultural amplification characteristics of different technologies, as well as the aspects of culture they marginalize. Similarly, we need a better understanding of the advantages and limitations of both print and oral based communication.

Suggestions for educational reforms that foster ecological intelligence. I know I am inviting the kind of judgment that reflects the very mind-set that we have to move beyond when I suggest that many oral cultures have developed ecological intelligence that has been shaped by their bioregion and their mythopoetic narratives. However, I am not suggesting that we should copy the ecological intelligence of different oral cultures. When I first introduced the idea of the cultural commons into the discussion of the priorities that should guide educational reforms, some readers suggested that I failed to understand that we cannot return to the 15th century. A British critic even suggested that I

needed to recognize that the commons were enclosed at the beginning of the Industrial Revolution. These critics failed to understand that the cultural commons are part of everyday life in urban communities across North America—as well as in every community in the world. Moreover, their lack of understanding led to thinking in terms of a linear pattern of cultural development—thus their association of the cultural commons with backwardness. In learning about the different ways in which some oral cultures have developed ecological intelligence, it is possible to recognize common characteristics that we may be able to learn from. I say “maybe” as the dominant ways of knowing in the West, which have emphasized understanding human/nature relationships, cultures and social classes, and approaches to knowledge in terms of hierarchies, may be so deeply entrenched as part of our taken-for-granted reality that anything associated with the so-called “primitive” oral cultures will be rejected as romantic nonsense.

Sean Kane has also observed a common trait among oral cultures that must become part of our approach to achieving a form of ecological intelligence that goes beyond the instrumentalities of western science and technologies. In Wisdom of the Mythtellers (1994) he writes that

Beyond community, but not far behind it, there is nature. For the oral societies that live by hunting and fishing, nature was the very source of voices. It was like a huge, infinitely resonant drum....Thus the discourse of the mythtellers is ultimately the discourse of nature overheard in something of their indigenous organization. That discourse has since narrowed itself to a condition that best be called *homophony*. The term denotes the reduced sound of human language when it is used under the assumption that speech is something belonging only to human beings, and when ‘other-than-human persons, both animal and plant, have been disenfranchised—defined or spoken out of discourse into dumb brutes or unconscious vegetable matter, each depersonalized by man the cosmic orator, the name caller’ (pp. 190-192).

That other oral cultures share essentially the same idea that the natural environment communicates in ways that are vital sources of information and wisdom of how humans should live can be seen in the title of an exchange between Derek Rasmussen (a Euro-Canadian working in the north) and Tommy Akulukjuk (born in Iqaluit, Nunavut).

Heading the introduction to their joint article on “Arctic Environmental Education in the Language of the Land” is Akulukjuk’s statement that “my father told me to talk to the environment first before anything else”.

In explaining the Quechua understanding of interspecies communication, Grimaldo Rengifo Vasquez (co-director along with Jorge Ishizawa of PRATEC, which is translated in English as Andean Project of Peasant Technologies) describes the nature of communication that is central to the Quechua approach to ecological intelligence.

“Conversation,” he writes,

requires, as everything in life, to be nurtured and stimulated, in order for life to be re-created. A prerequisite in this nurturance is that we all be disposed to listen perpetually and in each circumstance to the ‘speaking’, to the sign of each one. Since Andean life does not repeat an archetype but is instead capricious, it is necessary for everyone to be attentive to the often unpredictable signs that emanate from all the others—signs that will not be spoken again in the way expressed in a particular moment....Each one in every moment is saying something, and one has to converse with this ‘sign’ that indicates something to us and says something at the same time that invites us to give an answer. (Apffel-Marglin, 1989, p. 105-6).

Keith Basso’s book, Wisdom Sits in Places: Landscape and Language Among the Western Apache (1996) is part of a revival of the interest in how the vocabulary of indigenous languages has been influenced by intergenerational observation of the ecology of signs that circulate and sustain the natural systems that humans interact with daily, and the stories that pass on the place-based wisdom of earlier generations. When the place-based wisdom acquired over many generations of careful observation is replaced by the industrial model of thinking what is left is a language that leads to attributing to plants and animals attributes that reflect a concern with their market value and human usefulness. In effect, the language reproduces how the culture understands the attributes of the Other—and the nature of the attributes, in turn, influences what is regarded as moral behavior toward the Other. For example, the act of naming a plant as a weed or a desert as being empty carries with it the culture’s moral categories and judgments that in turn become the basis of human action. A weed carries the connotation of being not only

useless but also a threat to neighboring plants—and thus must be uprooted or exterminated with a pesticide. The desert, which is understood as empty and thus lacking in value, can be turned into an atomic test site or used as a garbage dump. The culture's moral codes that are reproduced in its vocabulary too often legitimate behaviors that have ecologically damaging consequences, as well as reinforce the mistaken idea that plants, animals, and other features of the environment can be understood as discrete entities—and not interactive participants in the larger web of life.

By way of contrast, a study of the languaging processes of many oral cultures reveals that indigenous languages influenced by interspecies communication are ecologically moral languages. In the case of the Quechua and Aymara of the Peruvian Andes, this moral language is responsible for the ecological diversity of plants that is under assault in regions of the world where western instrumental and profit-oriented approaches to agriculture have become dominant. The practice of ecological intelligence among the Quechua and Aymara, where interspecies communication plays a prominent role, is summarized in Jorge Ishizawa's explanation how cultural affirmation is practiced. As he observed,

... cultural affirmation is the process by which peoples who live in a place remember and regenerate the practices of their ancestors nurturing their *pacha* (local world) and letting themselves be nurtured by it. Since in the case of the central Andes, this local world is agrocentric, nurturance is the mode of being of the Andean *pacha*. Andean cultural affirmation is the continuous regeneration of this mode of being....An expression...found in both languages (Quechua and Aymara) is 'we nurture while being nurtured' (200?, p. 4).

In Bateson's language, the "difference which makes a difference" which constantly circulates among all the participants within the *pacha* are sources of information that must be responded to with a nurturing attitude—as the life of humans, plants, and animals are mutually interdependent. In effect, these cultures that may go back over eight thousand years have been able to sustain life in a wide variety of ecological niches by practicing a form of ecological intelligence influenced by a cosmivision that makes nurturing rather than human domination the central feature of life renewing processes.

Given that the dominant mythopoetic narratives in the West have represented humans as superior and thus in control of the natural environment, it might be assumed that this major obstacle to developing ecological intelligence can be overcome by promoting outdoor education. There is no doubt that there are often character changing benefits from outdoor experiences, but too often outdoor education, like so many other characteristics of public and university education, reinforces a number of assumptions that are seldom examined. One of these assumptions is that learning about the various natural systems can be kept separate from what is being learned in other parts of the curriculum that are based on the deep cultural assumptions that support the individualistic/consumer/ industrial-oriented lifestyle. Another assumption is that students will use their outdoor experience for constructing their own ideas, values, and stories—all of which are quickly replaced by the next experiences the students moves onto. A third problem is that these experiences, even when they involve participating in environmental restoration projects, usually fail to address the reforms that will reduce the ecological footprint of individuals and communities that have been shaped by the ideological requirements of the industrial/consumer oriented culture. The environmental education projects I have observed in public schools and in universities introduce students to some of the basic elements of ecological thinking. But they also reinforce thinking in categories that perpetuate the long-standing tradition of keeping the environment and culture as separate domains.

Educational reforms fostering ecological intelligence must introduce students to a more complex understanding of culture—including the environmental consequences of the different ways in which cultures encode and reproduce their knowledge systems. Students need to learn how the languaging processes that range from the spoken and written word to built environments carry forward earlier forms of cultural intelligence and the ecologically problematic moral values of the past. They also need to learn about the ecological and community enhancing differences between the local cultural commons and the forces that transform everyday life in commodities and monetized relationships. Other cultural approaches to ecological intelligence should also be studied. This will require a break from two traditions in education that have failed to engage students in a

deep understanding of the cultural patterns that most students (and as adults) take for granted..

The dominant tradition in western education has been to provide students in the non-science areas of the curriculum with abstract explanations about events, other people's beliefs and practices, and so forth. The assumption has been that the printed word (or talk based on knowledge acquired through the printed word) provide accurate representations of the external world that students need to learn about. But abstract words, framed by the assumptions that co-evolved with the ascendancy of print over oral patterns of encoding and passing on knowledge, generally do not lead to a careful consideration of the student's own cultural experiences. Reading textbooks, listening to lectures, and now computer mediated learning which also carries forward the tradition of thinking that is divorced from cultural contexts and the culturally mediated embodied experience of the student, were and continue to be the dominant features of this approach.

Another approach to education found mostly in the public schools involves a combination of abstract learning and, now, an emphasis on students constructing their own knowledge. While there is always an element of interpretation that is influenced by the students' previous experiences and taken-for-granted ways of thinking, the emphasis on students constructing their own knowledge has too often been based on the assumption of autonomous individuals who are free of cultural influences. The classroom teachers who promote this so-called discovery approach to learning are, like the students themselves, largely unaware of the importance of making explicit the otherwise taken-for-granted cultural patterns.

There are exceptions that can serve as models for breaking from the old patterns of thinking. For example, classroom teachers and university professors demonstrated how to make explicit otherwise taken-for-granted cultural patterns when they began to take seriously racial and gender discrimination. Unfortunately, with few exceptions, they have not made the cultural patterns that are deepening the ecological crises part of their curriculum and pedagogy. Recycling programs and school gardens, while important, fall far short of addressing the cultural roots of the double bind thinking where we continue to emphasize a consumer-based economy while at the same time receiving scientific report after report that the viability of natural systems is being rapidly degraded.

Making explicit the patterns and systems of information exchange that are part of the students' cultural ecology is the first step toward fostering ecological intelligence. It is also the step that needs to be taken if we are to replace the ecologically and culturally uninformed analogs of earlier eras that still influence much of today's language and thinking. The analogs that are consistent with the life and community sustaining patterns of natural and cultural ecosystems are part of everyday experience but go largely unnoticed because of the knowledge status system still perpetuated by public schools and universities. Current culturally and ecologically informed analogs are also being ignored for another reason. That is, most classroom teachers and university professors share the same cultural assumptions discussed earlier as providing conceptual direction and moral legitimacy for the industrial/consumer-oriented culture that is being globalized. Most also share the reductionist Enlightenment thinking about the nature of tradition, along with the bias against the knowledge systems of oral cultures that are not driven by the unending quest for progress. Given this mindset, it is understandable why the educational process, except in a few disciplines such as anthropology and cultural linguistics, has not developed a tradition of helping students understand the connections between different bodies of knowledge and local cultural contexts—including the student's own culturally mediated experiences.

The key to exercising ecological intelligence is being able to recognize how one's own cultural patterns are part of larger field of cultural patterns being reenacted by others—patterns that have also been passed along for generations. The other main feature of ecological intelligence is in recognizing how one's ideas and behaviors introduce changes that circulate throughout the network of social relations. It also involves recognizing the impact of these changes on the natural systems that are also part of the larger field of experience. The curricular changes that need to be introduced from the early grades through graduate studies is to focus on the tensions and contradictions between what is intergenerationally passed along as part of the legacy of abstract ideas and values (encoded in the context-free printed and spoken words—such as in lectures) and the interactive patterns that constitute the cultural and natural systems that the individual is always participating in. Hopefully, the following examples will clarify how reframing the meaning of words by identifying new analogs is essential to making the

transition to an ecological form of intelligence. The following examples can be multiplied many times over.

The current ways in which students learn to think of themselves as autonomous individuals is reinforced in many areas of the market-oriented culture. In classrooms they are continually being told to make up their own minds, to think for themselves, to choose their own values, to acknowledge when they borrow ideas from others, to respect copyright laws, to own their own property, to continually preface their sentences with the personal pronoun “I”, as in “I think”, “I see” and so forth. Given these historical cultural cues of how to think of oneself there is little inclination to give attention to the cultural patterns that are mostly learned at a taken-for-granted level of awareness. The challenge for the classroom teacher and university professor is to help students focus attention on the ecologically problematic cultural patterns, and to become aware of how interacting with significant others influences their own sense of self identity and what they will take for granted. Giving attention to the history of words that would otherwise be taken-for-granted would help illuminate how they unconsciously reproduce earlier ways of thinking—whether it is the subject, verb, object patterns of expressing themselves, how they perpetuate the same silences of earlier generations, and rely upon the analogs settled upon by earlier thinkers. Focusing the students’ attention on the mutual dance of non-verbal communication that is an integral part of how they participate in the ecology of information exchanges would help make explicit the myth of their autonomy as culture-free individuals.

Having students describe the many ways they are dependent upon natural systems would also help reframe their understanding of self as interacting with and dependent upon both cultural and natural systems. As the students become more aware of the cultural patterns that are part of daily experience it then becomes possible for them to question the cultural and historical origins of the idea of the autonomous individual. This line of inquiry also needs to take into account not only the connections between the historically influenced idea of individualism required by the environmentally destructive Industrial Revolution but also how this idea of individualism has led to positive developments such as in the area of civil liberties and in challenging various forms of oppression.

As students progress in the educational process and acquire a wider range of experience it then becomes possible to trace the origins of different views of individualism both in the West and in other cultures. How different western ideologies represent the rights of the individual also needs to be considered. What has to be kept in the forefront is how different views of individualism contribute to living within environmental limits and improving on the heritage that will be left for future generations. This issue of how an ecological perspective alters the self-image of the individual and raises the question of the nature of her/his intergenerational responsibility is dependent upon a careful mapping—or what can be called an autoethnography--of the cultural and natural systems that are part of the individual's culturally mediated embodied experience.

The language issues discussed earlier should be the focus of the curriculum that fosters an understanding of the differences between the student's exercise of ecological intelligence and the forms of intelligence inherited from earlier non-ecologically aware thinkers such as Rene Descartes and John Locke. The key issue in the early grades is to focus on the simple yet ignored insight that words have a history—and then to introduce examples of analogs carried forward from the past. Also, students from different cultural backgrounds should be encouraged to identify the analogs that their culture associates with the meaning of words. At the university level, the study of the cultural influences on how the meaning of words were understood in the past would include examining the cultural contexts that earlier thinkers were responding to, such as John Locke's attempt to establish a basis for private property as the transition was being made from the property systems of feudal cultures. Also, the university needs to promote an in-depth study of cultures that have developed a form of intelligence and metaphorical language that takes account of the sustainable characteristics of natural systems in their bioregion.

The development of ecological intelligence will not occur if another linguistic legacy of Enlightenment thinkers remains unchallenged. A more complex understanding of the word "tradition" is essential if students are to learn how to participate in the local cultural commons that needs to be revitalized if they are to become less dependent upon a consumer-based lifestyle. It is also essential to recognizing the political traditions that safeguard against the rise of the modern political phenomena of fascism—safeguards

now under threat from radio demagogues and politicians who appeal to the large segment of the public that associates patriotism with being told how to think. Tradition is an especially important word in this era of global warming, thus the extended treatment being given here. For most public school and university teachers, the word “tradition” carries forward the political/moral agenda of earlier Enlightenment thinkers that still influences the thinking of today’s social justice advocates. Many of them identify with the word “progressive” in order to communicate their view that traditions impede rational thought, the introduction of new ideas and technologies, and protect the interests of exploiters and other anti-social groups. This view is widespread in both public schools and universities.

When I was teaching a class of future teachers I would ask how they would explain the nature of traditions to students—and most would identify traditions with holidays. Jewish as well as students from other cultures who had not yet been fully socialized into the progressive way of thinking explained tradition in more complex ways. By recognizing that the mistake of Enlightenment thinkers was in identifying traditions only with what were horrifically unjust practices, it is possible to recognize that as a metaphor it is inclusive of the temporal aspects of culture. Unfortunately, the unexamined way in which contemporary thinkers accept the insights and reductionist thinking of earlier times has led to many students being socialized into thinking that traditions, except for holidays, stand in the way of progress—even though most of their daily lives are dependent upon the re-enactment of traditions that are sources of empowerment, as well as sources of behaviors that are socially and environmentally problematic. The bias perpetuated in public school and university classrooms can be seen in the way critical thinking continues to be explained as leading to progress, but seldom associated with identifying the traditions that need to be conserved—such as all the intergenerational knowledge and skills that enable people to be less dependent upon consumerism, and the civil liberties now threatened by progress in the development of surveillance technologies.

The curriculum that introduces students to a more complex understanding of how their lives involve the re-enactment and modification of traditions—even traditions that limit self-discovery of talents and interests as well as have a destructive impact on natural

systems—is essentially the same as the curriculum for developing the ecologically informed vocabulary essential to ecological intelligence. Instead of introducing students to the abstract word “tradition”, along with all the analogs that represent it as a source of backwardness and injustice (some of which are real), students should be asked to do an auto-ethnography of the daily experiences that involve the re-enactment of traditions.

As most of cultural traditions are part of the everyday background of taken-for-granted experiences, the extent that people re-enact traditions can be made explicit by inviting into the classroom craftsmen and women as well as representatives from various professions. Asking the local plumber, carpenter, and organic gardener what ideas, skills, and technologies they have discovered for themselves and what traditions within their trade they have learned from previous generations will provide concrete examples of how traditions are carried forward as sources of empowerment. A lawyer can be asked the same question, and students will start obtaining an understanding of complexity and importance of the traditions that underlie the rule of law and their Constitutional rights. Social justice advocates, along with the others invited to share with the class, will be able to identify traditions that are exploitive and sources of silences—as well as the traditions that help to justify needed reforms. This approach to nurturing ecological intelligence stands in sharp contrast to presenting the word tradition as an abstraction that has a singular and universal meaning. The expanded meaning comes from giving attention to the analogs derived from the auto-ethnography of the students and others in the community. The auto-ethnographies can be focused on the ecologies of the cultural commons as well as on the ecologies of consumer/industrial relationships with the natural environment. The further along the student is in the educational system, the more complex issues surrounding different traditions can be introduced—such as the role of traditions in the areas of science, technology, ideologies, religious beliefs, the cultural commons, and the forces of enclosure.

The meaning of other words in the modern Western vocabulary can be reframed by exploring the tensions and silences between their abstract use and the meaning they take on from a careful mapping of life experiences in the cultural/natural ecosystems. Textbooks and other sources of the printed word (including electronically printed words) that purport to pass on knowledge may be useful as examples of historical

misconceptions and ethnocentric thinking, but they are no substitute for learning to recognize the “patterns that connect”, to recall Bateson’s phrase, in culture and natural systems that students interact with.

Lectures and the teacher-talk that often frames the students’ experiential learning are not likely to be entirely replaced by computer-based learning—which is itself a powerful source of indoctrinating students to the taken-for-granted assumptions of the people who create the software programs. These traditions are not likely to disappear—even with global warming and the changes taking place in the chemistry of the world’s oceans. Hopefully a new tradition can be started, one that involves the classroom teacher and university professor playing the role of mediator in helping students become explicitly aware of the differences between their non-monetized experiences in the local cultural commons and their monetized relationships and activities. The role of the mediator is not to provide the explanations for how students are to think, but to ask questions about the issues and impacts on community and natural ecosystems as students move between the cultural commons and the increasingly monetized culture. As many students move between these two profoundly different realms of the culture they often are unaware of what is being taken for granted. Thus, the need for the mediator who can raise the questions that would not otherwise occur to most students, especially when they have become addicted to consumerism. The questions will help bring to the attention of students how they are embedded in the web of taken-for-granted cultural patterns. This is necessary if students are to learn how to think ecologically.

The mediator’s role also involves encouraging students to learn about the different forms of enclosure of the non-monetized and intergenerationally connected cultural commons—including how these different forms of enclosure (or transformation from what is shared largely outside of a money economy into what requires dependence upon a money economy) contribute to poverty and increased dependency upon forces over which individuals and communities have little control. Encouraging students to learn about the traditions of community self-sufficiency and mutual support, as well as the traditions of enclosure that can, in some cases, be traced back centuries, is also a responsibility of the mediator (Bowers, 2008, pp 57-74).

Ecological intelligence can be summarized as learning from the complexity of the interactive cultural and biological patterns and dependencies, and to making decisions that contribute to the mutual support and moral reciprocity within the community. Another criterion that ecological intelligence must meet is that it does not further degrade the viability of the natural systems. It also involves not being limited by earlier ways of thinking that are based on the myths of unending progress, the ability of rational thought to bring nature under technological and economic control, and the quest for greater individual autonomy. Unfortunately, most of what is being learned in public schools and universities involves perpetuating these myths, which are made more difficult to recognize as myth because of the emphasis on fostering the critical thought of the student and the need for emancipation from the past. As mentioned earlier, these seemingly laudable goals are also what the promoters of the consumer-dependent/industrial culture want to achieve by transforming what remains of the cultural commons (which includes our civil liberties) into the new markets that serve the interests of market liberals. What has escaped the attention of the proponents of student initiated critical thinking is that it is difficult to think critically about what is taken for granted. This holds for adults as well as students. Students in the early progressive schools of the Deweyian era did not become aware of racism and sexism, and students in the free classrooms of more recent times did not become aware of how their patterns of thinking contribute to the ecological crises. The teacher's and professor's role as a mediator is to ask the questions that will lead students to recognize the cultural patterns and silences they would otherwise ignore—and thus continue to be controlled by.

There are two other sources of resistance that impede the fostering of ecological intelligence. The first relates to the difficulty of classroom teachers and university professors to become aware of the deep cultural assumptions they learned as they became members of the language community. That these assumptions were further reinforced in an educational process that was falsely represented as contributing to a life of rational self-direction, as well as by colleagues within their discipline, creates the double bind of relying upon the interpretive cultural frameworks responsible for the distinction between high and low-status knowledge. Few recognize that what has been relegated to low-status knowledge is the intergenerational knowledge and skills that enable people to be less

dependent upon the monetized and commodified culture. And few recognize that the high-status knowledge being promoted in the curriculum underlies the consumer-dependent/industrial culture that is, over the long-term, ecologically unsustainable.

The other source of resistance will be equally difficult to change, mainly for reasons having to do with the fact that it is regarded as one of the highest values within the academic community. What now enables the majority of the non-science and non-technologically oriented faculty to pay only lip service to the environmental crises, or to ignore it entirely, is the tradition of academic freedom. This tradition has led to many genuine contributions in achieving greater social justice, improving the quality of daily life, and in allowing some faculty to examine environmental issues that seemed initially to be outside of the legitimate boundaries of the discipline. In suggesting that academic freedom has now become a source of resistance to fostering the ecological intelligence, I am not promoting the idea that it should be done away with. It is needed more than ever in this political climate that has seen a major segment of the voting public supporting the loss of civil liberties, the use of torture, the unprovoked invasion of Iraq that has led to the deaths of tens of thousands, and aggressive efforts to restore the traditions of placing profits above a concern with the well-being of workers and the environment.

The problem is that academic freedom is now being used by many faculty to ignore the nearly daily scientific reports that the world's cultures are moving toward a tipping point in terms of global warming and thus toward a scale of human catastrophe that cannot be reversed if the world's oceans and sources of potable water continue to be degraded. Scientists are warning that fundamental cultural changes must be undertaken even though the changes may be too late to slow the rate of global warming and to limit the changes taking place in the chemistry of the world's oceans. Many departments in the social sciences and humanities now have a faculty member or two who are engaging their students in a discussion of environmental issues—mostly by having them read the writings of environmentalists. This raises awareness but falls far short of enabling students to learn how to live more community-centered and less consumer-dependent lives. Unfortunately, a majority of faculty in these departments continue to teach the same courses and to pursue the same research as though the environmental crisis does not exist. If asked why they are ignoring the need to begin asking how the traditions within

their discipline may have contributed to the multi-layered crisis we now face, they will claim that the tradition of academic freedom, which is based on the assumption of an inherently progressive world, safeguards their right to exercise their own judgment about what will be taught in their classrooms and what they will publish.

As finding a solution to this double bind is especially daunting, perhaps we can learn from how faculty who were equally recalcitrant in recognizing that gender bias permeated every aspect of the university, ranging from whether women were qualified to teach in areas traditionally dominated by men, the issue of unequal pay, to the exclusion of women's scholarship and voices, were forced to rethink what was previously taken for granted. If we consider the history of the changes that have taken place on the issue of gender bias, we can see that students as well as the threat of lawsuits and federal legislation played an important role. Sexist professors were often openly challenged and their courses boycotted. Their biases were held up against the social justice standards to which they gave lip-service, and the exposure eventually led to change. Perhaps students now need to ask their professors how learning about the ideas of Plato, Descartes, such contemporary thinkers as Richard Rorty and John Dewey, the latest findings in brain research, and the literature of the past, contributes to understanding the many ways in which taken-for-granted cultural patterns of thinking are complicit in deepening the ecological crises. If faculty took seriously the ecological crisis as a crisis in cultural ways of knowing, what they now teach could be reframed in a way that allows thinking about the traditions that have contributed to the problems we now face or made positive contributions—as is the case with our assumptions about progress and individualism. People who are committed to addressing the interconnections between cultures and environments need to start focusing attention on what is being taught in public schools and universities—and not accept the current thinking that new technologies and the findings of scientists will avert the catastrophe that lies ahead. The ecological crisis is inextricably linked to the crisis in culture—which is linked to the crisis in education.

References

- Basso, K. 1996. Wisdom Sits in Places: Landscape and Language Among the Western Apache. Albuquerque, NM: University of New Mexico Press.
- Bateson, G. 1972. Steps to an Ecology of Mind. New York. Ballantine Books.
- Bowers, C. 2008. Toward a Post-Industrial Consciousness: Understanding the Linguistic Basis of an Ecologically Sustainable Vocabulary. Eugene, OR.: Eco-Justice Press www.cabowers.net.
- Ishizawa, J. 2002. "Notes for an Epistemology for the Affirmation of Cultural Diversity in the Central Andes" . Lima, Peru. Unpublished manuscript.
- Kane, S. 1994. Wisdom of the Myhtellers. Peterborough, Ontario: Broadview Press.
- Klein, Naomi. 2007. The Shock Doctrine: The Rise of Disastrous Capitalism. New York: Metropolitan Books/Henry Holt.
- Moen, P., Elder, G., Jr., and Luscher, K. (editors). 1995. Examining Lives in Context: Perspectives on the Ecology of Human Development. Washington, DC: American Psychological Association.
- Muhlhausler, P. 1996. Linguistic Ecology: Language Change and Linguistic Imperialism in the Pacific Region. London. Routledge.
- Nevett, L. 1999. House and Society in the Ancient Greek World. Cambridge, U.K.: Cambridge University Press.
- Polanyi, Karl. 2001 edition. The Great Transformation: The Political and Economic Origins of Our Times. Boston: Beacon Books.
- Reddy, M. 1979. "The Conduit Metaphor—A Case of Frame Conflict in Our Language About Language". In Metaphor and Thought, edited by Andrew Ortony. Cambridge: Cambridge University Press. Pp. 2884-323).
- Rengifo Vasquez, G. 1998. "The Ayllu". In Apfell-Marglin, F. (editor) The Spirit of Regeneration: Andean Culture Confronting Western Notions of Development. London: Zed Books. Pp. 89-123.
- Sachs, W. 1992. The Development Dictionary: A Guide to Knowledge as Power. London: Zed. Books.
- Worster, D. 1990 edition. Nature's Economy: A History of Ecological Ideas. Cambridge, U.K.: Cambridge University Press.

Chapter 3 Educating Students About the Political Economy of the Cultural Commons and the Nature of Sustainable Wealth

People of all ages are awakening to a reality that has been hidden by years of seemingly limitless consumerism and the expectation of life-time employment. This has been an evolving reality marked by increased automation, caution-to-the wind expansion of manufacturing capacity, outsourcing of jobs to low-wage regions of the world, the breakdown in the social contract between employers and employees, and the increasing sense of entitlement that the leaders in corporate America assume gives them the right to millions of dollars in compensation regardless of their performance. The consequences of these largely ignored realities are now impacting the lives of both students and adults. Unemployment and working for a minimum wage (if that is even available), the threat of losing one's home to foreclosure, the inability to pay for health care, growing food insecurity, and the reduced hopes for further education, are the realities now experienced by millions of people. To rework Charles Dickens' famous phrase, the best of times are now turning into the worst of times.

The spread of poverty continues with little hope in sight, especially now that fear is replacing the myth of unending progress in accumulating more material wealth. The fear, and sense of helplessness that accompanies it, are based on years of being socialized by the media and other consciousness shaping forces to equate wealth with gains in the money economy. In short, the amount of money one acquires has become the measure of wealth. This narrow understanding of wealth has led to a competitive form of politics where the achievement of success requires advancing one's own economic interests at the expense of others. Individuals, families, and ethnic groups gained in wealth as they took advantage of the marginalized and thus politically powerless, just as the wealth of corporations depended upon paying the workers as little as possible. Indeed, the more economically vulnerable the workers, the more easily they can be underpaid and their past gains in the workplace revoked. The role of government, as many market liberals understand it today, is not to impose limitations on industrial capitalism—while being ever-ready to pass legislation that furthers the interests of corporate lobbyists who provide the money necessary for election. In short, the form of politics essential to an industrial/market/consumer economy operates behind the façade of

being democratic, but continues to be based on the competitive pursuit of self-interest where money determines, with few exceptions, who will be the winners and losers in achieving greater material wealth.

This form of politics also ensures that the pursuit of profits will also ensure that the fate of natural systems will continue to be an “exploitable resource”. It must be acknowledged, however, that there is an increased awareness that environments are being degraded in ways that will further diminish the material wealth of this and future generations. This awareness is now creating greater tensions between political factions. Unfortunately, nearly half of the voting public still thinks of the free market ideology, and its underlying assumptions, as having the same status as the law of gravity. For the majority of these followers of Adam Smith and Milton Friedman, environmental changes are part of the natural cycles that have occurred over millions of years, and cannot be attributed to the excesses of human behavior.

The failure of public schools and universities to challenge the dominant cultural assumptions that underlie the political and economic system that equates wealth with the possession of money, and the credential system that provides access to power and money, has left most people ignorant of how to avoid sinking further into poverty and hopelessness. Part of the failure of these institutions, which is reproduced by their graduates who use the media to promote the same misconceptions and silences, is in not introducing students to a more complex and community grounded understanding of the sustainable forms of wealth that represent alternatives to what is dependent upon the money economy. The failure is partly linguistic, partly rooted in the high-status accorded to abstract knowledge and patterns of thinking, and partly rooted in a combination of cultural developments connected with the rise of science and what has become the mythic foundations of modernity. These mythic foundations include the idea of the autonomous individual, the progressive nature of change, the culture-free nature of the rational process and critical inquiry, an anthropocentric view of human/nature relationships, and the Darwinian view that the competitive nature of free markets will determine which genes and cultural memes are best fit to survive. It is important, however, to recognize that not all members of local communities or ethnic groups in North America have based their lives on these assumptions. Indeed, many have discovered the non-monetized forms

of wealth that have largely been ignored in the curricula of public schools and universities.

These non-monetized forms of wealth have not only been important to sustaining the lives of people locked out of the money economy, but are also taken-for-granted by people who live well above the poverty line. Because these non-monetized forms of wealth have been accorded low-status and thus omitted from the education of most public school and university graduates, they are caught in a double bind that they are not aware of. They lack an explicit awareness of the non-monetized community and intergenerational forms of wealth they rely upon, while at the same time they look forward to a return to the days of unbridled consumerism and life-time employment. The reality they will encounter in the future will be quite different. Automation, outsourcing, and downsizing are here to stay. In addition, the primary need of the industrial system of production and consumption to expand will lead to turning more of the non-monetized relationships and activities into new market opportunities— thus further increasing people’s dependence upon the money economy. Because of the historical roots of this system of production, and the cultural assumptions upon which it is based, it has not occurred to most people that the individualistic, competitive, consumer-dependent lifestyle, and its accompanying form of politics, is not ecologically sustainable—even over the short run. This double bind is more than a phase. It now describes the embodied experiences of millions of people who seek a return to the halcyon days, but are unable to recognize that those days will not return—and are unable to recognize the alternative forms of wealth that are part of the cultural commons of every community.

The task here is to clarify the forms of wealth intrinsic to the cultural commons, including how it differs from the wealth needed to participate in the money economy. Money is useful in many ways, and will continue to have a role to play in facilitating exchanges in the larger world. Its role, however, will be reduced by environmental as well as by global technological and cultural changes. These changes may range from Third World cultures resisting the western model of development to the collapse of the modern state that we are now witnessing in some regions of the world. It is now imperative that people obtain an understanding of the unique characteristics of the wealth that is available in the local cultural commons. The wealth of the cultural commons takes

many forms and has the following unique characteristics. It enables people to discover interests and talents that lead to less stressful and thus less medically debilitating lives, to lifestyles that have a smaller adverse impact on the ability of natural systems to renew themselves, to alternative ways of reducing dependence upon processed foods that are both costly and often unhealthy, and to maintaining the local traditions of participatory decision-making that safeguard against the further undermining of democratic decision-making.

A second task is to clarify the form of politics that supports the alternative economies of the cultural commons that vary from culture to culture. This task may seem rather straight forward, but it needs to be recognized that hundreds of years of mis-education are responsible for the difficulty many people have in recognizing the nature of their local cultural commons—even as they tacitly rely upon them as part of their everyday lives. There are also the problems of misinterpretation where readers will reach conclusions that reflect their own unexamined taken-for-granted assumptions—and, in some cases, romanticize the idea of the cultural commons rather than recognize examples of the cultural commons that do not fit current norms of social and ecological justice. There is also the challenge of introducing new ways of understanding the meaning of words as well as recognizing that words such as “wealth” and “commons” have different meanings in different cultures and in different historical periods in the West. Hopefully, these sources of resistance will not hamper efforts to consider the educational reform implications of introducing students to the political economy of the cultural commons, or the policy issues required to achieve a better balance between participating in the money economy and the lifestyles that are more engaged in renewing the cultural, and by extension, the environmental commons.

In order to understand how the cultural commons represent alternative forms of wealth it is necessary to go beyond abstract descriptions. Abstract descriptions found in printed texts too often are reduced to identifying what turns out to be general categories of intergenerational knowledge, skills and mutually supportive relationships—such as the growing, preparing and sharing of food, knowledge of the medicinal characteristics of plants and traditionally proven remedies, narratives and ceremonies, forms of artistic expression and craft knowledge, rules and practices that govern moral relationships and

forms of reciprocity, knowledge of how to adapt cultural practices to the life-cycles that sustain local ecosystems, and so forth. Each of these categories need to be understood in terms of culturally diverse local practices and, more importantly, the depth of background knowledge that the activities in each of these categories depend upon.

In order to grasp a partial understanding of how different aspects of the local cultural commons are dependent upon generations of accumulated intergenerational knowledge and skills it is necessary to do an auto-ethnographic account of how different aspects of the cultural commons are the basis of daily experience. Examples might include a description of how using recipes passed down within the family or through widely shared cultural practices is dependent upon knowledge gained and refined in the past. The auto-ethnography might focus on the background knowledge and intergenerational traditions that now lead to the taken-for-granted expectation that one's home will not be searched by government agents without a search warrant. Reliance upon proven techniques in framing the walls of a house, playing a piano, and following the rules of a game are also examples of intergenerational wealth that is the source of individual and group empowerment. Admittedly, it is difficult to do an auto-ethnography of the layers of accumulated knowledge and skills that are relied upon when participating in the cultural commons which we casually refer to as everyday life experiences. We are too often absorbed in completing the task at hand, and moving on to another task, to consider the knowledge and skills accumulated over many generations that we tacitly rely upon. The fast pace required by the increasing dependence upon technology and the need to participate in the cycle of work, consuming, meeting debt payments, contributes to a permanent state of cultural amnesia. Perhaps the even more overriding reason for the current state of ignorance of the wealth of the cultural commons is that it is largely taken for granted. Thus, what is taken-for-granted is often the tacit knowledge of skills, values, and activities that are relied upon in different physical and cultural contexts.

Unfortunately, when explicit awareness of the different forms of intergenerational knowledge and skills is lacking, outside economic and political forces may undermine or appropriate different aspects of the cultural commons without people knowing what has been lost. For example, important parts of our vocabulary have been lost to the forces of science and technology, just as non-western cultures have lost traditions of

intergenerational knowledge as their youth have been socialized to adopt the western assumptions essential to making them dependent upon an industrial/consumer-dependent lifestyle. Socializing the poor to the values and vocabulary that support dependence upon processed food, as well as the loss of intergenerational knowledge, has further undermined their health when they could more easily have afforded the basic ingredients that previous generations relied upon for a healthy diet. Examples of how not being aware of the wealth of intergenerational knowledge that represents alternatives to dependence upon the industrial/consumer-dependent lifestyle contributes to poverty and helplessness could be multiplied many times over.

Key characteristics of the wealth of the cultural commons: A primary characteristic among the diversity of the world's cultural commons is that the wealth of the cultural commons cannot be put in the bank, the stock market, or limited to a privileged few. Rather, it exists as the source of empowerment in daily practices, ways of thinking, patterns of moral reciprocity, as a source of self-confidence, as knowledge of what practices and policies have proven dangerous to life and community, as the accumulated knowledge and technical skill that lies behind every major advance in knowledge, social justice, and technology. Potentially, it is the most democratic form of wealth as it is shared through conversations, mentoring, observing others, as well as the through narratives and the other arts. Learning to think and communicate in the languaging processes of the community is the first step in acquiring the accumulated wealth of the cultural commons. Just as it makes more sense to think of language as a verb rather than a noun that turns it into an abstraction and object of analysis, it makes more sense to think of the wealth of the cultural commons as a verb—as existing in actions, performances, and relationships. Another characteristic of the accumulated knowledge, skills, and moral wisdom that is integral to many cultural commons is that as a form of wealth it cannot be lost through inflation or affected by the cycles of a money economy.

Indeed, as reliance on the money economy is threatened by the various excesses of greed, consumer debt, over-production, and collapsing markets, people become more aware of the need to rely on the wealth of cultural commons. The collapse of the economic system in Iceland is a prime example. As the source of money and employment dried up as a result of the failures occurring in the national and international banking

system, the people turned to sources of wealth that were part of their cultural heritage. That is, they turned to the wealth of their cultural commons. Instead of importing goods and services, the people of Reykjavik turned to the knowledge and skills passed down by their grandparents, who were themselves inheritors of the accumulated wealth of earlier generations. Instead of the descent into poverty, the people began to rely upon the wealth of knowledge that enabled them to create from wood, metal and fabrics items that could be exchanged or sold locally.

The current breakdown in the market economy has led to a similar recognition of the importance of the knowledge and skills of the local cultural commons. The increase in the number of individual and community gardens, the revival of interest in various crafts, the increase in volunteerism that in some communities has risen to over 36 percent of the local population and is focused on human needs ranging from food, repairing dwellings, restoration of local ecosystems to community performances. Local markets, as well as a revival of bartering and the use of local currencies, are part of the turn toward greater reliance upon the wealth of the local cultural and environmental commons.

This revitalization of the cultural commons is only a minor trend occurring across the nation, and does not yet represent a major shift in consciousness. The majority of Americans, even in being unemployed and facing foreclosure, are still hoping for a return to the days of a consumer dependent lifestyle and to taking their chances on achieving success in a money dominated economy. This expectation is being reinforced by politicians who are continuing to promise a return to the lifestyle required by the industrial system of production and consumption, even as they also warn that the deepening ecological crisis will require new advances in technology.

To obtain a fuller understanding of how people are dependent upon the wealth of the local cultural commons, even during years of a growing economy, it is necessary to consider what represents inherited knowledge and skill and what is original to the individual. Does the craftsman who is making a cabinet, violin, or framing the opening for a window, rely entirely on what she/he originates? Is knowledge of how to make the corners of a drawer that are both aesthetically pleasing as well as strong acquired through trial and error, or is it more often learned through a mentoring relationship, by following the advice of a neighbor or family member—or even following a manual? Did the Jonas

Salks and Albert Einsteins of the world rely upon the accumulated wealth of the cultural commons of which they were members in order to make their discoveries? In short, are there examples of cutting edge technologies or systems of thinking that do not depend upon a shared heritage? On a less lofty level, the craftsperson making a musical instrument is empowered when she/he can draw upon the knowledge accumulated by earlier generations about the sounds that will resonate from the use of different woods. Similarly, learning the rules of a chess game, the soil conditions and length of growing season for different plants, the way to prepare a curry and to preserve food, the patterns of meta-communication, and the established procedures to follow when one's civil rights have been violated, are everyday examples of the widespread reliance on the shared wealth of the cultural commons. Sharing is essential to intergenerational renewal and is another characteristic that separates the wealth of the cultural commons from what is privately owned.

While vast amounts of knowledge (much of it in the form of information) is increasingly available on the Internet it is nevertheless different from the knowledge and skills passed on through face-to-face communication. When the wealth of the commons is encoded digitally it does not take account of cultural contexts, tacit understandings, the powerful learning experience shaped by patterns of meta-communication that are part of mentoring relationships. Turning the wealth of the cultural commons into abstract descriptions has certain advantages, but it is also the first step to turning it into a monetized commodity. It is also an important step toward the enclosure of the cultural commons.

Before turning to a closer examination of the various forms of enclosure that students need to understand if they are to participate politically as adults in making decisions about what aspects of the local cultural commons need to be intergenerationally renewed, and which need to be modified or abandoned entirely, it is necessary to recognize that many cultural commons carry on traditions that are sources of exploitation and oppression. That is, the heritage or what is being referred to here as intergenerational knowledge may be a mix of wisdom of how to meet certain basic needs, and of prejudices that perpetuate various forms of discrimination and unjust social practices. For example, there are regions in the United States that have highly developed

community-centered musical traditions (an important form of wealth), while at the same time carry on traditions of racial and gender discrimination. These forms of discrimination lead, in turn, to reduced opportunities to participate in the money economy at a level necessary for meeting basic food, shelter, medical, and educational needs.

Summary of the differences between the political economy of the cultural commons and the market/industrial system of production and consumption: Focusing on the politics that separate the two economies brings out fundamental differences. A key difference is that the politics of the cultural commons are democratic in a way that empowers the community's traditions of mutual support and self-sufficiency. As skills and knowledge are shared in face-to-face relationships, and through other forms of intergenerational communication, questions and insights are shared. In effect, the interpersonal politics involve the element of mutuality and respect for others which is at the core of Martin Buber's description of dialogue. It is the form of the politics found in mentoring relationships—though, to be realistic, mentoring is not always free of petty and even intergenerational misunderstandings. The politics of the cultural commons can also be seen in the distinction that Guillermo Bonfil Batalla makes between a culture where the norm is returning work as opposed to paying for work (1996). The former is the politics of mutual support, while the latter is too often the politics of self-interest. There may be social hierarchies and systems of exclusions that influence who shares in the wealth of the cultural and environmental commons. These are sources of injustice and social pathologies that need to be overcome. In the healthy and life-enhancing aspects of the local cultural commons wealth is found in sustaining the diversity of talents and skills, and in maintaining the intergenerational connections.

The politics of the industrial/market economy are profoundly different. In these economies there is an emphasis on private ownership, and in accumulating more wealth—often by reducing the opportunities and wages of others. In addition, the dominant ethos within the business community is to reduce the role of workers in making decisions about the process of work and the overall goals of the business. Competition rather than cooperation governs most relationships, and the human vulnerabilities of wanting to consume what is stylish and costly also figure into the politics. At the governmental

level, lobbyists pour vast sums of money into acquiring special advantages in the market place—which often take the form of obtaining tax breaks and huge government subsidies.

There is an even more destructive side to the politics practiced within the industrial/market sub-culture. This is the politics of enclosing as many aspects of the cultural commons as possible. This can be seen in how intergenerational approaches to meeting everyday needs ranging from food, healing, creative arts, craft knowledge, ceremonies, civil liberties, and so forth, are being turned into commodities and services that require participating in the money economy. The politics of enclosure may occur behind the façade of democratic decision making when the members of the local community have been indoctrinated to equate expanding the money economy and markets with social progress. An educational system that represents the face-to-face non-monetized intergenerational knowledge and skills as low status and leaves them out of the curriculum, while representing the forms of knowledge required by the industrial/market-oriented culture as high-status, undermines the possibility of genuine democracy. For example, the silences perpetuated by public schools and universities about the wealth of knowledge that is part of our tradition of civil liberties easily leads to the kind of politics that leads to fascism. Both youth and adults will be more welcoming of the latest technologies when the silences and accompanying prejudices falsely represent traditions as obstructing progress. As people become addicted to relying upon these technologies for communicating with others on a non-face-to-face basis, their lives become more hurried and stressful. This, in turn, leads to greater dependence upon the pharmaceutical industry to substitute their drugs and definitions of illness for the wealth of knowledge accumulated as part of the cultural commons of many cultures. As Vandana Shiva points out, many of the drugs that lead to vast profits are pirated from the intergenerational knowledge of indigenous cultures (1996).

The following qualifications need to be kept in mind before addressing the educational reforms that enable students to share in the wealth of their local cultural commons, We are now witnessing the wealth that individuals and corporations invested in retirement accounts, bonds, stocks, and bank accounts losing value and largely disappearing. The wealth of the cultural commons may also be lost, especially when the prevailing ways of thinking are focused on the latest innovations and forms of

entertainment. Examples that come readily to mind include how reliance upon industrially prepared food leads to a loss of knowledge of how to use traditional recipes to prepare a meal and to grow vegetables. As youth spend more time playing video games there is less likelihood they will know the stories of their ancestors' achievements and wrongs done to others. Listening to market liberal talk show hosts such as Rush Limbaugh will further undermine awareness of the accumulated political wisdom encoded in the Constitution, the Bill of Rights, and the gains in civil rights and social justice. The continual effort to expand markets also contributes to the further attrition of the cultural commons. The lack of moral limits on what aspects of the cultural commons can be transformed into a commodity or service means that they are all under constant threat.

We should not think of the wealth of the cultural commons as entirely replacing the need for meaningful employment and a wage that enables people to meet their basic needs for food, shelter, health care, and education. Money is still required to purchase the goods and services that represent the genuine achievements of the scientific/industrial culture. However, the need for community, self-expression, and growth in developing an ecological form of intelligence can be met more fully by involvement in the local cultural commons. It's not an either/or issue, but one of balance that takes account of the excesses and exploitive nature of the industrial/consumer-oriented culture as well as the need to live in ways that have a smaller adverse impact on the Earth's ecosystems.

What students should learn about the differences between the political economy of the cultural commons and of the free-market system of production and

consumption: The basic concepts that teachers and professors need to introduce include the following;

- (1) The fundamental insight that should frame the discussion of educational reforms is Herman E. Daly's (1991) observation that while the environment establishes absolute limits on how far the industrial economy can expand, there are no environmental limits on the development of a culture's symbolic systems (or what is being referred to here as the life and community enhancing cultural commons).

- (2) An auto-ethnography needs to be undertaken as most aspects of the local cultural commons are experienced at a taken-for-granted level of awareness. This will involve a careful mapping of the intergenerational knowledge and skills that exist within the community, as well as the mentors who keep the traditions alive. This will ensure that the discussion is grounded in the culturally influenced embodied experiences of the students—and not treated as an abstract textbook explanation with which few students will be able to relate.
- (3) A survey of the number of people who are living lives of voluntary simplicity, as well as those who are unemployed, under-employed, and retired, needs to be undertaken, along with a survey of the knowledge that people have about the alternatives to meeting daily needs through consumerism.
- (4) Initiate a discussion of how the wealth of the cultural commons differs from wealth in a money economy. This discussion should also include issues related to which forms of wealth are a human right and which have to be earned in settings where equality of opportunity may be lacking.
- (5) The impacts that these two forms of wealth have on the natural environment should be considered, as well as how they differ in terms of their impact on the cultural commons of other cultures.
- (6) How these two different forms of wealth influence the democratic process should also be discussed.
- (7) As students acquire a more embodied understanding of the cultural commons and how they differ from experiences in the industrial/consumer-oriented sub-culture, they need to consider how transforming of the cultural commons into commodities and monetized services impact the environmental commons.
- (8) How to understand the connections between the intergenerational renewal of the cultural commons in ways that reduce the adverse impact on the environmental commons and the nature of ecological intelligence is important in itself. It also establishes the basis for considering a number of misconceptions that are a threat to the local cultural commons and to the prospects of an ecologically sustainable future.

- (9) Following a discussion of the nature of ecological intelligence (Bowers, 2009), and how it will be expressed differently from culture to culture, there needs to be a discussion of the origins of the misconceptions that are reproduced in the meanings that most people associate with such words as “tradition”, “individualism”, “property”, “progress”, “environment”. “freedom”, “technology”, “science”, and so forth. The key question is: How have these misconceptions limited the development of ecological intelligence?
- (10) The question of how different technologies, and the ideology that justifies their use, undermines the local cultural commons as well as the diversity of the world’s cultural commons, also needs to be considered. This should lead to examining how different technologies amplify certain ways of thinking, values, and relationships while reducing others. That is, can the mediating characteristics of different technologies become part of the process of cultural colonization?
- (11) Consideration should be given to how the transformation of scientific discoveries into meta-narratives that explain the development of cultures, such as the theory of evolution which is now being extended to explain cultural memes as well as the argument made by some scientists that they possess the only valid approach to knowledge, contribute to undermining the diversity of cultural commons—and, by extension, the environmental commons of the world.
- (12) There needs to be a discussion of the background knowledge students need to possess in order to challenge the injustices that are part of some cultural commons. There also needs to be a discussion of the background knowledge necessary for resisting various political and economic forces that are transforming the cultural and environmental commons into the private property of individuals and corporations.
- (13) Invite students to consider whether the spread of ecological intelligence among the general population will be necessary if they are to have a sustainable future. Also have them consider whether ecological intelligence will lead to a radical change in how private property is understood. The changes that represent a shift away from the traditional idea of private ownership of property, ideas, and innovations also needs to be discussed.

Two suggestions for integrating what is learned in schools with the intergenerational knowledge of the cultural commons: Public schools and universities need to provide leadership in connecting students to the wealth of the cultural commons. This is especially important today as real wealth is not attained by depleting the wealth of the environmental commons—the hydrocarbons, oceans and streams, soil, forests, and minerals—in order to meet the public’s consumer addiction. The first suggestion for exercising leadership is to establish a connection between the local high school and what can be called the community sustainability council. The council would be made of members of the community who possess knowledge of daily living practices that reduce dependence upon the money economy as well as have a smaller ecological footprint. The intergenerational knowledge and skills to be shared with the students through a combination of a class format and field experience would range from how to conserve water, plant eatable yards, reduce the use of electrical power, avoid the use of toxins, preserve (canning, in the old vernacular) fruits and vegetables, to preparing meals from local sources. As the knowledge and skills would be shared by members of the local community it would reflect an understanding of the unique characteristics of the bioregion. For example, knowledge about how to increase the number of pollinators and diversity of birds, as well as the types of vegetables that thrive in different seasons and in different soils, would have practical benefits. On their own, students are not likely to learn the knowledge and skills accumulated by the long-term inhabitants of the region. And as the money economy continues to slide, along with how automation reduces the need for workers, the students will begin to recognize that greater dependence upon the knowledge and practices that sustain the local cultural commons is a way of escaping the debilitating impact of economically driven poverty.

A second proposal for how the local high school can take a leadership role in revitalizing the local cultural commons would be for students in the social studies class to maintain a website that enables members of the community to network with each other in meeting the following needs:

- (1) Enable the unemployed and under-employed to contact various mentors in the community who are engaged in cultural commons activities—ranging from food security, creative arts, craft knowledge and skill, to volunteering, and developing

- social organizational skills. The first step would be for high school students to conduct a survey of the mentors in the community, as well as the different activities that are part of the local cultural commons. When the unemployed and under-employed are able to network with others in the community they will be more likely to discover interests, talents and the benefits of community participation that they did not have time for when they were caught in cycle of working in order to consume, and to prevent a further slide into debt.
- (2) Enabling members of different social groups to share their knowledge of how to prepare nutritious meals from locally available basic ingredients that can be obtained at a fraction of the cost of the processed foods handed out by food banks. This will empower people with the knowledge and skills necessary for meeting their nutritional needs with basic ingredients that ethnic groups have relied upon in the past. It will also provide a community alternative to the current practice of distributing packaged foods to the unemployed that contain many unhealthy chemicals.
 - (3) Enable farmers to communicate with others in the community about when their fields and orchards are open for gathering free vegetables and fruits. A computer network that connects local farmers with a community clearing house for those in need would be especially important, as well as ensure that a manageable number of people visit these farms.
 - (4) Enable people who have already made the transition to voluntary simplicity or have less need for an income connected with full time employment, to communicate their willingness to engage in job sharing. The network would enable people seeking part time work to communicate with people willing to make the transition to part time employment. There will be a number of issues, depending upon the nature of employment that will need to be worked out and agreed upon. The over-riding issue, however, is to strengthen the sense of community by helping reduce the level of unemployment and hopelessness that will continue to be a problem as automation, downsizing, outsourcing, and economic systems continue to undergo change.

- (5) Enable members of the community to barter with others who possess skills and can provide services, thus restoring the traditional understanding of the market as an exchange of goods and services that enhance the self-sufficiency of the local community.
- (6) Enable individuals and groups needing some form of assistance to communicate with members of the community who are willing to volunteer their time and energy.

As is often observed, new opportunities emerge during life-altering crises. We are now facing the consequences of excessive consumption, the production of goods that far exceeds the needs of sensible people, and financial speculation driven by pure greed. The major disruptions caused by these excesses are occurring at a time when further automation and a more cautious approach to consumerism borne of necessity is likely to leave many more people below the poverty line—or perilously close to it. We are also on the cusp of environmental changes that will create even greater challenges, as the scale of environmental change will lead to vast numbers of people here and abroad becoming environmental refugees as the ecosystems they previously relied upon for their livelihood become too degraded to support even a subsistence lifestyle.

There are increasing references in both scientific journals and the media to the need to introduce changes that will slow the rate of environmental degradation. Unfortunately, most people still give only lip-service to making changes, and the changes they do make are largely limited to recycling their trash into the proper disposal bins. Progress is being made in introducing new energy efficient technologies, and retrofitting buildings. Expressing concern about the environment, which for many is little more than giving expression to what is politically correct, is nevertheless a sign of an opening to learning about the important challenges that lie ahead. Too often the inability to act on current understandings about changes in the Earth's natural systems is a result of an educational system that indoctrinated people with the ideas and values that are now failing us. The local cultural commons do not have to be created by government, nor is their existence dependent upon implementing the abstract theories of academics. They can be traced back to the earliest human societies, and they continue to exist even in the most oppressive circumstances.

Religious groups are now struggling to correct a myth of creation that represented, in one powerful account, that “man” was put here to name and subdue the natural world. Even real-estate professionals must now pass a test on the sustainable characteristics of the houses they are trying to sell. Ironically, their awareness that houses must now meet environmental codes is way ahead of the thinking of most public school teachers and university professors. Aside from the small number of environmental educators, and a minority of faculty in colleges and universities who are pushing the boundaries of their areas of inquiry in ways that address environmental issues, the vast majority of faculty who have the potential for influencing young minds, especially professors in colleges of education, seem unable to recognize that the modernizing paradigm they learned from their professors does not lead to understanding the solution. The emphasis on individualism and progress, along with the measurement and control technologies that still dominate the field of teacher education, continue to perpetuate the silences and prejudicial language that make the non-monetized and intergenerationally-connected activities and relationships within communities appear as sites of backwardness.

The previous discussion of the political economy of the cultural commons is intended to address some of the silences that still contribute to teacher educators thinking that the ecological crisis is being met by scientists, technologists, and environmental educators who are, in many instances, limited in their understanding of the cultural roots of the ecological crisis. While learning how to foster the ecological intelligence of students will be a major challenge, especially since the practice of ecological intelligence requires abandoning many Enlightenment assumptions, encouraging students to learn from the people who are sustaining the wealth of the local cultural commons should be much easier—particularly when it involves face-to-face relationships and mentoring in activities that fosters the students’ self-discovery of community-centered interests and talents.

Nothing new needs to be invented and promoted. Rather, the role of public schools and universities in revitalizing the local cultural commons requires putting aside certain misconceptions inherited from earlier thinkers who were addressing an entirely different set of problems, and giving attention to the local practices that have not been monetized--

and that have a smaller adverse impact on the environment. Auto-ethnographies, the importance of face-to-face intergenerationally connected communication, and a greater sensitivity to the kinds of experiences that enable students to discover talents as well as who they are as members of a community, is the way forward. And if teacher educators, and professors in the other areas of educational studies, can make this turn perhaps they will then help students obtain a different understanding of wealth—one that takes account of what is shared with others and is personally fulfilling in ways that differ from owning what has been industrially produced for a mass market. Whether faculty in the social sciences and humanities begin to address the cultural roots of the economic and ecological crises, and the ways they have been complicit in the globalization of the industrial/consumer-oriented culture, is still problematic.

References

- Batalla, G. B. 1996. Mexico Profundo. Austin, TX: University of Texas Press.
- Bowers, C. A. 2009. “Educational Reforms that Foster Ecological Intelligence” In Educating for Ecological Intelligence: Practices and Challenges. Eugene, OR.: The Eco-Justice Press <www.cabowers.net/>
- Daly, H. E. 1991. Steady-State Economics. Washington D.C.: Island Press.
- Shiva, V. 1996. Protecting Our Biological and Intellectual Heritage in the Age of Biopiracy. New Delhi: The Research Foundation for Science, Technology and Natural Resource Policy.

Chapter 4 The Misuse of Academic Freedom in an Era of Global Warming

John Stuart Mill’s On Liberty (1859) provides the justification for academic freedom that most of today’s academics still take for granted. As Mill put it, “No one can be a great thinker who does not recognize, that as a thinker it is his first duty to follow his intellect to whatever conclusions it may lead”. While acknowledging that this imperative might lead to trivial and even destructive results, he held that the advantages of free inquiry were far more important to the future well-being of society. That freedom of inquiry leads to change, and that change is an inherently progressive force was the

cultural assumption that Mill took for granted. Government censorship, as well as the acceptance of various forms of societal suppression of new ideas, were thus viewed by Mill as impediments to social progress.

Today's understanding of the importance of academic freedom is based on the many examples of scholars and researchers who pursued lines of inquiry that challenged the orthodoxies of the larger academic community and society. Rachel Carson's research and writings were first met with resistance and only later with acceptance, just as Jerry Stanhill's early research on global dimming was rejected by other scientists—but is now viewed as fundamental to understanding the forces contributing to climate change. In spite of the many advances in understanding that can be attributed to academic freedom, it has a checkered history. One of the reasons that its misuses have not been given the attention they deserve is that it is based on the deep cultural assumption that freedom of inquiry leads to changes that are inherently progressive. Indeed, the widespread acceptance of equating freedom of inquiry with social progress makes questioning this tradition appear as reactionary and even deliberately pernicious. What self-respecting academic could possibly take seriously such questioning—especially when so many genuinely reactionary and traditionalist social groups have a long history of attacking academic freedom? As the stakes have never been higher in human history, given the rate of global warming and the rapid degradation of other natural systems that now threaten billions of humans and other species, it is now necessary to risk being mis-identified with these reactionary groups when suggesting that academic freedom is now being used as an excuse by the majority of non-science faculty to avoid addressing the cultural roots of the ecological crises.

Freedom is the metaphor used to justify the professors' right to pursue the area of inquiry and scholarly writing that interests them. Personal scholarly interest is, of course, influenced by a number of considerations—ranging from an awareness of what the politics of the department will allow if tenure is to be obtained to what represents the conventional wisdom within the field of inquiry. For example, academic freedom cannot be used to justify research that is intended to represent the Holocaust as a liberal hoax, nor can it now be used to justify the genetic inferiority of racial or other marginalized groups. There are many other examples of how personal scholarly interests may be viewed as illegitimate, depending upon what is widely accepted as progressive thinking.

Freedom is also one of the context free metaphors that goes largely unquestioned in academic circles. Indeed, it functions more as a talisman, with seemingly magical powers that ensures that anyone who claims its protection is engaged in worthy activities that are both selfless and that have the potential of making a major contribution to the well-being of humankind. On closer examination, the magical powers of the word often become frayed and even disappear entirely. While the phrase, academic freedom, is associated with the process of inquiry and scholarship, there is little about the professor's way of thinking that is free of the cultural assumptions learned at a taken for granted level when she/he is learning to think and communicate in the language of the larger culture, and in the specialized language of her/his chosen discipline.

Most professors still think of language as a conduit in a sender/receiver process of communicating ideas, data, information to others—even when they are critically reflecting on some of the prejudices being reproduced in the languaging processes. The result is that they remain largely unaware of how their academic freedom is constrained by the analogs carried forward in the metaphorical language they take for granted—analogs that too often reproduce the prejudices and silences of earlier thinkers who were also unaware of environmental limits. The unrecognized linguistic constraints that led professors to perpetuate the prejudices and other misconceptions of earlier thinkers can be seen in how, until recently, most professors took for granted the gender biases that limited the prospects of women. Today, leading scientists such as E. O. Wilson and Francis Crick continue the long tradition of relying upon analogs that represent organic processes, such as the human brain, as having the characteristics of a machine. To cite yet another example, the cultural assumption that change is inherently linear and progressive in nature continues to influence the cultural extrapolations of the theory of evolution. The seemingly unending quest for new ideas, values, and technologies is also rooted in the analogs chosen by Enlightenment thinkers, which led in turn to associating traditions with analogs that suggested backwardness, impediments to progress and critical reflection. With the development of nanotechnologies and other life changing technologies there is a growing awareness that questions about their destructive potential must now be considered. This could lead to limitations on the freedom to experiment with new ideas and technologies. In effect, the growing awareness that changes in natural systems have reduced

the margin for human error could lead to redefining what the appropriate boundaries and focus of academic freedom should be.

The cultural assumptions reproduced by generations of western philosophers are audacious for their claims, and for the silences they have helped to perpetuate in other academic disciplines. The rational process, which philosophers claim to exercise more judiciously than any other group in the university, has been represented as free of all cultural influences—thus allowing different philosophers to claim that both abstract and empirically based thinking are free of cultural traditions; that rational thought is the activity of autonomous individuals, and that other cultural ways of knowing are irrelevant. For thousands of years, western philosophers have relegated the community-sustaining intergenerational knowledge that reduced reliance on a money economy, and had a smaller ecological footprint, to the realm of silence. Indeed, if a university in the Pacific Northwest that prides itself on being an environmental leader is representative of the majority of philosophy departments, we can easily see what the faculty are unable to recognize: namely, that their academic freedom is heavily influenced by the dead weight of traditions that bring into question their ability to ask the most important question of this era: namely, what forms of knowledge are relevant in an ecologically changing world?

At this university, five of the faculty in the philosophy department are listed as resources in the Center for Environmental Studies, but only one faculty member who has a joint appointment with the Center offers a course that addresses environmental issues—supposedly from a philosophical perspective. Over forty-nine courses are offered within the department during the year, ranging from existentialism, Derrida, Sartre, feminist phenomenology, Descartes, Kant, to metaphysics and advanced logic. The department offers one course in environmental philosophy, which is a survey course that fails to address the double bind characteristics of the metaphorically layered language that is taken for granted in the discourses of various environmentalists and the discourses of market liberal groups whose agenda is the promotion of a global economy. For example a leading member of the department uses the key legitimating metaphor of the industrial/consumer oriented culture that is a major contributor to the ecological crises when categorizing environmentalists as part of the “progressive” movement in society. Questions that should be raised in any philosophy course are not considered as relevant: namely, what can we learn from the misconceptions of

past thinkers who have contributed to marginalizing the knowledge of cultures that have learned to live within the limits and possibilities of their bioregions? How have the giants in the history of western philosophy contributed to the hubris that characterizes the various systems of high-status knowledge that failed to recognize environmental limits and the short and long term consequences of colonizing other cultures? Reading Plato, Descartes, Locke, and other Western philosophers—right down to present day iconic figures such as John Dewey and Richard Rorty—would be justified if it led to examining how they contributed to ignoring how humans are participants in the complex interacting webs of cultural and environmental ecologies. But this is not what students are asked to consider. Rather, they are asked to read and reflect on the philosophers' culturally uninformed theories about the nature of knowledge and values. How the culturally diverse taken-for granted episteme, including how they represent human/nature relationships and frame everyday practices, are not considered. Instead, students graduate with an understanding of the history of abstract theories, and think of themselves as critical thinkers—and will be totally unaware of the silences about the changes their world is undergoing that will make irrelevant what they learned from their courses. The largely hidden ways in which language continues to reproduce the conceptual errors of the past, as well as the power of taken for granted beliefs and values to limit the exercise of academic freedom, as the above example highlights, is reproduced in most disciplines and in most universities and colleges across the country.

The widely held assumption that social progress and academic freedom are inextricably linked has led to little attention being given to how academic freedom is both constrained and misused—depending upon the limitations in the professor's own patterns of thinking. The power of a received vocabulary and its interpretative frameworks, both of which are acquired in the professor's own years of graduate study, generally are reinforced by colleagues who are unable to throw off their own taken for granted traditions of thinking. As we move closer to the tipping point beyond which the rate of global warming cannot be slowed, whether the professors of philosophy, economics, sociology, classics, political science, education, and so forth, are exercising a form of academic freedom that contributes to the public's ability to recognize the ideas and values that are major contributors to the ecological crises becomes increasingly critical. Equally important is their recognition of the need to use their academic freedom in ways that enable students recognize the existing community-centered and largely

non-monetized alternatives to the current level of consumerism that is increasing the rate of environmental degradation. Unfortunately, when compared to today's scale and rate of environmental change, most of the issues that professors pursue in the name of academic freedom are really quite trivial. Even the history of genuine achievement in the arts and civil liberties will become irrelevant as potable water, sources of protein, and the ability to meet the most basic human needs become limited to the point where armed conflict is seen as the only way of ensuring survival.

Resistance to radically rethinking how the different fields of academic inquiry may be contributing to the ecologically unsustainable pathway that western cultures are modeling for the rest of the world is not the only problem with how the current use of academic freedom is failing us. When we consider how scholarship and research have been justified in the name of academic freedom over the years and in different cultures, there is clear evidence that its exercise has been framed by the prejudices held by the larger society—and by the political centers of power in the society. We have only to examine the role of philosophers, jurists, and scientists in giving legitimacy to the Nazi regime in Germany. Martin Heidegger's overtures to Nazism are especially noteworthy, along with the decision by the University of Bonn to strike the name of Thomas Mann from its list of honorary doctors. Over 900 German scholars and scientists signed pledges endorsing Hitler's "patriotic" actions. Our own history of exercising academic freedom has been marked by research and scholarly writings that perpetuated racist and gender prejudices. The silences about the achievements of different minority groups, including women, is part of the evidence, as is the Tuskegee experiment involving the study of the death process of over 360 African American men who were suffering from syphilis. The long history of scientists who were deeply involved in the eugenics movement, and in developing intelligence tests that favored speakers of English must also be seen as part of the legacy of how academic freedom has been misused. More recently, academic freedom has been used to justify developing new weapon systems, and now surveillance technologies that are strengthening our downward slide toward a police state. Grants supporting socially problematic research, with only minor exceptions, continue to be justified on the grounds of academic freedom. In spite of the checkered history of academic freedom, it is difficult to question the search for new knowledge that will uplift humanity and contribute to realizing the

promise of a rationally based life. Or as Carl Sagan put it, who can question the power of “science as a candle in the dark” to illuminate the path to a better world?

Public concern about the short and long term consequences of global environmental changes is mixed, even though close to 80 percent of the public claims it as an issue that needs to be addressed. While the public was reaching a consensus on the importance of addressing environmental issues there was little public outcry about the efforts of President George W. Bush’s Administration to censor scientific reports on climate change. The same pattern of confused thinking can be seen in the current public support for less carbon producing technologies, while almost no attention is being given to one of the major causes of the current acceleration in the rate of environmental degradation—namely, the practice of measuring the state of the economy by whether the rate of consumerism exceeds the level of the previous year. Indeed, economic growth has become the standard for measuring the degree of progress in the entire world. When professors continue to use their academic freedom to pursue issues and to rely upon interpretative frameworks that were considered cutting-edge in the previous era of ecological ignorance and exploitation they add to the public’s confusion about how to think about the ecological crises. Similarly, conflicting educational priorities can be seen in the specialized fields of knowledge that students are expected to acquire. They range from knowledge of the epistemological differences between major philosophers, Milton Friedman’s abstract economic theory about the power of free markets, the idea that students should construct their own knowledge, that computers are a culturally neutral technology, that the brain functions like a machine, that environmental issues are the responsibility only of scientists, that reading environmental writers is sufficient for learning how to live less consumer dependent lives, and so forth. The current understanding and practice of academic freedom simply adds to the widely held perception that there is little agreement on what is the dominant crises of our era.

The liberal’s penchant for arguing from competing paradigms of understanding, as well as the lack of awareness of how the cultural assumptions that underlie the current phase of economic globalization still frame how academic freedom will be exercised, simply reinforces the idea that everybody, regardless of how well informed, has the right to their own opinion—both as to whether there is an environmental crises and to what steps should be taken to reduce its impact. In addition to a lack of basic knowledge about the extent of the ecological

crises, many opinions are being increasingly influenced by personal economic interests of how to avoid bankruptcy or how to achieve even further economic gains. In effect, the primacy of individual judgment and concern with economic issues continue to take precedence for most Americans over making basic changes in their environmentally destructive lifestyles.

One thing is clear. It seems that no amount of scientific evidence about the nature of the ecological crises, and no amount of reporting on the human suffering directly attributable to changes in the sustaining capacity of natural systems, will cause more than a small minority of faculty to make more than minor adjustments in their courses and research. Past experience has shown that there is little likelihood that the widespread reforms in curricula and research that must be undertaken can be achieved by faculty who represent a minority view within the department—especially if they are the younger members who are still facing the politically charged process of academic promotion. However, there is a way of overcoming the vulnerability facing these faculty. The precedent for supporting a minority point of view within otherwise traditionalist thinking on critical social reform issues can be seen in earlier responses of the academic community to changes in the public consensus about the need to address discrimination in the areas of gender and race. That is, without significant discussion about the exercise of authority by university administrators, they contributed in many instances to a new climate of opinion within departments that led to avoiding granting appointments to new faculty who exhibited racial and gender biases. The record of leadership on the part of university administrators, from the president to department chairpersons, is admittedly uneven. But when leadership is exercised, it becomes a model for motivating otherwise indifferent faculty to introduce students to how the discipline they are studying can be reframed in ways that clarify the connections between cultural and environmental issues that stand in the way of achieving a sustainable future. The problem, as everyone is likely to agree, is that university administrators are as divided in their thinking about the need to address the ecological crises as are the members in the various non-science disciplines. Thus, the problem becomes one of identifying the sources of authority that university presidents and administrators will take seriously—even when they personally fail to understand that humankind is at a turning point and that life as most Americans know it is undergoing fundamental changes that have their roots in the degradation of natural systems.

The sources of authority that would force many university presidents and administrators to exercise a more visible form of leadership include the President and Congress. While it is unlikely that even a Democratic president would risk alienating the segment of the American public that still views the environmental crises as a liberal conspiracy, Congress has already demonstrated its ability to reach a consensus on the nature of reforms that universities and colleges must undertake.

The passage of the Higher Education Sustainability Act (HESA) as part of the new Higher Education Opportunity Act of 2008 (HR 4137). HR 4137, which is expected to be signed into law shortly by President Bush, creates a "University Sustainability Grants Program" in the Department of Education. It will offer competitive grants to institutions and associations of higher education to develop, implement, and evaluate sustainability curricula, practices, and academic programs.

The availability of grant money has always lubricated the wheels of change in universities, even when it has led to new surveillance technologies, methods of behavioral manipulation and thought control, and weapons systems. Perhaps more important in terms of motivating university presidents and administrators to do more than give verbal support to ecologically sustainable curricular reforms is that Congressional action will be seen as the expression of a new level of consensus by the nation's highest decision makers. But there are other sources of authority in the political process that now need to provide leadership; and these include the state governors and state boards of higher education. If they were to make ecologically sustainable reforms across the academic disciplines a top priority, and to back it with changes in funding, we would see a basic shift in what should be regarded as the current misuse and trivialization of academic freedom. Just as academic freedom in many universities and colleges could no longer be used to justify promoting gender and racial biases in courses and publications, there would be a shift in thinking about what constitutes the appropriate focus and boundaries of academic freedom.

The role of the academic administrators would not be to censor the thinking of faculty--though their ultimate decision about the scholarly merits of new hires represents a limitation on academic freedom that often reflects changes in the public consensus. Rather, it would be to remind faculty of the university's primary mission, which is to enable its graduates to understand the cultural roots of the ecological crises, to learn how to live less consumer and

thus environmentally disruptive lives, and to develop the conceptual basis for exercising communicative competence in making decisions that ensure the future prospects both of humans and natural systems. These are very broad goals that in no way constrict the exercise of academic freedom. Rather, they simply reframe the boundaries and focus in the same way the consensus to no longer promote eugenics and racial agendas reframed what could legitimately be pursued in the name of academic freedom. The Rachel Carsons and Jerry Stanhills (the first scientist to report evidence of global dimming—which was rejected by the larger scientific community of his day) could still make positive contributions. Indeed, there are so many moral and conceptual orthodoxies that have their roots in the thinking of earlier centuries that academic freedom remains vital to the mission of the university. Ironically, a case can be made that only as the entire strata of administration keeps reminding faculty of the need to address the ecological crises that faculty will be free to challenge many of these orthodoxies.

As I pointed out in *The Culture of Denial* (1997) there is a need for foundations to promote conversations between university presidents and scientists who can present the evidence on the seriousness and immediacy of the ecological crises whose impact is now threatening the lives of billions of people—even here in North America. There is also a need for foundations to support the development and dissemination of materials that will enable faculty in the various disciplines to understand how their courses may be perpetuating the linguistic colonization of current ways of thinking by the earlier thinkers who were unaware of environmental limits, and to help students recognize the many ways that they participate in the local cultural commons that have a smaller ecological footprint—and how these commons are being enclosed by various ideological and social forces.

If the nation's foundations fail to take on this task, and if the people occupying the highest levels in the political process, including university presidents, give only lip-service to ecologically sustainable university reforms it is likely that the current state of hubris will lead most faculty members to think that their own cutting edge thinking and research makes it unnecessary to take seriously the ecological crises. That what many faculty take to be cutting edge thinking and research is based on ecologically destructive conceptual traditions is part of a tragedy that few of their former students will recognize. The fragments of knowledge students acquired from the diversity of courses and faculty perspectives will also leave them unable to recognize that the spread of social chaos that will follow the further decline in the life

sustaining capacity of natural systems opens the door to a fascist form of government. The technological infrastructure is already in place for this development, and graduates of our most elite universities are already demonstrating the political and legal skills necessary for ensuring that the interests of corporations, the military, and the fundamentalist religious groups who have merged their theology with an extreme form of patriotism will not be adversely affected by the environmental changes. Just as we need to reframe the idea of the autonomous individual by adopting culturally and ecologically informed analogs, we need to reframe the focus of academic freedom in ways that address the multiple political and ecological crises of our era.

Chapter 5 How Computers Contribute to the Enclosure of the Cultural Commons

There are two reasons why any discussion of how computers contribute to the enclosure of the cultural commons is immensely complicated. First, computers are now a ubiquitous part of everyday life. Understanding how they both empower and enclose the cultural commons is made more complicated by the fact that they are now responsible for a new kind of commons: that, is the cyber-commons. Second, the cultural and environmental commons are equally diverse and complex, especially when we take into account the different cultural approaches to what constitutes the intergenerational alternatives to consumerism. In order to reduce the complexity of issues, this discussion will focus on the educational uses of computers, as sources of entertainment, and as a technology that reinforces the pattern of thinking that is the basis of the industrial/consumer dependent culture that is contributing to global warming and to other forms of environmental degradation.

My analysis will be based on examples taken from various Western contexts, such as public school and university classrooms, as well as the cultural mediating characteristics of computer technology—including software programs. As criticisms are often framed in simplistic dichotomous categories, a special effort has been made to identify examples of how they enable us to understand new phenomenon and to develop

solutions to problems that were impossible before the introduction of computers. These range from scheduling airline traffic, analyzing changes in natural systems, providing more effective medical procedures, enabling people to access and exchange information on a global scale, and to keep in touch with friends and families spread over vast distances. To list all the benefits would take too many pages, and would still not be inclusive enough. But there is a downside to computers, such as enabling corporations to outsource work to low-wage regions of the world, and to keeping their profits offshore-- thus enabling them to avoid taxes. Other negatives include how computers have enabled scientists to genetically alter seeds that, in turn, threaten genetic diversity, how they now are the basis of a national surveillance system that is one of the hallmarks of a police state, and how they contribute to the enclosure of the diversity of the world's cultural commons that are essential to slowing the rate of global warming. The list of negative attributes is also too numerous to be fully identified here.

The various uses of computers tend to magnify the characteristics and agenda of the individuals and institutions using them. Individuals and institutions concerned with addressing environmental issues are able to network with others who have similar interests; just as hate groups, religious extremists, and corporations collaborate with groups that support their respective agendas. Computers enable corporations to achieve a level of efficiency and a scale of outsourcing that greatly enhances profit margins, just as groups concerned with social justice and environmental issues are able to create networks of support that increase their political influence. Students are able to access information and ways of thinking that go beyond what is available in textbooks, while other students who want a good grade without doing the work are able to download already prepared papers.

In order to identify the many ways in which the use of computers contribute to the enclosure of the cultural and environmental commons it is first necessary to summarize the chief characteristics of the commons. This summary will also be useful for clarifying the similarities and differences between what is being referred to as the "cybercommons" and the diversity of the world's cultural and environmental commons. For readers who may want more than a survey I suggest that they read my previous three books: [Revitalizing the Commons: Cultural and Educational Sites of Resistance and](#)

Affirmation (2006); chapter 5 of the online book, Renewing the Commons: University Reform in an Era of Degraded Democracy and Environmental Crises (2006); and the online book, Transforming Environmental Education: Making the Cultural and Environmental Commons the Focus of Educational Reform (2006). Other highly useful books include The Great Transformation (1944, 1957) by Karl Polyani, and the Ecologist's Whose Common Future: Reclaiming the Commons (1993). However, these latter two books, as well as the vast number of articles now available from the Digital Library of the Commons, do not address educational reforms.

The key characteristics of the local cultural and environmental commons, which are also found in the commons of other regions of the world, include the following: (1) the intergenerational knowledge, skills, relationships, and activities that are carried on largely outside of the Western model of a money economy; (2) examples of the commons, whether it is centered on food, creative arts, health care, entertainment, ceremonies and narratives, mentoring, civil liberties, etc., are largely dependent upon face-to-face relationships and the spoken word; (3) the languaging processes that sustain the different cultural approaches to moral reciprocity and patterns of mutual support are generally framed by the culture's mythopoetic narratives that explain the origin and purpose of life—and well as moral relationships; (4) intergenerational learning may occur through mentoring relationships, as well as through embodied learning that is influenced by observing the behavior, approaches to problem solving, and patterns of reciprocity exhibited by significant others; (5) the languaging processes, which vary from culture to culture, serve as a form of storage of the accumulated experiences of how to live within the limits and possibilities of the bioregion. These languaging processes include ceremonies, narratives, built environments, and uses of technologies that reflect the understanding of earlier generations. As Jared Diamond documents in his book, Collapse: How Societies Choose to Fail or Succeed (2005), not all cultures are able to adapt their intergenerational knowledge, skills, and technologies in order to live within the limits of what the local bioregion can sustain. In many cases, their guiding mythopoetic narratives and high status forms of knowledge misrepresented the importance of the ecology of human/Nature interdependencies which no culture can ignore.

By now, most readers are undoubtedly wondering whether the intergenerational knowledge—including narratives, skills, scientific discoveries, and technologies that are the basis of the industrial/consumer-dependent culture—should also be considered as part of the cultural commons. These forms of intergenerational knowledge carry forward a different set of cultural assumptions, and while they may involve face-to-face communication between teachers/professors and students, they are largely based on printed texts and other abstract systems of representation. What may be difficult for most scientists and nearly all technologists to understand is that their guiding cultural assumptions have been based on the mythopoetic narratives found in the Book of Genesis, as well as the theories of Western philosophers who established the tradition of thinking that ideas, especially about the nature of thinking, do not have to take account of different cultural knowledge systems and local contexts. The institutions most responsible for reinforcing these values and patterns of thinking are the public schools and universities—and now computer technologies that carry forward the de-contextualized knowledge that previously were the hallmark of print technology. These institutions, as well as the many forms of education promoted in corporations and in government, are part of the monetized culture that expands by enclosing more of the cultural and environmental commons. Indeed, this knowledge is bought and sold like other commodities and, within the context of schools and universities its value is increasingly being judged in terms of whether it increases the students' earning power.

As I pointed out in The Culture of Denial (1997), schools and universities perpetuate the distinction between high and low status knowledge through the practice of excluding from the curriculum the diversity of face-to-face intergenerational knowledge, skills, and activities carried on in the world's local communities that are only marginally dependent upon the money economy of the industrial/consumer culture. The marginalization of the face-to-face intergenerational knowledge can be seen in Al Gore's recent film, An Inconvenient Truth. After providing an excellent overview of the rate and consequences of global warming, the audience is presented with examples of how the adoption of more energy efficient and carbon reducing technologies will help to slow the rate of global warming. But the main alternative to the consumer dependent lifestyle—that is, the cultural commons that reduces the need for consumerism—is entirely ignored.

In effect, the message of the film is that people can continue to consume at the current rate as long as they adopt more carbon reducing and energy efficient technologies—and make purchases that last longer, and put their groceries in a reusable tote bag. Gore and the women and men who produced the film, and perhaps even the scientists involved in the project, reproduced in the film the high status knowledge promoted in our educational institutions—including the silences about the non-monetized practices and relationships that have a smaller ecological impact and are still part of the life of most communities. Their list for reducing consumerism which is one of the major causes of global warming, reflects how the high-status knowledge that was the basis of their university education prevented them from recognizing the need to change the cultural assumptions that underlie the industrial mode of production and consumption—and that continue to marginalize an awareness how the cultural commons are being enclosed.

High-status knowledge is largely print based (that, is decontextualized) and is based on culturally specific assumptions that represent the individual as achieving greater autonomy through education, change as the expression of a linear form of progress, the culture-free nature of the rational process, mechanism as a model for thinking about everything from the human brain to engineering new gene lines, the more “evolved” nature of the Western cultures, and the need to universalize the Western model of economic development. High-status knowledge is also characterized by a deeply held and largely unconscious yet profoundly problematic ethnocentrism discussed in the earlier chapter on how Western philosophies have contributed to the marginalization of the cultural commons. The high-status knowledge promoted in our educational institutions is also based on a conduit view of language that sustains the myth of a sender/received model of communication. This assumption contributes to the lack of awareness that words have a history, and that their meaning is framed by the largely taken-for-granted root metaphors of the culture. It also contributes to misunderstanding how language carries forward the moral templates of the culture, which it does by how the attributes of the different participants, including human/nature relationships, are represented. For example, the words “weed”, “wild”, “woman”, “man”, “primitive” were in the past assumed to possess specific attributes. The nature of the attributes, such as being worthless, a danger, weak and emotional, strong and self-reliant, backward, and

so forth, are examples of how the language of a culture carries forward, given the nature of the Other's culturally defined attributes, what is regarded as moral behavior.

Both the diversity of the cultural and environmental commons, as well as the high-status knowledge being promoted by our educational institutions, need to be taken into account when assessing what is constructive and destructive about the cybercommons. In writing about the connections between civic renewal and the commons of cyberspace, Peter Levine observed that

People used the Internet not only to view others' material but also to build sites and disseminate free text and pictures, creating a gigantic commonwealth of public information. Usually, there is a reason not to contribute goods to a common pool: others may use them up without donating anything of equal value. But the problem is reduced if the goods take a digital form, because they can be used many times over without harm. Of course, not all of these goods were equally beneficial. The free material that was available online included not just genuine public goods but pirated pornography, false rumors, and racist screeds as well. But at least people had a rare opportunity to generate free and nondegradable common resources at a low cost. Open architecture, free content, and norms of sharing together made a true commons in cyberspace (National Civic Review, 2001, p. 207).

Levine's summary identifies the mix of human values and agendas found in most face-to-face commons. What is important about the cybercommons is the open access that allows for the exchange of ideas and other materials that can be used over again. He also identifies another characteristic of the cybercommons that is shared with face-to-face cultural commons. That is, both types of commons are under similar threats of being monetized and thus enclosed to people who lack the necessary economic resources. However, what Levine fails to recognize is that, unlike the cultural commons, the cybercommons requires continual participation in the hi-tech part of the industrial/consumer culture. Both the initial access to the cybercommons, as well as the continual necessity to upgrade the technology requires a large investment. In the face-to-face commons there is no initial cost connected with participating--though some forms of commons activities may require the purchase of materials. These are important differences which bring into question whether identifying cyberspace as a commons is

basically misleading. An additional difference that cannot be overlooked is that since the passage of the Digital Millennium Act in 1998 everything that is digitally encoded and communicated is automatically copyrighted. In effect, everything that is digitized is privately owned—which is the most basic form of enclosure. The reluctance of most owners of digital material to demand payment is what creates the illusion that cyberspace is a commons.

If we keep these basic differences in mind, and go along with the illusion of cyberspace as being a genuine commons, we can see other similarities with such modern forms of the commons as municipal transportation systems, water facilities, and state and federal parks. Just as municipal water systems are being taken over by corporations, and public parks are under threat of being sold to private interests, the open use of the cybercommons is now being threatened by the corporations that produce the software and control the networking systems. The increasing availability of cable television lines and broadcast spectrum allows corporate owned search engines to steer users to products advertised on the websites. With this increase in digital traffic the cable and phone companies see possibilities of vastly increased profits, and are now pressing the federal government to allow them to introduce variable user rates. In effect, cyberspace as some of the characteristics of the commons now being transformed in ways where every level and form of use will have to be purchased.

The educational, entertainment, and email uses of computers still involve participating in the cybercommons that are still not entirely enclosed by corporate interests. However, when we consider the shared characteristics of these different uses, it is possible to recognize more easily how computers, in being limited to what can be digitized, contribute to the enclosure of the world's diversity of face-to-face cultural commons. As pointed out earlier, the face-to-face commons is dependent upon intergenerational knowledge that is passed along and often negotiated primarily through the spoken word—which is supplemented by the culture's patterns of metacommunication that may have a greater impact on relationships than the spoken word. Face-to-face communication is contextual, relies extensively upon tacit understandings—with silence often communicating important messages. Another inescapable characteristic of face-to-face commons is that meanings and agreements are

often the outcome of a very complex and ritually dictated process of negotiation that adheres to the taken-for-granted norms of the culture. Face-to-face patterns of communication are both identity forming and often a matter of identity preservation—as when issues have to be settled in a way that preserves the power and self identity of one or both of the participants.

Computer mediated learning, as well as other forms of computer mediated communication, lack the above aspects of face-to-face communication. The reason for computers lacking these human characteristics, which are essential to the intergenerational renewal of the cultural commons, is that they cannot be digitized. Tacit understandings, personal memories, the combination of contexts and taken-for-granted cultural norms cannot be turned into a text or a documentary without being fundamentally transformed into something that is abstract and reduced to what is viewed from a distance. What is lost can be seen by comparing the difference between participating in a ceremony and viewing a documentary record of it—or reading about it in text form.

There is also a difference introduced by the individuals who are observers, as well as those who transform the documentary material into digital form. They bring to this process of transforming the lived experience into an abstract text or visual product their own cultural assumptions which, in turn, influence what will be seen, as well as the interpretation that will be given. In addition, the taken-for-granted nature of much of human experience is also an important consideration in determining what is being misrepresented. As can be seen by looking at educational software used at different levels of formal education, the cultural assumptions of the people who write the program, regardless of whether it is intended to develop decision making skills in certain subject areas or is a game involving interactions with other players, are always written into the program. To put this another way, someone's mental processes, as well as what she/he is unaware of, are always encoded in what is encountered when involved in different forms of computer mediated learning.

These observations should not be interpreted as denying that computer mediated communication lacks many of the elements of human interaction. Arguments, negotiations of meanings and understanding, commands, misrepresentations of one's true

feeling and intentions—even one’s true identity (which is harder to do in face-to-face communication) are all part of electronically mediated communication. Even many of the culture’s distinctive patterns that regulate text-based communication come into play. But the importance of tacit understandings, context and place-based knowledge, personal memory, and the non-verbal patterns of communicating about the ongoing relationships are missing.

The many ways in which the cybercommons fosters the experience of participating in a community of shared interests, mutual support, and even moral reciprocity is definitely a social good. To learn from anonymous Others about the nature of slow food, green mapping of cities, as well as what scientists are reporting on changes in ecosystems, may leave the impression that the cybercommons represent a vast improvement over the human interactions in a shopping mall and in a traffic situation where tempers rise just short of violent behavior. But this would be a misinterpretation, as these latter examples represent how people focused on money, symbols of social status, and getting ahead seldom consider how their values, ways of thinking, and behavior undermine the patterns of reciprocity and mutual support that are the hallmarks of a vital cultural commons. Like the Janus god of Roman times, the cybercommons can also facilitate the promotion of hate, prejudice, pornography, money scams, and deliberate distortions of facts and events.

Another set of relationships needs to be considered. The cybercommons, unlike face-to-face communication and even cell phone communication, can be done at the time of the individual’s choosing. The individual’s own set of priorities, rather than the expectations of others, will largely determine how much time is devoted to using the computer. There is also a downside to this convenience; and it has to do with a point that Robert Putnam makes about the nature of social relationships that strengthen local democracy. As he points out in Making Democracy Work (1993), friends and neighbors passing each other on the street, taking time to exchange information about family events and other activities, and interacting with people from different social backgrounds and ethnic traditions, all contribute to a broader understanding of the issues and social impact that various political decisions will have. Thus, it is not the isolated individual who is spending hours playing games with participants from other parts of the world, or the

individual who sits for hours engaged in a chat room or searching for information, that strengthens local democracy—which is a key feature of the cultural commons. Rather, it is the face-to-face relationships in work settings, in mentoring others, in helping a neighbor repair a roof, in helping the poor and lonely to have access to food and decent housing, in sharing a skill, and so forth, that provide the background knowledge essential to making the democratic process work for the broader well-being of the community.

The industrial, consumer-oriented culture needs the isolated individual who must rely upon the money economy to purchase many of the needs of daily life that are freely available when participating in the cultural commons—and may only require minor dependence upon what the industrial culture can provide. The cybercommons can be used by people who are fully conscious of the benefits of the cultural commons, but in the final analysis the judgment has to be that the cybercommons works to the detriment of the cultural commons. The time spent in cyberspace is time not spent participating in the activities and mutually supportive relationships that sustain the face-to-face cultural commons. And individuals are spending an increasing amount of their time in the world of cyberspace that is so profoundly lacking in the sights, smells, sounds, and the interactive complexities of nature. I suspect that if a study were conducted as to whether individuals who spend a great deal of time online possess less awareness of environmental issues a direct correlation would be found.

The issues discussed above raise an important question: namely, given the cultural mediating characteristics of computers why is so little attention given in public schools and universities to helping students understand the cultural transforming nature of computer mediated thinking and communicating? Reliance upon technologies has been a major characteristic of the dominant culture in the West, yet its mixed record of achievements and failures is given so little attention—except to develop further the sciences that will lead to new technologies. We are just beginning to study the impact of various technologies on natural systems. However this, along with recent books examining the history of different technologies, have not filtered down to public school and university classrooms. The most common response of university graduates is to claim that technologies, including computers, are both the engine of progress and a culturally neutral tool. Given the challenges that global warming and the changes in the

chemistry of the oceans now confront us with, it is even more imperative that educational reformers give high priority to helping students understand how technologies generally, but computers specifically, undermine the diversity of cultural traditions that represent alternatives to the consumer dependent lifestyle.

The following is a more focused discussion of the different ways in which computers affect the viability of the cultural commons. It is hoped that this overview will help teachers and professors recognize how to engage students in discussions that lead to a more complex understanding of the appropriate and inappropriate uses of computers—and to an understanding that computers and other technologies are not culturally neutral tools. The focus here will be on how computers contribute to the enclosure of the cultural and environmental commons.

How the Idea that Individuals Construct Their Own Knowledge Contributes to Enclosing the Cultural and Environmental Commons. The two most ubiquitous forms of enclosure include the silences that individuals unconsciously accept as part of their taken-for-granted daily experience. This results in the inability to recognize when different aspects of the cultural commons-- such as civil liberties, the knowledge of how to farm without relying upon pesticides and other chemicals, the grass lands and marshes that disappear under the pressure of developers, mentors who are dying off without having passed their knowledge and skills on to the younger generation, etc.—are being enclosed. This form of enclosure results from how the media and most public school and university classes reinforce the knowledge and values supporting the expansion of the industrial, consumer dependent culture. What a few students learn about the various natural systems that are being degraded is overwhelmed by the larger number of classes that perpetuate the silences about the community centered alternatives to a consumer dependent lifestyle.

The other form of enclosure promoted mostly in public schools can be traced to various theories that promote the idea that students should be encouraged to construct their own knowledge—though, as mentioned earlier, a more ideologically based emphasis on students doing their own thinking is reinforced in universities. Proponents of computer-based learning often claim that computers make it possible for constructivist learning to occur in the classroom, which then leads to teachers playing the role of being

a facilitator who does not impose their prejudices and limited knowledge on students. The so-called virtue of students constructing their own knowledge is now being further supported by another largely unquestioned assumption: namely, that the manner in which the expanding digital culture allows people to make their ideas available to others as part of the cybercommons fosters a more democratic society—and the flat earth that Thomas Friedman of The New York times celebrates as the latest expression of technological progress.

As I have written several books that are critical of various constructivist learning theorists, such as John Dewey, Paulo Freire, Jean Piaget, and less known theorists who argue for the more intelligent yet basically wrong idea of social constructivism, I shall summarize here the most salient criticisms. For those wanting a more in-depth critique, I suggest they read The False Promises of Constructivist Theories of Learning: A Global and Ecological Critique (2005); and the online book, Transforming Environmental Education: Making the Cultural and Environmental Commons the Focus of Educational Reform (2006). The chief misconception underlying the various constructivist theories of learning that proponents of computer-based learning rely upon is that, contrary to popular thinking, the individual is not the Cartesian individual who is free of the influence of culture's taken-for-granted patterns of thinking, who stands apart from the external world as an objective observer, and who makes autonomous decisions about what constitutes knowledge, and the values that are to be lived by, and what is unworthy of attention.

What the Dewey, Freire, Piaget, and the ideologues that promote the high-status knowledge in university classrooms overlook is that the supposedly autonomous individual's pattern of thinking, values, and behaviors are influenced from the first moments after birth by the intergenerational languaging patterns that sustain the culture's symbolic systems. These initial encounters are learned as part of the taken-for-granted stock of knowledge that the infant, and at later stages of development, is unable to name except in the language largely made available by others. Sounds, tastes, what will be seen and not seen, the non-verbal patterns of communication and moral values constituted earlier in the culture's history, all become, in varying degrees, part of the individual's natural attitude toward the everyday world. This legacy of taken-for-granted culture may include the narratives that exclude and lead to the exploitation of others; it may also

include the values of moral reciprocity, as well as an understanding of the patterns of interdependence with the non-human world. This legacy may also include the forms of knowledge that are valued by the culture—including an awareness of the importance of critical inquiry. The role of critical inquiry in some cultures is to assess which traditions are essential to retaining a degree of self-sufficiency and thus in need of being conserved. The goal of various models of critical thinking in the West is to overturn all traditions that limit the progress of supposedly autonomous individuals who are engaged in constructing their own knowledge. What the proponents of critical inquiry overlook is that the constant quest for new technologies and markets also relies upon critical inquiry, and that this quest also impacts the non-consumer oriented traditions of the community by turning them into new market opportunities. What is largely missing in the thinking of constructivist theorists, as well as in the thinking of proponents of computer-based learning, is the need to have a more balanced understanding of the role of critical inquiry in contributing to a more ecologically sustainable culture.

The assumptions shared by various interpretations of how students construct their own knowledge, including the way computers supposedly further empower students to achieve even more autonomy as thinkers, represent what can be called an “ecology of cultural misconceptions” that will contribute to yet another example of cultural collapse as we exceed the sustaining capacity of the natural systems. Common sense should lead to the awareness that socializing students, and adults who are increasingly at home in the cybercommons, to the idea that they are constructing their own knowledge of reality, and that is as valid as the realities constructed by others, creates a deep prejudice against learning the many ways they have been influenced by their cultural traditions. This prejudice is the source of a double bind whereby they continue to reenact the taken-for-granted patterns of thinking of their culture, including the culture’s silences, while at the same time maintaining the illusion that they are autonomous individuals—and thus free of the need to consider which taken-for-granted traditions need to be intergenerationally renewed and which need to be overturned.

An example of how the “I am in charge of my own destiny” generation (or what can be called the iPod-cell phone- computer gaming generation) continues to reinforce the consumer lifestyle while ignoring the traditions of the cultural commons that most

intelligent people would want to conserve is the enclosure of different traditions that have long been associated with our civil liberties. What is being lost as this generation is electronically connected includes the right to privacy, habeas corpus, and the presumption of innocence until proven guilty. The federal government now monitors most of the individual's activities, and can even have her/him declared an "enemy combatant" and turned over to the CIA for various forms of interrogation that exceed what the Geneva Convention allows. The irony is that many of the current and previous generations who have been educated in our public schools and universities continue to be not just indifferent, but to actively support this loss of our civil rights. This many sound like an over-generalization, but we need to remind ourselves that the majority of Congress that represents (indeed, reflects) the will of the majority of Americans passed the Military Commissions Act as well as Public Law 109-364; both of which gives the President sweeping powers, including taking federal control of the National Guard to put down domestic unrest, to arrest citizens as "potential terrorists" and "enemy combatants," and to hold them in detention centers now being built by a subsidiary of Halliburton. Not only does the iPod-cell phone-gaming generation ignore the loss of traditions essential to a cultural commons governed by the rule of law and the presumption of innocence, but also the loss of the environmental commons as the industrial consumer dependent culture demands more resources.

It is impossible to digitize the inner world of the individual—emotions, thoughts, and insights, embodied sensations when participating in various face-to-face activities ranging from participating in a ceremony, engaged in being mentored and in mentoring others, and walking along a trail in the woods—without reducing them to an abstract text or documentary that is supposedly free of the individual's perspective and powers of interpretation. The taken-for-granted world of the individual, which the educational process should help students to recognize and assess in terms of whether they contribute to a sustainable future, is beyond the technological capacity of computers. How the past influences the present, as well as how the changes in distant ecosystems make us less secure than we can understand in terms of our individualized perspective, are critically important to our collective future. Unfortunately, computer mediated learning, along with the constructivist theories of learning now being used to promote greater reliance upon

the use of computers in the classroom, contribute to the silences and sense of indifference about these aspects of human experience. Constructivist theories of learning, which are now an orthodoxy in many parts of the world where computers are considered as essential to preparing students for the global economy, perpetuate the illusion that teachers no longer have responsibility for helping students to recognize the importance of what they don't know.

How the Conduit View of Language Contributes to the Enclosure of the Commons. The complex set of relationships that can be referred to as the ecology of language cannot be accurately represented by computers. The reason for this limitation is the sender/receiver model of communication required by computers. The sender/receiver model of communication comes into play in educational settings where facts and information are represented as objective. However, in many other face-to-face relationships this model of communication is inadequate. Words that are assumed to convey a certain meaning or conceptual image are often challenged, which may lead to a search for a better analog—and even to adopting a different root metaphor in order to reframe how something should be understood. Face-to-face communication may also involve one of the participants pointing out that words have a history, with the meaning associated with a particular word often challenged as no longer appropriate in terms of today's understanding. The ongoing negotiation of meanings, which may move to the level of negotiating (or dictating) which root metaphor provides the most appropriate explanatory framework, cannot be reproduced through computer mediated communication. Words that appear on the screen appear as factual representations of a fixed reality. That words have a history and may have taken on different meanings over time as the underlying root metaphors changed in response to other developments in the culture is simply lost. An example of this is the way the “individual” was understood as a subject in feudal times, as a citizen during the time leading up to the American and French Revolutions, and as a source of creativity during the German Enlightenment—and today as constructing her/his own knowledge. Essential to the ecology of languaging that occurs in face-to-face communication, which is also missing from computer mediated communication, are the non-verbal patterns of communication that are powerful sources of framing not only how words are to be interpreted but also how interpersonal relationships are to be understood.

The differences between the conduit view of language and the participatory nature of the ecology of languaging in face-to-face communication is largely lost on the naïve student whose other formal educational experiences have not led to a in-depth discussion of the history and political/power implications of words.

The experts who write the software programs tend to reproduce what they learned from their professors, which is that language is a conduit through which ideas and information are passed. Aristotle’s misunderstanding of the nature of metaphorical thinking—a misunderstanding that was further reinforced by John Locke’s argument that we put ideas into words that then convey the ideas to others (the conduit view of language), still contributes to the silence about the layered nature of metaphorical thinking—and how metaphorical thinking is an inescapable aspect of thought and communication. The writings of George Lakoff and Mark Johnson have helped to dispel the misunderstanding that represents language as a conduit, rather than as a metaphorically layered process of framing how words are to be understood. But even they have not fully understood how the history of metaphorical thinking needs to be taken into account—especially how the root metaphors constituted in the distant past continue to influence how we think today. This lack of historical perspective led Lakoff to identify the root metaphors that underlie classical liberal thinking with today’s conservatism, and Mark Johnson to label environmentalists working to conserve habitats and species as “progressives”—which is the metaphor that more accurately represents the efforts of technologists and capitalists concerned with inventing new products and achieving greater profits.

By ignoring how the metaphorical nature of language carries forward over many generations ways of understanding that were the outcome of the taken-for-granted root metaphors and the prevailing analogs of an earlier time in the culture’s history, computer mediated thinking contributes to marginalizing an important part of the cultural commons. The need to continually renew the linguistic storehouse of knowledge and values that are part of the cultural commons is especially important today, as many of the root metaphors are responsible for the cultural excesses that have contributed to global warming and the degradation of other natural systems. The root metaphors that had their origins in the consciousness forming mythopoetic narratives of the distant past can be

seen in how patriarchy and anthropocentrism are now being contested and revised. Other root metaphors that are part of the intergenerational commons, and in need of being understood as ecologically destructive, include mechanism, progress, individualism, and, how evolution is now being used to explain which cultural “memes” are better adapted. A strong case can be made that computer mediated learning, rather than helping students understand the cultural and historical origins of these root metaphors and why they are problematic in this era of ecological crises, actually reinforces the students’ acceptance of them. Educational software is nearly universal in reinforcing the cultural assumptions (which can be traced back to root metaphors constituted in the distant past) about the autonomous nature of individual decision making, the unrelenting quest for innovations and change as leading to progress, and a mechanistic way of thinking about organic processes.

The question that seldom comes up in discussions about the educational advantages of relying upon computers is whether the skills learned in navigating through the seemingly endless sites in the cyber-commons can be transferred into those areas of daily life where the exercise of craft knowledge and manual skill enables individuals to make something for themselves, rather than being dependent upon hiring an expert or purchasing what has been produced on an assembly line. As Matthew Crawford points out in an article titled “Shop Class as Soulcraft ([The New Atlantis](#), No. 13, Summer, 2006, pp. 7-24) craft knowledge and manual skill enable people to produce material objects that are useful and have aesthetic qualities that reflect individual judgment. They are also essential to making repairs that have social usefulness recognized and valued by others, that are a source of pride for doing something well, and that combines what has been increasing severed in the computer driven industrial system of production—that is, the interplay between the exercise of intelligence and manual skill in wiring a building, repairing an engine, in choosing the right wood and crafting it into a cabinet or musical instrument. As Crawford points out, the combination of craft knowledge, manual skill, and the drive to doing something well, is a source of personal pride--which is an essential part of human experience seldom realized in the kind of work connected with digital world of computer technologies. The skills developed in cyberspace add little to what is required of a master craftsman. Indeed, a strong case can be made that reinforcing as

high status a life spent in the world of abstractions (the cyber-commons) undermines the importance of an integrated life of manual skills and creative intelligence by relegating them to low-status. This low status leads to greater efforts to bypass craft knowledge and performance with automated systems of production that further weaken local economies and the self-sufficiency of local communities.

The Role of Mediator Between the Cultural/Environmental Commons and the Industrial/Consumer-Dependent Culture. It would not be inaccurate to claim that all uses of computers involve some form of learning. What is being learned, however, ranges from learning about changes in natural systems that can only be modeled by a powerful computer, participating in an online course that enables students to interact more freely than in a traditional classroom, acquiring the technical information for assembling a bomb and coordinating its use in a terrorist attack, to accessing information on government policies that otherwise would remain hidden from public view. Many pages would be required to list everything that is being learned from using computers. Not all forms of learning contribute to the well-being of the individual, the community, and the environment. And much of what is being learned, as pointed out in the earlier discussion of how language carries forward the misconceptions of past generations, increases the ability of corporations and other anti-social justice groups to further exploit the cultural and environmental commons.

The question that now needs to be asked is “What should be the responsibilities of school teachers and university professors in this era of increased reliance on online learning?” Currently, there is widespread acceptance of the idea that public school teachers should be facilitators of student initiated learning. Teachers are not to impose their ideas upon the students, but rather limit their influence to that of providing a complex set of learning possibilities. However, as many students, even the very young, have achieved greater competency in the use of the computer than their teachers, the teachers’ role as facilitators is often reduced to that of making various educational software available—and leaving the students exposed to the values and cultural assumptions that the designers of the software take for granted.

In the upper grades as well as in university classes, the role of the teacher and professor continues much as before computers appeared on the scene. Assignments are expanded by making the computer a research tool that provides access to a wider range of information—including already written papers that students can download and hand in as evidence of their own diligent efforts. Online courses change the dynamics of the teacher/professor relationship with students in a fundamental way. Online relationships have the advantage of marginalizing skin color, as well as the clothes and body language that communicate social classes and ethnic differences that sometimes are the basis of prejudicial judgments on the part of the teacher and professor. Computers also tend to make the relationship between students and teacher/professor less hierarchical, as well as freeing students to exchange ideas with each other—rather than with an authority figure standing in the front of the room. Ideas and questions can be exchanged without becoming part of the power relations that are communicated through the body language that is often misinterpreted and thus damaging to achieving mutual understanding of what is being discussed. In addition there are the economic advantages for both the students and the university. Students can take courses while living a great distance from the university and even when their work schedules do not match the rigid scheduling of courses on a university campus. Universities gain economically by being able to offer courses to large numbers of students scattered around the world. Thus, they are able to extend the “market” for online courses and degrees.

What may not occur to the professors teaching these online courses, or to the administrators ever in search of new markets from which to draw students, is that the online courses represent a form of cultural colonization to the idea that education automatically translates into a higher material standard of living. The colonization takes two forms: that of educating students to taken-for-granted Western assumptions—including the assumptions that Western technologies and ways of thinking are the most progressive and enlightened in the world. The other form of colonization that online education promotes is the way it represents both directly and indirectly the knowledge, practices, and activities of the local cultural commons as the expression of backwardness—even though the cultural commons is, in many instances, a storehouse of

knowledge about how to live the more self-sufficient/non-consumer lifestyle that global warming will eventually force all cultures to adopt.

I have argued in [The False Promises of Constructivist Theories of Learning: A Global and Ecological Critique](#) (2005), as well as in the online book, [Transforming Environmental Education: Making the Cultural and Environmental Commons the Focus of Educational Reform](#) (2006) that given the adverse environmental impact of our industrial consumer-dependent lifestyle it is now necessary for school teachers and university professors to recognize how the high-status forms of knowledge they promote contributes to the ecological crises. In these two books, as well as in the other essays in this collection, I have argued that most academic disciplines carry forward the prejudices and silences that further undermine what remains of the cultural and environmental commons. If educators at all levels of institutionalized education are to contribute to slowing the rate of global warming and reducing the amount of carbon dioxide that is changing the chemistry of the world's oceans they will need to recognize that the world is now divided in two ways: the industrial consumer-oriented culture that is now being globalized, and the diverse cultural and environmental commons that go back to the beginning of human history. The commons of cultures that have been heavily colonized by Western ways of thinking and the consumer lifestyle are being enclosed faster than the cultures still under the influence of religions that have not made economic progress the highest expression of human success and a sign of God's chosen people. Unfortunately, many of their environmental commons have been degraded by population pressures, changes in weather patterns, destruction resulting from local and global wars, and the exploitation of their resources by international corporations. But this is another story that is not the primary focus here.

The issue that requires our attention is why these two cultural orientations –the industrial, consumer-oriented culture, and the diversity of the world's cultural and environmental commons— should lead us to rethink the role of the school teacher and the university professor. The fundamental differences between these two cultural orientations suggest the nature of the changes that need to be made in how we understand their responsibilities in this era of global warming. The suggestion that social justice liberal school teachers and university professors should reach a consensus about the

primary challenge we now face is not likely to lead to widespread agreement. Indeed, getting agreement in our individualistic culture, where it is assumed that social progress is advanced when each person pursues her/his own interests, is like herding a group of cats. Even though my argument may be ignored, I will nevertheless present the reasons why teachers and professors should stop promoting an uncritical acceptance of the high-status knowledge that furthers the enclosure of the cultural and environmental commons, as well as the reasons why they should adopt the role of mediators between these two cultural orientations.

As mediators, the teachers' role should change from that of reinforcing the taken-for-granted cultural assumptions that underlie the industrial culture to helping students identify the **genuine** achievements of the last two hundred or so years of Western science and technology, as well as how the misconceptions of the past have prevented a more critical assessment of scientific and technological discoveries. That is, the achievements must be assessed in terms of whether they contribute to a more ecologically sustainable future, and to more socially just international relationships. In short, their mediating role requires avoiding socializing students to take-for-granted the idea that the industrialized and scientifically based West has achieved a higher level of development than the non-industrialized and non-Western scientific based cultures. In so many ways, the decline in the ability of natural systems to support the current level of human demand suggests that the hubris and the cultural assumptions formed in the distant past, and that still serve as the basis of the thinking of experts, are both fundamentally flawed.

Mediating between the two cultural orientations also requires that the cultural and environmental commons not be represented as a lost paradise, and the industrial consumer culture as a colossal mistake. If a colossal mistake has been made it has taken the form of ignoring the nature and ecological importance of the local cultural commons as well as the diversity of the world's commons. Not only have the cultural commons been ignored, but the promotion of high status knowledge has prejudiced students against the traditions and intergenerational knowledge that exists largely outside of the money economy. This mistake cannot be rectified by policies that further expand the economy and the level of consumerism, even if these policies also promote the wider use of energy efficient technologies.

Mediating between these two cultural orientations will require a fundamental shift away from those aspects of the Cartesian mind-set that are so widespread in our educational systems. Helping students become aware of the differences in relationships, values, and patterns of mutual support that separate the two cultural orientations will require replacing the assumption about the authority of their subjective judgments as well as their equally subjective perspective on an external world with a more focused and in-depth understanding of the complexity of the cultural patterns that are consciously and unconsciously re-enacted in everyday life. Introducing students to an ecological way of thinking will help them recognize that the dominant characteristic of everyday life involves interdependent relationships—with others, the environment, and the legacy of the past of which they may not even be aware. The Cartesian legacy not only misrepresents the autonomy of the individual's perspective on an external world, but also reinforces a key element of the industrial consumer-dependent mind-set, which is to ignore the legacy that everyday life is largely based upon. Viewing the past as irrelevant helps to ensure that what is being enclosed by market forces will go unnoticed—even as the loss, such as in the areas of civil liberties and mutual support systems, increases peoples' vulnerability to forces over which they have less and less control.

Mediating is different from indoctrinating or privileging one point of view over others. Rather, it requires recognizing that the old criteria for thinking about progress no longer holds—which was largely a matter of equating new ideas and technologies with progress. Today, each aspect of the cultural and environmental commons, as well as the many technologies and expert systems, must now be assessed anew as to whether they contribute to the long-term sustainability of the culture, as well as a culture that has achieved a greater level of social justice. As I point out in Chapter 4 of the online book, [Transforming Environmental Education](#), mediating between the two cultures may take the form in the elementary grades of helping students to articulate—that is, to name and to identify relationships and interdependencies that often go unnoticed. This may include discussing the differences they experience in face-to-face conversations and what they experience when communicating through the printed word—and through a computer. Later in the students' exploration of the two cultural orientations they experience on a daily basis, the process of mediating may involve an examination of the differences

between different forms of oral communication (face-to-face, narratives, expressive arts, etc. and different forms of abstract communication (mathematical and other forms of modeling, printed word, abstract art, learning about the past and other areas of the world that can never be evaluated in terms of direct experiences, ideologies derived from earlier texts, and so forth).

The range of activities, skills, relationships, and forms of knowledge that separate the two cultural orientations should be the focus of the curriculum at all levels of formal education—and the teacher's and professor's role as mediator should essentially be the same. That is, helping students learn how different forms of enclosure undermine local democracy and contribute to greater dependence upon a money economy that is becoming increasingly unreliable for many people. They should also help students recognize and understand how different forms of enclosure may represent a genuine contribution to the community and to achieving a more sustainable form of existence. The tradition of segregation in the South and the racial prejudices that dominated the workplace in most regions of the country was part of the cultural commons that needed to be enclosed—that is, it required overturning the use of racist language, narratives that upheld the virtues of slavery, and the laws that supported a racist society.

Mediating between cultures also requires helping students acquire an awareness of, as well as the language for articulating the empowering and mutually supportive activities that are part of the local cultural commons. Learning the traditions of knowledge and interdependencies being lost when a corporation such as Monsanto introduces a genetically altered cotton seed that resists the pesticide Round Up, or when young people have been too preoccupied in cyberspace to learn how to prepare a meal using traditional family recipes that they have to rely upon industrially prepared food, could also be the focus of learning about the differences between the two cultures. Other examples include clarifying how giving corporations the same status and legal privileges as individuals, as well as the court's recent interpretation of what can be patented, have impacted the local cultural commons in different parts of the world. The mediating process should also help students examine the differences that separate the core cultural commons that sustain the identity and mutual support systems within their ethnic culture from the industrial, consumer culture where everything potentially is for sale—and where

relationships between the producer and consumer are increasingly anonymous and based on the exploitation of young workers in factories located in the low-wage regions of the world.

Some professors may view as naïve and as a poor use of their special fields of knowledge the suggestion that their focus should be on the sustainable characteristics of the cultural commons, as well as on helping students acquire the communicative competence necessary for challenging various forms of enclosure that are both environmentally destructive and that create new forms of dependency upon a money economy. This response will reflect their lack of understanding of important characteristics of their discipline, as well as a lack of understanding of the complexity of the culture they, like their students, largely take for granted. As I point out elsewhere, Western philosophers have contributed to the Titanic mind-set driven by their hubris and an excessive privileging of abstract thinking. The result is that most academic disciplines are deeply ethnocentric, as well as lacking in an awareness of how their most fundamental interpretative frameworks have contributed to the high-status culture that is overshooting what the environment can sustain. Reframing future inquiry in their disciplines can be achieved by examining how the dominant interpretive frameworks in fields such as economics, philosophy, political science, literature, psychology, sociology, business administration, educational studies, and so forth, have contributed to the different forms of enclosure that are now being accelerated by the globalization of the Western system of production and consumption.

A topic as seemingly banal as helping students understand the difference between making something that is based on self-directed craft knowledge and skill, and industrial production, would require going into the history of industrial production, including the role that Taylorism played in creating the separation of intelligence from the act of production, thus contributing to the increasingly segmented and repetitious work of the assembly line. The history that students need to learn goes back even further to why the Luddites of the English Midlands protested the factory system, and then back to the forces that led to the enclosure of work itself—where the tradition of work that is returned was replaced by work that had to be paid for. It would also be important to learn why other cultures value different forms of production, why many commons-

centered cultures have located their market in one location and held on specific days -- which is so unlike how our market-oriented mentality has made it a nearly inescapable presence.

There is also the need to bring an historical and cross cultural perspective to understanding the intergenerational sharing of a craft, which may range from glass blowing, making a musical instrument and a piece of furniture. The cultural assumptions that have created the status system that continues to influence how we think about the person who works with her/his hands can even be traced back to the ideas of Plato. Students would also benefit from exposure to the early history of the labor movement, as well as the economic and ideological forces that are now enclosing the local economy in so many different ways. Other seemingly prosaic aspects of the cultural and environmental commons need to be studied from a variety of disciplinary perspectives. Much of the research on these relationships has already been done, but it should be presented to students in a way that helps them understand their own embodied/conceptual experiences as they participate in different activities of the local cultural and environmental commons. Most of the existing scholarship that should become part of the cultural mediating process has not been framed in terms of the most crucial issues we face today — which includes the need to reduce the cultural practices that are contributing to global warming and to the changes occurring in the chemistry of the world's oceans.

The difficulty of mediating between these two cultural orientations is that most of the cultural patterns that need to be named, understood in terms of how they are part of an ecology of historical misconceptions, unexamined cultural assumptions, daily practices, ongoing languaging systems that reinforce many of the patterns most in need to being made explicit, are part of what both professors and their students too often take-for-granted. The ability to name and thus make explicit the taken-for-granted cultural patterns, and to understand how they interact with other taken-for-granted patterns, is essential for participation in the democratic process. If students lack the knowledge necessary for exercising communicative competence it will be impossible for them to resist the forces of enclosure as well as to conserve the practices and traditions that contribute to the self-sufficiency of the community. Indeed, it is more likely that they will not even be aware of different forms of enclosure — especially as they are usually

represented as the latest expression of progress. As mentioned earlier, the failure of our schools and universities to identify the silences in the curriculum can be seen in how the tradition of habeas corpus has been enclosed by a combination of military, corporate, and market liberal ideologues, with only a minority of the population expressing concern. If students can't name it, know its history and why it is important, they cannot protect it.

In summary, when we begin to consider the relationships and forms of knowledge that are part of the process of mediating between the two different cultural orientations, we find that computers are extremely limiting. In comparing the limitations of computer-based learning to what is required when teachers and professors view their responsibility as mediating between the two cultural orientations, we find the following: (1) As mediators teachers and professors need an in-depth knowledge of the local culture that others take-for-granted—including the taken-for-granted conceptual and moral foundations of the culture of consumerism as well as the moral traditions that are the basis of the cultural commons social justice legacy. (2) The mediating process also requires face-to-face questioning, sharing of insights, developing the language for naming what previously was the un-named and un-recognized part of experience, and the continual comparing of the abstract representations of everyday experience with embodied experience. None of these requirements can be met by the experts who write the software, as they will be unable to represent accurately the local experiences, cultural contexts, and the characteristics of the bioregion. The best they can do is construct abstract scenarios and models that may replicate certain cultural patterns of decision-making—but they will still be abstract and thus reinforce the spectator and game-oriented mentality of students.

The use of constructivist theories to justify the increasing reliance upon computers is also problematic. What we should have learned from earlier approaches to student constructed learning during the late nineteen twenties and early thirties, but didn't, is that students, like many adults, are unaware that what is most critical to learn—namely, what is taken for granted. Constructivist approaches to learning in the child-centered classrooms did not lead students to ask about racism and gender bias, nor were they concerned about the destruction of the cultural and environmental commons that were coming under assault by the new technologies and market forces that changed

the meaning of the word consumption from that of a disease to a social virtue. Learning about the skills and accumulated knowledge connected with most cultural commons activities will be beyond the grasp of students who have been indoctrinated into believing that they can only find oppression and the stunting of their creative insights if they learn from the traditions of their community. The questions that should have been asked by the early progressive educators, and by today's proponents of constructivist, computer-based learning are: Will reliance upon the students' immediate experience and insights enable them to learn about the medicinal characteristics of different plants, how to perform the skills connected with the building trades, how to prepare a meal that has the right nutritional ingredients, how to set up a loom and to play a game of chess, and what civil rights they should protect? Will they be able to recognize the political changes that characterized other democratic societies that allowed themselves to be transformed into fascist societies? What the constructivist-oriented classroom teachers will not do out of fear of imposing their knowledge on supposedly vulnerable students is to ask the important questions. And this is exactly what the role of mediator requires—to ask the questions about the taken-for-granted and ecologically problematic aspects of the culture that few if any students have the background knowledge to ask. It is in knowing what the important questions are-- what taken-for-granted ways of thinking and experience need to be named and thus critically examined, and what needs to be changed and what needs to be intergenerationally renewed--that makes the constructivist approach to teaching and learning so inadequate. Indeed, given the silences about the nature of the ecological crises that characterize the thinking of constructivist learning advocates, it would not be incorrect to say that their approach is an example of the culturally and ecologically uninformed leading those who lack the background for recognizing what is happening to the environment on a global scale.

Computer based learning provides access to important as well as what is often misleading information. It also fosters the experience of participating in an abstract community that reduces personal vulnerabilities. However, it can never be the basis for learning about the deep experiential differences between the cultural commons and a money dependent existence--or about the cultural roots of the ecological crisis that the computer, as well as the people who use it, are complicit in deepening.

Chapter 6 The Leadership Role of Deans in Colleges of Education

Deans and department chairpersons in colleges of education are now being confronted with a new set of challenges. The need to reduce the environmental impact of our culture is being documented by the steady stream of scientific reports on the declining state of natural systems. These new environmental/cultural challenges will not reduce the importance of addressing traditional social justice issues--including the pressures from local communities and the federal government. These will remain important challenges, but the challenges we now are becoming increasingly aware of, given the consensus of scientists, is entirely different—and have consequences that are already set in motion on a global scale.

Leadership is needed in preparing classroom teachers with the necessary knowledge and pedagogical skills that will enable students to live a less consumer and thus less individualistic and change-oriented lifestyle. One of the paradoxes that few faculty recognize is that the ideal of the autonomous individual who has not learned the value of the intergenerational knowledge, skills, and mutually supportive relationships that are the basis of greater community self-reliance, is the kind of individual required by the industrial system of production and consumption. Overcoming faculty resistance to recognizing how many of the ideas and values that have guided their own approaches to education contribute to the consumer dependent lifestyle that is one of the major contributors to degrading the ability of natural systems to renew themselves will be a difficult challenge—especially since many will claim that academic freedom protects their right to promote educational reforms even though the reforms contribute to overshooting the sustaining capacity of natural systems. The dawning of a new consciousness, which the civil rights and feminist movements are still struggling to achieve, requires both conceptual and moral leadership. The same conceptual and moral leadership will be required in transforming the long-held traditions of thinking in colleges of education.

Before spelling out the broader implications of basing educational reforms in teacher education and other areas of study on ecologically sustainable ideas and values, it is necessary to summarize the nature of the changes that the Earth's natural systems are

undergoing. It is important to keep in mind that this summary must take account of the realities of the world in which we now live. **Changes in natural systems:** The industrial system of production and consumption, along with the decline in the ability of species and habitats to regenerate themselves, are increasing the rate of global warming as well as changing the chemistry of the world's oceans. Degraded habitats in oceans and in different regions of the world are leading to the disappearance of species (including a rapid decline in the viability of the world's fisheries). Other environmental changes include the spread of deserts, the melting of glaciers that are the source of water for hundreds of millions of people. The loss of topsoil, depletion of major aquifers, and the destruction of forests, are also major sources of change already influencing the prospects of the current and future generations. **Increase in world population and the spread of poverty:** Over the last hundred years the world population has increased by five and a half billion people at the same time the natural resources have been exploited in ways that have led to the impoverishment of more people. The current estimate is that over 2 billion people live on less than two dollars a day. For the different groups in American society, the era of cheap food is over—which, along with the rising cost of fuel and other basic services will force many people further into poverty. **Changes in Lifetime Employment:** Economic globalization, along with the spread of the morally unrestrained culture of corporations, will cause more people to outlive their savings in the increasingly privatized retirement programs. The lack of health insurance now experienced by nearly forty-seven million Americans is the leading cause of bankruptcy and homelessness. Youth entering the job market will find that the outsourcing of work to low wage regions of the world, even in highly skilled occupations, will limit their possibilities—and thus their ability to educate their children, to own a decent house, and to save for retirement. The present plight of older workers will also be the plight of younger workers as the government safety nets become further overwhelmed by the current shift in the distribution of wealth in society.

The future is made even more uncertain by the current globalization of an industrial/consumer oriented lifestyle. While economic globalization is being viewed as the expression of progress, it is increasing the rate of global warming and the depletion of the Earth's natural resources. Unfortunately, scientists and other experts have no way of

knowing the regenerative capacity of the natural systems that are being exploited at an accelerating rate. How long will it take for various fish stocks, such as the codfish once so abundant and the blue fin tuna now on the verge of extinction, to recover? Can the aquifers that are being mined as though they are an infinite resource regenerate themselves within our lifetimes—or even the seventh generation from now? Can the world's oceans reverse the acidic levels and warmer temperatures that are now contributing to the death of coral reefs that nearly 25 percent of fish species depend upon? What is the time frame for regenerating the glaciers that are the source of fresh water for hundreds of millions of people? Even though we do not have the answers to these questions, more of the world's governments have made the adoption of the American consumer lifestyle their goal. Many regions of the world are already experiencing the degradation of natural systems that were assumed to be inexhaustible—such as potable water, forest cover, topsoil, fisheries, petroleum, and other natural minerals.

Globalization is dependent upon an increased reliance on Western technologies—especially technologies that rely on microchips. While there have been genuine benefits from the development of computer-based technologies the increased reliance on these technologies has led to losses that go unnoticed. Many of the losses are the very traditions that would enable us to slow the rate of environmental degradation and the depletion of natural resources. For example, as youth become increasingly dependent upon cell phones, and on Internet based relationships, learning, and gaming, it is assumed that they are gaining more control over their lives—such as participation in a peer culture of their choice, directing their own learning, and in pursuing their own form of entertainment. The more time youth spend in the online culture the less likely they will become aware of the local cultural commons that provide alternatives to being dependent upon the industrial/consumer-based culture. Instead of becoming increasingly empowered, they are, in effect, becoming more dependent upon an economic system that is under stress from outsourcing, the increasing cost of basic materials and transportation, and competition from regions of the world where wages are low and environmental regulations non-existent. As the ecological crises deepen they will be unaware of how much of the intergenerational knowledge of how to live more mutually supportive and

less money dependent lives will have been lost. While living in the Internet cocoon will continue to isolate them from engaging in the renewal of the intergenerational knowledge, skills, and mutually supportive relationships of the local cultural commons, they will still experience the shortages and dislocations resulting from the twin crises caused by global warming and economic globalization

Briefly, the **cultural commons** encompass those aspects of community life that are less dependent upon a money economy and thus are less environmentally destructive. The cultural commons include the intergenerational knowledge, skills, and relationships that are relied upon in the areas of growing and preparing food, expressive arts, craft knowledge and skills, narratives and ceremonies, civil liberties, healing practices, games, and even language itself. Communities in every culture are sustained in part by the intergenerational renewal of their cultural commons—which may also include traditions that do not meet today’s social justice standards. The important point, however, is that the local cultural commons include relationships characterized by mutual support, mentoring, and the development of personal talents and skills—all of which are fundamentally different from being dependent upon what is industrially produced or that involve monetized relationships. To reiterate a key point, as youth become increasingly dependent upon the new Internet technologies the less likely they are to participate in the cultural commons of their communities in ways that enable them to discover personal talents and skills that strengthen the bonds of community. And the less likely they are to be aware of how ideologies, technologies, and economic forces are enclosing more aspects of the cultural commons—thus forcing them to become increasingly dependent upon a money economy that is becoming less and less reliable.

Initial Awakening to the Importance of the Ecological Crises

Increasing attention is being given to reducing the human impact on the natural systems at all levels of government—from the United Nations, federal, state, and even to city government,. While primarily motivated by the possibility of increasing their profit margins, businesses ranging from mega corporations to small one-person operations are attempting to use energy more efficiently and to be more mindful of reducing excessive waste. University presidents across the country are signing declarations promising to

exercise leadership in promoting ecologically sustainable reforms--though most of the reforms are limited to recycling programs and to the introduction of more energy efficient technologies. While science faculty have made the environmental crises a major focus of their research and teaching in the sciences, the situation is quite different in other areas of the university. For example, in the social sciences and the humanities the reforms are being undertaken by a distinct minority of faculty, and mostly consist of adding readings by environmental authors to existing courses in the traditional disciplines. Exposure to environmental writers raises awareness of the many ways in which the environment is being degraded, but it does not provide students with the practical knowledge of the community-centered alternatives to consumerism and the so-called "progressive" forces that are enclosing the world's diverse cultural commons. The sustainability initiatives listed on the website of the American Association for Sustainability in Higher Education bulletin@aaashe.org demonstrate once again how relying upon technological solutions is being viewed as more important than the need for a fundamental change in consciousness.

What is happening in colleges and departments of education is typical of the rest of the university. Just as in the sciences, the environmental educators engage students in learning how to introduce such environmental issues as the degradation of local habitats, the loss of species, and the industrial sources of environmental damage into their public school classes. Introducing students to environmental authors can only be found in courses taught by a few faculty in the area of educational foundations. The limited interest in environmental issues by faculty in colleges and departments of education is illustrated by the fact that of the over 10,000 faculty who attended the 2007 meeting of AERA in Chicago there were less than 20 papers that focused on environmental issues, and less than 5 papers that addressed educational reforms related to introducing students to the mutually supportive nature of the local cultural commons. The irony is that even though such groups as Real Estate organizations are requiring their agents to pass a test certifying their knowledge of the ecologically sustainable characteristics of houses, the majority of faculty in colleges and departments of education continue to frame the content of their courses and research in terms of the social justice priorities and

interpretative frameworks that were constituted before there was an awareness of the growing ecological crises.

The tradition of departmental autonomy has led education faculty to refrain from encouraging colleagues in other departments to begin introducing ecologically informed curriculum reforms, particularly in the teacher education programs. However, there is evidence that a few environmental educators are beginning to recognize that the destruction of the cultural commons has a direct relationship to the environmental damage they are working to reverse, and are joining what can be called the eco-justice network. The environmental educators and educational studies faculty that make up this network are spread across the country and number less than a 100 members. An even smaller number have participated in workshops that addressed how the language in various areas of teacher preparation, and used by classroom teachers --including public school curricula--carries forward the misconceptions of earlier times when there was no awareness of environmental limits. These workshops helped to clarify how the deep taken for granted cultural assumptions that still underlie the current digital phase of the industrial revolution that is now being globalized are also the taken for granted assumptions that underlie what is being learned in most education classes. These assumptions, in turn, are being passed on to public school students.

These workshops demonstrate why reforms in teacher education and other areas of educational study that are based on a different paradigm cannot be initiated in any broad and lasting way by individual faculty members. Participants in the workshops, which were far too short to provide the in-depth knowledge required to understand the connections between language, various forms of cultural colonization, and the forces that are transforming the world's diversity of cultural commons into new markets, returned to their departments to find that few of their colleagues understood their new insights and approaches to curriculum reforms. In some instances, they were met with hostility as they were seen as no longer reinforcing the values and ideas that their colleagues associated with progressive educational reforms. In effect, the eco-justice/cultural commons orientation of the workshops and publications brought into focus the difficulty of engaging in discussions with colleagues who still take for granted the same cultural assumptions that underlie the modern individualistic, progress-oriented mindset.

The difficulty of an individual faculty member to bring about a major shift in the thinking of colleagues has its roots in the unique culture of academia. Perhaps the two most powerful impediments to making this paradigm shift are the traditions of academic freedom and the specialized language and values associated with different fields of study—such as school administration, educational psychology, curriculum, teacher education, educational studies, and so forth. The specialized language and interpretative frameworks that have their roots in a past when environmental limits were not understood make it difficult for faculty to communicate with others who are accustomed to thinking within specific traditions of inquiry. The need to adhere to what is deemed politically correct in the larger society and across the fields of study in education generally have limited the introduction of new ways of thinking. In spite of the important role that academic freedom has played in the past, this tradition remains one of the chief obstacles to engaging colleagues in a serious and prolonged discussion of the educational reforms that must be undertaken. Academic freedom should not be used as an excuse for dismissing the need to address the ecological challenges we face. There are other major impediments to recognizing that what is being learned in teacher preparation programs, and in the supporting areas of research and teaching, must undergo fundamental changes. These include the demands made by state and federal governments—and the constant quest for innovations that further strengthen the modern paradigm that is ecologically uniformed. Time to think deeply and to engage in sustained discussions of which traditions of thinking within colleges of education need to be carried forward, reformed, or abandoned entirely is severely limited by heavy teaching loads, committee meetings, pressure to publish, advising students, and keeping current with their special field of interest.

Understanding the Leadership Role of Deans and Department Chairpersons in Initiating and Sustaining Ecologically Informed Reforms in Teacher Education

Reform of education courses generally, and especially teacher education programs, will require deans and department chairpersons to provide both conceptual leadership as well as the ability to hold faculty accountable for working through the difficulties in making the paradigm shift that is now required. The major difficulty that

both administrators and faculty face is that they were, with few exceptions, educated to think within the conceptual paradigm that was based on assumptions that did not take account of environmental limits. To paraphrase Albert Einstein, we cannot rely upon the same mind set that created the problem to fix it. Understanding the shift in thinking that must take place in colleges and departments of education requires thinking against the grain of so many of the conceptual orthodoxies held by both education faculty and faculty in the sciences, social sciences, and humanities. The need for making a paradigm shift is, in effect, a university wide problem. The following is a brief sketch of the differences between the two paradigms.

Key ideas and assumptions that underlie the paradigm that most academics were socialized to accept as leading to a socially just and progressive future.

- The individual is the basic social unit, and progress is defined in part by empowering individuals to think for themselves and to create their own values.
- Change, especially when based on scientifically informed technologies and new ideas, is inherently progressive. One of the goals of the educational process is to contribute to more change.
- This is a human-centered world, and one of the purposes of rational thought is to control and exploit the natural environment in ways that improve the human condition.
- Language is a conduit in a sender/receiver process of communication, thus making it possible to share objective knowledge.
- Individuals are capable of exercising rational thought in ways that are uninfluenced by the assumptions of the culture into which they were born.
- Traditions , except for holidays and religious ceremonies, are generally impediments to progress and to the realization of the individual's fullest potential.
- Computers are a culturally neutral technology that enables students to access the world of information necessary for the construction of their own ideas and values.
- Multicultural awareness should be one of the primary goals in teacher education and other areas of educational studies—and there is no conflict between

- understanding and appreciating cultural differences and promoting the key values and assumptions that underlie the modernizing mainstream culture of the West.
- The social justice agenda inherent in teacher education programs, and in other areas of study, prepares students to experience equality of opportunity in the areas of work, politics, and consumerism.

Key ideas and assumptions of that will lead to more ecologically sustainable cultures, and that will help reframe approaches to teacher education, curriculum, learning theory, administration, environmental education, and educational studies.

- The individual is nested in culture, and culture is nested in natural systems—thus the individual must be understood as part of the interacting ecologies of interdependent relationships. In effect, the idea (and ideal) of the autonomous individual is a western cultural myth.
- Language is metaphorical in nature and carries forward the patterns of thinking (the analogies settled upon in the distant past) that were constituted before there was an awareness of environmental limits and the diversity of cultural ways of knowing. As the root metaphors underlying Western culture influenced the selection of many of the analogies we still rely upon, such as thinking of change as progressive in nature and a human-centered world, today's educational process continues to reinforce students for adopting the level of intelligence (or unintelligence) of past thinkers.
- Intelligence, from an ecological perspective, is relational, participatory in ways influenced by the information exchanges within the natural environment, influenced at a taken-for-granted level by the layered nature of metaphorical thinking, embodied, and expressive of the culture's basic narratives.
- Tradition is a metaphor that carries forward the misconceptions of Enlightenment thinkers. Actually, traditions represent all the ways of thinking, practices, and values of the culture that have survived over four generations. Traditions are sources of empowerment, special privileges and forms of exploitation, and are constantly changing—sometimes before there is an awareness of the importance

- of what is lost, and sometimes too slowly. People who hold the idea that traditions do not change should be referred to as “traditionalists”.
- The cultural commons, which exist in all of the world’s communities, include the intergenerational knowledge, skills, and patterns of mutual support that enable people to live less consumer dependent lives—and thus to have a smaller adverse impact on the natural environment. If students learn to think of traditions as a source of backwardness and of themselves as growing more autonomous, they will continue to ignore how their embodied/culturally mediated experiences of participating in the local cultural commons differ from their experiences in the industrial/consumer oriented culture.
 - Social justice issues need to be understood within the context of what reduces the exploitation of the resources of other cultures, of what enables people to participate in the cultural commons that strengthen mutual support while reducing their dependence upon a money economy, and of learning to develop personal talents and skills through mentoring relationships.
 - Teacher education programs need to prepare classroom teachers to recognize that words have a history and that they often carry forward the misconceptions and biases of the culture that is overshooting the sustaining capacity of natural systems, to play the role of a mediator who helps students recognize the differences in their cultural commons and consumer-based experiences—and to help them acquire the language necessary for communicative competence in resisting the further enclosure (monetizing and privatizing) of the cultural and environmental commons.

In effect both faculty and administrators will be challenged to rethink the conceptual frameworks they acquired as part of their own graduate studies and subsequent socialization within their specialized areas of inquiry and teaching. This challenge is not an expression of my own biases and subjective judgments. Rather, it is being dictated by the different ecosystems that are being degraded to the point where they can no longer sustain the North American consumer lifestyle—much less the consumer

dependent lifestyle that the hundreds of millions of people in such countries as India and China are now pursuing.

If there ever was a time for leadership it is now! But the question that needs to be addressed is: How can the dean and department chairpersons provide this leadership when they themselves may not have a solid understanding of the ecologically and culturally problematic nature of many of the deep cultural assumptions that are so widely taken for granted by their colleagues across the country? They can begin by convening a meeting of the entire faculty for the purpose of hearing a scientist explain the changes occurring in the world's oceans, when humankind is likely to reach the tipping point where the rate of global warming cannot be slowed by human effort, the consequences that accompany the melting of glaciers and the release of methane now frozen in the permafrost that is now beginning to melt, the loss of species, habitats, and topsoil, the shifts in weather patterns that are contributing to droughts and the desertification of previously fertile lands. This talk should send the message that if there is going to be a sustainable future for their children, and for their children's children, fundamental changes must be introduced in the education of teachers—and in content of curriculum materials.

The next step is to schedule a series of faculty discussions for the purpose of considering how the basic assumptions that underlie the individualistic/progressive agenda contribute to overshooting the sustaining capacity of natural systems and to undermining the cultural commons. These discussions also should consider not only the implications of the ecologically informed assumptions for introducing reforms in teacher education programs but lead to basic changes in pedagogy and curricular decision making.

Although some faculty will embrace this approach and will want to move forward by revising their courses accordingly there will be forms of resistance that need to be recognized. For example, many faculty will be unwilling to engage in in-depth discussions, and will dismiss the issues as irrelevant. Others may think that the pedagogical and curricular implications of the assumptions that underlie an ecological way of thinking can be fully understood by participation in only a couple of sessions. After a few discussion sessions, they will return to their traditional patterns of thinking.

One of the characteristics exhibited by even highly intelligent faculty is the tendency to reduce the complexity of issues and ideas to simplistic representations that quickly can be dismissed. Another problem that often arises when new ideas are introduced is that too often faculty will limit their interest to learning the new vocabulary and then show no interest in understanding its fuller implications.

If faculty in colleges of education were already well informed about actual changes taking place in the world's ecosystems their responses would be of less concern.. And if they were more accustomed to thinking within an ecologically and culturally informed paradigm they would be less likely to engage in superficial discussions. The following introduction to the complexity of issues relating to an ecologically and culturally informed understanding of language, intelligence, and the cultural commons, to cite just three examples from the preceding list, is meant to highlight the danger of superficial and reductionist thinking that will ensure that no substantive educational reforms will result.

For example, if education faculty begin to rethink the assumption that language is a conduit in a sender/receiver process of communication they will find themselves addressing some of the most critically important misconceptions shared by many classroom teachers and professors. For example, learning that language is not a conduit, but is based on metaphors whose meanings were framed by earlier processes of analogic thinking that were, in turn, framed by the prevailing taken for granted root metaphors of the culture, has broad and vitally important implications for both teachers and the people who produce curriculum materials. The implications are even more profound for students who are being told that computer mediated learning (which reinforces the conduit view of language) facilitates the construction of their own knowledge. The myth that language is a conduit hides how language carries forward the insights and, more often, the misconceptions of earlier thinkers. When teachers fail to clarify that words have a history, and that their current meaning was framed by earlier processes of analogic thinking that reflect both a culturally specific tradition of thinking and the political struggles of an earlier time, students are likely to assume that words provide a factual account of events and thus are the source of objective knowledge.

To put it more succinctly, not only does language carry forward the patterns of thinking that both teachers and students may take for granted, it can also be understood as one of the more powerful expressions of linguistic colonization of the present generation by past generations. Relying upon the analogies settled upon at an earlier time may also reduce the students' ability to make an intelligent response to current relationships, such as thinking of women in the same limited way that was taken for granted over the centuries. The discussion of language presented here only touches the surface of what teachers need to understand as they mediate between the past, present, and future.

Other conceptual orthodoxies that do not take account of environmental limits, and that need to be revised if pedagogical and curricular decisions are to be part of the solution rather than a continuation of the problem, include how to understand intelligence in a way that not only takes account of the influence of language, but also its participatory and relational nature. Most thinking about intelligence, which is increasingly being based on a mechanistic model, is still predicated on the assumptions of the French philosopher, Rene Descartes, and other western philosophers who did not understand the deep symbolic foundations of their own culture and the radically different symbolic systems of other cultures. The idea that intelligence is an attribute of an autonomous individual (autonomous in the sense of being uninfluenced by the cultural assumptions carried forward in the language she/he learns to think and communicate in) assumes that the thinker is an objective observer of an external world. It also assumes that ideas originate along with other mental/emotional processes in the brain. An ecological interpretation of intelligence takes account of a variety of relationships that influence the student's intelligence. These include the ongoing relationships with other people and the environment, the words and interpretative frameworks from the past that carry forward the misconceptions that illuminate and hide what the individual will be aware of, and a host of embodied and psychological influences. These influences on intelligence vary from culture to culture—and in no way correspond with the orthodox view that intelligence is exercised by an autonomous individual who is the source of ideas, and so forth. The pedagogical implications of this more relational way of understanding intelligence, are in turn, complex and not fully grasped in a short discussion session.

Similarly, understanding the nature of the local cultural commons and the forces that are transforming it into new market opportunities that are ecologically destructive is also unattainable if educators think it can be addressed in a couple of sessions. Faculty participate daily in different aspects of their local cultural commons. Unfortunately the failure of their own professors to make explicit the many forms of mutual support, as well as the intergenerational knowledge that enables people to be less dependent upon consumerism, has contributed to their lack of awareness of the need to include in the curriculum an in-depth understanding of why revitalizing the cultural commons, as well as conserving the cultural commons of other cultures, are essential to a sustainable future. Again, understanding the complexity of the cultural commons, including those aspects that are sources of injustice, can be viewed as a career long endeavor—especially if students are to be introduced to the history of the forces that are privatizing and monetizing what remains of the cultural and environmental commons. How should teachers help students become aware of the differences between their experiences in the cultural commons and their experiences as a consumer of what is ready made and that requires participation in a money economy? What do students need to understand about the nature of traditions in order to recognize the importance of some forms of intergenerational knowledge and skill? How does the teacher help them to develop the linguistic basis of communicative competence that will enable them to resist the enclosure of such areas of the cultural commons as the traditions of civil liberties and the narratives of past social justice achievements? What are the different silences in the curriculum that represent the process of enclosure that are not being recognized?

These are just a few of the questions that demonstrate the need for faculty to make a long-term commitment to rethinking whether the cultural assumptions they are reinforcing in their courses will lead to the cultural changes that will help slow the rate of environmental degradation. This commitment, if it is to succeed must be a collaborative effort of the entire department and between departments. If not, students will be taking courses that are based on the same assumptions that gave rise to the industrial/consumer oriented culture that is overshooting environmental limits, and in other courses they will be encouraged to begin thinking of an ecologically informed approach to pedagogy and curriculum—including the place of computers in the learning process. The tensions that

will arise within departments as it becomes more evident that the ecological crises are impacting people's lives both here and in other parts of the world will require leadership from deans and department chairpersons. The following list suggests the way leadership can be expressed without becoming dictatorial and an interference with the faculty member's academic freedom. Leadership can actually facilitate faculty collaboration, especially when the faculty have a clearer understanding that the deepening ecological crises not only threatens their own future but also that of already marginalized groups. As there is little possibility that faculty will begin to introduce ecologically informed changes in their courses and programs if they do not take the ecological crises seriously, it is necessary to emphasize again that the first step in exercising leadership is to have a scientist present the consensus overview of the degraded condition of different ecosystems, as well as the evidence of how these changes are impacting people's lives. Taking this step will also communicate to the faculty the priorities supported by the various levels of administration within the college and university, and that these also are the priorities being promoted on a national basis by American Association of Sustainability in Higher Education and the Higher Education Associations' Sustainability Consortium,

Legitimate and Necessary Expressions of Leadership:

- **Announce that a major priority of the college of education is to collaborate with other divisions of the university in introducing curriculum reforms that contribute to an ecologically sustainable future (see the website of the American Association for Sustainability in Higher Education bulletin@aaashe.org).**
- **Convening the entire faculty for the purpose of listening to the scientific evidence of natural systems that are no longer regenerating themselves at a level necessary for sustaining life, or are undergoing changes, such as global warming, that are already affecting the quality of life of billions of people.**

- **Convene the entire education faculty for a discussion of the cultural roots of the ecological crises. This session should provide an overview of how current thinking and practices being reinforced in the various programs in the college are based on assumptions that do not take account of environmental limits or how to live more community-centered and thus less consumer dependent lives.**
- **Use discretionary funds in the budget for the purpose of collaborating with other colleges of education in sharing the most effective ecologically informed approaches to teacher education and to ways of thinking within other departments of the college.**
- **Ask that department chairpersons provide regular reports on the progress faculty are making in engaging in discussions of the reforms that contribute to more ecologically and culturally informed courses and publications.**
- **Remind faculty that in conducting searches for new faculty attention should be given to the candidate's background education—specifically whether she/he shows evidence of being able to question currently held assumptions and to engage in dialogue about the reforms that need to be undertaken.**
- **If faculty in a department fail to consider the culturally and ecologically related challenges in recommending the hiring of a candidate, then as a last resort the dean should encourage that a further search be conducted.**
- **Encourage faculty who possess a better understanding of culturally and ecologically informed educational reforms to establish collaborative relationships with faculty in other parts of the university who are addressing similar concerns. The education of most faculty in the sciences, social sciences, and humanities was based on the same deep cultural assumptions that are ecologically problematic and may welcome discussions of**

pedagogical and curriculum reforms that address the limitations in their own education .

Summary

While many indigenous cultures have understood for hundreds of years the need to adapt cultural practices to what is sustainable over the long term, it has only been in the last thirty or so years that the exploitation of the environment has become the concern of the American public. Aldo Leopold and Rachel Carson were among the first to sound the alarm. Leopold explained the nature of a land ethic but was unaware of the land ethic of the indigenous cultures that still inhabited the region where he had his life-changing insight. Rachel Carson's concern with the life destroying effects of the chemicals being introduced into the environment in the name of scientific progress was yet another wake-up call of major importance. The various Earth Day celebrations and international environmental conferences that followed focused mainly on issues of excessive consumption, various forms of environmental degradation, and environmental justice issues. Only recently has attention been given to the taken for granted cultural assumptions—including how they are linguistically passed on—that gave conceptual direction and moral legitimacy to the industrial/consumer oriented culture that is a major contributor to global warming and to the decline in the viability of other natural systems. This needs to be taken into account when understanding why few deans and department chairpersons possess an in-depth knowledge of the conceptual/linguistic issues that need to be addressed in any effort to initiate reforms that are not based on the old (ironically “progressive”) mind-set that is now beginning to be recognized as part of the problem.

Deans and department chairpersons, like the rest of us, should view themselves as participants in the beginning stages of discovering a post-industrial pathway that will avert what Jared Diamond documents in his book, *Collapse: How Societies Choose to Fail or Succeed* (2005). Other cultures have found their own pathways. Unfortunately, the intergenerational knowledge that has sustained them for thousands of years is now being threatened by economic and ideological globalization. We can learn from their cultural commons without copying them, and learning from them will help to remind us

that making ecological sustainability a priority of educational reform needs to be a collaborative effort. The only thing that can be universalized is the danger of ecological collapse now faced by all cultures—and it needs to be recognized that responsible scientists are increasingly using the word “collapse”. What deans and department chairpersons can do, even if their own educational backgrounds do not provide for an understanding of the cultural/linguistic issues that also are being ignored by faculty in other departments of the university, is to keep reminding the faculty that both the ecological crises that scientists are documenting and the cultural traditions that are major contributors to overshooting environmental limits, must be in the foreground of reforming teacher education and in the supporting fields of studies in colleges of education.