The Janus Machine: computers, language, and the enclosure of the cultural commons

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> The commons represent both the naturals systems (water, air, soil, forests, oceans, etc.) and the cultural patterns and traditions (intergenerational knowledge ranging from growing and preparing food, medicinal practices, arts, crafts, ceremonies, etc.) that are shared without cost by all members of the community…what has not been transformed into market relationships (Ecojustice dictionary *http://cabowers.net/dicterm/CAdict003.php*)

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 cybercommons. 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. A fuller discussion of their conceptual errors is available in the essay on linguistic complicity that is part of this collection of essays.

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. That 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 cybercommons 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 craftsperson. Indeed, a strong case can be made that reinforcing as high status a life spent in the world of abstractions (the cybercommons) 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 progess 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: Making the Cultural and Environmental Commons the Focus of Educational Reform*, 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 pointed out in the chapter on how Western philosophers have contributed to the Titanic mind-set driven by hubris and an excessive privileging of abstract thinking, 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 an 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 a 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.