

Chapter 4

Feminist Pragmatism Looks at Distance Education

Educom, the academic-corporate consortium, has recently established their Learning Infrastructure Initiative which includes the detailed study of what professors do, breaking the faculty job down in classic Tayloristic fashion into discrete tasks, and determining what parts can be automated or outsourced. Educom believes that course design, lectures, and even evaluation can all be standardized, mechanized, and consigned to outside commercial vendors (Noble, 1998).

This chapter applies the theoretical tools developed in Chapters 1, 2, 3 to web based instruction (WBI) as currently practiced. In extant WBI, I look for the location of the body, gendered technologies, separation from and domination of nature, cyborgization, attention to experience, sources of power, and possibilities for organic holism and connection. I begin with some general description of WBI and then turn to specific examples.

What is WBI

This section relies heavily on the work of McIsaac and Gunawardena (1996). I use the concept of Distance Education (DE) to introduce WBI. DE stands at the intersection of pedagogy, media studies, and technology. It tries to make the human and moral endeavor of education fit into a technological mold allowing expansion of instruction into time and space and largely limiting the student's physical interaction to keyboards and monitors. Consequently, DE requires expanding some spheres of education while contracting others.

Distance Education has many instantiations including mailed correspondence courses, television transmission of courses, satellite downlinks, Integrated Services Digital Networks

(ISDN) transmission⁴⁷, interactive video instruction, and web based Internet delivered courses. Today, web based, asynchronous courses are very popular and economically accessible to universities, the military, and industrial educational efforts. In this dissertation I focus on the issues of web based asynchronous instruction, WBI. Web based asynchronous instruction represents the paradigm of different place /different time instruction as explicated by McIsaac and Gunawardena (1996).

Web based asynchronous distance education is a particular combination of instructional technologies (tools) allowing students to be space and time independent of each other and their teacher. The distinctive characteristic of this modality is centralization of course deployment through a World Wide Web (WWW) interface. This makes course access theoretically available to anyone with a web browser and a connection to the Internet. I say theoretically because other factors such as speed of Internet connection, reliability of Internet connection, age of connecting computer, and skill of the user also impact availability. Although this mode of instructional delivery is primarily asynchronous, sometimes synchronous components like real time conferencing are added so students may directly interact with each other and with their teacher. I will still refer to a course as asynchronous if it is primarily asynchronous in contrast to a technology like interactive video conferencing, which is primarily synchronous.

In addition to a WWW interface WBI uses many tools of computer mediated communication such as e-mail, chat rooms and multi-user forums, multi-user Domains (MUDS), streamed video and audio transmissions. These tools are embedded in the web interface using hypertext markup language (html) or a web scripting language such as Java or perl to create the environment into which the other tools are embedded. The student normally requires a computer,

⁴⁷ ISDN is digital transmission over fiber optic telephone lines. It is much faster than standard modem transmission, also more expensive, and not available in all market areas.

Internet access, web browser, and other Internet tools such as plugins, telnet, audio, and video utilities.⁴⁸

Chat rooms are typically places where people log in to a web site or use a special chat client to post messages. Messages are displayed in the order in which they are posted so that discussions on one topic are often interrupted by messages from another discussion topic. Some chat rooms have discussions listed by topic. The chat room is then called a threaded chat room or discussion forum. There is no notice sent to participants when new messages are posted so individuals must initiate checking the chat room for continuation of discussions.

E-mail is a CMC⁴⁹ tool that is familiar to most students. At Virginia Tech, it requires using a post office protocol (POP) client such as Eudora to poll the mail server for new messages. Class members and teachers can use nickname lists so that one message may be sent to all class members. Listserves function similarly to e-mail nicknames lists except that they have a few more features and work seamlessly so that every message sent to the listserve is exploded and sent to all members via e-mail. Again, a POP client is needed to access the Virginia Tech mail server to receive the listserve messages. Large listserves can generate huge amounts of messages particularly when members respond to the entire list instead of to an intended individual.

MUDS are complex conglomerates of chat rooms built on the metaphor of physical space. They require knowledge of complex commands to navigate through the space.

⁴⁸ The use of these other utilities is often the problem for students with older computers.

⁴⁹ Communication that takes place through, or is facilitated by, computers. Examples include Usenet and e-mail, but CMC also covers real-time chat tools like lily, IRC, and even video conferencing ("Free online dictionary of computing," 1998).

Interactions with other MUD dwellers are possible and encouraged. MUDS, which arose from multi-person adventure games such as "Dungeons and Dragons", are supposed to be particularly well suited for cooperative activities. As digital graphics improve, the visual look of MUDS has also improved, even including 3D, or virtual reality imaging. While they may represent a programming advance, I find them awkward and tedious to use. They are tedious because they are text based, command line tools, yet a great deal of depiction of emotion, character development, and movement is expected. Therefore, one is writing huge amounts of text for small gain.

Computer mediated communications (CMC) allows participants to initiate and read messages or discussions at any time, a practice referred to as asynchrony. Synchronous chat sessions can be scheduled when all class members are required to log into the chat room at a scheduled time. These scheduled synchronous events vary in their usefulness. Confounding characteristics such as server capacity, students' schedules, and particularly tact and skill of moderator affect their value. In the best of circumstances, CMC engages more students in discussions, fosters writing skills, and provides an ever-available tool for class communication (Bellamy, 1996; Feltovich, Spiro, Coulson, & Feltovich, 1996; Hiltz & Johnson, 1990; Johnson-Eilola, 1994; Koschman, Kelson, Feltovich, & Barrows, 1996; Riel, 1995; Riel & Levin, 1990; Roschelle, 1996; Ruberg, Taylor, & Moore, 1996; Wresch, 1994). Consequently, CMC is often used as an effective adjunct to co-present classrooms as well as the primary communication channel for WBI.

Students in WBI situations read text off their computer screen or print the screens on their locally attached printers, write responses to exercises using word processors and other editors, and watch and listen to audio and video emanating from their web interface. There may be scheduled synchronous chat sessions, required group activities, other reading materials, or other required activities (on-line or off-line). Bodily involvement with instruction is chiefly limited to reading and typing activities with occasional listening activities.

WBI is frequently a hybrid of on-line and co-present activities. For example, a course may require an introductory co-present session, periodical co-present activities, scheduled synchronous sessions on-line, or activities in the student's local environment with members or perhaps non-members of the class.

The WBI student needs computer literacy skills, excellent literacy skills in written English, and good planning skills (Harasim et al., 1995).⁵⁰ She or he is located on a college campus, industrial site, or receives instruction at home, or in another setting away from the source of the instruction. In general, she or he may access the web server at any time. Thus, the student might be both physically and temporally distanced from both teachers and other students.

Some researchers [Lockee, 2000 #450] attempt to simplify the description of distance education by breaking it down into its primary components of instructional method, delivery mode, and media attributes of the delivery mode (i.e., level of realism, ability to provide feedback, etc.). Wisely, they want to discriminate between the tools of technology and other aspects of the instructional event. Applying this to WBI, I can say that the instances of WBI presented later in this chapter largely share mode (web based delivery). They share much of their media attributes (text based web interfaces, listserves, e-mail, and chat rooms). Least of all, they share method. Method or the instructional methodology is much more teacher dependent than are media or mode in WBI. Of great importance, I call attention to the fact that in a holistic sense all three of these characteristics of WBI transact. This transaction sometimes makes it difficult to separate methodology from media and mode. In fact, the range of possible methodologies depends upon mode and media. When designing WBI, one may only use the media and methodologies that the World Wide Web allows. Skill and resources limit the media that are used. This further constrains teaching methodologies. In general, while design of instructional

⁵⁰ Some WBI courses screen for these capabilities and temperaments with online quizzes and other advising techniques (Western Governor's University, 2000).

technology may call upon a certain sequences of decisions (Dick & Carey, 1996), these decisions are often constrained by previous choices or availability of mode and media (Shambaugh & Magliaro, 1997).

Learning = Growth = Change

I briefly review my concept of learning which draws heavily on the pragmatic ethos, explained in chapter 2, and organic holism. Following Dewey, I view education as growth. "Since growth is the characteristic of life, education is all one with growing; it has no end beyond itself" (Dewey, 1916/1980, p. 58). Learning as growth implies change. Change requires disequilibrium, the state of allowing oneself to be vulnerable to change. Inquiry follows disequilibrium. Creation of new habits results from inquiry, and re-establishment of equilibrium eventually follows.

A frequent alternative to learning as growth is learning as ventriloquation (Bakhtin cited in Wertsch, 1991), also known as the banking model of education (Freire, 1996), or the conduit metaphor of education (Reddy, 1979). Here, the information deposit or knowledge download causes no moral or aesthetic change. Minds are filled not formed. The student is a passive recipient or vessel of what the teacher offers. The teacher is the only active participant in this exchange.

What does education as growth entail? A change in habits is change within the student's very body but not always change that can be seen. Dewey advocated a holistic, qualitative educational experience that was emotional and embodied as well as cognitive. He wrote:

The bookish (the so-called academic and scholastic) character of education, the absence of concrete materials and appliances, was a natural correlate of the depreciation of experience. The mottoes "from the concrete to the abstract," "induction before deduction," "teach things, not words," "learn to do by doing," are all of them products of the exaltation of the function of experience. (Dewey, 1911/1978, p. 449-450)

Several of these mottoes relate educational experience to empirical experimentation. Dewey promoted an environment for educational experience that supported experimentation. The need for experimentation, experience, and appropriate environment do not change with the use of technology. Education is an endeavor that strives to connect students and teachers to subject matter with the goal of continued growth of both the student and the teacher.⁵¹ If this broad outline of education were to change with the use of technology then we would have to say that technology drives education rather than serving it.

Standardized tests do not easily measure the kind of growth and change that Dewey valued. This kind of learning often involves changes in emotion and habit that become manifest long after the student has gone onto another class or grade. The inability to guarantee learning and to measure learning makes this kind of pedagogy unpalatable to those who seek control, power, and certainty from the educational experience.

Feminist interests are also looking for change, specifically re-balancing power hierarchies to include women in decision making in education.⁵² Schools can be scenes of enforcing norms and they can be places for explorations of new possibilities, new ways of being. Feminism and pragmatism coalesces very strongly in a desire for the latter possibility. Recall from the last chapter that feminism and pragmatism are both marginalized for "linking the dominant discourse with domination". The schools are one such site for this work.

⁵¹ When education is viewed as a transaction between a teacher, a student and subject matter, any of these three components must be free to move and change. To expect growth only from the student is disingenuous and restrictive of the holistic transactional relation.

⁵² In the United States in k-12 settings, the majority of teachers are female while college level teacher and administrators such as principles and superintendents are mainly male (Grumet, 1988).

Four Examples of WBI

For the rest of this chapter, I frequently refer to four examples of WBI. The first is a woman's studies course that I attended as a silent participant observer, hereafter referred to as WS. I learned some of the philosophy of the teacher of this course from a book chapter and from personal communications (McCaughey, 1999; McCaughey & Burger, 1999). The second example is a course on media, technology, and diversity in which I was a student and which was the subject of a dissertation and presentations at professional meetings (Hegngi, 1996, 1997, 1998), hereafter referred to as MTD. The third example represents the larger context of WBI, an on-line university, the Western Governor's University, hereafter referred to as WGU and accessible via the web interface <http://www.wgu.edu>. I use these three examples to explore instantiations of WBI, to examine how WBI is applied in a higher education setting in the United States, and to provide concrete examples when evaluating my feminist pragmatic tools. I do not claim that these examples represent all possibilities of WBI; the scope of this dissertation does not include such a survey. I selected these examples because they are part of my personal experience, they represent typical WBI settings, and they are in the public domain by virtue of publications and web sites.

WS was an introductory summer school course for non-majors. Students participated in the course by reading assignments from two textbooks, investigating on-line modules of web sites and supplementary papers, using e-mail to transport their assignments to the instructor, and receiving comments from their instructor via e-mail. There was also a class listserve and chat room (only at the end of the course), both mainly utilized by the instructor. The on-line modules include "Cybergrrrl Webguide, an introduction to the Internet itself", "Service Learning", "Women and Science", "Lesbigay module", "Gender and Sports", "WebWomen: A Women's Studies sampler", "Global Women", "Girls Online", "Sexual Violence & Self Defense", "Gender & the Media", "Women and Childbirth: Historical Perspective", "Feminism and Spirituality: The

Revival of the Goddess", "Women in Male Dominated Occupations". These modules are located at <http://www.cis.vt.edu/ws/wsmodes/moduledirectory.html>. The creation of these modules resulted from a grant from the university, Virginia Tech, to develop online Internet teaching technologies for introductory courses. Some of these modules are links to other sites, some are pages of web links to other sites, and some include introductory text, summary questions, and electronic discussion forums.

WS suffered from serious technological problems. The server was inaccessible for large parts of the summer school semester. In desperation, the instructor moved the site to another server for the end of the course and relied on e-mail and a listserv for the balance of the interface with students. Consequently, the students had to adapt to two vastly different servers and software suites. Few students took advantage of the chat room facilities finally available at the end of the course. I think they were too overwhelmed by technology to risk spending more time in order to use a new tool.

MTD, also a summer school course, was for advanced undergraduates and graduates. It was cross-listed between education and black studies. Participation in this course included more varied activities than in WS. These involved co-present introductory sessions, online explorations in personal knowledge of stereotyping, written responses to readings and other types of assignments, participation in online discussions, viewing movies, both embedded in the web sites and available from the local university library, interviewing of community members, and a final project which was an example of a culture sensitive multi-media presentation (Hegngi, 1998). The web site was quite elaborate and evolving even as the class took place. The current version of the web site is:

<http://malachi.etl.vt.edu/Mtds297/start.htm>.

MTD also suffered from server problems of two kinds. First, although the class size was small, 11 students, the server was inadequate for synchronous discussion sessions, attempted towards the end of the summer school session. Second, there was no redundancy of the server.

The server crashed at the end of the summer session shortly before the final project was due. Since the instructor involved with the technology was out of town, there was a frustrating delay in restoration of the server with its final project instructions.

Western Governors University (WGU) is a large multi-state consortium that provides online courses and degree programs.

Western Governors University is a unique institution that offers degrees and certificates based completely on competencies -- your ability to demonstrate your skills and knowledge on a series of assessments -- not on required courses. We make it possible for you to accelerate your "time to degree" by providing recognition for your expertise.

(Western Governor's University, 2000)

They advertise certificates or degrees in five programs, mainly technological, such as a certificate in Network administration. The only non-technological degree program is the associate degree in arts. They promise to provide mentors for their students and provide online services such as a bookstore and library from their web site <http://www.wgu.edu>. There are many courses offered through WGU and they reside on servers at several educational institutions. I will not comment on them individually but use WGU as an example of the larger administrative issues in WBI.

Lastly, I call attention to an example of WBI that I find exemplary in many respects, The Union Institute (2000). The Union Institute (TUI) provides tutorial-based instruction leading to BA's, BS's, and PhD's. Meant for non-traditional students, it was founded by a consortium of non-traditional colleges including Hofstra University, Bard College, Antioch College, and Sarah Lawrence College. It is now a freestanding university composed of undergraduate and graduate

colleges. Some programs of TUI (including graduate programs) are largely dependent upon WBI. Consequently, it attracts place bound adults who desire or require a graduate degree. Features of The Union Institute that I find positive are its inclusion of co-present sessions⁵³, the small size of its online classes (under 20), its provision for individual counseling, and its insistence upon stable and continuing peer collaboration (often over CMC). I claim that TUI provides a useful educational experience for the non-traditional student who is mature, motivated, and organized but place bound.

Location of the Body

Educational theory is overwhelmingly concerned with the cognitive development of students (Bransford, Brown, & Cocking, 1999; Gardner, 1985; Schneider, 2000). I demonstrated in chapter 1 how commercial interests promote the Internet as a disembodied realm. Recall how my pragmatic ethos strives to unify dualisms such as mind and body. Recall also my discussion of the body as treated in feminist pragmatism. In summary of these discussions, I remind you that learning takes place in the body in intimate connection with the mind. Dewey noted that he had never met a mind independent of a body.

Digital technology does not erase all traces of the body. The body remains imbedded in writing and discourse style (Herring, 1994; Herring et al., 1995). Still, meaning-making is richest in a context that requires the body (Scheckler, 1998). Rather than a matter of erasure of the body, the issue in WBI is situatedness and representation of that body. When I discuss AI and virtual reality in relation to feminist-pragmatism, I will broach these issues. In this section, I discuss the physicality of the body as a material and space taking entity. Where is the student's body and does her corporal reality have an effect on her learning? Is the class restless today because it is a

⁵³ The Union Institute makes its co-present session accessible by having several centers, by providing short (weekend) sessions preceded by readings and followed up with papers and online chats.

warm and fragrant day of early spring after a long hard winter? Are the students too cold or too sick to concentrate? Is the single mother's toddler getting in the way of her concentration? Perhaps a student who learned English as a teenager does not understand the particular language you use as a teacher. Are there new glints of understanding and sparks of excitement not seen in this student before? How would you know across the bandwidth of WBI?

I suggest that the most effective education involves the entire student. The student is a body with a mind and emotions that are qualitatively and experientially unique and a one time only event. However, the student is also more than this. The student participates in communities, a history, a culture, and hence a context. Teachers of young children know how embodied is the reality of their students. They would rarely suggest the advantage of WBI for these students. Is there a sudden change in education at high school or college where the body becomes less important and can be reduced to its cognitive components or does the curriculum render the body increasingly docile over time? How do my examples of WBI fit into this concern with the body? Students enrolled in WBI have bodies that participate at some level with WBI. Minimally their bodies interact with a computer and its peripherals. When do students learn best, with minimal physical involvement with learning or with a more active involvement? What part of the pragmatic ethos helps give an understanding to the place of the body in education?

Organic holism is one place that gives counsel concerning the body. An individual body does not function in isolation. As discussed in Chapter 2 and earlier in this chapter, bodies gain their meaning from their context through habits. Remember that in a holistic sense, we are part of the environment. "Life goes on in an environment; not merely in it but because of it, through interaction with it (Dewey, 1934/1980, p. 19). Also, education is experimentation with the world. Thus, growth of a body involves readjustment and experience with its environment. Remember the earlier discussion of learning as growth and Dewey's insistence that growth requires connection and plasticity. Furthermore, Dewey viewed the process of education as functioning through the environment (Dewey, 1916/1980, p. 172). I conclude that WBI must consider the

entire student, in a holistic sense, as much as any other form of education. The context of the WBI student includes her or his context and this is often unknown to the instructor. This lack of information makes it very difficult to provide a holistic education that considers the student as an integral part of a context.

Dewey said that learning involves experience as in "learning by doing". He also said that interaction and continuity were critical to this experience of education (Dewey, 1938). Experience for Dewey was the result of transactions with the environment (Garrison, 1998a, p. 65). Continuity for Dewey was continuousness with context. In context, habits develop from previous habits and in connection with experience. Habits, for Dewey, are experiences embedded in the body. If I seem to be circling back on my argument, starting with the body and ending at the body, it is because I view education as organically holistic. Any change in one part must affect all other parts. There can be no consideration of cognition, context, or emotions by themselves. They are all one, all important to education, and all transacting.

When I lived in Edmonton, Alberta, I was a biology demonstrator (the British name for an instructor) for several semesters. In that position, I taught laboratory sections of an introductory biology course. One lab was always about vertebrate reproduction. I was visibly pregnant during some of those classes, young enough to be viewed as an ally, and sympathetic to my students' larger concerns. In that laboratory, I frequently answered questions about human sexuality.⁵⁴ I was asked about many things from effectiveness of contraception to premature ejaculation. I am reasonably certain of two things although I cannot prove them. First, I do not believe those students would have asked similar questions via CMC. They could see my earnest attempts to answer their questions without smirks or embarrassment. Second, I believe that these information sessions were a very valuable part of their education. I certainly would have thought

⁵⁴ I had also been an intake counselor at Planned Parenthood of Tompkins County, NY shortly before I moved to Edmonton. Thus, I felt fairly confident in my sources of information and practice in providing the details of human sexuality.

my job well done if I saved even one of those students from venereal disease, unwanted pregnancy, or sexual abuse.

My own schooling experiences were most absorbing and satisfying when they involved embodied experiences. Some memorable examples include observing gender identification at the site of an all girl's computer club, studying marine algae in the inter-tidal zone of Maine's rocky shore, learning about difference by interviewing people unlike myself, and discussing philosophy and theory with other graduate students who had very definite and very different ideas than myself. These experiences were so compelling that they set me up for months of reading and studying so I could understand more about the situations I participated in, so that I could make my case better the next time, so I could engage fully in future similar events.

What does feminist theory add to this Deweyan understanding of the body in education? There is a compulsion to unify mind and body in feminist -pragmatism as a disruption to the patriarchal attribution of mind and reason to maleness. Recall my discussions in the last chapter, a patriarchal, capitalist culture fights these efforts at unification of mind and body, and it singles out women's bodies as those in need of improvement and correction.

There were different levels of embodied activity in WS and MTD. WS involved minimal embodied activity. The student read, wrote, thought, and responded. No requirements for physical actions existed outside of these, not even the acts of speaking and discussing. MTD required students to interview people of ages and cultures different from themselves, an activity one the students of MTD found quite rewarding (Hegngi, 1997). MTD also had some interesting online interactive assignments meant to spur self-evaluation of one's feelings about race and diversity. There are different degrees of bodily involvement with WBI, depending upon the resources, skills, and desires of the instructors or in terms of Lockee, the methodology involved. Still, both of these courses are largely examples of the conduit metaphor where the web page is the conduit through which the active teacher downloads information to the passive student. WBI is in danger of committing the intellectualist fallacy where only knowledge in the head is valued.

⁵⁵ When committing the intellectualist fallacy, WBI also creates the danger of being gendered male. When the male equals mind and female equals body dualism continues to prevail.

I am not alone in my desire to restore concern for embodiment to education. Michele Tolela Myers, the president of Sarah Lawrence College, confirms my pleas in an op-ed piece printed in the Roanoke Times as a reprint from the Washington Post (2000). Myers differentiates between transmission of information and education. She says,

More than ever, we must teach our young people to learn how to learn, to sort and evaluate information, to make judgements about evidence and sources....No computer can sharpen the mind as well as a crossfire discussion among students with their teacher....The emergence of computers challenges us to know what our business is. We must respond that we are in the business of ideas, not information, of forming minds, not filling them. (p. A7)

The distinctions that Myers makes are the distinctions between education of minds and education of students who must one day function in social settings.

Student's bodies on campus have needs for health care, exercise, and nutritious food. Thus, universities employ dieticians, physicians, recreational sports specialists, health educators, and sometimes child caretakers. I suggest that WBI students have the same physical needs as those on campuses. I want to know where are the gym, clinic, day care center, and cafeteria of WGU. I hear the pleas of WBI for those homebound such as single mothers with children or those with physical disabilities.

⁵⁵ The instructor can modify this with activities beyond the web the based format, as in MTD. This involves changing instructional modes, since the mode of web based instruction is inherently limiting.

My pragmatic ethos seeks contingency and contextually, organic holism and a community of inquirers. These goals all depend upon a known transacting body, affecting and being affected by its environment. Furthermore, the body in my pragmatic ethos is a social body. In other words, it requires other bodies to transact with. There is no doubt that the body involved with WBI is in a context and an environment. The peculiarity about the context and environment of the WBI student is that it overlaps very little with the context of other students and teachers in the course. Thus, the context or situation of the WBI class is quite dispersed. What does this mean to engage in studies in such a dispersed situation? I suggest that it must make the communication less intimate and less coherent. Again in terms of my pragmatic ethos, all the students are selves decentered in fields of action but the fields of action have very little overlap. Bakhtin's (Wertsch, 1991) notion of heteroglossia describes our words as coming from the words of others. Here, also the overlap of contexts forms groups that can communicate well because they literally share each other's words. They co-designate meaning with each other's words. An empirical study of on-line communication confirms my intuition that divergent contexts make communication difficult (Dubrovsky et al., 1991). This study showed that consensus is more difficult to achieve via CMC than in co-present situations. My explanation is that people communicating via CMC are less likely to share speech registers, idioms, metaphors, and heteroglossia. They may suffer from a "Tower of Babel Syndrome" where they do not speak the same "language".⁵⁶

The teachers of WS and MTD had very different impressions of the utility of WBI because they had different expectations of the role of the body in learning. Joyce Williams-Green, teaching MTD, wanted emotional involvement with course discussion on racism, stereotypes, prejudice, and bias (Hegngi, 1997, p. 88). She found affect lacking in the computer

⁵⁶ Indeed, they all speak English. Yet their English derives from different sources and unless mediated in some way to find commonality (See Wertsch, 1991). There are many anecdotes of misunderstandings via CMC. I suggest that some of these arise from varying speech registers that never get mediated.

mediated communications (CMC). This is an excellent example how media attributes and the mode of delivery limit teaching methodology. The instructor of WS wanted to keep the emotions of sexual abuse, sexism, and sexual preference at bay. She found WBI useful for her purposes (McCaughey, 1999; McCaughey & Burger, 1999). I claim that WBI controls the body in definite ways particularly in regard to expressing affect. The body that shows up in CMC only does so with expression of emotions dampened. It becomes so tiresome to explain emotional stances in words that those attempts are frequently slighted. This limitation of WBI can be overcome by requiring co-present situations, as TUI does, or embodied activities, as MTD does, in addition to the more usual WBI activities of reading and writing. In other words, a hybrid of WBI with co-present experiences and embodied modes of delivery allows more range in teaching methodologies and more embodied experiences.

In summary, all students have bodies. Those bodies are each unique. WBI largely ignores, dampens, and standardizes these bodies. This effect of WBI can be moderated by finding alternative communication channels to supplement those usually offered with WBI and by requiring more embodied activities of its students. In the media, mode, methodology paradigm, this is an extension of media and methodology.

Attention to experience

Recall how my pragmatic ethos established experience as transaction of an organism with its environment and established refined experience as education. Recall also how feminist pragmatism tries to re-establish gendered experience as a source of knowing to counter the dependency on men's knowing as the standard. Furthermore, using Harding's strong objectivity requires notice of the context of experience. A quote from Adrienne Rich in the first chapter relates the disequilibrium of not seeing our experience reflected in the institutions where we participate. Here I discuss the production of this disequilibrium in school settings.

Both co-present education and WBI reinforce a dominant patriarchal view of experience. I digress briefly to describe some of the ways that a computer science program ignored my gendered experience. In one large lecture class, I endured jokes about rape by a teacher who later received university awards for the quality of his teaching. There is no one woman's experience. Yet, most women would feel violence against their bodies is an experience they wish to eradicate. Thus, this teacher's attitude, treating rape as a joke was sufficient to make me leery of the hidden agenda of that course. Other women I was personally familiar with were also very disturbed by these "jokes". You might be curious about why I persisted in this program. The short answer was that I loved the field. The logic puzzles of the programming assignments were like intriguing cross word puzzles to me. If they had only given me half a chance to find some reflection of my "woman's" experiences, I would have been such a joyful student.

Women's studies courses, in keeping with the general principles of feminist pedagogy, are often a place to explore theory from the starting place of individual experience (e.g., see Fisher, 1981; Lather, 1991; Mayberry, 1999; Schniedwind & Maher, 1993). There are women's studies professors who dislike this aspect of the field and specifically eschew the emotional and other particulars of their students' experience. They may view experience as too messy and difficult to handle since women's studies courses frequently include such issues as sexual abuse, abortion, and homosexuality. The teacher in WS is one such women's studies professor who prefers to stay distanced and abstract with her students. Thus, she prefers WBI and women's studies courses taught in large lecture classes where she is not so liable to get involved with her student's emotional experiences (McCaughey, 1999). I do think that her students sensed her unwillingness to engage because there was very little student use of CMC in this class. This instructor chose to stay distanced from her students and WBI gave her the means.

MTD actively encouraged students to reflect on their personal experiences as participants in racism. It provided some excellent materials and exercises to encourage students to consider racism from a personal viewpoint (Hegngi, 1998). It also provided many opportunities for

asynchronous conversations in a chat room. Even so, discussions and reflections broke down in this chat room. Students needed prodding, encouragement, and some sense of security to explore their personal stereotypes and prejudices further.

Dr. Joyce Williams-Green, a co-teacher of MTD, was experienced and eager to do this task but became frustrated with the asynchronous nature and the dearth of the discussions (Hegngi, 1998). She seemed to be frustrated because she wanted to monitor these touchy situations but there was no assurance that her comments, in response to a discussion, would reach the intended recipient. She eventually suggested and then required a synchronous chat session. The synchronous sessions suffered from inadequate server capacity to handle the entire class. They also suffered from the ability of students to log off when they became uncomfortable with the conversation. I sensed and shared her frustration at the difficulty in maintaining sustained and sensitive conversations. I also regretted losing an opportunity of a co-present classroom to be better acquainted with the two African-American professors who taught the course.

I have had only two other African-American teachers in my many years of schooling and very few African-American colleagues. I fear saying the "wrong thing" to African-Americans. From a very personal viewpoint, I could have learned much that was not included in the class objectives from co-present experiences with these two professors. For teaching methodologies that seek to involve student's affective responses the media attributes and delivery mode of WBI are limiting.

My pragmatic ethos requires experience. Experience is the interface between the body and the world. When the self is decentered in a field of action, it is the transaction with the field of action that composes experience. Experience is experimentation with the world, the testing of the water before the leap, the immersion in the cold swirling surf after the leap. WBI cannot provide the feel of the water, it can only provide a model of this experience. WBI can ask a student to go swimming and come back and report the sensations to the class. This might be the

best option for connecting WBI and experience. Although the best possible experience would result from the entire class swimming together and then processing the experience of swimming together. They would then have overlap in their field of action by virtue of shared experience.

The feminist wants experience but asks whose experience will be noticed, privileged, or affirmed (Seigfried, 1993b)? This is particularly pertinent to ask of WBI where the rule bound nature of the medium enforces a particular (if tacit) standpoint. I suggest that WBI requires more flexibility, continuity, and plasticity of its interface in order to meet the needs of a wide array of students. I will have more to say about this in the next chapter.

Gendered/Situated Technologies

In Chapter 3, I discussed gendering of technologies. Computers are traditionally boys' toys, gendered male as a pretense to their pure mind and rationality. In the gendering of technologies, the means become the ends. The connection of computers to maleness serves to keep women less involved in certain aspects of computer use (American Association of University Women, 2000).

Women are users of computers at work. As secretaries and office managers, they might be the most prolific users of computers at work. Women are also becoming users of the Internet in large numbers and thus computer users at home. This seems to be the result of women realizing the communication capabilities of e-mail rather than the more typical male usage of game playing and downloading of pornography. There is another discrepancy. Women are the primary labor in the production of computer components. Men are the primary programmers or designers of the hardware and software that computers run.

I claim that the gendering of technologies has an implicit and explicit effect on the use of these technologies as tools. The tools of WBI are the main interface with the subject matter and thus very important to the acceptance of WBI. In saying this, I do not imply that WBI is then

gendered male. Use of e-mail may be gendered female just as telephone use largely seems female and social. Also, gendering shifts over time.

I give you some examples of how technologies enforce certain limited viewpoints and knowledge. These do not all deal with gendered knowledge, although several do including this first example. When working in an elementary school with an all girls' computer club, I helped teach the use of a web-site construction tool. This software had limited backgrounds and color combinations, in order to simplify its use by young children. The choice of colors and backgrounds eliminated all possibility of an Afro-centric web site. None of the girls complained about the limited choices but then they did not know there were other possibilities.

Artificial Intelligence (AI) represents a special kind of technology used for IT and WBI. In general, AI concerns a broad range of computer applications that model human intelligence. Specific aspects of AI sometimes applied to WBI are machine learning, expert systems, and robotics. AI is the high end of high technology. Alison Adam represents a very thorough feminist critique of AI in which she demonstrates the gendering and disembodiment of technology predicted by my discussion of feminist-pragmatism in chapter 3 (1998). Adam particularly discusses the embedding of the knowledge of male professionals and college students in AI (Adam, 1998, pp.70, 76-77, 90, 98). I can not say that Adam considers herself either a pragmatic-feminist or a feminist-pragmatist. Yet, her discussion of such topics as embodiment and situatedness, her recognition of the dualism perpetuated by AI, and her denial of a God's eye view make her an ardent feminist and a good ally of pragmatism. She cites different authors than I do but within her book I find confirmation of the theoretical stances of Dewey's and other authors cited here.

I was an AI programmer for several years. Along with Adam, I wondered at the attempt to reduce knowledge to a cognitive level.⁵⁷ As an AI programmer, I wrote programs based on algorithms such as "probabilistic hill climbing", "simulated annealing", "constraint satisfaction" and, "genetic algorithms". While I found these algorithms were powerful tools in the ill bounded and large search spaces of the whole farm planning problems I was trying to solve, I never believed I was creating meiotic crossovers or heating metals up to high temperatures with my computer.⁵⁸

Writers of AI programs commonly try to imbed what they consider common knowledge in the knowledge base (rule base) of the software. Alison Adam discusses this process in two large AI software projects called Cyc and Soar (Adam, 1998). Both projects suffer from some of the same problems. I only discuss Cyc here.⁵⁹ Adam points out that Cyc, as a model of a knowing subject, operates with millions of axioms denoting common sense knowledge, some of these rules deciding what to do when there is conflict between the triggered rules (pp. 85-86). The software must understand what constitutes a conflict, a point where problems of representation may arise. In order for Cyc to understand conflict, Cyc must take the stance of believing a particular model or world view such as capitalism and then understand other worldviews such as Marxism. The problem here is not only which view Cyc believes but also what other world views it will recognize as part of a conflict. If the programmers of Cyc, most likely middle class,

⁵⁷ My most memorable quote from a male colleague was "I love computers because they are completely rational".

⁵⁸ Genetic algorithms involve representing a solution set as a chromosome with many genes. The chromosomes engage in random mutations and non-random meiotic crossovers to form new solution sets. A selection function determines which solution sets will persist and which will perish. In simulated annealing, a version of probabilistic hill climbing, solution sets are metallic molecules. With heat these molecules expand, become more active, and exchange atoms to form new solutions sets. The rate of new solution formation can be controlled by simulated parameters such as the level of heat applied.

⁵⁹ Cyc was conceived as a huge knowledge base representing common or consensual knowledge (Adam, 1998, p. 81).

professional males (Adam, 1998, p. 90), make these decisions, they may privilege the viewpoints with which they are personally familiar. If they are perceptive, they may program in rules for, say, a “feminist” viewpoint or an “Asian” viewpoint. They are much less likely to recognize a black lesbian feminist or N. Korean viewpoint. For instance, if they included knowledge of childbirth in North America and Europe, would they also include knowledge of midwifery and home birth? It is highly unlikely that all the intricacies of any non-dominant stance would be represented in Cyc's knowledge base.

My next example refers to Blackboard course info™. This is a commercial software package designed for building course web sites. It has at least one restriction that makes it less useful for a teacher trying to de-center authority as one might do in feminist pedagogy classroom (Maher & Tetreault, 1994). There is no way to turn off the label "instructor" in that software. Thus, it assumes that someone must take that central position of authority. Hierarchical control in the classroom is maintained by the assumptions of this software.

I have previously discussed the connection of experience with education. The experiences we have compose our education, whether guided by a wise teacher in the company of peers, or encountered alone. We are constantly reminded that we live in the information age. Information, largely delivered over the internet is our ever available and supposedly egalitarian source. However, even in the putative open frontier of the internet there are gendered assumptions that control what information we obtain and hence the experience of our search.

My last example comes from a paper by Garrison and Burton (1995). Search engines such as Hotbot or Yahoo index items on the Internet. The way these items are indexed or categorized affects how and when they will be found. The example used in Garrison and Burton's paper concerns the indexing of abortion. Abortion categorized as a health issue, rather than a criminal issue, or murder, or birth control, yields different search results. A person searching the Internet will find vastly different sites dependent upon the indexing of abortion. Bowker and Star present many other examples of categorization and how this effects power

relationships (Bowker & Star, 1999). Indexing and categorization are very potent creators and protectors of power hierarchies.

An incident I am personally familiar with concerns the indexing of religious web sites attempting to convert Jews to Christianity. Some groups which refer to themselves as messianic "Jews" are believers in Jesus. They call themselves messianic "Jews" just so they will be categorized with Jewish organizations. Their web sites are replete with mainstream Jewish symbols and other pretensions of Judaism. Their entire goal is to lure impressionable young Jews to them in order to convert these often high school and college students to Christianity. A search of the internet for Judaism will bring you to these sites as well as those of genuinely Jewish organizations. Messianic "Jews" have the hope that they can lure Jews to them with their familiarity, hook Jews with pretensions of friendship and support before finally making their pitch for conversion.

The examples in this section give weight to Dewey's contention that technologies are not value neutral. They become value-laden in their creation. The stance and values of the creator of a technology influences the tool. This makes sense in an organically connected world where dynamic equilibrium of creatures in their environment extends out in all directions, only limited by the Deweyan situation and selective interest. Valuation of tools may change with use but only within the constraints of the tool. Winner's example, previously cited in this dissertation, of the bridges on Long Island, NY, are a good example of valuation in creation limiting future uses of a tool (Winner, 1980).

Cyborgization

Earlier parts of this dissertation emphasized the projection of human abilities into tools and the resulting reciprocation as these tools acted back upon the user. I now turn to my examples of WBI to look for this characterization in the formation of cyborgs. Recall that I already noted that all language users are cyborgs. For Dewey, cyborgization is implicit in tool

making and tool use. Recall that Dewey's cyborg gives equal value to nature and to culture. This is an important point in the use of WBI, the refusal to allow culture to trump nature.

Tool use and participating as a cyborg is not new for the student or teacher of WBI. Perhaps the most significant part of WBI is the many layers of tool based mediation as people attempt to co-designate meaning between two or more centers of action. WBI uses many digital tools, all embedded in a web interface. I again use the example of chat rooms in MTD to examine this multi-layered tool use more closely. In particular, I review the synchronous chat sessions. This class had members located off campus using modem connections. In order to participate in the scheduled synchronous chat session a student needed to be available at the scheduled time, connect to the Internet via modem or campus Ethernet, launch a web client, connect to the class server, find the chat room, manipulate the software of the threaded chat room, negotiate the terminology and subject matter of the course, and get over the fear of the discussions on racism.

There are many places a student can run into difficulties in the process of participating in the class discussions. "The MTD course was designed to examine the influence of stereotypes and the values and beliefs of the designers on media products. The students as media technology designers would assess their own stereotypes, values and beliefs" (Hegngi, 1998, p. 5). I suggest that the process of recognizing stereotypes, values, and beliefs is emotionally charged for most students. Since this was a major goal of the class, there might have been better results from stripping away some of the layers of language and tool mediation, paring down the cyborg a bit.

In this class the reciprocation from the tools silenced the students or at least muffled their attempts to deal with racism. The projection of the students functioning as communicators could have been accomplished as well or better without all the involved tools. We are always cyborgs and much of this cyborgization helps us. As a student, I cannot function as effectively without my glasses or my word processor and printer. There are other tools including televisions, VCRs,

and voluminous listserves that distract me from my studies rather than focus me on them. It takes a lot of wisdom to recognize the limits of tool use because tools are not equally valuable.

Separation from and Domination of nature

My greatest fear of digital technologies is decontextualization, their tendency to remove people from their environment, their natural and cultural surroundings. This issue relates to power dynamics and virtuality, presented later. I fear decontextualization because I believe it leads to less respect and protection of the material world. It seems reasonable to assume although I cannot prove that students learning to dominate a virtual world will also dominate their material world. Earlier chapters give the tools to examine this image of separation from nature and domination of nature in WBI.

Chapter 1 showed some of the images of domination of nature by digital technologies. Recall the cover of Technological Horizons in Education Journal celebrating the natural world captured in the virtuality of computer screens. Recall also the Philips commercial where the teacher controls the images of nature shown in the classroom. Most frightening to me are Schank and Cleary's claims that using computer models are the equivalent of learning by doing (Schank & Cleary, 1995, p. 72).

My pragmatic ethos developed in Chapter 2 endorses a contextual organic holism. Within a holistic system, an organism must remain in dynamic balance with its environment. Dewey, who frequently used biological metaphors, remarked on the need for humans to transact with their environment in order to survive. The environment of pragmatism and organic holism supports the inter-relatedness of animals and environment.

Chapter 3 investigated the many ties of feminism and nature in the form of eco-feminism. There I established parallels between the domination of women and the domination of nature. I also discussed the incompleteness and changability of nature.

Carolyn Merchant discussed a shift in metaphor from earth as nature to earth as machine during the industrial revolution (Merchant, 1980/1990). I fear another shift from earth as machine to earth as virtual during our current digital and information age. Regarding earth as virtual allows a vision of the earth that is complete, certain, and controlled. This vision is complete, certain, and controlled the same way a model of the world (or part of the world) is complete, certain, and controlled. Both a vision of earth as virtual and models of the earth are in conflict with a holistic view. The programmer's certain rules create a model or simulation.⁶⁰ Rules describe and encircle the totality of the model. A model or simulation has definite endings of its extent. It cannot allow the flows and connections of organic holism to trespass its borders. It can not allow the flows of student's interest to overflow its hard and fast borders. In the terminology of Chapter 2, it cannot allow large shifts in situation. The rules and therefore the model are invariant (see fig 4.1). Dewey's The Quest for Certainty was a refutation of certain, immutable, and invariant rationality (1929/1982).

⁶⁰ I use modeling and simulation interchangeably in this document. In the digital realm, they are the same processes of creating an invariant, self-contained, and immutable image of reality.

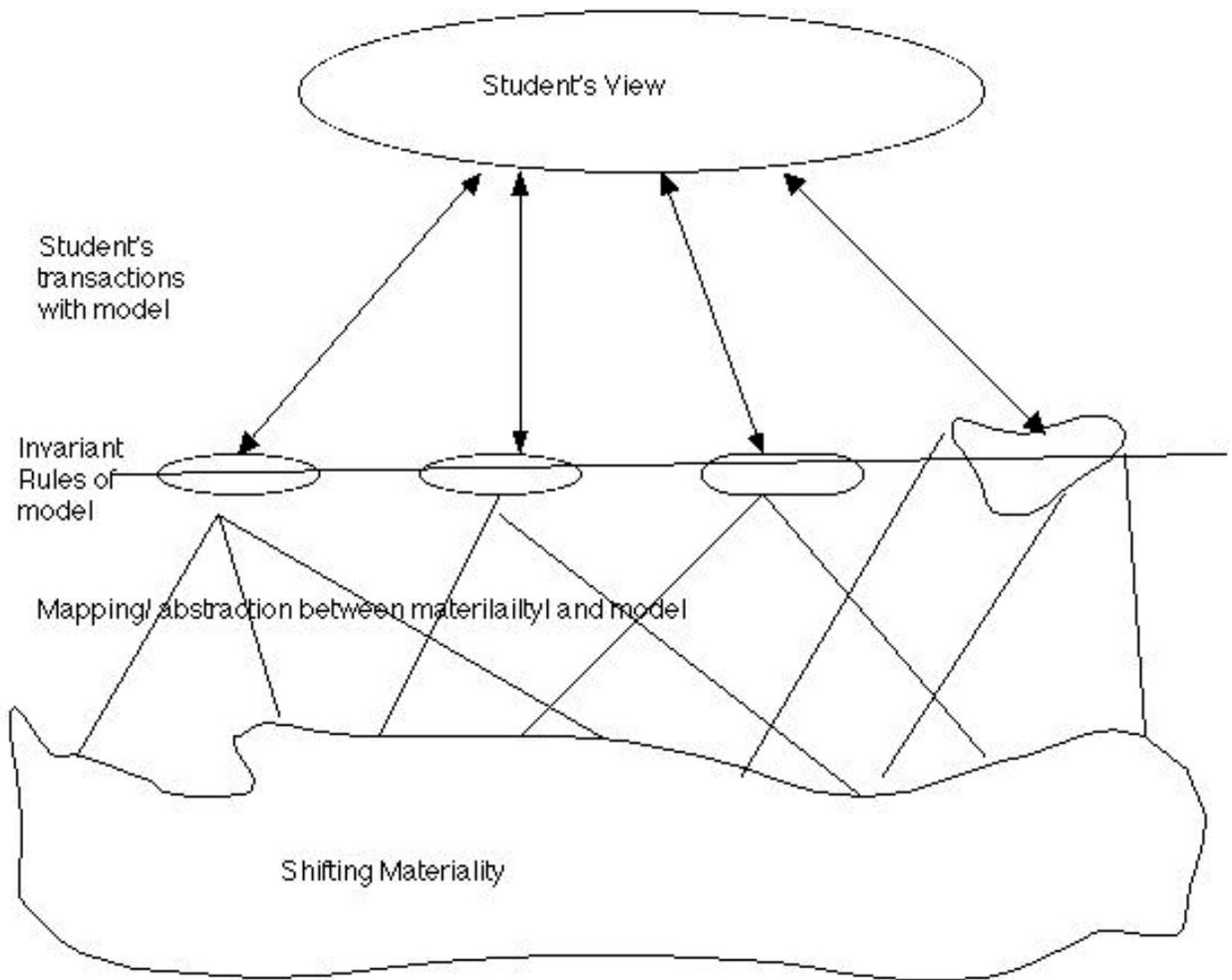


Figure 4.1 Schematic view of computer models

I have already established the reduced bodily involvement of students while participating in WBI. I now develop how the use of computer modeling further reduces students' connections to nature. On-line classes sometimes use computer modeling of natural events. Schank and Cleary advise the use of AI programs for individual instruction and view them as experimenting with the world. Roger Schank is an AI guru and has more confidence in modeling and simulation than I do. Anyone who believes computers can model the function of the human brain must surely have a lot of confidence in the techniques of AI.

The use of models and simulations lulls teachers into thinking they are encouraging participation rather than observation of natural phenomena. They are indeed encouraging

participation in a model. However, this model is at least one level removed from experimenting with the world. Not only did Dewey eschew the "spectator view of knowledge" but the feminist who draws knowledge from embodied experience will find models and simulations strangely separate and remote from their lived experience. For the feminist, this estrangement derives from the particular viewpoint of the programmer, which is almost certain to be foreign to the feminist, as well as to the epistemological objections already mentioned.

There is no doubt that computer models allow some degree of manipulation and experimentation with a virtual environment. We have to question how much this environment opens the experiences of the student or constrains and limits it. All computer models or simulations are a mapping, a simplification or abstraction from something else. They all involve selection and interpretation of aspect to model. The selective attention of the programmer determines what is incorporated in the model. For the programmer to perfectly replicate the natural world or part of the world assumes a view from outside the world, a view as God might have or a God's eye view. Thus, when a computer programmer writes rules to make the computer behave in a way approximating a natural event, the model is always a synecdoche of the situation. It is always a partial representation of the event so it is a part, the model, representing the whole, the natural event. A student may indeed feel a similarity to manipulating the actual event with a cleverly done model. Yet, the model is always a depleted abstraction of nature so the student's experiences are with the rationalized, impoverished, analytical model and not with holistic, messy, and changeable nature. No matter how realistic the model, the student is only experimenting with the rules of the model and not with the larger environment. As Garrison and Scheckler discuss (In Press) this leads to a bi-level conception of reality that can founder on foundationalism and the myth of certainty with the danger of creating dualisms of knower/known and subject/object.

There is no doubt that models are valuable to students. They allow them to investigate situations too dangerous for corporal involvement. They allow them to investigate processes that are time or place constrained such as models of global warming or the growth of a large tree.

Yet, there is another danger for the feminist. The reduction of materiality to rules enforces a Cartesian view that the mind, as separate from the body, can be represented by rules (Adam, 1998, p. 37). The feminist as well as the Deweyan pragmatist resists the certainty of nature although for different reasons. The feminist eschews a natural essentialism that limits women to certain "natural" roles while the pragmatist denies the implied dualisms of mind/body, nature/culture, and subject/object. Instead, the feminist views women's nature as relatively stable but changeable and the pragmatist extends this concept to all experience.

I have already discussed the dangers of foundationalism and the fact that Dewey rejected the metaphysics of presence. Dewey supported a position wherein we could not know "truth" with certainty; we cannot step outside of the earth and view it from outside as a God might. Dewey also accepted a neo-Darwinian view where reality evolves. Thus, a computer model, no matter how realistic it appears today might not be a good match in the changed future.

For the WBI student, the manipulation of models as if they were manipulating nature has three dangers. First is the impression that it is appropriate and possible to dominate nature. The student who grows up manipulating computer models and viewing them as some kind of "true" nature may transfer this attitude to the manipulation of the material world.

Second is the trap of mistaking the synecdoche for the whole. The student viewing the model has no reason to understand it is a synecdoche. The goal of the model is to mimic another reality, thus the closer it is to this reality, the more successful it is, and the less likely students will realize it is a model or a part representing the whole.

Third is the largely cognitive component of this manipulation and the consequent reduction in bodily and emotional participation. Again I remind you of the Cartesian dualism of

mind/body enforced by rule based models. Both the feminist and the pragmatist struggle to unite this dualism.

This does not deny the value of models in some circumstances nor the ability of students to understand the difference between models and materiality. It does warn about the exclusive use of models. I also warns about the substitution of models when direct observation can be made.

I must be wary here, that I do not introduce another dualism, that of reality versus virtuality. For the pragmatist, they are the same, both part of reality. For the pragmatist, there is nothing but reality. This is part of my quandary with models. They are indeed part of the student's reality. As such, they threaten to replace a rich, messy, and varying view of the world with a certain, safe, and controlling one.

I fear that virtuality will entrap nature as some neat flattened cognitive component that can be dominated and captured in virtuality, forever encapsulated and certain in its functions. This is not only an erroneous view of nature but it allows unconcern with the changeable and somewhat unknowable nature that provides our material needs. I have already described how the destruction of our environment endangers our continued existence. Students and all other world citizens require more respect and understanding of nature not less. I surmise that when students understand the precariousness of nature, they will tread much more lightly on environmental shifts such as draining wetlands, cutting coastal redwoods, burning tropical rainforests, depleting water tables, fertilizing suburban lawns, and otherwise recklessly consuming natural resources. They will understand that human behavior can limit the future of human survival. There will evade the disingenuous shield of a protective model shielding them from what must be recognized and dealt with.

My interest in nature has other ties to my view of distance education. I seek connection in distance education. When I seek connection, I seek ties to nature, culture, and history in order to

provide stability to education and to provide a check on relativism. I am wary of any pedagogical practices that separate and deny the context of teachers, students, and subject matter.

Real Virtuality/Virtual Reality

Virtual reality is a one of the tools of WBI. It is on the cutting edge of WBI and is not yet widely used. For Dewey there is no qualitative difference between the virtual and the real. They are both part of the real because there was nothing else that existed for Dewey (Garrison & Scheckler, In Press). For Dewey, there is no transcendence or escape from the immanence of existence. All life involves existence on a single plane. Remember from Chapter 2 that this plane is falliblistic, antifoundational, contingent, and social. Here I concentrate on viewing the social nature of virtual reality (VR). How does VR used in the context of WBI cultivate the social nature of self in a critical community of inquiry? The feminist might further ask where gendered experience fits into VR. Is there a place for relatively stable yet changeable gendered experience?

All my criticisms of computer modeling also refer to virtual reality. It is a particularly elaborate instantiation of modeling or simulation and often uses AI methodologies such as natural language understanding and expert systems. In its visual components, VR may be even more seductively deceptive than other forms of modeling and simulation. I suspect that we are more prone to believe what we can see with our own two eyes.

VR differs from other forms of modeling in its reliance upon bodily sensations connected to the model. For instance, flight simulators are early examples of models using VR. They might involve an operator sitting in a mock up of an airplane cockpit with controls that duplicate the controls of the plane. The device may pitch, yaw, and roll in response to the user's manipulation of the controls. In addition there may be views projected in front of the operator that simulate the views outside a cockpit again in response to the use of the plane's controls. Even the noise and gravitational effects of plane travel can be modeled. This is all more elaborate than WBI allows

today yet bodes for future development in WBI. For now, three-dimensional imagery, VR gloves, glasses, and other body wear are possible and used in WBI although not commonly and not in WS or MTD.⁶¹

One of the most elaborate examples of VR is the CAVE™, a three-dimensional, room size VR environment developed from the visualization paradigm of AI.

"CAVE," the name selected for the virtual reality theater, is both a recursive acronym (Cave Automatic Virtual Environment) and a reference to "The Simile of the Cave" found in Plato's Republic, in which the philosopher explores the ideas of perception, reality, and illusion. Plato used the analogy of a person facing the back of a cave alive with shadows that are his/her only basis for ideas of what real objects are. (What is the CAVE™?, 1998)

The CAVE™, available at several universities, is a multi-user environment, literally using light and mirrors to create its three-dimensional imagery. It also models sound and movement. It is indeed an experiment with perception, reality, and illusion, a fact that I fear VR researchers often want to forget.

I wonder at the huge amount of energy used to remove the body from WBI, and the huge amount of energy used to incorporate VR in WBI with its images, sounds, and feel of the body. This virtual substitute for the body is a body disconnected from materiality by simulation rules as discussed above. Avatar, is the name for this virtual reality equivalent of a human form. In Hindu myth an avatar is "the descent of a deity to the earth in an incarnate form" (Oxford English Dictionary, 1992). The avatar may look like a person but its etymology makes its extraterrestrial source explicit.

⁶¹ Various wearable VR devices provide interfaces between the model and the person that are more sensory than mice, keyboards and monitors.

Going beyond rules, I have to ask what the avatar represents. Computer programming is absolutist. There is an invariant mapping between computer languages and machine code. Instructional Design is also rule governed in many of its forms (Dick & Carey, 1996) making it hard for me to imagine WBI as allowing fallibility. The hyperrationality of programming enforces the viewpoint of the programmer or program designer. This may be quite deceptive in VR. For instance, the avatar may have the appearance of a woman yet not be built upon an epistemology makes it act like a woman.

What kind of social community of inquirers results when I converse with an avatar? I suspect this reinforces already constipated social values and behaviors. Think of Bakhtin (Wertsch, 1991) and heteroglossia. We get our language from the language around us. I speculate that conversation with avatars will reinforce the already dominant language and ideas of an androcentric society. Any particularity of experience will be lost in the honing of rules to meet a particular and already dominant view of experience.

Following the paradigm of "weak" and "strong" AI (Adam, 1998, pp. 51,53), I make the distinction between "weak" and "strong" VR. Weak VR uses VR as a tool such as in visualization of the inside of a brain or a cell or a molecule. Strong VR views VR representation as being a brain or a cell or a molecule. I strongly support "weak" VR. I have much more difficulty with replacing the whole with a part as in strong VR. I am not discounting the utility of computer visualizations and other high-end technologies. I am questioning their use in certain pedagogical situations where the part might be confused for the whole.

Other issues in WBI

WBI has put serious thought into creating virtual communities. Revisiting the tendency of WBI to disembody, can we have a community of minds? Does the lack of the thickness of co-presence limit communication to a point where it is not adequate for creating community? My feminist-pragmatism tells me that physical and emotional engagement are required to make

meaning in a social group. According to Bakhtin (Wertsch, 1991) with augmentation by Mead (1910/1964) and Dewey (1925/1981; 1925/1984; 1927/1984; 1929/1982; 1930/1984; 1931/1981; 1931/1985; 1934/1980; 1938), meaning requires a social and historical context.

The self, decentered in a field of action, is the speaker and listener in dialogic engagements. Narrow the field of action sufficiently by reduction in context and those in dialogue will not understand each other, particularly if they normally derive meaning from different fields of action. In the extreme case, they are speaking different languages, literally or figuratively, when their fields of action overlap minimally or not at all. If you are co-present with someone who speaks another language, you might still be able to communicate via body language, gestures, or props. Take away those visual cues and you also remove the resulting overlap of the field of actions. There are then no means for the co-designation of meaning. Granted this is an extreme case of inability to communicate, yet it is useful to remind us of the utility of context in our making of meaning since WBI so frequently tries to provide a generalized and universal context.

Another concern of WBI, with its use of the Internet, it must expand its ethics to a global sphere. Our reach with the Internet is truly international. I do not believe that we can rely on a personal ethics to guide us in such a global domain. We must establish a social ethics, one foreign to the atomic and individualistic "man". Do we know or care who in South East Asia make our inexpensive microchips at peril to their eyesight and for pennies a day? Does it matter that these exploited workers are largely women? The trajectory of involvement with networked computers expands our effects as users of these technologies. I think that we must acknowledge our complicity in this large and extensive reach of our technologies. We must inform ourselves of the hidden labor and invisible oppressions involved in our decisions to use these technologies.

How is the ethics of care incorporated into WBI? Does WBI allow enough affect for enacting an ethics of care? Is an ethics of care important in higher education? I say that it is as important as an ethics of care in pre-school, elementary school, or high school. I see an ethics of

care as an expansion of the transaction between student, teacher, and subject matter explicit in my pragmatic feminism. This transaction must involve caring for how else can we sensitively and effectively transact with those unlike ourselves? We must maintain civility and patience in our transactions even if this level of care gains motivation from respect for another human being.

For the pragmatist, needs and desires govern selective interest. Learning will not occur unless there is consideration of engaging interest. A pragmatic take on education would build from the student's interests (Tanner, 1997). This does not eliminate the need for the teacher's guidance in pointing out new ideas, other interpretations of observed events, and otherwise directing learning. I have severe problems imagining the enactment of this kind of education in WBI. The rationalistic nature of ID and computer programming where everything is governed by rules give me problems when considering selective interest and WBI. How can instruction be geared to individual interests in a WBI setting? The other side of this problem is providing enough teacher interactions to help guide the interests of students. I have heard many horror stories of WBI instructors being overwhelmed by communications with just a small fraction of their students. The rest of their students may be cheerfully lurking, not participating, or too lost to ask questions.

Schank and Cleary's (1995) answer to this problem is to provide teaching engines with AI methodologies. They admit that learning from a teacher would be preferable but claim that there are not enough experts to teach the necessary skills. "The experts we have captured in our programs have only so much time to spend educating others" (Schank & Cleary, 1995, p. 73). This is a statement of blatant and unabashed positivism, the belief that experts know the truth and that truth can be encapsulated and distributed via digital technologies. This explains Schank and Cleary's belief in computerized education systems. There is only one truth to dispense so that the only variable is how to motivate the student. While they talk about Dewey's (1995) progressive education and learning by experience (pp. 66-68), they seem to lack an understanding of Dewey's and other constructivist's goals in education. I will not explore this any

further except to say that Schank and Cleary's book Engines for Education is a good example of misuse and misunderstanding of educational theory.

Critique of CMC

Both pragmatism and feminism support pluralism. Recall Dewey's criteria for defining a society, "How numerous and varied are the interests which are consciously shared? How full and free is the interplay with other forms of association?" (1916/1980, p. 89). Dewey, (1939/1981) made the second point even stronger when he said:

To cooperate by giving differences a chance to show themselves because of the belief that the expression of difference is not only a right of the other persons but is a means of enriching one's own life-experience, is inherent in the democratic personal way of life (p. 228).

How is one to achieve diversity and support difference in classrooms? One powerful way is to support dialogue across difference or dialogue among those who do not agree. Feminists are also eager to incorporate diversity within a movement, often seen to exclude all but white, middle class women (Tong, 1998). This section and the next one on engaging the other deal with this issue of dialogue across difference in WBI.

Computer Mediated Communication (CMC) is the WBI equivalent to pedagogical dialogue. Pedagogical dialogue in its most basic sense is communication used for educational purposes. According to Nicholas Burbules (1993), dialogue itself is a "symbiotic, communicative relationship between equals that requires emotional as well as cognitive involvement" (p. vii). In this section, I explore the fit between pedagogical dialogue and CMC.

Description of pedagogical dialogue takes a number of forms. Burbules and Suzanne Rice (1991) stress communicative virtues as the source of pedagogical dialogue. These are ...tolerance, patience, respect for differences, a willingness to listen, the inclinations to admit that one is mistaken, the ability to reinterpret one's own concerns in a way that makes them comprehensible to others, the self imposition of restraint in order that others may have a turn to speak, and the disposition to express oneself honestly and sincerely (p. 411). These virtues set a necessarily high standard for situations where dialogue occurs among people who may vigorously disagree.

For Dewey, virtues as any other part of a dynamic system must interact holistically. Dewey wrote,

The mere idea of a catalogue of different virtues commits us to the notion that virtues may be kept apart, pigeon-holed in water-tight compartments. In fact virtuous traits interpenetrate one another; this unity is involved in the very idea of integrity of character.

[LW 7, p. 257]

For instance, tolerance does not mean that hate speech or "flaming" is tolerated in a classroom (or anywhere else).⁶² The virtue of tolerance must balance with the virtue of restraint, and an open mindedness to examine and discard stereotypes. Pedagogical dialogue sometimes falls in the trap of favoring one virtue over another. (Ellsworth, 1989)

In addition, Burbules states three rules of pedagogical dialogue including the rule of participation, the rule of commitment and the rule of reciprocity. The rule of participation requires "active participation of all participants" (Burbules, 1993) in a way which is voluntary

⁶² Flaming refers to vituperative on-line speech. It is usually a response out of all proportion to a proceeding message. I presume that lack of context encourages these flame wars to erupt. The singled victim is often a newcomer in a particular CMC conversation and unknowingly steps into a trap laid by preceding conversations.

and accessible to all participants. Active participation includes both active talking and active listening. The important point here is that everyone must be cognitively engaged in the dialogue and not trying to block other's participation in overt or covert ways. According to Friere (in Burbules, 1993), monologue ("logos with one") is the chief threat to the rule of participation. Burbules (1993) states that "... any participant should be able to raise topics, pose questions, challenge other points of view, or engage in any of the other activities that define the dialogical interaction."(p 80). Conversely, no one should be able to choose a mode of communication that excludes others. Speaking in a language unknown to all group members, whispering in a small subgroup, using e-mail when other members of the group do not have e-mail are all violations of the rule of participation. Required attendance in class might be a violation of the voluntary nature of this rule.

The rule of participation is an intriguing concept when one considers normal standards of teacher authority and how it plays out in most classrooms. Here the teacher engages in almost a non-stop monologue giving no authority to the learners to question or challenge or comment. It is not surprising that Burbules (1995a), an avid advocate of pedagogical dialogue would say:

...dialogue as a pedagogical relation constitutes in form and process a practical repudiation of hierarchical conceptions of authority: It exemplifies the core values of mutual respect, egalitarianism, open participation, and reciprocity in the teaching-learning relation--perhaps more so than any other sort of pedagogical relation (p39) .

Feminist pedagogy tries to decenter authority and requires CMC that allows this (Maher & Tetreault, 1994)

The rule of commitment deals with the necessity of sticking with the dialogue in an open and honest way, without ulterior motives, and despite difficulties in coming to a common understanding. It is the "for better or for worse" clause of pedagogical dialogue, giving validity

to the asking of difficult questions that may be uncomfortable to discuss. It means that we will not walk away from an uncomfortable dialogue in either a cognitive or physical sense. Logging out of a chat room, walking away from a discussion, throwing a tantrum, or day dreaming in a class just as the discussion gets difficult are all violations of the rule of commitment.

The last of Burbules rules, the rule of reciprocity is a paraphrase of the golden rule: “ Do not do unto others what you would not have them do unto you”. It tries to sustain a “spirit of mutual respect and concern” (Burbules, 1993, p 82) where any dynamic must be reversible and reflexive. This rule allows participants to ask questions as well as be asked questions, to challenge as well as be challenged and is a further elaboration of the role of authority in the classroom. Shouting others down, acting superior and therefore beyond challenge, and not reading others postings to a chat room where you post messages are all violations of the rule of reciprocity.

All three rules are extensions of the communicative virtues, tolerance, patience, respect for differences, a willingness to listen, the ability to admit when one is wrong, the patience to allow others to speak, and the commitment to honesty are, in a sense, examples of the common sense and common courtesy that children should learn at an early age from interactions with and modeling by caring adults, both parents and teachers.⁶³

⁶³ Harasim (1995) lists the communication problems of distance learning. These include causing communication anxiety among technophobes, lacking immediacy because of the asynchrony already mentioned, potentially providing infoglut⁶³ to students and teachers, a perennial lack of participation in discussions because writing takes more effort than speaking, difficulty in getting the conversation flowing, tendency for competition rather than cooperation among students, difficulty in controlling group dynamics, unequal participation by students leading to “lurkers”, and ease of miscommunication via typos or lack of emotion leading to “flaming”. Harasim (1995) also lists the communication assets of distance learning as the potential of cooperation and collaboration across time and space, the increased possibility of intimacy of very large classes, possible use of multimedia allowing more access to different learning styles, a non-linear organization of materials, race blindness, and use of computer simulations to allow more experiential learning in situations that were never before open to experimentation in the class room situation.

Trust issues in the electronic arena need to be considered. How honest and revealing can we be with someone we may have never seen? We cannot read their reaction as we speak and we cannot be assured that our words, perhaps said in pain, will not be transmitted around the world instantaneously via someone's nickname file or listserve. The naive user of CMC tends to be very trusting as she is lulled by the seeming anonymity of not being able to see her correspondents. However, observation of abuses such as harassment and indiscriminate sharing or knowledge of the privilege allowed systems analysts soon teaches most users of CMC that care must be taken in what one communicates over these media.

Engaging the other

I discuss the specific issue of dialoging across difference in WBI environments. Recall my discussion of a Bakhtinian approach to meaning in the last chapter. A Bakhtinian approach to meaning has four components:

rejection of a “disengaged image of the self” and the “atomism” associated with it; 2) recognition of a “dialogic” as well as a “univocal” text function; 3) recognition of the authority attached to a text; and 4) rejection of literal meaning as the starting point for a theory of meaning. (Wertsch, 1991,p.68)

CMC has a difficult time supporting these approaches to meaning. CMC encourages individualism and atomism by isolating the individual at her/his computer station where she/he stares at the screen or at the keyboard. The writer is often creating monologues, because sustaining a discussion is difficult in unthreaded chat rooms. Under pressure of grades to post to chat rooms, students will frequently post long monologues unconnected to other postings in an effort to gain points with the instructor. I have seen this done more by males than by females.

The authority attached to text is a difficult problem for CMC since it is largely text based. We create our monologues that then show up as text. The textual nature is then static and authoritative. In a sense, the very presence of the text in black and white gives it authority over oral conversations. We create it and then we see it published on the web where the text reflects back our image of ourselves in an affirming way, whether or not affirmation is appropriate.

According to Dewey (1916/1980; 1938), education is growth. Growth requires change, room for exploration, and a plasticity of representing self that text does not necessarily allow, particularly the text that is publicly displayed in chat rooms and on listserves. Course participants, early in this semester in a course on education and diversity, discussed the danger of judging members by statements made at the beginning of the class. They feared being stymied in their growth by first impressions. For students to grow and change they must be treated as though they will grow and change. Their past mistakes must not be used against them when they progress past those first rudimentary understandings.

Garrison recalls that education was a social function for Dewey. Isolation from social contact is the antithesis of education and reduces freedom (1996, p. 249). Garrison also points out that the right to free speech is not adequate to guaranteeing communicative and democratic freedom (p. 431). What more is required? Among other things, the ability to dialogue across difference must be learned and practiced. As Garrison also notes, the ability to listen so that the self is open to change is an important part of these skills (p. 433). Can these skills be learned via WBI? WBI reduces the verbal interchange of education. When dialogue does occur off line, there are no role models of teachers to follow. Myers, the president of a liberal arts college, makes a plea for more conversation and dialogue among college students (2000). She notes that learning how to argue, discuss and debate are essential parts of education.

I do not deny that text and writing are important to instruction and pedagogy. Writing is said to aid students cognitive development in ways that speech cannot accomplish. Writing is an essential skill that requires practice and experience. It is useful for students to keep their writings

and reflect on changes in thought over time. This experience differs markedly from the public nature of web based chat rooms where comments once posted are available over at least one semester for class perusal and comment.

Bakhtin's (Wertsch, 1991) last point is rejection of the literal meaning of text. Text then requires context for it to have meaning. Writers spend much effort in establishing the context of their text. Conversation in a classroom has a context and questioning the speaker can clear up confusion about this context. Chatting in MTD was a strange experience. I felt like I was throwing my comments into a vast void. I could not see who was "listening" to my "talk" and I certainly could not tell their moods or dispositions. This course had a context. There was a context created by the interface and the expectations of how one behaves in class. There was also a context of discomfort and guilt caused by the topic of racism. It was just not a very rich context.

Mary Leach suggested an interesting alternative to standard means of communication in her use of "serious gossip" as a feminist -pragmatic form of conversation (Leach, 1995). We tend to have a view of gossip as a female gendered mode of communication that spreads rumors and falsehoods. Leach wants to reclaim gossip for the exploratory, joyous, and playful role it often plays and one that frequently gets deleted from pedagogical and other formal dialogue including CMC. Of particular importance to my sense of organic holism is the fluidity and social explorations Leach attributes to serious gossip. Leach writes,

...we have become seduced by the fixed, certain, and finished in philosophical, and institutionalized discourses to such an extent that we have created a hierarchy in which reason (constituted by uniformity and order) dominates while the realms of emotion, imagination and sensation have been relegated to a lower level - worse to the "unreal".
(Leach, 1995, n. 51, p. 138)

This description of discourse is almost a description of my concept of WBI, so close that I shivered when I read it in mute recognition of my common bond with Mary Leach (whom I have

never met). I might have to substitute "unvirtual" for "unreal" for as I explained above we are playing a dangerous game of allowing virtuality to be our main route to experience in some instantiations of WBI. What Leach speaks of reinforces Dewey's desire for possibility in an unfinished world.

Geography of cyberspace

Metaphors of location are commonly used concerning the Internet. Some examples of Internet terms denoting location are map, address, site, home, rooms, and Cyberspace. I have long puzzled the need to create this parallel virtual space. MUDS are great examples of building virtual physical spaces, such as schools, complete with student unions, classrooms, and libraries. Gyms and cafeterias are lacking because this is virtual space where virtual, disembodied students have no need to eat or exercise.

After recently reading Geographies of Exclusion (Sibley, 1995), I began to see cyberspace as an elite place promoting social exclusion much on the model of gated residential communities where the rich sequester themselves from the common rabble. The hype of cyberspace is a utopian environment. The limited presence or total lack of bodies limits sickness, disability, and discomfort. Utopia is the ideal, the complete. Because it is complete, there is no room left for new ideas, no room for change. The Internet is Donna Haraway's god trick (1997), creation completed. Indeed, rules called programming languages create the Internet. Thus, it is formed by rationality. The alterity of Levinas cannot find a home here because creation of the Internet is complete (Levinas, 1998). We may never visit all the permutations of the Internet but the permutations are finite and defined.

The Internet as a virtual world requires minimal bodily involvement, thereby lulling us into a false sense of safety and security. I fear we begin to believe that computer technology can overcome cultural and biological reality. The fantasy is that virtual space will protect us from

reality. There is no AIDS in cybersex or head lice in cyberschool.⁶⁴ Muggings do not occur on the streets of a virtual city. Cyber relationships save women from physical, if not emotional abuse. In our concern for bodily safety, we create dangerous fantasies of escaping into cyberspace. First, we lose the physical connection we need with our friends, relatives, and neighbors, all of whom are cultural imperatives. Second, we lose sight of our connection with the environment and nature, which are our biological imperatives. The codependence of culture, human nature, and nature entwine these two problems.

This myth of safety, provided by this limited vision of cyberspace, gives more warrant to those who promote WBI. It meshes well with the certainty of WBI results promoted by advertisements in Chapter 1. Promises of certainty and safety lull administrators, legislators, college presidents to transfer control to the mythic machine, the computer. Mythic because no matter how wonderful and capable extant digital technology, there is the myth of what it can do and what it will do in the future.

Michael Streibel also investigates the usage of place in education (1998). Using an ethnography of the Western Apache (Basso, 1996) to investigate the semiotic relationships of person, place and story, he says,

Virtual reality technologies pose a particularly difficult problem here [a relational concept of space] because they seem to extract abstract pattern from every physical substrate except computational devices....they have the power to completely disconnect our “perceptual reciprocity” with physical places (p. 423).

In response to this problem, Strieblel claims that we must avoid splitting the abstract from the concrete and that even when involved with virtuality, “we should always be consciously

⁶⁴ This does not mean that there is no danger in cyberspace. Virtual rape has been reported (Star, 1996, p. 35) and damaging sexual deceptions (Turkle, 1995).

present where we are physically emplaced” (p 424). In Chapter 5, I will explore ways of doing this.

Sources of Power/Sources of Freedom

Power, control, and certainty are dominant themes chapter 1. Recall the promises of advertisements to keep students under control, to teach everyone, to provide limited web searching and access, to keep students safe. Computers and their software are effective automated control agents. Recall Foucault's "panopticon" and Garrison and Burton's use of this metaphor to represent the "power of technology" (Garrison & Burton, 1995). What are the sources of power for WBI? How does it achieve its potency? Similarly, what are the sources of freedom? How can WBI provide freedom to act and freedom from oppression? Some of this discussion continues into the next chapter where I express my greatest hopes and worst fears for WBI. I discuss power and freedom together here because they often transact. Those in power often implicitly and explicitly suppress the freedom of others to act, but they might also enhance the freedom of others to act. Freedom may mean freedom to act as well as freedom from sources of power. Power and freedom need not be in opposition but can enhance each other.

Notice that I did not include power in my pragmatic ethos. Dewey (Seigfried, 1996) did not appreciate the tremendous power over relationships inherent in (for instance) racism, sexism, and homophobia. He was more apt to talk about power to rather than power over. Dewey's pragmatism was stronger in appreciating freedom from and freedom to imperatives. These distinctions are helpful in understanding both the rights and responsibilities of freedom and democracy. Fortunately feminism recognizes and fights the power over relationships. Indeed, I could claim that power over inequities motivated the establishment of and continue to drive the maintenance of feminism in its most basic and general state.

Feminists, largely left out of the power hierarchies of digital technologies, have a strong and persuasive need to come to terms with the freedom and power of WBI. I suggest that the rule

bound nature of WBI means that women and other marginalized populations need to become writers of the rules. Women need to enter the canons of computer science and instructional technology not only to become participants in WBI, but also to change the premises of WBI and its sources, AI and computer science. While WBI depends more and more on “user friendly” templates, there are still coders of these tools. The tools being templates can and do limit the media and the instructional methodology that can be used with them. A good example of the inflexibility of templates is my inability to remove the term instructor from “Blackboard CourseInfo” so this tool could be use in a collaborative group where there was no instructor.

WBI and Capitalism

Here I investigate one source of the power of WBI, capitalistic interests and motives. In doing this, I attempt to examine the consequences of this capitalistic turn in education. Increasingly higher education is being run on the model of a for profit institution (Press & Washburn, 2000). Also increasingly, corporations sponsor universities research (Bromley, 1998). Although, these are two separate issues, they connect by virtue of their capitalistic model of operation. In this model, profit dominates other needs such as environmental protection, educational equity, and social connection.

Universities receive massive amounts of funds from for-profit business ventures. In return, they frequently generate copyrights, and patents that become the property of the sponsor. The Bayhe-Dole act of 1980 allowed universities to patent products funded by federal funds (Press & Washburn, 2000). This bill made it possible for industry to profit from university research and started a massive inflow of private funds to universities at the same time state and federal support dropped. For example Berkley, a state supported institution went from 50% public support in 1988 to 33% public support today (Press & Washburn, 2000).

This commercialization of universities to form "the university-industrial complex" directly affects WBI and IT. As Bromley notes, there is a context of use and an industrial agenda

that privileges digital technologies and WBI (Bromley, 1998, pp. 5-10). There are many reasons and many connections here, some subtle and some pronounced. I can only mention a few of the links here. The U.S. economy is currently in a prolonged growth phase, largely because of its technological prowess and the success of many digital technology companies. These industries generate some of their profits by enlisting schools to use their products and by indoctrinating students to use their products after graduation.

Current hype perpetuates a notion that the work force of the future must be technologically literate (President's Information Technology Advisory Committee, 1999).⁶⁵ This claim provides justification for education delivered via various tools of IT. The need to transform schools for a post-Fordist economy seems to motivate states to fund education in ways where other pleas for funds fail.

The outcome of assumed industrial needs and governmental educational funding for specific instances of technology pressure schools to fill a mandate for technological education. Standardized testing and state micro-control of schools is another symptom of this pressure. I summarize and surmise that the employee of the future is seen as a uniform, predictable, and passive product of uniform, predictable, and certain education.

Women and other marginalized groups have lauded digital technology for its freedoms of information flow and communication. Indeed, there are examples of grass-root organizations that have used new technologies for freedom projects. The irony for me is that these wonderful possibilities are also being using for domination and control. There is a strong conflict between hype of digital technology for free flow of information and the increasingly proprietary uses of educational research including the research in instructional technology. The free flow of information might instead follow a Marxist metaphor. In this case, those who need, take

⁶⁵ Needs for certain high tech workers are increasing. The disingenuous part of this claim is that this is still a very small part of the workforce. The largest sector of the U.S. workforce is still the service and care industry, everything from wait staff to nurses and teachers.

information and those who can, produce new information. Instead, I suggest that a capitalist metaphor overwhelms and consumes us. I have heard this called the golden rule of the information age: "Them with the gold gets to tell them without the gold what to do".

WBI's design allows detailed surveillance of participants. Everything from time on task, to internet searches, to written participation in class discussions, to e-mail can be archived, analyzed, and noted. There is no such thing as privacy or safety from indiscriminant distribution of messages. Think of the now common use of grocery store "discount" cards. I am not stupid. I know that prices for card holders are identical to pre-card levels. What used to be sale items ("loss leaders") available to anyone walking into the store are now reserved for card holding users. Along with encouraging brand loyalty, these devices record our every purchase. Our grocery shopping habits are now under surveillance. Many grocery stores now include drug stores, video rental areas, magazine and book racks. Just think of the information they have about us. I can look at this benevolently as now they can prepare the store stock for my individual needs. I can also imagine the malevolent usage of such detailed knowledge of their customers. At the least, this makes grocery shopping more expensive for transients, those who shun the surveillance and the poor who may "cherry pick" specials from store to store.⁶⁶

In conclusion, the sources of power for WBI derive from an industrial-educational complex (Noble, 1998; Press & Washburn, 2000). Potent capitalistic forces back WBI and IT. The ease and use of surveillance with these technologies has the potential to keep power hierarchies stable. Profit-making motives inordinately maintain stability of power in contrast to melioristic projects.

⁶⁶ Almost all the relatives of my grandparent's generation were retail merchants. Thus, I know some of the retail parlance.

Possibilities for Organic Holism

Does WBI encourage or stifle possibilities for organic holism in education? I start by reviewing the properties of organic holism. Organic holism, if nothing else, is connection and continuity. It is the viewpoint that represents the world as a system in dynamic equilibrium. My pragmatic ethos is an instance of organic holism. Its characteristics are interconnected and transacting. This leads me to claim that the manner in which we perform education transacts with other parts of our lives and civilization.

We cannot isolate our schools, whether co-present, or "cyberized" as something apart from the rest of the workings of our culture. If we want our students to be eloquent, reflective, able to communicate with a wide array of people, cognizant of the ecological precariousness of their world, striving to understand and improve the difficulties of others, invested in democracy, their schools must reflect these desires. In particular, schools as well as other public institutions must allow, encourage, and teach these skills. I earnestly believe that we must provide schools that project the best future we can imagine. We must take seriously the premise that schools are locations for experience and growth. I want the experience of schools to reflect a melioristic future and I want the students of those schools to practice the skills that will make them change agents and melioristic dreamers of even better futures.

My version of organic holism accepts the premise that we are participants in an unfinished world. This universal characteristic allows currently unnamed possibilities and future creative action. Certainty, standardization, top down power hierarchies do not encourage creativity, new frontiers, and possibility. That is why I seek a different world view than the one I saw reflected in commercial products of and for extant WBI.

More of the Same?

So many times when I talk about WBI as rigid, divorced from the natural environment, steeped in sexual stereotypes, and power hierarchies, I get the response that "normal" school situations (i.e., textbooks, large lectures, field trips) are just as sterile, hierarchical and inequitable as WBI. The next comment usually reflects the opinion that WBI is no "worse" than extant conditions in schools. Why should I be so unhappy with some WBI practices? My response to this is three fold. First, there are "low-tech" examples of extant school situations that avoid these pitfalls. Second, why should we spend millions if not billions of dollars on technologies that are reifying the same old stuff? Third, recall from Chapter 2 that my project here is melioristic. Meliorism is the assumption that human acts can improve the human condition. This is a part of my pragmatic ethos and a part of my feminist practice. I do not favor change for change's sake but for meliorism's sake. This also fits into my claim that the world is not perfect, it is unfinished. I am motivated by my desire to leave this world a better place than I found it. Not surprisingly this goal also fits in with my Jewish ethic of making the world whole, tikkun olam.

When I was a systems analyst and needed to buy a new server, I always began that task by asking: what functions do I need this computer to perform? My second step was to find software to accomplish these tasks. My third step was to find hardware that would run that software. In summary, I always started with a needs assessment, based on human needs. Similarly, when I was a programmer, the first part of programming was always communicating with clients and finding out their needs for the software. I see a much different process around the selection of tools for WBI. My cynical viewpoint is that we, Instructional Technologists, are busily justifying the use of extant technology, technology that was designed for purposes other than education (Noble, 1991). We must ask what are the power hierarchies behind these technologies that make them so potent and indispensable to education. In other words, who gains

from the introduction of such technologies as WBI? Are we going through all these contortions to improve education or to line the pockets of already wealthy corporate interests?

My goal in this dissertation has always been melioristic. I want to improve the state of education in general and specifically of WBI. I am not content with replacing one pedagogical technology with another for no gain. If WBI is replacing deadening lectures and texts with deadening web sites we have a very expensive problem of ineffectiveness.

In the next chapter, I look for ways of making WBI more embodied, more connected, more responsive to personal experience, less dependant upon androcentric tools and particularly more ecologically situated. I launch this melioristic investigation with help from the examples of WBI I find exemplary such as TUI and aspects of MTD, with literature from the field of IT, and with my own dreams. My goal is not to dismantle WBI (as if I could) but to bolster it towards a sense of organic wholism and a Deweyan sense of responsible technology as well as my own sense of sustainable technology. I use computer technologies, enjoy using them, and want to see their continuing development in the service of education, in the service of women, and in the service of diversity.

Chapter 5

Sustainable Technology

In Chapter 1, I examined advertised images of tools of WBI that stressed certainty, power, and control. In that first chapter I identified and in later chapters I discussed key and recurring issues including control of nature, loss of bodies, gendered experience, transactions of bodies, tools, and organic holism. Now I deliver on my promise for an alternate view of technology that I call sustainable technology. Sustainable technology supports preservation of nature, recognition of bodies, gendered experience, use of cyborgs for melioristic projects, and particularly organic holism.