

Chapter 1

Media Images of Tools of Web Based Instruction

This dissertation is an attempt to make some sense of the intersection of gender, computers, and education by focusing on web-based instruction (WBI) and the texts of educational philosophy, instructional technology, and women's studies. We start, however, within none of these texts but with the public images of the tools of WBI as conveyed by advertising. Public images created by advertising firms tell what no text can tell. They speak of the commercial sector's hopes, projections, and plans for the near future of WBI. Initially, it seems wise to heed the intuitions of commercial interests since they have the monetary power and incentive to make their dreams timely and accurate representations.

Advertising

Thus, I start with advertising in trade magazines and journals commonly available to purchasers of products for the instructional technology community and to a lesser degree to advertising on TV and the popular press in order to look for images of the tools of WBI. One cannot know who actually reads the Instructional Technology (IT) trade journals nor the effect the advertisements in them have on adoption of technologies. What one can know is that the businesses that market WBI tools spend much effort and money in being successful. Therefore, it is highly likely that these advertisements are effective.

Advertising plays at least three roles. First, it reflects vendors' self-image of product performance and their desire to condition the values and spur the appetite of the consumer for the product. Second, it shapes buyers' expectations of what the product does, what it means, and how it is valued in their world. Third, as a part of culture, advertising plays a role in the construction of self-image and in an assumed image of

technology. Advertising represents global commercial interests that live and die by their ability to make a profit and as education becomes increasingly pervaded by commercial enterprise, advertising becomes more aggressive in its involvement wooing educational projects.¹

I examine the advertising of products used for digital technology. In particular I look at advertising for instructional technology software. The images reveal that WBI is not gender neutral (fully explicated in Chapter 3) because these images reflect a particular view of women in the WBI subculture and a vision of unequal participation in that subculture.

In addition to feminist analysis, Deweyan pragmatism features prominently in this dissertation. While I apply this Deweyan theoretical framework in Chapter 2 and subsequent chapters, here I simply note the connection John Dewey made between technology and tools. Larry Hickman, director of the Dewey center, sees Dewey's philosophy as a philosophy of technology. Hickman, (1992) says that "Technology must be thought of as a family of methods and tools that evolves in response to the needs and goals that it is called upon to serve" (p. 61). In this way, WBI a technology, uses a collection of tools that have evolved in response to its needs. WBI has evolved in order to use extant tools. Observing images of these tools gives me insights into the evolution of the needs and goals of extant WBI.

One of the very prominent tools of extant WBI is the Internet. Currently, the Internet delivers WBI, which is quite dependent upon the characteristics of the Internet.

¹ Examples of the conflation of business and education include: Channel one, which provides schools with TV's if they are willing to air commercial messages; for profit schools including WBI projects, continual involvement of school children with commercial ventures such as collecting Campbell's soup labels, or selling candy, to raising money for books and other tools; the insistent suffusion of the internet with commercial messages.

Other tools include those used for the design of WBI and also the "utilities" of WBI, such as software embedded in WBI for registration, student assessment, and surveillance.

My interpretation of the images I see reflect my current interests, past experiences, and hopes for the future. There is no way to make one's way through the world without reflecting such things. All observations emerge from selective interest, and selective interest mirrors my history, current culture, and thoughts of possible futures. Thus, these interpretations reflect my background as a white, middle-class, middle-aged, Jewish woman who has raised three children, lived in small academic communities for many years, and has studied botany and computer science extensively. They represent my status as a doctoral student maneuvering between Instructional Technology (IT), with which I am most comfortable, and the social foundations of education, with which I am most interested. They reflect my analysis of the present as I work for a better future using education, research, and social action as best I can. They are being viewed through a feminist lens in the pluralist pragmatic sense of Cleo Cherryholmes (for other examples of feminist readings see 1999)

WBI is mediated by many layers of technologies including computer architecture, computer operating systems, communication protocols, communication infrastructure, tools of instructional technologies, and teaching methodologies. While WBI is largely dependent upon all these layers of technology, there are numerous interactions in the other direction. When any of these technologies are gendered a certain way, it effects WBI. Thus, there is a complicated relationship between the computer technologies that support WBI and gender. For instance, the demographics for students in computer science is overwhelmingly male (American Association of University Women, 1998; Davies & Camp, 2000; Morell, 1996). Other authors discuss the additional connections between gender and technology whereby computer technology is gendered male (Adam, 1998; Gill & Grint, 1995; Grint & Woolgar, 1995; Ormrod, 1995). Since both gender and

technology are constructed and contested, the case for the gendering of tools used for WBI is influenced by although not necessarily identical to those of underlying layers of technology. I will discuss these issues later in this dissertation particularly in light of feminist pragmatism. For now, I accept this premise that these tools have been defined predominately by men and has led to exclusions in the development and use of the tools of WBI. A quote from Adrienne Rich, demonstrates the problems of exclusion in WBI although she did not write it with this intent.

When those who have the power to name and to socially construct reality choose not to see you or hear you, whether you are dark-skinned, old, disabled, female, or speak with a different accent or dialect than theirs, when someone with the authority of a teacher, say, describes the world and you are not in it, there is a moment of psychic disequilibrium, as if you looked into a mirror and saw nothing.(Rich, 1986, p.199)

This poignant passage reminds me of the power of images and the power of absence in images. Absences are hard to "see"; usually we feel them first and name them later. Invisibility of women in the tools of WBI has other effects as well. As Rich notes later in her essay, invisibility leads to fragmentation of experience. Following Rich, invisibility can be understood as a message that what is invisible ought to be private. The consequence of this message is a dichotomy of public and private identity. Thus, it is no surprise that fragmentation of identity is a recurring theme in feminist literature (e.g. Anzaldúa, 1987). Women may suffer more than average fragmentation of this type because they often suffer from multiple oppressions since the oppression of their gender adds to other oppressions they experience. The more multiple the oppressions, the less likely that all aspects of a woman's image will be seen in public spaces such as the classrooms of WBI. The less one sees of one's image in public spaces, the more intense the disequilibrium of invisibility.

MCI, an international telecommunication corporation, chortles about what they see as the inherent invisibility of the Internet. In a series of television commercials they say: "There is no race. There is no gender. There are no infirmities. There are only minds. Is this a great time or what? :-)" (MCI, 1997). According to MCI, everyone is equally invisible on the Internet because they lack a physical manifestation, a body. MCI views invisibility as an equalizer of opportunity. Everyone is equally invisible on the Internet, and thus everyone is equally empowered by his or her invisibility. The claim is that there can be no discrimination based on difference if no differences are physically present. This is an appealing and inviting characteristic of the Internet and frequently cited as one of its greatest advantages. Unfortunately, it perpetuates several dangerous fallacies.

Among these fallacies of invisibility is the literal separation of mind and body, the diminishment of context, and the attempt to separate text from cultural influences. Another fallacy of invisibility is to deny the inscription of the creators of the Internet onto the functioning, appearance, and valuation of the Internet. I will deal with these fallacies later in this dissertation. For now, I point out that this alleged invisibility of the Internet does not advantage (or disadvantage) all users equally. The Internet and its traditions bear the inscription of white, male, middleclass privilege based on its origins in the white, male, middleclass, military establishment (Noble, 1991). For instance, Alison Adam (1998, p.5) discusses how the reasoning instantiated in a large Artificial Intelligence (AI) project, Soar, "...rests on a fairly limited set of psychological experiments on technically educated, male US college students..." (p.5). These subjects come to represent the universal subject but without explicit acknowledgement. Consequently, this male, arrives covertly as the representation of knowledge and reasoning skills.

In addition to the proscribed tools of WBI, there are aspects of web based WBI that are not totally limited by the software and hardware. Computer mediated communication (CMC) allows varying types of questions, responses, and conversations.

Here, power hierarchies inscribed in hardware and software products are somewhat less important and expectations of users are more effective in establishing anticipation of user membership. As an example, Margaret Riel's work with on-line learning communities demonstrates how grade school age World Wide Web users imagine themselves in the writings of others who they cannot see. In Riel's study, classes of children collaborated on school projects across the Internet for several months before they exchanged pictures of each other. "When students in Louisiana received the class photo from their partners in New York, the students turned to the computer and wrote, 'Great to see the pictures of you all, but where are the brothers????'" (Riel, 1995, p. 237). The black children expected to see their own faces reflected in the pictures but met white faces, instead. I can imagine equal surprise in the responses of the white students when they "met" their mostly dark skinned World Wide Web collaborators. This incident raises several interesting points. First, it shows the need for recognition of the body by those involved in computer mediated communication (CMC). Second, it demonstrates interesting challenges for dialoguing across difference on the Internet. Third, it suggests that invisible difference is not a source of learning about difference. Fourth, it suggests that we challenge our stereotypes of appropriate collaborators only when we need to save ourselves from the disequilibrium of surprising and unexpected encounters. Lastly, it suggests the ability to control encounters over the Internet by projecting the self into the "other" when the "other" is unknown.

Through a feminist reading of the advertisements for the tools of WBI, I now show how a strong desire for control and certainty leads to power hierarchies of access and inequity and ultimately limits possibilities. In this reading, I suggest that absence from the Internet and World Wide Web is a characteristic of those people who fall outside power hierarchies for reasons of gender, race, class, physical infirmity, sexual

preference, or other "otherness". As with many aspects of our world, power hierarchies define access and determine purported "intuitive" usability of technology.

Representations of the tools of WBI in advertisements disclose attitudes and foretell expectations for WBI. In the sections that follow, I mainly use advertising in journals read by librarians, administrators, principals, and others in authority to buy such products. Librarians at my university receive one of these publications, Technological Horizons in Education, without charge. I surmise that income from its advertising is sufficient to cover production costs and profit needs and makes me think the publication is successful in selling its advertised products. It is important to recognize that those who see these publications and purchase these products are not usually the end users of the products. Thus, the advertisements court those who purchase (the top of the power hierarchies) rather than those that use (often the bottom of the power hierarchies) the products. The magazines and journals used in the following descriptions are Technological Horizons in Education, Media and Method, Educom Review, and Wired. Wired is not one of the magazines that I include in the domain of those purchasing IT products. It is very much of the popular culture but is wonderfully illustrative of gender construction in relation to digital technologies.

Images of Gender

Wired Magazine has images of gender representing both maleness and femaleness. I make no claim that these images are typical of all publications concerned with digital technologies. What I do claim is that digital technology is implicated in gendered social constructions. This is a claim that others support (e.g. see Weinstein, 1998). First, I describe a vision of maleness from advertising in Wired. "Coolink", an Internet service provider, has a page full of computer mice in iridescent colors trailing wires, drawn to look like sperm (Coolink.com, 1999). The caption is "The best

connection known to man (OK, second best)". In an obvious play on words and images conjoining sexual union with Internet union, this advertisement suggests that using the Internet is a male act.

Two other advertisements demonstrate the construction of femaleness (e-centives, 1999; www.bluefly.com, 1999). Both depict women as shoppers, in particular as users of e-business or e-tail (on-line shopping services).² The first is a two-page spread called "Give the people what they want". The only person in this ad is a woman dressed in a business suit with well-coifed business-like hair, standing in a packing box among its Styrofoam "popcorn". She holds a surfboard in one arm and a tiger striped bikini bathing suit top on a hanger in the other hand, her face in a broad smile.

The other ad from www.bluefly.com is appropriately in five shades of blue. Here, a woman in white leisure sarong and crop top, reclines on a chaise lounge with her container of chinese take-out food at her side. In one hand, she holds a beverage, probably a martini, and with the other hand she is connecting, via her laptop, to the bluefly web site. It is evening, I imagine that she is relaxing over "dinner" after a long day's work. The caption reads, "tuesday, 11:15 p.m. bought **him** a new tie" [emphasis added]. Under the www.buefly.com title are the words, " the outlet store in your home". Although several interpretations are possible, the engagement in e-tail is an obvious connection to "woman".

Images of Nature

I now look for images of nature in advertising for the tools of WBI. Eco-feminism connects women with nature (Merchant, 1980/1990; Warren, 1996) and the images of

² E-tail is a recently coined word that joins retail and e-mail into a word describing on-line retail shopping.

nature might provide more understanding of gender. The cover of a recent Technological Horizons in Education Journal shows a school girl, book bag on her back, surrounded by three larger than life computer screens (1999).³ On her right is a larger than life ocelot within a computer screen. Behind her is a larger than life copy of Vincent Van Gogh's painting Starry Night within a computer screen. To her left the computer screen contains a larger than life man of color squatting at an open-air market where he is weighing commodities from piles in front of him onto a brass balance beam scale. Directly in front of this screen is a round screen containing the image of a rugged mountain landscape. Above the girl, floating in the sky is an astronaut maneuvering in his space suit. The girl is reaching up to touch the astronaut in wonderment with one outstretched index finger. It is an attractive and pleasant scene suggesting that student's needs for art, science, exotic places, and adventure are all met equally well with virtual reality hardware and software.

Notable on this magazine cover and in advertisements, nature, as represented by the ocelot and the rugged mountain scene, is contained within an image of the computer screen. This encircled image of nature then comes into the classroom manacled and controlled. This is an image of technology dominating nature. I find this a powerful and unsettling representation of nature. It evokes ecological feminist (eco-feminist) concerns, biblical promises of human domination over the earth, and reminds me of currently escalating environmental degradation. My eco-feminist concerns arise in connection to Carolyn Merchant's discussions of the industrial revolution transforming the world as organism metaphor into a world as machine metaphor (Merchant, 1980/1990). I fear expansion of this transformation into a world as network metaphor. The image I fear is: this world of nature, already dominated by the oppressive moves of the industrial

³ A cover of a magazine is an advertisement for the magazine itself. In this case it is attempting to sell the value of virtual reality in education.

revolution, is now further dominated by computer technologies and gender plays a special role in this domination.

Another view of nature says "Capture their attention and you'll capture their minds" (Philips, 1999). In this picture, the image of nature from the teacher's computer projects onto the classroom television (TV). The TV (which never quite made it as a classroom technology) is now a window into the material world via the World Wide Web and controlled by the teacher. This dualism of mind and technology is quite hostile where the goal is for one (technology) to capture the other (mind). The domination of nature is apparent in this advertisement where, the taming of nature by technology aggressively proceeds.

In other examples of tools for WBI, not only does technology dominate nature but also technology's simulations of nature replace students' experiences with nature. Roger Schank, a leading researcher in Artificial Intelligence and cognitive science, views learning by doing as the optimal learning situation. "There is really only one way to learn something and that is to do it" (Schank & Cleary, 1995, p. 74). He also equates computer simulation with "learning by doing". Schank views simulations as superior to real-life situations in part because they allow teachers to monitor students and they allow the codification of teacher's knowledge and interventions into the body of the simulation. Schank even recommends computer simulations as useful in teaching social situations.

Those in Control Want to Stay in Control

I am uneasy with Schank's desire for individualized instruction and his insistence on supplying it by means of computer simulations. My uneasiness with his view of individualized instruction is partly the result of my image of children toiling at their personal terminals, never conversing with, collaborating with, or questioning each other. There is strong evidence that students require collaboration to be successful in difficult

courses (Nespor, 1994). Theories of social constructivism, scaffolding, and the zone of proximal development all require instruction in a social context.⁴ A very important part of education is social experience, which requires learning how to communicate with and live within a democratic community. I am also uneasy that computer simulations represent a reduced abstraction of the world as model. This abstraction reflects the worldview of the creator of the simulation and thus limits experimentation and experience. It is rule bound and only allows the possibilities of interactions imagined by the writer of the rules.

Much of Schank's book is a whiny complaint about students who are not allowed to progress as fast as they are able and thus learn to "hate" school. To me, this sounds like the mantra of middle class parents, including me, who want their children to maintain their selective social and economic advantage by means of tracking and "individualized" instruction. This is a very competitive but seductively compelling ploy. Unfortunately, it is as detrimental to the middle class students it favors as it is to the larger society of students. It does not consider children's own interests in school, it does not consider children's social needs, and it views particular children's momentary success and advantage as more pressing than the needs of their community. This is far from the ideal of the "village raising the child". Rather the parent is pitting the imagined future needs of their child against the village. This kind of mentality results in school districts where schools get resources in proportion to the ability of the parents to make demands. The immoral and frequent results of these parental tactics are schools within districts varying considerably in their resources available to educate their young. Usually, the schools with

⁴ By social context, I mean a situation where there is the transaction of learners and teachers or learners with other learners. For instance, scaffolding requires that someone who is more knowledgeable assists someone who is less knowledgeable.

the most needs and least economically advantaged parents get the least resources (Kozol, 1991).

Images of Education as Business

I see images of education as business in advertising for the tools of WBI. SCT, an IT software corporation says, "The business of learning is not education as usual....It's time to start thinking of education as a business" (SCT, 1999). This stark and business-like ad is mainly text. It suggests that education can be managed and reap profits in the same way that business is managed for profit. Furthermore, this image of education views its primary purpose as meeting the needs of business for trained workers. Capitalism is the model for this kind of education as "institutions must work to meet an increased demand for value equal to the cost of education" with the software meeting even the e-commerce needs of the campus (SCT, 1999). The unspoken message devalues education that does not show an immediate monetary gain and suggests that there will be immediate and obvious monetary rewards from "appropriate" education. In viewing education as a business, politicians can then demand a given return on their money and perhaps return the student (the goods) to the institution (the factory) if the student (the product) is faulty. My cynical question is to wonder: if we can expect to see these profits in kindergarten and pre-school or must we wait for middle school, high school, or college to reap the rewards? What do we do with those children whose education is not likely to reap a profit or at least not one we can immediately recognize and quantify? Will we try to make predications of economic usefulness at a young age so that we can avoid the expense of education for the unprofitable? SCT claims that its software "creates an unusually strong, positive, and cohesive campus community" and is at the same time "A community dedicated to meeting individual needs" and "A business streamlined for maximum efficiency" (SCT, 1999). I have an uneasy feeling that a campus devoted to "the business

of learning” will not foster a cohesive campus community because business makes its profit on competition, cutthroat practices, valuing money over people, and having more rather than being more.

Esther Dyson, technology expert, industry analyst, and venture capitalist, when interviewed on National Public Radio’s Morning Edition of 12/15/99 revealed a view of the Internet as a promoter of liberal individualism. For Dyson, the Internet promotes individual initiative. With strength acquired from Internet opportunities, the individual has adequate power to oppose the endowment of large institutions. She represents the views of liberal individualism when she claims that it is now up to the individual to find "his" own opportunities. Moreover, the World Wide Web provides ready access to these opportunities. When NPR interviewer Susan Stamburg challenged Dyson’s view of opportunity on the Internet in the face of gross inequality of access, Dyson evaded the issues in this way: "If you want to talk about inequality, you would begin by talking about education rather than access to the Internet" (Stamberg, 1999, p. 6). Stamburg made the point that half of the world’s population has never used a telephone even though telephones have been around for over 100 years (Stamberg, 1999, p.7). Thus, how can we expect the Internet to proliferate in the very markets that do not support a technology as rudimentary as the telephone? Dyson gave the impression of only understanding the reality of the “West” and that as she interprets it. Perhaps the Internet is supposed to provide a global economy and equal opportunities for all but apparently only within the reality of western industrialized nations. There is a growing dichotomy, or more strongly a dependency, between industrialized countries as users of networked computers, and developing countries, as sources of sweatshop labor that produce the networked computers. In addition, we know that even in the western industrialized countries, inequities of power and wealth subvert Dyson’s assumptions (Hoffman & Novack, 1998; Spender, 1995).

Images of Control of Bodies

Computers are used to track and assess students. The American Education Corporation says, "Academic success begins with assessment. How can you improve your students' performance without knowing where to begin?" (American Education Corporation, 1999). This advertisement focuses on a schoolgirl happily holding aloft a paper with only an A+ on it. The advertised software uses standardized tests to assess, next identifies student's individual academic skills, and then "with the click of the mouse, the teacher assigns the individual lesson plans ... to teach the necessary skills". Subjects from Reading to Math, Geography, and Science appear down one side of the advertisement. This software seems to be an automated teacher. The classroom "teacher" can focus on discipline because she/he no longer needs to teach. Any scheme of standardization raises the question of who is the standard student and whose standards provide the basis for assessment. As in the discussion of the assumed subject in AI, the assumed subject in educational standards may not be representative of a wide array of difference. Other problems that haunt standardized tests and state standards of learning likewise plague this software.⁵ Geoffrey Bowker and Leigh Star talk about standardization as a way of dealing with information flows across different contexts (1999, pp. 291-292). The problem with such standardization (and classification) is that the original voice or intent gets both black boxed and potent in the process (Bowker & Star, 1999, p. 325). With standardization, the original intent, now hidden, may continue functioning long past any practical usefulness.

In addition, I see images of computers as devices for control. Comprise, an educational software corporation, markets SoftED Complete as "The Educators Solutions

⁵ The problems of standardization include teaching to the test, ignoring varying interests and abilities of students, and removal of creative freedom from the teacher's domain.

for Controlling School Computers" (Comprise, 1999). This product purports to allow superintendents/principals, technology coordinators, and teachers the control they need. Marketing of SoftEd promotes it as a means for controlling student's covert activities, for grading, and for "safe and effective Internet control". The message is that we want students to explore the networked world of information but only in condoned and controlled ways. Taken to extremes, computer-monitoring software records student and teacher keystrokes and gives exact measures of time on task. I have a similar objection to this as I have to normalization and standardization. There is someone in authority, probably a white middle class male, who decides what comprises the ideal activities and tasks (Adam, 1998; Bromley & Apple, 1998). Students who do not meet the ideal are then sub-standard or abnormal. I have a persistent objection to software that involves surveillance. Just like the Foucauldian "pan-opticon" (Foucault, 1995) or the surveillance cameras in the local convenience store, teachers and students cannot tell when they are being watched but the constant possibility of surveillance keeps them acting in sanctioned ways.

Images of Multi-culturalism

There are plenty of images of multi-culturalism in some WBI advertisements. Academic Systems, a vendor of multi-media math and English courses, shows a scene containing the heads of four students, the full faces of two men and the eyes and upper heads of two women. One male student may be African-American and one female student may be Asian. The other two students appear to be of white European background. Above their heads is the text: "Not all great minds think alike. Or learn alike...But they can all learn". (Academic Systems, 1999) The text mentions interactivity twice and differences in learning styles twice. Most notably, it ends with the certainty that all students can learn and the assumed message is that all students can learn

with this particular software package, a very positive, seemingly pluralistic, and confident message.

The implied message emerges that anyone can benefit from WBI. The reality of Internet access in the USA and other countries makes this an ironic and disingenuous message. Lack of computer hardware and software, lack of Internet connections, language barriers, computer literacy barriers, barriers to discourse style, physical disabilities, and personal interest make the Internet more accessible to some individuals and groups than to others (Harasim, Hiltz, Teles, & Turoff, 1995; Heward & Bunwaree, 1999). Thus, it is a cruel and unrealistic expectation that WBI is equally available, accessible, and useful to everyone. It is also unrealistic to think that software can do what the most gifted teacher cannot always do, motivate any student to learn.

Images of Cyborgs

Images of cyborgs abound in advertisements. In fact, a main goal of these advertisements is to demonstrate how artifacts such as computers and computer software extend human prowess. The cyborg, a combination of human and artifact (Haraway, 1991), is just what technology businesses hope to promote. Haraway and other users of the term cyborg promote a sharing of agency between person and machine. I believe that advertisers subvert this by promoting dependence upon and greater agency in the artifact. Consider the section above on images of control. As the software teacher gains control, the human teacher loses control. Now software determines teaching practices and curricula rather than teaching and learning being a transaction between teacher, learner and subject matter. Michael Apple calls this shift in agency "A Curriculum on a Cart" (Apple & Jungck, 1998, p. 143). It is another way of trying to maintain perfect control over what happens in classrooms. The cyborg also invokes constructive images of

breaking down dualisms such as person and machine, culture and nature, and human and non-human animal.

Bowker and Star(1999) see cyborgs as boundary objects that induce "rethinking of human nature itself" (pp. 303-304). For Bowker and Star, this cyborg or monster, created at a boundary, represents the monster, reviled and cast off. It also represents "politics of ambiguity and multiplicity" (p. 305). As such the cyborg presents novel situations, renewed diversity, and the struggle for finding solutions in complex locations. This dissertation is very much a cyborg. It tries to bridge philosophy of education and Instructional Technology (IT). If it is successful, it will introduce new solutions in the borders it fords.

Safety

I see images of user-friendly information access in advertising for WBI. Geac, a company that writes software for information access, promotes a World Wide Web based client/server "solution" for information access (Geac, 1999). The Geac advertisement shows a schoolboy exploring the outside world with great interest and enthusiasm. He is gingerly walking on rocks above a body of water, barely balanced. Over his head its says. "Whatever you're searching for....Geac helps find the answers". The text on a strip along the right side of the page says, "Today's kids are reaching higher and searching further for answer's to life's questions. But, they'll need help along the way. Can your library system point them in the right direction?" The child is so intent on his exploration of the world outside and so engaged in his current interest; I would be reluctant to call him to a computer "to find his answers to life's questions". The main message seems to be that the Internet is always the best and most necessary source of information and safety. The child in the picture described above no longer needs to walk gingerly (and recklessly) above the body of water in order to explore the world, he now has access to the World Wide

Web. A sub-text is that information provided by the World Wide Web is equivalent to the embodied experience of the child.

The Geac advertisement dramatizes the tensions between free access to information on the Internet and increasing amounts of standardization, licensing, and regulation of its usage. Standardization of information in educational settings is increasingly common. State after state is adopting standardized curricula ("A defeat for education standards," 1999). In my own state of Virginia, the Standards of Learning, are being instituted, criticized, and feared. E. D. Hirsch and his popular series of books make a case for a standardized canon of age appropriate knowledge (Hirsch, Kett, & Trefil, 1988). Schools regularly monitor and censor what their students can access on the Internet. The Commonwealth of Virginia restricts access to certain web sites by any of its employees or students using state resources (Masters, 1999). I see growing conflict between increasing regulation of information and the use of the Internet as an accessible and open source for information. This echoes the friction between the Internet as a place for anyone to publish or access information and the reality of who has the resources and the permission to do so.

Images of Disembodiment

I see images of physical isolation in advertising for WBI, as there is increasingly more dependence upon networked communications and networked services to students. Lotus, a branch of IBM, has an advertisement with glaring capitalized text superimposed on a double page spread of a starkly empty hallway of an assumed school building (Lotus, 1999). The hallway looks like the high school halls of my youth and my children's youth with its painted cement block walls, lit trophy case, and mottled charcoal gray linoleum floor. The text speaks more of the functions performed in a college setting than in a high school setting. It says, "RIGHT NOW 1156 STUDENTS ARE

DROP/ADDING 434 ARE CHECKING THEIR GRADES 121 ARE PAYING OFF THEIR TUITION 22 WANT PARKING PERMITS AND THERE'S NOT A LINE IN SIGHT"[capitalization in the original]. There is smaller text below, highlighted in white, that mentions empowerment, simplification of administrative tasks and reduced costs (twice) as the result of web based student services. The decisive factor is the last line of text, pointed to by an indentation of the lower border that says "SUPER.HUMAN.SOFTWARE". Lotus is making a case for moving administrative functions from the public space of hallways, gyms, and auditoriums to the private space of computers in dorm rooms or offices or homes. They claim cost savings as administrative functions move to the World Wide Web. Lotus counsels us that we are super humans if we adopt this techno-scheme.

In a continuing trend to move public functions to private space that is dependant upon technology, a New York Times Magazine article tells how new college dorm construction includes less public space and more accommodations that are private. Students bring their own electronics equipment "from stereos and TV's to powerful computers, scanners, color printers, fax machines and satellite dishes" to their dorm rooms (Barnes, 1999) and have less need for public spaces. The same article mentions issues of safety in the dormitories of large cities and how special security measures in dorms from human surveillance to mechanized alarm devices create safe spaces for students whose parents demand the certainty of absolute safety. The article differentiates between low tech and high tech means of security. U.C.L.A. represents low-tech security where new dorms are low-rise clusters with visible public spaces on the model of a small village. Here knowing and watching out for your neighbors provides security from crime. "High-tech" solutions such as optical scanning of hands are the devices of choice at other schools such as N.Y.U. where no acquaintance with fellow dorm mates is necessary to maintain security.

Many middle class students who grew up watching TV alone in their rooms (Kaiser Family Foundation, 1999) come to college with this habit. College policies, as promoted by Lotus, that transfer formally public administrative functions to private spaces further isolate students. There is a trend then to isolate students in many ways as they interact with computers rather than people for many of their academic needs from instruction to entertainment to administrative functions to dormitory security. If students fear being outside their rooms at night, there is even more motivation to be physically isolated into spaces where one can be “safe” even if not part of the co-present academic community. The result are students virtually locked into cell like dorm rooms where their frequent internet based activities make them subject to almost as much surveillance as a prison might provide.

The long registration lines of my undergraduate years were simultaneously annoying and welcome. I rankled at the mindless waiting, enjoyed the social jostling, and received academic benefits from those lines. They brought me into welcome contact with people I had not seen all summer or all semester. They brought me into contact with university organizations (e.g. musical performance groups, clubs, and political groups) that used the opportunity of large enforced student gatherings to announce their programs and recruit members. When I was required to talk to a faculty member in order to drop or add a course, I often received additional information from the conversation with that faculty member. This was information about alternative courses, the advisability of my taking a particular course, the humanness of the professor, ongoing projects, and possible paid jobs, usually a very important adjunct to my growth and education. I am not pleading for more requirements that are bureaucratic and indeed, I find some web-based

utilities very convenient.⁶ I am pleading for the importance of community building and maintenance within large institutions and I seek the replacement of public spaces and student gatherings recently eliminated by new software and new administrative practices.

I started this review of WBI and Internet advertisements with the amazing statement by MCI that there are only minds on the Internet.⁷ MCI predicted the total lack of bodies or decorporalization of the Internet. I end my brief review of advertisements with one from Nortel networks.⁸ This recent series of advertisements asks, "What do you want the Internet to be?" The Nortel advertisements give many answers but the last one is always "It can be whatever you want it to be". Another answer (spoken by an African-American man) is "It will level the playing field" (Nortel, 2000). This series of Internet, print, and TV ads is an advancement of the notion of liberal individualism and disembodiment. It suggests that the Internet can level the playing field by suppressing embodied characteristics such as race, gender, disability, and age. The Internet can be whatever we want it to be, thus we have control over its use, promotion of the doctrine of liberal individualism or atomism. Many advertisements, e.g., Nortel and MCI, support the Cartesian paradigm, which we inherited from modernism. This position maintains the ideal of the "atomic man", independent, rational, and imbued with free will. He controls his emotions, his destiny, and now his Internet usage totally and perfectly. If he fails in these endeavors, it is because of his own weakness, since he is an atomic creature who functions without regard for history, culture, or context.

⁶ On the other hand, I also want to recognize how hard it is to solve administrative snafus when all I get is another recorded message, e-mail address, or web site for redress of an individual problem. Then real people can duck responsibility and hide behind their faulty computer programs.

⁷ The Internet is the container and enabler of World Wide Web based WBI, thus it is reasonable for me to consider advertising images of this technology.

⁸ Nortel networks is another company, similar to MCI that provides large scale Internet services.

A major problem with a disembodied public, as on the Internet, is the disconnect from the power hierarchies of our society. These hierarchies are formed on the basis of embodied differences such as race, class, and gender. When we ignore these structural differences, we reproduce it and at the same time erase its roots. This is similar to Bowker and Star's (1999) contention that black boxing of categories leads to frozen power hierarchies. Without seeing the sources of power we have great difficulty deconstructing them.

Control, Certainty, and Power

With its statement of "not a LINE in sight" Lotus also promotes erasure of human bodies. What could be the advantage of removing the body from the Internet and from WBI? I claim that this is a way of maintaining control, certainty, and power, a frequent triad. This triad makes itself appear benevolent when it includes safety and convenience as related issues (for example in relation to dorm safety).

Human bodies are messy and fraught with emotional, spiritual and physical needs and desires. They require food, waste disposal, medical care, and protection from extremes of climate. Discipline controls bodies. Virtuality is the extreme form of bodily discipline because it seeks to remove the material body.

Other advertisements add to this image that WBI is an agent of control, certainty, and maintenance of extant power hierarchies. Nature and "natural" reality unlike their virtual counterpart are messy and unpredictable. "Nature" is a locus for contestation of control on the Internet. I have already pointed out how images of nature come into the classroom shackled within the enclosing screen and how computer simulations

masquerade as "experiments" with nature.⁹ Because they are often interactive and constructive, computer simulations appear to be more multifarious than they really are. What is usually forgotten is that the simulation is a mapping or abstraction of materiality. As such, the creator of the simulation produces a synecdoche that represents his selective needs, desires, and interests.¹⁰ Virtual reality is of course "real" but it is a sanitized part of the larger whole.

In summarizing, I briefly review the journal ads. If Philips wants to capture minds and SoftED wants to control what students can do with their computers, the body is gone and the ideal mind is subject to control. Furthermore, SCT wants to run WBI as a business where accountability, inventory control, and profit are the structuring elements. The American Education Corporation promotes software to assess and track students, another aspect of surveillance and control. Profit, an unnamed corporate advantage, looms behind these advertisement discourses potentially sapping the resources of school, families, and municipalities. In sum, control, certainty, and maintenance of power hierarchies are glorified in the advertising for WBI. These images participate in a mechanistic worldview where components, such as the atomic "man", are imagined to be independent of nature, history, or society. Carolyn Merchant relates the development of a mechanistic worldview to the domination of nature when she says:

The metaphor of the earth as a nurturing mother was gradually to vanish as a dominant image as the Scientific Revolution proceeded to mechanize and rationalize the worldview. The second image, nature as disorder, called forth an

⁹ It is true that textbooks also control and shackle nature. The dangerous difference with IT is that we may not as easily recognize the control involved in the multi-media presentations of WBI.

¹⁰ The use of male nouns and pronouns is intentional in parts of this document, not because I choose to perpetuate sexism, but because this language reflects the reality of who does the computer programming, and other creative work in computer science fields.

important modern idea, that of power over nature. Two new ideas, those of mechanism and of domination and mastery of nature, become core concepts of the modern world.(Merchant, 1980/1990, p.2)

WBI as a tool of control often promotes a mechanistic view of the world associated with linear causality and personal atomism. Control and certainty do many things, one of the most damaging is the limiting of possibilities. With perfect control and perfect certainty, there is no evolution, no change, and limited ability to adjust to adverse or unusual situations.

I believe we need to move beyond thinking of certainty, control, and maintenance of power hierarchies as the ultimate goals of WBI. I seek a paradigm for WBI that reflects and supports a different worldview. The worldview I seek is one of organic holism. With organic holism, there is attention to the environment of the student, the embodied affective experience of the student, and other connections of the student to the subject matter, the teacher, and the world at large. I have shown how advertising images promise connection to the minds of others and loss of one's own body. If the current model offers some degree of connection to others, it also reduces meaning, context, and history, which are all contingent upon embodied experience.

Organic Holism

In this dissertation, I meld Deweyan pragmatism with feminist theory in order to form a theoretical basis for examining WBI. In particular, I examine whether disembodiment in WBI is a particular threat to women. I investigate the possibility of diverse experiences in a computer world built by white, middle class men. I explore engaging the other via WBI where projection of self replaces images of the other. I consider what a feminist pedagogy of WBI would look like. I investigate how sense of place exists in the time/space compression of experience with networked computers. I

examine the effects of globalization on diversity of thought. I explore the wisdom of replacing embodied experiences with computer simulations. I query whether domination of nature by technology dooms our world to ecological degradation and destruction. These discussions lead to a different paradigm of technology and WBI.

Sustainable Technology

The paradigm of WBI, I propose, as an alternative to extant WBI is "sustainable" WBI and sustainable "technology". At first thought, sustainable technology seems to be a contradiction. We expect our computers to be obsolete before we take them out of their packing crates. Cars, stereos, houses, and other durable goods also have built in obsolescence. We so frequently encounter, rapidly changing technologies often marketed as throw away for the sake of profit that it is hard to imagine sustainable technologies. Adopting a broader view of technology, where hand tools, knitting needles, writing, language, and sometimes our very selves are all examples of technology in addition to computers, televisions, and space ships renders different possibilities for technology.

Instead of a mechanistic concept of the world where we separate minds and tools from bodies and treat them as self-sustaining entities, I see the world as a system where parts cannot be isolated from their contexts. Timothy Kaufman-Osborn reminds us that artifacts (also called tools or technologies) are projections of human function which then reflect back on their users in a process he calls "reciprocation" (Kaufman-Osborn, 1997). Word processors for instance are projections of human functions that involve recording and interpreting symbols. With usage, humans learn to compose written works differently with word processors than with typewriters or with pens or pencils and paper or with chisels on stone tablets, editing more, depending upon spell and grammar checking software, formatting in ways that are more complex. I write differently with a word processor than I did with a typewriter and thus the artifact changes me. Schools reflect

the use of word processors by putting less time into teaching handwriting and spelling skills and more time into teaching keyboarding and computer literacy. This transaction between people and artifacts is true of all artifacts, even ones as simple and as invisible as shoes, forks, or telephones.¹¹ Humans create artifacts which then "act back upon and so remake their makers" (Kaufman-Osborn, 1997, p.46). We tend to consider digital technologies without considering all that such technologies affect, without looking at the entire trajectory of our digital artifacts. When we focus on truncated trajectories, we risk missing important consequences. An example of a consequence we frequently neglect is the labor pool producing our electronic components.¹² I believe that a connected, sustainable way of talking about digital technologies, one that seeks to understand their trajectories, is more honest, more useful, and more melioristic.

The possibilities I imagine for sustainable technology are those that recognize the projection and reciprocation of technology or put more simply, the social aspects of technology. Sustainable technology supports rich concepts of community and contextuality of humanity. Sustainable technology works with and enhances the dynamic equilibrium of organic holism to strengthen the diversity and plasticity of humanity. Sustainable technology encourages the best of human talents such as communication, creativity, action, and reflection. The goal of sustainable technology is meliorism, the use of human action to improve the human condition.

¹¹ Artifacts lose their visibility with use. For instance when telephones were new, their usage was novel and noticed. Now they are taken for granted and less visible. There are areas where telephones are not common (such as rural parts of northern Africa). Taking a telephone to such a place would be very visible and noticed while taking a telephone to Northern Chicago would not be particularly visible or noticed.

¹² Electronic components are assembled in Asian countries, mainly by women, under sweat shop like conditions (Haraway, 1997).

An example of sustainable technology is mass transit that encourages people to load bikes, baby strollers, and wheelchairs. Such transportation eases the life (at least briefly) of the burdened parent, bicycle rider, paraplegic, or other traveler so that transportation is safe, comfortable, convenient, and even pleasurable for a variety of users. At the same time, this sustainable technology preserves non-renewable resources and environmental quality. This technology serves the needs of humans without neglecting the varied contexts that sustain human life.

Examples of sustainable instructional technology are much harder to find, since sustainability has not been a goal of instructional technology. A hypothetical example of sustainable instructional technology is a computer mediated communication device that builds on and maintains social and community relationships and does not seek to replace them or reduce them to text or talking heads. Such devices are hybrids between technology and human interventions. Such devices bring the student and teacher closer together and foster cooperation and collaboration between students. They help students observe their environment and allow student created simulation of environmental processes as further means of exploration and experimentation. This technology does not depend upon sweatshop labor to fashion and assemble the devices. This technology endures; it is not soon obsolete but is adaptable to different contexts, recyclable, and upgradable by its users. This technology serves the needs of humans by recognizing community contexts, contexts of economic development, contexts of production and consumption, and usage. It is hospitable and open to differences. Some of these goals are met by technology enhanced classrooms where computers and software enrich collaboration with fellow students and teachers and investigations of nature rather than replacing them.

Overview

In this dissertation, as I develop an organic worldview that supports sustainable technology, several recurring issues appear. These issues include control of nature (and the body), loss of bodies, gendered experience, transactions of bodies and tools, and organic holism. I briefly review these issues and their importance to WBI.

Large scale extinctions, acid rain, global warming, holes in the ozone layer, desertification, and rain forest destruction are realities of our time. Degradation of our natural environment must cease. Even those who do not see the value of nature for its own sake must realize that human survival depends upon the survival of nature. I do not find it far fetched to imagine that WBI and its emphasis on disembodiment, simulation, and control of nature contributes to environmental problems.¹³ Students require more contact with nature and more understanding of the inter-relatedness of nature and culture while WBI often encourages less.

Loss of body is an extreme endpoint in the control of nature, since the body cannot be separated from nature. The ability to travel virtually in time and space does not remove the material needs of the body. WBI must consider the repercussions of loss of body and examine the evidence that supports decorporalization of the Internet.

Much effort has been devoted to denying gendered experience in WBI. A strong distaste for recognizing gendered differences prevails among many feminists and non-feminists alike although for vastly different reasons. Yet gendering must be an issue since, at the very least one must recognize that so very few women work as well paid creators of computer technology and so many women work as the poorly paid assemblers

¹³ For other authors concerned with this issue see books by Bower and Heim (1994; 1998)

of computer technology and the poorly paid users of computer technology. Renewed efforts in WBI must disrupt the rapidly hardening gender dualisms.

Transactions of bodies and tools to form cyborgs encourage a new view of WBI. It is a view that potentially unifies dualisms and rids computer technologies of the Cartesian paradigm. It is a view that can enhance the need for connections with nature, culture, and history. WBI must use the cyborg as a helpful and sensitive boundary object.

Organic holism encompasses diversity and the possibility of change. Sustainable technology must serve a diverse population and thus requires diversity of forms and room for experimentation. Diversity is also necessary since it funds possible solutions to new and perplexing problems. Experimentation by students and teachers, designers and manufacturers allows the search for new solutions. WBI must encourage these endeavors.

This need for diversity and fluidity in WBI highlights a pervasive tension between certainty and possibility. Standardization and normalization of learning, guaranteed safety in dorms, control of information, removal of the messiness of bodies, and domination of nature by technology point to a desire for certainty. Certainty strives to stay with a sure thing, cutting off diversity and eliminating future possibilities. This is true of both biology and philosophy. Sustainable philosophy and the sustainability of life require diversity of thought and experience. Experimentation is a way of maintaining such diversity. I postulate that the desire for certainty is a desire that limits possibility.

In this dissertation, I use these reflections to launch a view of WBI from a feminist pragmatic perspective. I apply Deweyan pragmatism and feminist theory to form a theoretical stance to investigate these suggestions and predictions. The outcome is a feminist-pragmatic view of WBI, a view that opens the possibility of feminist projects in WBI. In Chapter 1, I discussed recurring images in the advertising of the tools of WBI. These images form a basis for points I discuss throughout the rest of the chapters

Chapter 2 is a discussion of the pragmatic ethos, an attempt to encompass the organic holism of pragmatism with particular attention to Deweyan pragmatism. Pragmatism is not a dogmatic philosophy. Rather, it embraces many perspectives. Thus, I take a chapter to carefully describe the ethos or character of pragmatism and demonstrate how the parts of pragmatism interact to form an organic whole. I pay particular attention to pluralism, meliorism, continuity, and consequences in addition to organic holism.

Chapter 3 introduces specific instances of feminist theory and melds it with pragmatism. This provides an expansion of the work in feminist-pragmatism done by other authors such as Charlene Haddock Seigfried, Shannon Sullivan, and Timothy Kaufman-Osborn. My particular concerns are for what pragmatism adds to feminism and what feminism adds to pragmatism in order to fortify both. I give attention to aspects of eco-feminism, postmodernism, multi-cultural feminism, and Marxist feminism. The feminist literature is voluminous, as it should be to include the plurality of women. Thus, I will reflect on particular works in feminist literature, discussing specific themes such as feminist experience, disembodiment, cyborgization, domination of nature, and organic holism. I do not attempt to be inclusive of feminist theory but rather use what is helpful for the synthesis of an expanded feminist pragmatism.

In chapter 3, I start with a feminist birth story. Birth from one's mother is one the few experiences we hold in common across culture, time, and place.¹⁴ This story is fictitious yet based on my experiences at the births of my daughter and sons. It melds a uniquely women's experience with the birth of gender and gender's first connections with technology, a pragmatic tale. I next consider woman as body, and discuss the creation of

¹⁴ At least at this time, we all are born from a mother. *In vitro* fertilization is now being practiced and *in vitro* incubation of a trophoblast (early stage of human embryo before it imbeds in the wall of the mother's uterus) to a full term infant may yet replace the up to now indispensable role of the mother's womb.

meaning with and without the body, another pragmatic story. Following the story of the body, I look at the connections of humanity and technology, nature and culture, humanity and culture, a story of Donna Haraway's cyborg in juxtaposition with a pragmatic cyborg that was never called that name. I next use eco-feminism to consider the "nature" of nature, essence, and the domination of nature. Lastly, I consider how pragmatism and feminism come together to form a philosophy of connection.

Chapter 4 provides a description of current examples of WBI. It graphically shows the male gendering of extant technology. I also consider globalization and community formation as I describe the geography of cyberspace and its implications for WBI.

Chapter 5 concludes this dissertation with speculation about feminist-pragmatic projects in WBI. Here, I consider hybrid projects that encompass the best of feminist-pragmatic pedagogy and the best of instructional technology. These projects provide my melioristic hopes for the future. This chapter expands my concept of sustainable technology in conjunction with John Dewey's responsible technology (Hickman, 1992). I suggest steps toward a concept of instructional technology that enrich cultural diversity, community, inquiry, and possibility and thus funds the prospect of better futures for humanity and for existence.

Thus, chapters 2, and 3 create a tool, a feminist pragmatic theoretical stance. Chapters 4 and 5 then use this theoretical tool to view web based instruction.