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Cyborgification is a dual process of fragmenting the human body and decentering subjectivities.

- Jennifer L. Croissant, 1998, p. 285

If every important part of human life — birth, education, sex, work, aging, death — is transformed by intimate connections with technologies, then the language of technology will begin to "invade" the ways we express and perceive these experiences.

- Chris Hables Gray, 1995, p. 6

[W]e are all chimeras, theorized and fabricated hybrids of machine and organism; in short, we are cyborgs.

- Donna Harraway, 1991, p. 150

Introduction

In this paper I consider ways in which the cultural and physical constructions of "cyborgs", organisms that blur the boundaries between technology-mediated experience (mechanical, electronic, medical, etc) and biology, offer sites of emerging pedagogical inquiry in technology education. I use the term "cyborg" as an analytical tool to describe certain social processes in relation to technological / human formations and education. Donna Harraway calls cyborgs, "simultaneously a myth and a tool, a representation and an instrument, a frozen moment and a motor of social and imaginative reality." (quoted in Gray, 1995, pg. 1). The notion of "Cyborg" has been considered from a variety of cultural, social, and scientific positions but they have rarely been directly applied to educational research. While human hybrids have been imagined for centuries in art and literature, the term "Cyborgs" can be traced to two births: in 1960 as a term coined by Manfred Clynes and Nathan Kline speaking of human hybrids that could survive in outer space and again in 1985 with the publication of Donna Haraway's frequently cited "Cyborg Manifesto" (Haraway, 1991) in which she introduces them as a social, political, and analytical tool.

Since the publication of Haraway's influential work, there have been various anthologies

(Gray, 1995, Downey, 1997, Davis- Floyd, 1998) and books (Balsamo, 1996) that have considered the cultural impact (in terms of what processes and social positions are considered "human") of the accelerating technology/biology union. I will draw upon this work to offer a background to my inquiry into the intervention of technology into the pedagogical relationships in the educational media production classes that I teach.

Blurrings, between technology and humans, teachers and students, teaching and learning, are the reoccurring themes of this paper. While much of the cyborg literature has addressed the cultural implications of technology on physical processes like reproduction (Mentor, 1998), this paper will tangentially address this work to highlight the growing areas of cyborg infiltration in postmodern life. I will borrow from this work to examine how the pedagogical spaces of cyborg learning offer sites for educational inquiry in relation to traditional constructions of teacher and student. Specifically, I will focus on my own practice as a teacher of educational new media (e.g. web sites, CD-ROM, videos) to graduate students and explore how computers mediate (cyborgify) the pedagogical space. To accomplish this goal I will imagine the impact on agency of the "cyborgification" of both myself as a teacher and my students.

Like Donna Haraway who believes that the marriage between humanity and technology has already taken place, I argue that we (myself and my students) are already all cyborgs. Because of this, we educators, should consider forms of pedagogy that directly speak to the characteristics of cyborg that I shall lay out in this paper. I will raise questions for teaching technology that speak from the perspective of "cyborg learning". Cyborg learning represents a form of learning that situates the student in a mediated (in this case by computers) learning environment in which students' attention is divided between their interactions with their computers, the teacher, and each other.

A common question that arises when trying to distinguish the uniqueness of a Cyborg subjectivity asks, "Haven't we always been cyborgs using tools to augment human limitations and foster adaptation in various environments?". Cyborgs move beyond tool using by blurring the distinctions between the tools and the biology that they replace, enhance, and transform. The tool and the tool user become increasingly indistinguishable. Cyborgs often don't consider themselves cyborgs because they have reified the technology/biology union. Some use the words "posthuman" and "transhuman" to explain this blending.

Technology is causing the contexts of learning to be distributed across multiple mediated fronts including traditional real time, real place interactions as well as virtual times and places that are interceded by computer hardware, software, and the connectivity to information and access provided by the Internet. Computer-mediated distance education is a very cyborg form of learning. Important to consider in naming cyborg subjectivity, is that at the heart of this construction humans are seen as lacking and limited; they need technology to complete themselves physically, emotionally, intellectually, etc. that they lack. This underlying anxiety will be addressed as a significant pedagogical dynamic in cyborg learning — a dynamic that is worth disrupting and sidestepping through pedagogy.

I claim that traditional education practices rooted in conventional subjective constructions of the student do not yet fully understand the cyborgification of the learner and teacher. The

effects of cyborg attitudes within educational inquiry have rarely been acknowledged by educational researchers. Current educational practices find it difficult to adjust to a mediated pedagogical space in which the teacher has less direct control over the processes and outcomes of learning. Cyborgs distribute their sense of reality across numerous mediated fields including television, computers, and the Internet. These fields represent distinctive but overlapping mediations of an individual's experience. The implications of this sense of reality change the sense of agency that teachers and students possess. While a great deal of educational discourse has advocated the changing role of the teacher from information font to information guide, it is the cyborg learner who represents the praxis between the discourse and actual learning. This praxis highlights the direct implications of what occurs when teachers and students are confronted with changing notions of agency while teaching and learning. The implications represent a very cyborg process. To clarify what I mean by this, I will explain the ways that individuals in western industrialized societies have become cyborgs and cyborg learners.

Cyborg Subjectivities

We are immersed in cyborgs; they saturate our language, our media, our technology, and our ways of being, posing questions we cannot answer about the exact location of the fine line between "mutilating" a natural process in a negative and destructive way and "improving" or "enhancing" it.

In presenting a description of cyborgs, I am not offering essentialized characteristics of real people but instead I am outlining an emerging subjective position that individuals may or may not take up depending on the context of their lives and learning. By their very nature Cyborgs resist definitive characterizations. How individuals take up this subjective positions exists along a continuum. At one end a cyborg subjective position may represent an identity in which a person strongly affiliates their conceptions of self and their relationships with others as cyborg. At the other end people may only take up this position occasionally, for example when they are immersed in more heavily technology-mediated environments like a computer lab. Rather than explaining every point along this continuum, I will present the aspects that I believe impact the learning and teaching that occurs in the classes that I teach.

Cyborgs have come to represent a metonym for the evaporating borders between biological experiences and those mediated by technology. From conception to death western society increasingly clouds the lines between mechanical and biological. Donna Haraway calls cyborgs chimeras, a word derived from the character in Greek mythology represented by a fire-breathing female animal with a lion's head, a goat's body, and a serpent's tail who terrorized the people of Lycia. In biology a chimera is an organism containing genetically grafted, mutated, and altered tissue. In short, chimeras are hybrids. As I use the term, "Cyborgs" as are social and cultural hybrids who are comprised of traditional subjective positions based on gender, race, class, as well as positions derived from their experience with technology and media.

As Gray notes cyborgs are "situated knowledges". To call a social process a cyborg process or someone a cyborg, one must also articulate the technologies and subjectivities that operate

within a given context. The fluid and dynamic social hybridity of cyborgs are best described in snapshots within specific contexts. I will look at the context of teaching computer software to adults in a lab setting without making any other claims. I will identify how cyborg dynamics influence, impact, infiltrate their lives.

Cultural approaches to the cyborg reveal that the distinctions between culture and physical processes are inseparable. Conception and birth are technologized to the extent that parents who do not undergo the battery of tests and processes offered by the western medicine are considered irresponsible and endangering the lives of the baby and mother (Dumit and Davis-Floyd, 1998). These examples illustrate the strong social pressures towards cyborgification. Cyborgs not only confront pressure to adopt technologies but they must also address the anxiety produced by making decisions about their technologies choices

In addition to maintaining affiliations based on traditional subjective positions like race, class, gender, etc, cyborgs cluster around particular technologies. These technological alliances can be as mundane as a religious zeal for a particular computer platform or as significant as the choice of treatment (e.g. traditional or alternative medicine, standard" vs. experimental treatment, etc.) for a life threatening disease like cancer. Cyborgs live in a paradoxical relationship with technology as technology may produce distress while also being capable of soothing it. Within this neurotic desire as Balsamo (1996) articulates, cyborgs dream of immortality and body control. The desires for immortality, body control, accelerated knowledge, etc. all work to form the cyborgs relationship to technology.

Another important component of cyborg's relationship to technology is that to cyborgs technology must always be updated and improved. Dumit and Davis-Floyd call this, "the compelling, addictive quality of our relationship to cyborg technologies..." (1998, p. 1). One example of this cyborg process is the planned obsolescence of personal computers in which there is an artificially produced need (induced by the computer industry) to make a significant investment in time and money to "keep up" with the latest advancements in computer technology. If one does not maintain state-of-the-art equipment and knowledge, then one is at the risk of falling behind the vanguard cyborgs who have access to the latest knowledges. One who resists this technological determinism is often considered a laggard. This might be exemplified in the need to have the most current version of a World Wide Web browser (and the hardware to support it) in order to access all the possible content (and therefore, most "complete" knowledge) that is available on the web. The personal computer represents one venue in which the cyborg drive for constant improvement, in the form of more technologized augmentations, is performed. This idea will be further examined as I explore my own teaching processes.

Technological interventions into biological functions contribute to cyborg consciousness on many levels. Cyborg technologies can be restorative, normalizing, reconfiguring and enhancing (Gray, 1995, p 3). Cyborgs often compulsively seek to understand and improve the technology that pervades their experiences. Some cyborgs adapt to technology and the amendments and limitations that it grafts upon human learning. These cyborgs exist in the same realms as the docile bodies characterized by (Foucault, 1990) whose agency is co-opted by the corporatization of technology. Other cyborgs adapt technology to their own uses. Cyborgs are always in danger of losing their agency to technology. Cyborg learners are

always in danger of confusing their learning of technology with their general learning because technology tends to camouflage itself as the primary object of learning.

Cyborg Learning

While I offered a cyborg subjective position in the preceding description, when I describe "Cyborg Learners" and "Cyborg Learning" I wish to use these terms as analytical tools to describe how this subjective position relates to learning. People, of course, learn in a variety of non-cyborg contexts and styles. I don't wish to deny these ways of learning, but rather to add another emerging way of learning for educators to consider.

"Cyborg Learning" represents a media-rich pedagogical approach that attempts to address an increasing hybridity based upon gender, race, class, sexuality, nationality ethnicity, **and** technology that many future learners increasingly will possess. Cyborg learning can include the desire for technologies (procedures, methods, teaching styles, material) that accelerate learning. Cyborg consciousness is often motivated by a fear of partial knowledge. This is what drives cyborgs to become more cyborg. Partial knowledge is often characterized as knowledge that lacks information. The danger during cyborg learning is confusing information with knowledge, facts with the contextualization of those facts.

Now, I identify some of the important characteristics in talking about cyborgs and cyborg learning. These include "shifting identities", "shifting ideas about reality", "learning in networks".

Shifting identities — In discussing the use of computer simulations by adolescent children Ito observes that "...couplings with virtual environments provide opportunities for alternative embodiment through subject positions enabled by the sociotechnical apparatus. These identities are not ultimately reducible to identities located in "real life", but rather are contingent on the particular semiotic and material technologies mobilized by the game." (Ito, 1998, p. 305) In a cyborg world, identities and subjectivities are not being erased. Cyborgification is not creating a genderless, raceless, classless world, however it is redrawing the boundaries along more complex tangents. Feminist writers like (Balsamo, 1996) have understood the concept as a site of social struggle by arguing that the body is gendered in its interaction with technology.

Shifting ideas of reality — When learning, cyborgs move easily between simulations and 'reality' (Turkle, 1998). Cyborgs make fewer distinctions between real life and representations of real life. During the early 80s, children "...disassociated ideas about consciousness from ideas about life", for the first time there existed the possibility of experience a machine (the computer) as "sort of" alive, to fluidly "cycle through" various explanatory concepts and to willingly transgress boundaries." (Turkle, 1998). This shift in consciousness signifies an important component of cyborg learning. The cyborg learner invests differently in reality compared to the non-cyborg learner. The cyborg learner accepts a fluid oscillation and blending between "real life" and virtual life. One reality is not seen as superior to another. Reality isn't what it used to be.

Because cyborg learners divide their sense of reality among various mediated and real life contexts, concepts of what is real and what is mediated are shifting. Baudrillard

(Baudrillard, 1983) has identified this shift as a simulacrum in which a mediated world and the world that media represent are often indistinguishable. While most individuals have never seen a public figure like Bill Clinton in person, many maintain opinions and perceptions of him through various mediated representations of him including television, radio, and the Internet. These representations are often interpreted by experts who further mediate these representations. Cyborg learners effortlessly navigate between multiple levels of representation. They don't distinguish between what is more real or less real. They think, learn, and work within a distributed consciousness which exist and work within various networks.

Learning in Networks — Cyborgs by my definitions are connected -- they live in overlapping systems. Cyborgs thrive in networks, information networks(e.g. the WWW), business networks, social networks. As Ann Balsamo writes cyborgs represent, "the identity of organisms embedded in a cybernetic information system." (Balsamo, 1996, p. 11) Cybernetic systems represent communications and automatic control systems in both machines and living things. Gregory Bateson argues that a cyborg body, "is not bounded by the skin but includes all external pathways along which information can travel." (Quoted in Balsamo, 1996, p. 11). Cyborg identities are scattered across networks in complex webs. Networks represent connection through affiliation. An important component of Cyborgs and their learning is that Cyborg learning takes place in mediated systems like the Internet while traditional learning theories often isolate individual learners.

Teaching Technology

Given that cyborgs by definition involve human-manufactured technology and (in the most common use of the term) "high" technology, can one be holistic, be organic, be embodied, and still be a cyborg or embrace cyborg modes of living?

To map the cyborg characteristics that I have described onto learning in a classroom is a problematic process . Not only are the borders between technology and machines harder to define, but the borders between cyborg as subjective description and real people difficult to describe without essentializing how people interact with the world. I hope to avoid the latter pitfall without oversimplifying the former processes. Instead of creating this awkward overlay, I will create a juxtaposition in which both description and reality are held side by side to create a space for reflection. A juxtaposition creates a moment in which multiple ideas, constructs, concepts, feelings, thoughts, are seen in relation to one another to help create new meanings and interpretations for both.

Appropriately, I teach new media in a computer lab called the Biology New Media Center, housed in the Genetics Biotechnology Center building on the UW-Madison campus. The center offers a hub of cyborg activity as it supports research in plant, animal, and human genetics. The New Media Lab offers some of the most powerful computers with the largest selection of software on campus for students to learn new media production. where it would be put to much different uses. Cyborg technologies, like genetics, have captured the western imagination and therefore find it easier to locate the funding to create resources like this lab where I teach students how to create educational web sites, videos and CD-ROMs.

The students that I teach are generally new to designing and developing educational media on computers. They come to the class eager to recreate the engaging CD-ROMs and web sites (with multiple media including sound, colorful visuals, video and animations) that they have seen and experienced. They take the course in order to materialize their **own** ideas in multiple media. Yet my students rarely understand the technical complexities that are required to actualize their ideas before they take the class. In the course of the class, their ideas constantly bump up against the limitations of their skills and the limitations of the technology.

It frequently seems that I barely understand the technical challenges presented by students wanting to work through complex educational ideas on a web site or CD-ROM. I spend a great deal of my time trying to understand the technologies involved in the creation of such media and yet I am often acutely aware of how partial and limited my knowledge is as it comes into contact with my student's ideas. The tools are constantly changing. The software is always updated and changed to add more features as the hardware becomes more powerful and capable. Hardware and software are practically never in synch and if they are in synch it is not for very long. Crashes (emotional, intellectual, and technical) are common.

At every moment in teaching with/as/through technology--the pedagogical relationship I stage with students is profoundly unstable. As a teacher I'm constantly at the edge of my own skills, updating, and upgrading the ability to absorb all that's coming at me. My students ask questions and want to do things that they don't know might be impossible at my or their skill level.

In the biotechnology lab, the pedagogical space between the teacher and the student gets blurred and it represents a model example of cyborg learning. This blurred relationship creates subject positions for both teacher and student that go beyond the traditional student/teacher distinctions--because the pedagogical relation itself becomes mediated by technology. I as a teacher can't simply teach about this technology, because we (myself and my students) are always already hooked into the technology. It is always already structuring what I can/can't teach, how I can/can't teach, whether I can teach at all (crashes, hardware problems, connectivity issues, software incompatibilities etc). In the biotech classroom we become cyborgs in terms of how the software we're using takes up/invades/inhabits/structures/hybrids our conceptual spaces as teachers and learners. The ways we conceptualize things, talk about things, teach things, and learn things is always already structured in, through, and by the software, hardware and learning environment that we're interacting with, using, and being used by. In the biotechnology lab, students don't face each other or the teacher, they face their computers. They're hooked into the keyboards, they're using and being used by the hardware software. The aesthetics of the room, including the lighting and layout, make it easiest for students to see their own computers and the large screen at the head of the room that is used to demonstrate computer software.

At times I think the technology often robs me of my ability to teach effectively by displacing ALL other learning besides its specialized languages, characteristics and unpredictable behaviors. It is often difficult to fluctuate between thinking like a computer to thinking like a teacher of computers. But I must realize that as a Cyborg teacher, the technology will always be just out reach of my comprehension and control. Cyborg teaching is made unstable and

unpredictable by technology, yet I work to avoid allowing technology to become THE lesson. My questions about seeing this as an example of cyborg learning include: Where can I, as teacher, have agency? Where will that agency end/ fail in the face of the technology stealing/tripping up that agency? Where can students have agency as learners? Where are they thwarted by technological meltdowns, complexities, my and their own ignorance.

On the surface, my students might not appear to be "cyborg learners". They are adults who may not move as seamlessly between the various levels of mediation that I have laid out as distinctly "cyborg". Yet, they are made cyborg by the computer mediation of the work that they are trying to accomplish. Students take up subjective positions from various points of reference. As I mentioned cyborgs can be defined and led by the technologies that they engage with or they can define themselves through the technology. This is where I argue that students can find agency in their "cyborg learning".

In discussing agency in relation to cyborg learning it is helpful to come back to the work of Donna Haraway. She imagines a cyborg coyote or trickster that refuses technological determinism by "defying their founding identities as weapons and self-acting control devices, thus trying to trouble U.S. Cultural commitments to what counts as agency and self-determination for people-and other organisms and machines (as quoted in Gray, 1995, p. xvi.) Her cyborgs are not innocent and they "...do not stay still." (Gray, 1995, p. xix). Her cyborgs are the antithesis of the Star Trek species, The Borg, who assimilate into their collective thousands of species across the galaxy rallying behind their monotone threat, "Resistance is futile". Perhaps resistance to Cyborg co-optation of learning is futile but there are other ways to sidestep technology's assimilation of the learning process.

While teaching students in the New Media Lab I work with them to resist, work against, and deconstruct their positioning as docile cyborgs by searching for pedagogies that invite new and unintended cyborg subjectivities--parodic cyborg learners, ironic cyborg learners, bricolage-ing cyborg learners - cyborg learners that use technology in ways it was never intended to be used (in relation to their biological bodies) and who use their biological bodies in ways not intended to be used (in relation to technology). I try to help students define the technology for themselves.

While there exist countless ways for cyborgs to sidestep the loss of agency that technology threatens, I will explore three kinds of positions; parodic, ironic, and bricolage-ing, that have emerged in my students. A parodic cyborg meets, diffuses, and contextualizes technology with humor; an ironic cyborg understands the paradoxical quality of technology to create problems while it solves them; and a bricolage-ing cyborg is able to improvise technology according to their own uses. At times I facilitate the development of these positions, and sometimes students find their own path to them, but most often we find them together. At times students experience this kind of cyborgness as a progression from one to other, in other instances they experience them all simultaneously, while at others they may only want or need to experience one. Every student is different. A more detailed description of these three types of improvising, sidestepping, trickster cyborgs will be helpful in clarifying some of the pedagogical strategies that I attempt to accomplish with my students.

Parodic Cyborgs

A parody imitates an idea, cultural product, individual, political position, overemphasizing particular characteristics in order to highlight, and ultimately to scatter the rhetorical, social, cultural power they hold. A frequent bi-product of a parodic interpretation is the creation of humor which has the capacity to defuse technology anxiety and technological determinism and put it into new perspectives within someone's daily life. Learning with, through, and by technology I often stress to students that it is important to maintain an ability to see and appreciate the ludicrous and absurdly incongruous nature of our relationship to technology.

As mentioned, cyborg learners are often in danger of confusing their learning of technology as the only aspect of learning. Humor helps to displace this tendency. I tell students if they want to be able to create a certain effect or a particular type of interactivity then they will need to spend the rest of semester, at the exclusion, of other aspects of their lives, to materialize that idea. I point out (in what seems like an exaggeration to them) the time and energy that it will take them to be able to accomplish their ideas through media. The joke often becomes a reality to them as they work on project and spend a whole day or weekend making one web page look close to what they have in mind. It is then that they often experience the irony that is at work in their position as Cyborg learners.

Ironic Cyborgs

An ironic cyborg is able to see the incongruity between the promise of cyborg technologies and what these technologies actually offer them. An ironic cyborg recognizes those moments when their relationship with technology is not equitable and that what they give in learning and struggling through the learning of a technology is not always what they get back from the technology. Often the return is an agenda to learn more technologies.

There are times when I must make myself ironic to students when I find myself at various moments positioned as a docile cyborg abdicating my agency as a teacher and computer user. This is often exemplified while enacting a significant component of the course pedagogy that stresses to students that the ideas they try to express are much more important than their ability to express those ideas. Even if they can't make something happen technically, they are encouraged to think about who their audience is and how they represent their ideas to that audience. Often, however, when I'm the midst of helping them with a technical problem, I'm barely considering their ideas. Solving the technical problem becomes subordinate to all other concerns. Through practice I've come to recognize these times and now try to make myself ironic at these moments by showing to students how I've been positioned.

Often, I joke with students and say that when the newest version of a particular piece of hardware or software is released that the problems that they are having will cease. A repetition of this joke starts to reveal its irony, becoming clearer as students realize that upgrades often make a part of their knowledge instantly obsolete and create other unanticipated problems such as new incompatibilities with other hardware and software. Students begin to understand that technology is created by other humans, frequently with commercial interests, and that there is nothing inherent in a technology that predetermines their learning. The ironic cyborg learner realizes that using the tools at hand in new ways, in unintended ways, is maybe more desirable than adding yet another tool to their repertoire. They become Bricolage-ing Cyborgs.

Bricolage-ing Cyborgs

Bricolage has been taken up by various disciplines, including art, anthropology and cultural studies to mean behaviors and techniques that are used to trouble and reorganize discourses. Quoting the Concise Oxford Dictionary of Literary Terms (Paley, 1995) uses the term in its artistic sense, "as an analytic method that reflects its definition as a "term of improvisation...sometime applied to artistic works in a sense similar to collage: an assemblage improvised from materials ready to hand, or the practice of transforming 'found' materials by incorporating them in a new work." Bricolage-ing cyborgs are able to put technology to their own uses. They multiply the meanings of learning with/through technology, instead of allowing those meanings to be narrowly defined by software, hardware, computer lab classrooms. They work with the software and hardware at hand in order to materialize their ideas rather than constantly searching the horizon for the promises of approaching technologies.

I try to model an approach to computer-based media production that acknowledges that there is always more than one way to do something with computers. As I'm demonstrating software, problems invariably arise. The software crashes, the hardware fails or a student asks a question that I can't answer. I try to verbalize my problem solving processes as I move the mouse across the screen. I attempt to show that I don't always use the software to create the most efficient solutions to problems. A bricolage-ing cyborg is not efficient in the traditional sense of the word in which they find the fastest most direct way to accomplish a task on the computer. They are efficient in that they find the solutions that make the most sense to them.

Bricolage-ing cyborgs are always looking for alternate routes to the destination; their use of computers stresses being flexible with the technology, but not being flexible for the technology. I try to match the tool with the user by introducing the student to the tools that best fit their ability, knowledge, hardware at home, identities, personalities etc. It is easier to say, "You need to learn x software or have x kind of hardware." rather than to say, "OK let's see what YOU have and know and work from there."

Bricolage-ing Cyborgs are able to move between "low tech" and "high tech". They understand that sometimes it's easier to use a pencil to work through an idea rather than to turn on the computer. Bricolage-ing cyborgs know when to step away from the computer because it not longer meets *their* needs. The step away from the technology can be as important as the step towards the technology for the sidestepping, trickster cyborg. As a teacher, I must resist the tendency to think of a computer solution to every pedagogical issue that student's raise.

Conclusions

My discussion of the various ways that teachers and students can find new forms of agency in their teaching and learning with technology stressed different strategies that I use and students develop to define and redefine our relationship to the technologies that we work with. Thinking about myself and my students in term of "cyborg" allows me to foreground how my teaching has become indelibly inscribed by technology. In other words, it has taught me that I can never be a "pure" teacher in the biotech lab, and my students can never

be "pure" learners. Those subjectivities blur as they relate to each other and to the technology in the room. We have become cyborgs, but there are many entry **and** exit points into cyborg.

Locating those several entry and exit points through ironic, bricolage-ing, and parodic turns around common cyborg discourses make it possible for me, as a teacher, to imagine a pedagogy that avoids a docile / agentful binary. This bifurcation is disrupted and exploded at the very moment that the technology that infuses the pedagogical space breaks down, my understanding of the technology fails, and the lines between teacher and student become indistinguishable. Each moment a pedagogical trajectory is blocked, the choices to respond to the obstacle extend in all directions as a result of pedagogies that refuse to fix students subjectivities and that move beyond binaries about agency. These choices not only present themselves in routes that take the learning deeper into avenues populated by technology, but in directions that allow us to move away from technology. These routes offer the promise of a relationship with technology that moves towards, with, and at times retreats from technology.

Considering multiple entry and exit points into cyborg reframes future questions about cyborg teaching / learning in more useful ways (i.e. away from docile/agentful, literate/illiterate, teacher/student, vanguard/laggard towards multiple and simultaneous cyborg subjectivities many of which have not been thought of yet.) These emerging conceptions of cyborg may help facilitate the possibilities that allow one to, "be holistic, be organic, be embodied, and still be a cyborg." In other words they can allow educators to consider the complex interplay between technology and learning while maintaining the capacity to embrace, reject, join and retreat (in varying degrees) from the introduction and diffusion of existing and emerging technologies.

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